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LA MODERNA ODONTOIATRIA

TRA TECNOLOGIE AVANZATE E UMANIZZAZIONE

CATANIA 20-22 APRILE 2023

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Collegio dei Docenti Universitari di discipline Odontostomatologiche ETS

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tra tecnologie avanzate e umanizzazione

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SUMMARY/SOMMARIO

LONG TERM DENTAL STABILITY AFTER ORTHOGNATIC SURGERY: AN ANALYSIS REVIEW OF THE LITERATURE

Cauli I., Filetici M.T., Usyk E., Brilli D.

Aim: the aim of this literature review was to evaluate the long-term dental stability after orthognathic surgery, by evidences available in the literature.

Methods: an electronic search was performed on PubMed (Medline), using the keywords: "Dental Stability" AND "Orthognathic Surgery".

Systematic reviews, RCTs, longitudinal controlled clinical trials written in English, from 2013 to 2023 have been included. Scientific articles not completely related were automatically discarded.

According to these eligibility criteria, 8 articles were selected.

Results: long-term dental stability after orthognathic surgery is a controversial topic in the literature. It is influenced by multiple factors such as patient-related, orthodontic and surgical aspects.

According to the findings from this review, several risk factors for dental relapses after orthognathic surgery are described in literature as: surgical complications, poor occlusal stability, large OB, negative OVJ, deep curve of Spee.

Different studies suggest variability of dental stability in both skeletal class II and III patients. In general, OVJ tended to increase in skeletal class II and decrease in skeletal class III patients over time, independent of the type of osteotomy or direction of movement performed. Overbite increased in class II patients, whereas class III showed variable results.

Conclusions: in conclusion, current evidences suggest that to reduce relapses, risk factor should be prevented. Further, about the different surgical procedures and dento-skeletal outcomes, more studies are required.

NASAL PROSTHESIS RESTORATION IN A PATIENT WITH A SURGICAL RESECTION OF THE NOSE

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Aim: a 60 years-old patient with a surgical resection of the nose due to squamous cell carcinoma, needs to restore the defect with a facial prosthesis. Digital technologies are employed in this case report.

Methods: face scanner: Artec Space Spider (Artec 3D Lussemburgo) is a high-resolution scanner with a 1 mln point/s. Digital impression is rendered by the software Artec Studio Project, allowing the creation of a 3D model.

Sculpting: Zbrush software (Pixologic Inc., Los Angeles, CA) is used for artistic objects. The modelling of the nose is made by tools and brush.

3D Sprint: is a software for editing, management and optimised workflow for printing objects. 3D System Print (Rock Hill, SC USA): Nexdent 5100-3D System is an LCD high resolution printer combined with printing materials for medical device biocompatible. LC-3D SystemPrint Box UV Unit (Rock Hill, SC USA): is used to post-curing the photosensitive material.

Results: using the brand-new digital technology, a device to test out a nasal prosthesis has been made. A very precise facial prosthesis is made using digital impressions taken with facial scanners, software sculpting, and 3D printing. The patient's nose try-in demonstrates the defect's accuracy along the edge, and the patient confirms the aesthetic shape.

Conclusions: maxillofacial prostheses are required to restore facial defects caused by cancer- related surgical resections. New technologies assist producing try-in prostheses that are effective and efficient as well as a less invasive method for detecting impressions.

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GORHAM-STOUT DISEASE IN MAXILLARY BONE, DIAGNOSIS AND NONSURGICAL TREATMENT: A CASE REPORT

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Aim: Gorham-Stout Disease (GSD) is a rare lymphatic disorder which results in bone destruction. The treatments for GSD include drugs therapies and/or radiation and surgical approach. The aim of this study is to report a non-surgical case successfully treated with bisphosphonates.

Methods: a 67 years-old female patient presented facial asymmetry, localized pain to the right maxilla and both vertical and horizontal diplopia. The OPG, the CT and the MRI revealed the presence of an osteolytic lesion involving the zygomatic arch, the orbital floor, the alveolar process and the maxillary sinus. Medical therapy with intravenous zoledronic acid (4 mg every 28 days), vitamin D and calcium carbonate was administered for six months. The patient, with a monthly recurrence, had to check her calcium and creatinine levels. OPG, CT, and MRI were performed alternately every two months for one year to follow up the evolution of the disease.

Results: the patient referred absence of pain without adverse effects and clinical improvement. Radiologic findings confirmed the quiescence of osteolytic phenomena. After one year of therapy no sign of disease progression was observed so medical therapy was interrupted.

Conclusions: maxillofacial surgeons and dentists play an important role in identifying this pathology and should include it in the differential diagnosis of any osteolytic process of the jaw.

DIGITALIZATION OF IMPLANT-PROSTHETIC REHABILITATION IN NOSE CANCER: A CASE REPORT

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Aim: facial rehabilitation in H&N cancer patients has been improved by use of endosseous implants, providing a long-term reliable option for reconstruction. Piezoeletric implantology – with the ultrasonic implant site preparation (UISP) – can be used to improve a faster tissue healing and to maximize primary stability, empowering early loading of implants. The clinical case consists of using of the UISP for the placement of two implants in the anterior maxilla in a patient with nose cancer. The aim is to apply UISP and digital planning to reduce surgical risk and optimize bone healing, allowing shorter rehabilitation times.

Methods: the case study started with the computer-aid surgical planning made on the CBCT. The patient underwent a partial rhinectomy including the tip of the nose, leaving the anterior margin of the upper maxilla free from neoplasia. Then the UISP was performed with piezoelectric inserts and the implant placement was carried out with the dynamometric lever. After, the MUAs were inserted, and the optical impression was taken.

Results: one month after surgery the provisional removable nasal epithesis supported by peek extensions screwed on implants was delivered. The final nasal prosthesis will be constructed after the end of radiotherapy.

Conclusions: the use of the UISP together with the digital planning allowed to achieve primary stability, granting a simplification of the surgical steps and a rapid esthetic rehabilitation, which is essential for the patient to return to the social sphere in the least shattering way possible.

ITALIAN SCIENTIFIC PRODUCTION IN DENTISTRY: A BIBLIOMETRIC ANALYSIS FROM 1993 TO 2022

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Aim: in the last decades, Italian scientific production has grown in different areas of medical sciences, including dentistry. Understanding the trends and patterns of scientific output in dentistry can provide insights into the research interests and priorities of Italian dental researchers, as well as identify potential areas for future research. The aim of this study was to perform a bibliometric analysis of scientific production by authors with Italian affiliation from 1993 to 2022.

Methods: a search was conducted until December 2022 for all articles published in journals indexed under the Scopus category "Dentistry", with at least one author affiliated with an Italian institution. The bibliometric data was extracted and summarized for analysis. Additionally, a comparison of scientific production across three different decades (1993-2002, 2003-2012, and 2013-2022) was conducted.

Results: the study identified 16305 records published in 434 different sources, with an average annual growth rate of 10.2%. The year 2020 saw the highest number of published articles (1038), while the highest number of citations (180688) was collected in the decade 2003-2012.

Over time, the average number of authors per article has increased from 4 to 6.

The University of Milan was the most productive affiliation, while Minerva Dental and Oral Science (formerly Minerva Stomatologica) and Dental Cadmos were the most productive sources. Furthermore, a co-occurrence analysis of author keywords revealed changing topic interests over time.

Conclusions: the total number of publications increased steadily over the years, as did the mean number of citations per year.

However, this analysis is limited to publications in the Scopus database, and further studies are needed to evaluate the quality and impact of Italian dental research and identify areas for improvement and investment.

EFFECTS OF SURGICAL TREATMENT ON MANDIBULAR CONDYLAR FRACTURES WITH HEAD DISLOCATION

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Aim: a radiological classification is necessary to evaluate the topography of mandibular condylar fractures and the grade of displacement of the condylar head and then to decide the treatment, which can be surgical or non-surgical. This study aimed to assess the grade of displacement and to understand its correlation to the success or failure of the surgical treatment.

Methods: CT scans of 34 surgical patients with 40 mandibular condylar fractures were collected before and after surgical treatment. Topography of fracture and displacement of condylar head with regard to the glenoid fossa were analyzed using the AOCMF Level 3 Classification System for Condylar Process Fractures. The grade of displacement was recorded pretreatment and 6 months after treatment.

Results: condylar base fractures were the most common (65%), followed by neck region (30%) and condylar head (5%). Before treatment, absence of displacement was observed in 17.5% of fractures, while displacement and dislocation were 65% and 17.5%, respectively. A complete resolution of displacement and dislocation was found in all patients that underwent surgical treatment.

Conclusions: a radiological classification is useful in order to highlight topography of mandibular condylar fractures and the grade of displacement of the condylar head and then to decide the type of treatment to choose. Surgical treatment has proven to be effective in treating displacement and dislocation.

COST-EFFECTIVENESS ANALYSIS OF ENDOSCOPY *VS* GLAND EXCISION FOR SIALOLITHIASIS TREATMENT

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Aim: sialolithiasis is one of the major diseases of salivary glands. For many decades, gland excision represented the treatment of choice. In the last years, attention has been focused on more conservative approaches, making sialoendoscopy increasingly used for diagnosis and treatment of sialolithiasis. The aim of present work is to compare the two approaches in terms of costs and effectiveness.

Methods: a decision tree with two branches, Sialoendoscopy and Sialoadenectomy, has been modelled using TreeAge Pro software. Costs were obtained from hospital services tariff of Campania region (Italy). The effectiveness of each intervention, expressed in Quality Adjusted Life Years (QALYs) was estimated basing on the available literature. Surgical outcome probabilities (success, failure, complications, recurrence) were extracted from a database, containing 248 patients with sialolithiasis treated with sialoendoscopy (150) and sialoadenectomy (98) at University Luigi Vanvitelli.

Results: the sialoendoscopy resulted to be a cost-effective approach, characterized by lower cumulative costs (2276 *vs* 3246 €) and greater utilities (0.97 *vs* 0.96 QALYs), compared to gland excision, even if accompanied by a lower success rate (56%) after first endoscopy and requiring re-intervention in 21% of cases, in comparison to almost 100% of resolution after gland excision.

Conclusions: sialoendoscopy should be considered as primary approach for the treatment of sialolithiasis, since it provides economic benefit and better quality of life for the patients.

QUALITATIVE AND QUANTITATIVE AUTOMATED 3D ANALYSIS ON ACCURACY OF FACIAL SCAN

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Aim: the aim of this study was to evaluate the accuracy of three-dimensional (3D) facial scans taken with a facial scanner App available for iPhone.

Methods: twelve patients requiring large field of view CBCT scans were enrolled, and 3D facial scan was acquired at the same moment with a facial scanner App for iPhone (EM3D) by rotating the phone around the patient's head. The software 3D Slicer was used for the qualitative and quantitative analysis. An automated surface registration was performed using the soft tissue segmentation of the CBCT as reference. The 3D model obtained by the App was superimposed with the 3D model of the CBCT scans for each patient, recording linear and volumetric differences with automated tools. Fifteen soft tissue landmarks were also identified on each model, and linear and angular measurements were calculated. Statistical analysis was performed setting $\alpha = 0.05$.

Results: patients requiring CBCT scans for severe dentoskeletal malocclusions were included. Statistical analysis showed accuracy between CBCT scans and 3D facial scans. The average value of linear differences between the 3D CBCT models and the 3D facial scans was 0.218±1.814 mm. No statistical differences in comparing the two models were recorded neither for linear nor for angular measurements ($p > 0.05$).

Conclusions: three-dimensional facial scans taken with facial scanner App showed negligible differences and a good clinical accuracy when compared with CBCT scans.

CAN FACIAL SKELETAL ASYMMETRY HAVE AN INFLUENCE ON UPPER AIRWAY MORPHOLOGY?

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Aim: a three-dimensional (3D) analysis of the upper airway morphology was conducted to compare Class III patients with and without skeletal asymmetry.

Methods: a retrospective study was designed to collect Cone-beam computed tomography (CBCT) scans of patients with Class III malocclusion. Mandibular deviation higher than 4 mm was the primary predictor variable to distinguish symmetric group (SG) and asymmetric group (AG). Using Slicer3D software, 3D reconstruction of the upper airways was generated and different models were obtained according to different anatomical areas (nasal cavity, nasopharynx, velopharynx, and glossopharynx). Volume and minimal cross-sectional Surface were calculated as outcomes. Statistical analysis was performed setting $\alpha = 0.05$.

Results: the study included 28 patients in AG and 30 patients in SG (mean age 28,1). Descriptive statistics showed higher values in the SG compared to AG for each variable. Minimal cross-sectional Surface didn't show any statistical significance neither in the total evaluation, not in the different areas of interest ($p > 0.05$). The total volume was significantly higher in SG compared to AG ($p < 0.05$). Linear regression model showed a positive significative correlation between the total volume with the glossopharinx volume, with the minimal surface of the total upper airways, and with the minimal surface at velopharinx ($p < 0.05$).

Conclusions: upper airways morphology in class III patients could be slightly influenced by skeletal asymmetry. Prospective studies with breathing assessment should evaluate the clinical relevance.

CUSTOM-MADE SUBPERIOSTEAL IMPLANTS FOR PROSTHETIC RESTORATION IN SEVERELY ATROPHIC JAWS

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Aim: subperiosteal implants were introduced in 1941. Poor clinical results led those implants to be progressively abandoned. This study aimed to evaluate an operative and surgical procedure for the application of custom-made 3D-printed subperiosteal implants for fixed prosthetic restoration of severely atrophic jaws to minimize complications.

Methods: between January 2017 and December 2021, all patients who presented to our department with partially and total edentulous jaws, who did not want to undergo bone regenerative procedures or were not eligible to other rehabilitation treatments, were included in this study. These patients were rehabilitated with custom-made subperiosteal implants, designed from CBCT and fabricated in titanium. Evaluation was carried out using a questionnaire before the treatment and one year after the treatment for four items: Chewing, Esthetic, Fonetic and Comfort. All patients were followed up for 1 year after surgery.

Results: 18 patients, were included in the study. At the one-year follow-up, no implants were lost (survival rate 100%). One implant presented late minor complication with slight exposition (2 mm) of the implant. The final complication rate amounted to 5,6% (one out of eighteen patients). In the entire sample, the post-operative questionnaire score increased for all four items.

Conclusions: this surgical technique may represent an alternative treatment procedure in patients with severely atrophic jaws, since it permits to avoid of regenerative bone therapies. Further studies are needed to confirm these outcomes.

CHANGES IN THE UPPER AIRWAYS MORPHOLOGY IN RELATION TO ORTHOGNATHIC SURGERY

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Aim: this pilot study aimed to evaluate the 3D modifications of the upper airway morphology after orthognathic surgery, correlating the results with the amount of the jaws' displacements.

Methods: pre-surgical (T1) and 1-year post-surgical (T2) CBCT scans of adult patients with skeletal Class III malocclusion were collected. 3D Slicer and Dolphin Imaging software were used for the 3D analysis. After T1 CBCT orientation, T2 CBCT was automatically registered selecting the cranial base as the reference area of superimposition. Automated landmarks identification was performed to determine the maxillary and mandibular movements in all three spatial directions. Automated segmentation of the upper airways was generated, and different models were obtained (nasal cavity, nasopharynx, velopharynx, and glossopharynx). Automated quantitative assessments allowed to calculate the volume and the minimal cross-sectional area at T1 and T2. Statistical analysis was performed ($\alpha = 0.05$).

Results: the study included 15 patients. Descriptive statistics showed higher values at T2 for all measurements with an increasing trend after surgery. However, no significant difference in volume and area was recorded comparing the two timepoints ($p > 0.05$). Linear regression showed that the upper airways surface is negatively correlated with mandibular setback, whereas the volume is directly related to area's changes ($p < 0.05$).

Conclusions: preliminary results indicated that orthognathic surgery may influence the upper airways morphology in patients with class III malocclusion, mainly after mandibular repositioning.

MMA IN PATIENT WITH SEVERE OSAS: "SURGERY FIRST" APPROACH AS AN IMMEDIATE SOLUTION

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Aim: in the present study the authors discuss the application and the reliability of "Surgery First" approach as an Alternative for Maxillomandibular Advancement (MMA) in patients affected by severe Obstructive Sleep Apnea (OSA).

Methods: a 23-year-old male patient diagnosed with OSA, based on an apnea-hypopnea index (AHI) score of 51,8. He was affected by Class II malocclusion with hypodivergent pattern, a brachycephalic biotype, and short mandibular condyles. Initial cone-beam computed tomography (CBCT) showed a reduced upper airway diameter. "Surgery first" approach followed by orthodontics, was chosen.

Results: an immediate improvement was observed in the soft-tissue profile after surgery. The postsurgical CBCT showed an increase of more than 100% in upper airway diameter. Post-treatment records confirmed that we had optimized the patient's facial and dental esthetics, improved the overjet and overbite, and aligned the dental arches. Polysomnography exams were performed before and after treatment. An overall follow-up of 6 months was performed, demonstrating an apnea hypopnea index (AHI) reduction from 51.8 events/hour to 8.8 events/hour, oxygen desaturation index (ODI) 8.3 events/hour. No complications were reported at 6 months control.

Conclusions: the "Surgery first" approach is an excellent treatment option for the correction of skeletal dysplasia and can immediately address the problem without presurgical orthodontic treatment.

CAD/CAM RECONSTRUCTION AND IMPLANT SURGERY, IN MAXILLARY RESECTION AND FREE FIBULA FLAP

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The free fibula flap is a reliable approach used to reconstruct maxillofacial osseous defects. CAD/CAM maxillary reconstruction with FFF and dental implant is a surgical technique which can allow the achievement of esthetical and functional rehabilitation.

Aim: the present study analyzed the possibility of proceeding with maxillary resection, maxillary reconstruction, and dental implant surgery in the same surgical procedure, evaluating: 1) the discrepancy between the pre-operative virtual plan and the post operative results obtained by computer tomography (CT); 2) patient satisfaction; 3) peri-implant tissue health.

Methods: seven patients have been treated by means of free fibula flap maxillary reconstruction, together with the insertion of 20 dental implants. A computer tomography was performed between 60 to 360 days after reconstructive surgery and has been compared to the virtual planning. Peri-implant health has been evaluated during the follow-up period with a periodontal probe and periapical radiographs. Patient satisfaction has been evaluated with specific questionnaires.

Results: the virtual planning of all seven patients allowed to proceed with prosthetic dental rehabilitation

The mean score for patient satisfaction was 7.8 (on a scale from 0 to 10). Furthermore, the analysis of peri-implant tissue health showed a high implant survival rate (90%).

Conclusions: within the limit of the sample size and the short follow-up, the results of this clinical study are encouraging mostly because this surgical technique allows shorter rehabilitation time and better life being for oncological patients.

THE USE OF THE "HUGHES FLAP" FOR THE RECONSTRUCTION OF DEFECTS OF THE LOWER EYELID

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Introduzione: a seconda del coinvolgimento del margine palpebrale orizzontale, sono state utilizzate diverse tecniche per la ricostruzione di difetti palpebrali a tutto spessore. Questi includono il lembo di rotazione semicircolare Tenzel, l'innesto tarsocongiuntivale libero, il lembo di rotazione della guancia Mustardé ed il lembo tarsocongiuntivale (procedura di Hughes). L'utilizzo del "lembo di Hughes" o lembo tarso-congiuntivale, è una tecnica chirurgica per la ricostruzione di difetti della palpebra inferiore, a tutto spessore, in caso di asportazioni oncologiche. L'asportazione può interessare fino alla totalità della palpebra inferiore e l'intervento si prefigge di ripristinare anatomia e funzione con il miglior risultato estetico possibile.

La procedura di Hughes modificata è una tecnica adatta per la ricostruzione dei difetti della palpebra inferiore che interessano fino al 100% della lunghezza orizzontale della palpebra. Lasciare il muscolo di Müller attaccato al lembo di Hughes previene la deiscenza prematura del lembo senza aumentare a sua volta la frequenza delle retrazioni della palpebra superiore. L'utilizzo di un innesto cutaneo libero o di un lembo di avanzamento pelle-muscolo per la ricostruzione della lamella anteriore sembra essere insignificante per il risultato estetico-funzionale.

Conclusione: verranno descritte la nostra esperienza a partire dal flow chart decisionale per la scelta della tecnica ricostruttiva e verranno riportati una serie di pazienti trattati al fine di evidenziare le ottime caratteristiche ricostruttive del lembo di Hughes.

UNDERWOOD SEPTA AND CORRELATION WITH THE SCHNEIDERIAN MEMBRANE IN ALTO ADIGE'S POPULATION

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Aim of this investigation is to evaluate prevalence, localization, and height of 120 maxillary sinus septa by using cone-beam computed tomography scans. The study was conduct on the population of Alto Adige.
The thickness of the mucosa has been measured together with the variations of the membrane in relation to those septa.
A total of 240 maxillary sinuses have been considered. Septa were identified using "panorex" reconstructions and axial scans of cone-beam computed tomography using the software "NewTom" The thickness of the mucosa has been evaluated in the paraxial scans and related to those septa where they were present. In the current study, the prevalence of sinus septa is 38.3%.
Significant difference can be found in the height of primary and secondary septa. The mean height of primary septa was 5.7 mm ("1.19) and of secondary septa 3.2 mm ("1.6). Anterior and medium septa resulted significantly higher than posterior septa (P.0.003).
The medium thickness of the mucosa was 0.73 mm ("0.58), whereas close to the septa it turned out to be 1.8 mm ("1.87). The difference is statistically relevant (P.0.003). There is no statistically significant proportional relation between dimensions of septa and thickness of mucosa (P.0.53).
Underwood septa are frequent anatomic variations of the maxillary sinus. Their presence may result in a thickening of the sinus membrane. The systematic study of radiographic anatomy of maxillary sinus is necessary before the sinus lift surgery planning.

SIMPLE MINIMAL SAFE TECHNIQUE IN THE SINUS LIFT WITH APAG GEL: A CASE SERIES

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Aim: in the last 20 years, technological evolution in the regenerative field has made it possible to exploit growth factors and platelet concentrates. Simultaneously, the transalveolar techniques have become increasingly predictable and reliable, leading to the additional advantage of simplified procedures. The aim of this study is to evaluate the effectiveness of a new technique to lift the maxillary sinus through a transalveolar approach, Simple Minimal Safe (SMS), with use of activated plasma albumin gel (APAG).
Methods: a total of 33 patients (22 female and 11 male), aged between 36 and 79, were selected for this study. 44 implants were positioned using the SMS technique in the premolar or molar areas of the maxillary bone (dental elements: 15, 16, 17, 24, 25, 26, 27). The surgical technique was performed in flapless mode with the use of a mucotome and a first drill (2 mm of diameter), in order to perforate the sinus cortex and then inject the APAG gel. No implant was lost during the follow-up period of 6 months and all implants were then prosthetically loaded.
Results: the average bone gain was 4.43 mm. Analyzing the data considering the sex, implants in women had an average gain of 4.66 mm, while in men the average gain was 3.83 mm. Thanks to the SMS technique, we reached a reduction in postoperatory morbidity and in the frequency of Schneiderian membrane perforation.
Conclusions: maxillary sinus augmentation via the transalveolar approach has demonstrated the predictability and the fluency of the surgical procedure due to less operator-dependent processes.

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MEDICATION-RELATED OSTEONECROSIS OF THE JAWS IN OSTEOPOROSIS AFFECTED PATIENT

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Aim: the aim of this study is to demonstrate the importance of centers for osteonecrosis prevention. In our hospital clinic, we have dedicated a special assistance and care service to patients undergoing treatment with bisphosphonates and other anti-resorptive drugs.
Methods: a 77-year-old woman, referred by her dentist for a fistula in the 14-15 area, painful on palpation, noticed after the extraction of root 13, performed almost a year earlier, has been taking bisphosphonates orally since 2005 for osteoporosis. After repeated abscess episodes and cycles of antibiotic therapy without resolution of the clinical picture, she came to our attention. A CBCT was prescribed to better define the contours of a possible right jaw osteonecrotic lesion, which was later confirmed. Therefore, it was necessary to remove the bone sequestrum and extract the residual roots of 22, 23, 24, in broad-spectrum antibiotic therapy, full dosage and prolonged.
Results: at the follow-up, the site of the intervention shows good healing of the mucosa and stable oral conditions. This case demonstrates the importance of the diagnostic interception program, based on an in-depth medical history and follow-up aimed at protecting the quality of life of these delicate patients.
Conclusions: every single patient candidate for or undergoing treatment with anti-resorptive medications must be evaluated with the utmost caution, especially in the presence of systemic health disorders such as diabetes, rheumatic or autoimmune diseases, and the intake of cortisone or other drugs considered ONJ-promoting.

ULTRASONIC SURGERY: AN ALTERNATIVE TO TRADITIONAL GERMECTOMY

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Aim: ultrasonic surgery is a surgical device that allows performing simple and complex extractions in an atraumatic way as an alternative to osteotomy with conventional rotary instruments that could be invasive in several cases. The aim of this study is to evidence the benefits of ultrasonic surgery compared to the traditional one by analyzing 10 third molar split-mouth extractions. This study compares postoperative signs and symptoms after extraction of impacted mandibular third molars using ultrasonic surgery or conventional rotary osteotomy.
Methods: split-mouth germectomy in 5 pediatric patients were performed, with both traditional (C) and ultrasonic (T) surgery, two weeks apart. The following parameters were considered for each patient: intraoperative pain (VAS scale); duration of surgery; measurement of tumefaction pre-surgical and after 7 days; one-, three-, seven- and twenty-one-days postoperative pain (VAS scale) and post-surgical complications.
Results: the sample showed that the T group reported less intraoperative and postoperative pain than the C group. The duration of surgery was shorter on average in the T group. There were no significant differences between the T and C groups for postoperative complications.
Conclusions: complete recoveries without any complication were reported in all patients at the T sites. The beneficial postoperative signs and symptoms make ultrasonic surgery a favorable therapeutic option; it allows a cleaner, simpler and less traumatic surgery than the traditional one. The only disadvantage of the piezoelectric technique was the length of operation time.

MINI SINUS LIFT: RADIOGRAPHIC COMPARISON BETWEEN SUMMERS TECHNIQUE AND MAGNETO-DYNAMICS

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Aim: the magneto-dynamic technique's promise is mini-invasiveness, predictability and standardization in surgical procedures. The aim of the study is to verify these characteristics into the transcrestal mini sinus lift, comparing it with the traditional Summers technique.

Methods: 12 patients were divided into 2 groups: in the test group of 6 patients magneto-dynamic osteotomes were used; Summers osteotomes and a surgical hammer were used in the control group of 6 patients. In both, a truncated cone or root form implant was placed at the same time as the mini-elevation procedure. Through dental x-rays, the volume's maintenance of the bone augmentation compared to the pre-operative residual bone (T0) was evaluated through two following measurements: in the immediate post-operative period (T1) and at 4 months (T2).

Results: from the difference in bone height at T0 and at T2, an average increase of 3.39±0.96 mm is detected for the first technique and 3.42±0.85 mm for the second. From the difference in bone height in T1 and T2, we detect an average bone remodeling of 0.66±0.42 mm for the first technique and 0.85±0.33 mm for the traditional technique. There is a similarity in the results.

Conclusions: the superimpositions of techniques can be affirmed.

However, the magneto-dynamic technology clinically confers less invasiveness, a major frequency of sinus'membrane integrity, shorter treatment's duration, minor intra and post-operative complications, less post-operative pain and a decrease of the waiting time for prosthesis, from 6 to 4 months.

BONE GAIN AFTER MAXILLARY SINUS LIFT: 5-YEARS FOLLOW-UP EVALUATION OF THE GRAFT STABILITY

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Aim: the aim of this study was to evaluate, through digital radiographic measurements, the long-term changes in bone gain after maxillary sinus floor elevation surgery in order to obtain a stable and predictable volume augmentation for implant-prosthetic rehabilitation.

Methods: a retrospective study was conducted on 33 patients affected by atrophy of posterior maxilla. All patients were treated with lateral wall approach, using 100% deproteinized bovine bone mineral as graft material, with simultaneous implant placement. Panoramic radiographs were taken immediately after sinus floor augmentation procedure (t0) and after 5-years follow-up (t1). For the analysis the distance from implant platform to the apex of the grafted material in the maxillary sinus at t0 and t1 was detected (d), using a digital caliper as suggested by Hatano et al.

Results: 77 implants (length: 11 mm) were placed in patients ranged in age from 43 to 74 years. The results of this study showed a survival rate of 100% for all implants inserted. The mean change of "d" at t0 was 19.5±3.53 mm. The mean change of "d" at t1 was 18.25±4.25 mm. The mean of the difference between t1 and t0 resulted to be 1.37±0.138 mm. There was a statistically significant difference ($p < .001$) between measurements before and after sinus regenerative therapy (paired t- test).

Conclusions: these results demonstrate that the graft material remained clinically and radiographically stable after 5-years follow-up, with an average vertical resorption of 1.37±0.138 mm.

WOUND CONDITIONING WITH ENAMEL MATRIX DERIVATIVE IN TOOTH TRANSPLANTATION. A CASE REPORT

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Aim: to describe the procedures and 1-year results of autologous tooth transplantation in combination with enamel matrix derivative (EMD).

Methods: a 28 years-old male affected by stage I, grade B periodontitis presented with an unrestorable first mandibular molar (#3.6), which was programmed for extraction and replacement with #3.8. After root separation and extraction of #3.6, #3.8 was extracted and its root complex was conditioned with EMD. The tooth was immediately transplanted, stabilized with silk sutures and splinted with composite resin. Root canal treatment was performed after 6 weeks. The splint was removed after 4 months, and interdental contact points were adjusted. The patient was recalled up to 12 months for professional plaque removal as well as clinical and radiographic assessments.

Results: postoperative healing was uneventful. Gingival inflammation and spontaneous gingival bleeding were highly prevalent in the first months and decreased thereafter. After the removal of tooth splinting, grade 2 mobility was recorded. At 7 months, mobility had decreased to + and remained stable up to 1 year. At 1 year, no signs of root resorption or ankylosis were observed, and an almost complete radiographic defect fill was evident.
At all observation intervals, probing depths never exceeded 3 mm.

Conclusions: autologous tooth transplantation in combination with EMD is a valid option for oral rehabilitation.
However, the efficacy and indications of EMD in tooth transplantation procedures remain to be defined.

EVALUATION OF BONE EXPANSION DURING IMPLANT SITE PREPARATION USING MAGNETIC MALLET®

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Aim: the purpose of the study is to evaluate the use of a magnetodynamic instrument (Magnetic Mallet®, Metaergonomica, Turbigo, Italy) to perform a horizontal bone expansion in edentulous sites that need to be rehabilitated with a dental implant.

Methods: from October 2019 to May 2022, a sample of 15 patients, 11 men and 4 women, age between 39 and 78 years, was analyzed. A total of 18 conical-shaped implants with a diameter of 3.80 mm and a length between 10 and 11.5 mm were inserted in the maxillary region in the area between the lateral incisor and the first upper molar. The patients were treated by two different surgeons.

Results: no implant failed and all of them achieved a correct osseointegration. The average pre-surgery bone thickness was 4.36+0.70 mm, it changed to 5.58+1.11 mm after using the Magnetic Mallet®, finally stabilized at 6.72+1.24 mm with the insertion of the implant. Significantly different outcomes were obtained by operators with a different learning curve.

Conclusions: at 3 months of follow-up, the Magnetic Mallet® proves to be a useful tool in the horizontal expansion of the atrophic upper jaw bone crest, along with the preparation of the implant site. A learning curve is necessary to optimize the clinical outcomes. Further studies are needed with a larger patient cohort and a longer follow-up to confirm the present results.

SIALOLITHIASIS OF WHARTON'S DUCT

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Aim: this case report describes clinical evaluation and surgical treatment of sialolithiasis of Wharton's duct.

Methods: a 48-years old no-smoker woman referred to the Oral Surgery unit of Odontostomatology II complaining about pain and swelling under her tongue, exacerbated with eating. Clinical examination revealed normal anatomical structures, except for a hard and painful at palpation mass, floating on the floor of her mouth. X-rays and US exam showed an ovoid mass located in the depth of soft tissues upon mylohyoid muscles. On local anesthesia, exploratory surgery, sialolithectomy and sialodochoplasty were performed. On a 1-week follow-up, pain and swelling were absent. Compression of the salivary gland revealed the correct salivary flow.

Results: laboratory examination confirmed clinical diagnosis of sialolithiasis of Wharton's duct.

Conclusions: sialolithiasis is a common disease, representing approximately one-half of benign salivary gland careful anamnesis, physical examination and imaging techniques are important in the diagnosis of sialolithiasis. The management can be both medical and surgical. Stone removal may be complicated by trauma to the duct and associated sublingual glands (increasing the risk of formation of retention cysts) therefore, surgical treatment should be accurate. Other diseases may affect the salivary glands and must be distinguished from sialolithiasis. These include infections, inflammatory conditions, and masses, including neoplasms.

ASSOCIATION BETWEEN COMMON IL-1α AND IL-β POLYMORPHISMS AND EARLY FAILURE OF OSSEOINTEGRAT

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Aim: interleukin-1 is a pro-inflammatory cytokine indispensable for host immune response and bone metabolism during dental implant osseointegration. The aim of this systematic review and meta-analysis was to identify the possible association between common polymorphisms of the IL-1a and IL-1b genes and complications of osseointegration, that is implant failure and early crestal bone loss in healing period.

Methods: an electronic search was conducted on various databases using the following search string: (Dental OR Oral) AND (Implants *) AND (gene polymorphism OR genotype) AND (IL-1 OR ILs) AND (failure implant complications OR implant loss OR marginal bone loss).

Statistical analysis used: Odds ratios (ORs) and corresponding 95% confidence intervals (CI) were calculated for each polymorphism in different genetic models, or the TT genotype alone was studied.

Results: after the elimination of the duplicates, 34 articles remained, and for first, the title and the abstract were read considering the eligibility criteria. 12 articles were analyzed in the entire full-text and finally 7 studies were included that investigate the association of polymorphisms IL-1α C-889T, IL-1β C + 3954T and C-511T with early implant failure / loss or early marginal bone loss.

The results of the ILα-1 -889 and IL-1β +3954 gene did not reveal significant associations between any genotype of these genes with the risk of complications in osseointegration of the implants. Forest plot that compares the C-511T polymorphism revealed a significant association between the TT genotype and an increased risk of marginal bone loss during healing.

Conclusions: the association with early implantation loss did not yield any significant results and in general studies elaborated according to this type of outcome tend to contain various disturbing factors and to further invalidate the results. More prospective studies with a higher number of participants are needed.

EXTRACTION SOCKET PRESERVATION USING GROWTH FACTORS AND STEM CELLS: A SYSTEMATIC REVIEW

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Aim: the aim of this systematic review is to evaluate the reported literature on the use of stem cells or growth factors for post-extraction treatment of alveolar bone.

Methods: the search was conducted on various computer databases such as PubMed, Scopus, Cochrane and Embase, through the search string: "extraction socket" OR "extraction socket" AND "growth factors" OR "extraction socket" AND "stem cells" OR "extraction socket" AND "mesenchymal stem cells" OR "alveolar ridge preservation" OR "alveolar ridge preservation" AND "stem cells" OR "alveolar ridge preservation" AND "mesenchymal stem cells" OR "socket preservation" OR "stem cells" OR "socket preservation" AND "mesenchymal stem cells". In order to identify clinical studies reporting the clinical, radiographical, and/or histological outcomes of socket preservation techniques after applying mesenchymal stem cells or growth factors.

Results: seventeen studies were identified fulfilling the inclusion criteria. Of these, 10 studies were on the use of rhBMP-2 (human recombinant morphogenetic protein), 1 study on growth factors (CGFs), 1 study on rhPDG-BB (human recombinant platelet derived growth factor) or PRP, and 5 on stem cells applied in the post extraction socket. The meta analysis considers only those studies evaluating changes in width and height following the use of rhBMP-2. Relative to the first outcome "reduction in alveolar ridge width" an SMD of 0.72 was estimated with 95% IC and SD (0.30-1.15) p value 0.0009. In contrast, a SMD 0.65 95% IC and SD (0.16-0.14) p value 0.009 was estimated for the second outcome "reduction in alveolar ridge height". The insertion of rhMBP-2 into the post extraction alveolus allows greater preservation of post extraction alveolus width and height. Conversely, in the variably represented control groups, the reduction in width and height is greater.

Conclusions: the use of mesenchymal stem cells or bioactive osteogenic molecules promotes bone regeneration after tooth extraction as evaluated clinically, radiographically and histologically. However specific differences that support particular recommendations are still unclear in light of the current published evidence. Future studies should include the standardization of the mesenchymal stem cell selection and purification as well as dosage and delivery methods of bioactive molecules.

RARE CASE OF SOLITARY BONE CYST OF THE UPPER JAW: A CASE REPORT

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Aim: this case report describes the diagnostic process and the surgical treatment of a solitary bone cyst of the maxilla. In addition, we aimed to verify the bone healing of the surgical site supported by PRF (platelet-rich fibrin), 12 months after the enucleation of the lesion.

Methods: a 59-year-old patient, with no significant systemic pathologies, came to our attention with a large osteolytic lesion of the upper jaw. Surgical enucleation of the lesion was performed under general anesthesia, followed by primary wound closure of the access flaps.

The residual cavity was filled with PRF from a sample of the patient's blood.

Results: the postoperative course was uneventful, without significant complications. After 12 months, a three-dimensional radiographic evaluation showed complete restoration of bone architecture in the surgical site and no sign of recurrence of the lesion. Pulp vitality was preserved for all the elements adjacent to the enucleated lesion.

Conclusions: the outcomes of this clinical case suggest that the clot formation, the support of both the flap and the clot with palatal plate, and the enrichment of the clot with PRF promote good healing and re-ossification of bone cavities, even after enucleation of large lesions. Noteworthy is also the rarity of the location of the solitary cyst.

FLAP TUNNELING TECHNIQUE IN BONE REGENERATION: REVIEW OF THE LITERATURE

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Aim: techniques for bone augmentation are often associated with adverse events and patient discomfort. In order to overcome them, a subperiosteal approach, the tunnel technique, has been proposed. The aim of this work is to compare this technique to traditional ones in terms of complications and PROMs.
Methods: two electronic databases (Medline, Embase) were screened for articles focused on the tunnel technique for alveolar bone regeneration published in English up to 2nd March 2023. Mesh terms were tunnelORtunnelingANDoral, (Minimally invasiveORmini invasive)AND(alveolar ridgeORsinus liftORbone regeneration)ANDoral. Data regarding postoperative complications and PROMs were extracted and analyzed.
Results: four papers out of 1613 were eligible, including 203 patients (96 tests, 106 controls). The mean follow-up ranged between 6 and 30 months after bone regeneration. All patients were evaluated for implant placement. The main complication was dehiscence in both groups. Complications seem to be lower for the tunnel approach (dehiscence 9.3% *vs* 29.2%). A trend was observed in terms of graft loss reduction (5.1% *vs* 11.3%). No differences in neurological and infectious complications and no PROMs data were found.
Conclusions: the tunnel technique can be considered a safe approach for bone augmentation, presenting a reduced complication rate compared to other flap designs. Well-designed clinical trials investigating patients' experience are recommended. Finally, considering the relative complexity of the technique, future investigations should evaluate the surgeons learning curve.

DENTAL MANDIBULAR AVULSION WITH MAGNETO-DYNAMIC TECHNIQUE: PRESENTATION OF A CASUISTRY

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Aim: evaluating magneto-dynamic technique in dental mandibular extractions aiming to preserving the alveolar bone in view of a prosthetic implant replacement.
Methods: the device used for all extractions is Magnetic Mallet, modern instrument proposed to facilitate tooth extractions and limiting the patient's discomfort.
Teeth, selected using randomized method, are hopeless mandibular teeth from 41 different patients. After a longitudinal dislocation all around the tooth with Magnetic Mallet and forceps 69 mandibular teeth were extracted. Patients have been recalled at 7 and 21 days from extraction evaluating clinically and through intraoral x Ray examination the healing process.
Results: all the teeth analyzed were extracted. The 26% of the cases the tooth was ankylosed: in the extraction none had needed osteotomy or odontotomy, but just using Magnetic Mallet and sometimes forceps.
About 60% of teeth were dislocated just using the instrument inclination of 0° (or 180°) that is parallel to the tooth axis, while in the other cases was necessary changing the inclination from 0 to 45°.
At 21st day from extraction was possible observing clinically and radiographically an effective process healing with a good alveolar preserving.
Conclusions: the results show that the use of the Magnetic Mallet is an efficient alternative for mandibular dental extractions compared to traditional methods using elevators and forceps, making tooth dislocation easier and improving post-extraction healing.

A NEW TECHNIQUE FOR LATERAL SINUS LIFT: "SINUS PACK"

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Aim: the outcome was to evaluate the vertical bone gain obtained with the "sinus pack" technique which involves the insertion of biomaterial wrapped in a resorbable collagen membrane.

Methods: this retrospective study evaluates vertical bone gain, comparing measurements at baseline and after 12 months, in 19 patients in whom lateral sinus lift was performed with the "sinus pack" technique. To be included in this study was required <5 mm of residual crestal bone height below the floor of the sinus and patients had to have no contraindications to the surgery. All patients had preoperative and 12 months postoperative CBCT.

Results: patients preoperatively had a mean bone ridge height of 3.03 mm±0.92 mm and was observed, after 12 months, a vertical bone gain of 8.8±0.9 mm using the sinus pack technique. By histomorphometric analysis of the regenerated bone tissue was found a percentage of viable bone of 44.5%±19.8%. The results obtained are comparable to those obtained with other sinus lift techniques.

Conclusions: a possible explanation of the greater amount of bone present using porcine grafts in Sinus Pack Technique may be that the membrane acted to better contain and immobilize the graft particles during the bone healing phase and the GTO porcine graft, thanks to the presence of copolymers that make it compact at body temperature, remains stable without undergoing micromovements. For this reason, this technique can also be used in the case of Schneiderian membrane perforation.

PREVENTIVE DENTAL PROCEDURES IN PATIENTS AT RISK FOR MRONJ: A RETROSPECTIVE ANALYSIS

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Aim: Medication-Related Osteonecrosis of the jaws (MRONJ) is a serious adverse drug reaction in patients taking bone modifying agents, and major clinical research efforts are dedicated to the development of effective preventive measures and protocols. The purpose of this retrospective study is to evaluate the preventive oral examination and treatments, as well as follow-up therapies performed and their effect on MRONJ risk.

Methods: the study included patients who underwent a preliminary examination and any preventive dental therapies before starting with a drug therapy at risk for MRONJ development (bisphosphonates or denosumab). Patients with previous radiotherapy of the head/neck region were excluded.

Results: 20 patients were included in the retrospective analysis. Patients were treated according to a complete (50%), partial (30%) or non-necessary (20%) preventive protocol. Among the 12 (60%) who underwent preventive extractions, one patient developed MRONJ following post-extraction waiting time of 2 weeks. Most of the teeth were extracted due to endodontic infections (40%), followed by periodontal disease (25%) and non-restorable caries (10%).

Conclusions: maintenance of oral health is not questionable, in particular through the elimination of infectious-inflammatory foci through both surgical and non-surgical therapies. From literature reviews, the time between preventive extractions and initiation of risk therapy seems to be of crucial importance in minimizing the risk of early onset of MRONJ. From the data analyzed, it can be inferred that the time between the last extraction and the start of risk drug therapy is of crucial importance in reducing the risk of disease onset. Despite the limited number of subjects, our results confirm this hypothesis and suggest further investigation to define clearly preventive surgical dental protocols.

RESTORATION OF BONE DEFECT BY GBR TECHNIQUE: THE USE OF CGF AND MELATONIN. A CASE REPORT

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Aim: the aim of this case report is to demonstrate how concentrated growth factors (CGF), a novel generation of autologous platelet concentrate, melatonin and endogenous indoleamine with also bone regenerative characteristics, may be useful for reconstruction of bony defects and esthetic rehabilitation without any complications as well as pain and swelling of perioral soft tissues.
Methods: we report a clinical case of a female patient with substantial bone defect in both dental arches. GBR surgery combining with CGF isolated by blood sample, melatonin and heterologous biomaterial was used to restore defect.
Results: excellent postoperative recovery without any complications was reported. The clinical and radiographic evaluations 5 days after surgery showed significant bone regeneration. In detail, the surgical-treated area presented appropriate bone density and volume that guarantee implants stability. Interestingly, there were no infectious episodes and no other adverse complications during the monitoring postoperative period. The postoperative healing response at the surgical-treated sites was excellent, and the patient reported a good recovery without discomfort or inconvenience in the quality of life.
Conclusions: this is an impact clinical report that used CGF plus melatonin-based scaffold in GBR surgery holding a promising outcome in tissue regeneration applications and restorative dentistry. This protocol may have important roles also in improving implant osteointegration and, not less important, in preventing postoperative complications.

REGENERATION OF SEVERELY ATROPHIC JAWS WITH TITANIUM REINFORCED E-PTFE MEMBRANES

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Aim: the aim of this study was to retrospectively evaluate the effectiveness of titanium reinforced e-PTFE membranes in association with autogenous bone and bovine bone mineral particles for guided bone regeneration (GBR) of vertically deficient edentulous ridges.
Methods: the procedure consisted of: a) bone harvesting from the mandibular ramus with a bone scraper; b) correction of the initial defect with a 50:50 mixture of bone particles and bovine bone mineral and stabilization of intraoperatively modelled titanium reinforced e-PTFE membranes with titanium microscrews or tacks; c) hermetic suture of the previously released flaps. After 7 to 9 months, membranes were removed, and implants placed in the regenerated areas. Fixed Prosthetic restoration started 3 to 5 months later.
Results: in total, 12 patients (1 male, 11 females, aged 22-76 years), requiring an implant-supported rehabilitation were treated with GBR and received in a second stage 29 dental implants. Two patients had a membrane exposure (16.6%) but without failure of the GBR procedure. All planned implants (29) were placed as initially designed. No other complications occurred during the follow-up (3 to 15 years) with an implant survival rate of 100%.
Conclusions: data from this study seem to confirm that vertical GBR with titanium reinforced e-PTFE membranes is an effective method to allow fixed implant-supported restorations in initially severely vertically atrophied edentulous ridges. However, it must be underlined that complication rate is not negligible and success of the procedure is technique-sensitive.

DECOMPRESSION ON ODONTOGENIC CYST IN PEDIATRIC PATIENT: IS TIME AN ALLY?

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Aim: odontogenic cysts are epithelial-lined pathologic cavities, they are divided into two groups: the inflammatory and the developmental one. Although these cysts occur more frequently during the second and third decades of life, they can also be found in children and adolescents in the mixed dentition stage. The aim of this study is to show a case of dentigerous cyst managed within our clinic in pediatric patient.
Methods: a twelve-year-old patient was referred to our clinic by her dentist with the chief complaint of a tumefaction localized in the right side of the mandible. The intraoral examination showed the presence of a mixed dentition, with the absence of the element 44.
We decided to deepen the diagnosis through radiological exams that revealed the presence of an osteolytic lesion evolving from the crown of the impacted tooth 44 and displacing the root of the tooth 45 and the correlation between the lesion and the inferior alveolar nerve.
Due to the clinical and radiological findings an incisional biopsy was performed and the diagnosis of dentigerous cyst was made.
Results: the patient undergoes on a follow up program to see how the lesion evolve. OPT exams were made at 3,6,12 months that showed a complete healing of the bone and the eruption of the tooth 44.
Conclusions: this case show that decompression of the lesion could lead to success in correlation with time to treat large dentigerous cysts in pediatric patients. Several authors have reported excellent results by this technique. However, the follow-up of the patient should be done until the complete eruption of permanent teeth in their right location in the oral cavity.

MICROLEAKAGE AND FATIGUE STRENGTH OF CONICAL *VS* INTERNAL HEXAGON IMPLANT: *IN VITRO* STUDY

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Aim: the aim of the present study was to evaluate through an *in vitro* standardized cyclic loading simulation the micro-leakage of conical regular (CS) and internal hexagon (IH) dental implant abutment-joint interfaces.
Methods: a cyclic loading test was conducted on different dental implant prosthetic joint: CS group (diameter 4 mm- length 10 mm) and IH connection (diameter 4 mm- length 10 mm).
The mechanical behavior and the microleakage was evaluated at the end of the cyclic test.
Results: after a total of $5x10^4$ cyclic loading, the prosthetic screw has been removed. The CS group abutments appeared stable while the 5 samples of IH implants were stable.
No microleakage of CS implants was detected, while the IH group was positive to the paper cone test.
Conclusions: the study data showed that conical abutment-joint interface reported a higher stability compared to the internal hexagon connection avoiding microleakage. This prosthetic connection could take a significant advantage for a more useful and durability of dental implant rehabilitation in the clinical practice.

TREATMENT OF ORO-ANTRAL COMMUNICATION: A COMPARISON OF SURGICAL TECHNIQUES

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Aim: the objective is to evaluate the effectiveness of different interventions for the treatment of oral-antral communication of odontogenic origin.

Methods: for this systematic review, the following inclusion criteria have been applied: RCTs without language restriction were considered in which oro-antral communication was treated by the technique involving buccal mucosal flap or Bichat's bubble closure in which the success of COA closure was evaluated.

In addition, an electronic search was conducted on the following databases: PubMed, Cochrane Library and Embase, through the search string: "Oro-antral communication OR oro-antral fistula OR oro sinusal AND Buccal Fat Pad AND Buccal Flap" and five articles with a total of 118 patients were included.

Results: the Odds Ratio was assessed, i.e. the ratio of the probability of the event (success of the intervention) occurring in the group of patients in which the buccal flap was used or in the group of patients in which the buccal fat pad was used. The value obtained was 0.29[0.04, 2.08]. The Odds Ratio value of less than 1 associated with the buccal flap technique establishes an albeit minimal inferiority in terms of the number of associated successes.

Conclusions: there is no statistically significant difference between the two techniques, so new large- scale RCTs, analyzing the two types of interventions are needed.

INTRAORAL GIANT CELL LESIONS AND HYPERPARATHYROIDISM: AN ALERT FOR ORAL SURGEONS

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Aim: this retrospective case series aims to alert oral surgeons about the intraoral giant cell lesions associated with hyperparathyroidism.

Methods: this study included patients with intraoral giant cell lesions referred to the Unit of Odontostomatology of Aldo Moro University of Bari from 2017 to 2022. Patients with intraosseous lesions underwent panoramic radiograms and computed tomography, and those with peripheral lesions underwent magnetic resonance imaging. All patients underwent excision of the lesions followed by a histological exam. After the diagnosis of giant cell lesions, all patients underwent the screening of the concentration of the parathyroid hormone, serum calcium, phosphate, and alkaline phosphatase to assess the parathyroid function. Patients with hyperparathyroidism underwent further endocrinological and/or surgical assessment to receive the treatment. The clinical and radiographic follow-ups occurred every 6 months.

Results: 8 men and 8 women (mean age 46 years) showed 12 mandibular and 4 maxillary lesions. 4 were central giant cell lesions, 1 lesion was an aneurismal bone cyst, 4 were brown tumors, and 7 were peripheral giant cell lesions. 4 patients showed serology of hyperparathyroidism and received proper treatment. No recurrences or metachronal lesions occurred during the up to 5 years follow-up period.

Conclusions: the results suggest oral surgeons be aware of hyperparathyroidism as a systemic cause of giant cell diseases to prevent the occurrence of related metachronal lesions and/or recurrences.

MICROSCOPICAL ANALYSIS OF EXPLANTED TITANIUM ALLOY CUSTOMISED MESHES FOR BONE AUGMENTATION

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Aim: one of the most common complications is exposure during the healing time, but no studies have yet investigated whether the sudden variations of the oral pH may affect the surface and the internal structure. The aim of this study is to analyse the surface and the internal structure of explanted devices produced by different manufacturers.

Methods: 16 samples were received in the laboratory after the explanation and prepared for analysis in epoxidic resin and observed with Scanning Electronic Microscopy, both on the surface and in the margin immediately after fracture. A further investigation was also made by means of Specific Energy-dispersive X-ray spectroscopy.

Results: the analysis was conducted on a total of sixteen samples (8 from BTK and 8 from Bone Easy). The profile analysis of the upper and lower faces revealed that the superficial defects extended inside the device and the X-ray spectroscopy showed the presence of carbon in the margins. In particular the device from Bone Easy shows numerous small defects, ranging between 2 µm and 15 µm, while the device from BTK presents less and more regular defects with an average diameter of 20 µm.

Conclusions: in this study the presence of carbon was observed inside the devices together with several internal structural defects on all the examined samples. Based on these preliminary findings, it can be concluded that some issues are referred to the alloy powder composition as well as to the additive manufacturing fabrication process. Nevertheless, these devices should be carefully evaluated by the clinicians and until more evidence is available, they should be considered with precautions.

PLATELET-RICH FIBRIN IN CONTROL OF PAIN IN ALVEOLAR OSTEITIS: A SCOPING REVIEW

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Aim: the aim of this scoping review was to evaluate the effectiveness of the platelet-rich fibrin in control of pain associated with alveolar osteitis.

Methods: reporting was based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews. A literature search was conducted in the PubMed and Scopus databases to retrieve all clinical studies on the application of platelet-rich fibrin in control of pain caused by alveolar osteitis. Data were extracted independently by two reviewers and qualitatively described.

Results: the initial search retrieved 81 articles, with 49 after duplicates removal; of these, 8 were selected according to the inclusion criteria. Three of eight studies were randomized controlled clinical trials, four non-randomized clinical studies, two of which controlled. One study was case series. In all of these studies, pain control was evaluated using the visual analogue scale. Overall, the use of platelet-rich fibrin resulted effective in control of pain determined by alveolar osteitis.

Conclusions: within the limits of the included studies, the application of platelet-rich fibrin in the post-extra-extraction alveolus reduced the pain associated with alveolar osteitis in almost all the included studies. Nevertheless, high-quality randomized trials with adequate sample size are necessary for drawing firm conclusions.

HYPNOTIC FOCUSED ANALGESIA FOR MULTIPLE TOOTH EXTRACTIONS: A CASE REPORT

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Aim: the aim of this study is to describe the efficiency of hypnosis as a powerful non-pharmacological tool in an extreme case of a patient affected by multiple disorders, which made it impossible to use local anesthetics.

Methods: due to her systemic conditions such as deficiency of cytochrome P450 enzyme, numerous anaphylactic shocks, Addison's disease, thrombophilia, epilepsy, multiple allergies to drugs, asthma, insulin resistance and toxic encephalopathy, a 48-year-old female (ASA IV) could not intake any local anesthetic or painkillers.

Patient had previously experienced hypnotic focused analgesia for skin tumor removal surgery and wisdom tooth extraction several years ago.

Exclusively through the voice of an expert hypnotist (anesthesiologist and neurologist), the patient was guided to obtain local anesthesia, sedation, and pain control as she underwent tooth extraction of first and second left upper molars in absence of any local anesthetic.

Results: both teeth were surgically extracted prior incision, osteotomy and odontotomy. During the whole procedure all vital parameters were monitored: blood pressure remained stable (mean 135/85 mmHg), heart frequency ranged between 80-100 bpm and SpO_2 between 98-100%.

Conclusions: this study confirms data already available in Literature about hypnosis as an alternative to pharmacological tools, in cases when pharmacological anesthesia is precluded.

DIGITAL VISUALIZATION OF THE INFERIOR ALVEOLAR NERVE IN LOWER THIRD MOLAR EXTRACTION

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Aim: injury to the inferior alveolar nerve (IAN), is a rare but serious complication that can occur during mandibular third molar surgery. Proper preoperative radiologic assessment is hence key to avoiding neurosensory dysfunction. The aim of this study is to evaluate the benefits of a CBCT's tridimensional reconstruction through the use of freeware and open-source software: 3D Slicer.

Methods: in order to obtain a 3D model of the anatomical structures, the CBCT's DICOM files were imported into 3D Slicer. The reconstructions were obtained using the module "segmentation editor", in particular, the wisdom teeth were segmented through the function "grow from seeds", the IANs through the function "Draw tube" and the mandible through "threshold".

Results: the nerve was highlighted and it was possible to see every relationship between the inferior alveolar nerve and the third molar in all three dimensions of the space.

Conclusions: the segmentation allows accurate visualization of the IAN and clarifies its relationship with the tooth's roots. This aspect may help the surgeon in planning and thereby may reduce complications during dentoalveolar surgical interventions. Furthermore, the reconstruction offers a second advantage that cannot be taken for granted: a clear and understandable visualization for the patient, making him more aware of possible complications in the case of nerve involvement at the time of signing the informed consent.

REVERSE GUIDED BONE REGENERATION FOR TREATMENT OF JAWS ATROPHIES: A PROOF OF CONCEPT

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Aim: the purpose of this study is preliminarily evaluating the effectiveness of a new design customized titanium non-absorbable occlusive membrane realized with a prosthetically guided procedure.

Methods: 12 partially edentulous patients, requiring 1 to 3 implants, with a Seibert class II or III were enrolled. 8 patients were treated for a mandibular atrophy and 4 patients for a maxillary atrophy. A CBCT scan and a virtual digital impression of soft tissue were made and matched to obtain a 3D virtual model of the jaw. Digital wax-up of the rehabilitation in occlusion with the antagonistic dental arch was made, from which implant planning was carried out. The length of the implants was chosen to obtain a clinically achievable bone reconstruction: no more than 7-8 mm vertically. Bone reconstruction was virtually simulated, and the customized titanium plate was shaped on the virtual model to fit the jaw.

Results: postoperative complication and the absence of exposure of the membrane were evaluated during the follow-up period. One Ti-membrane was removed at 3 months and one at 4 months due to a soft tissue dehiscence. The mean deviation between the planning of the grid and its actual position obtained through post-op CBCT was of 0.50±0.51 mm. The mean of reconstructed bone obtained was 1676,44 mm^3.

Conclusions: this method has given encouraging results, which push us to carry on the research. Subsequent studies are necessary to evaluate the accuracy, predictability, and complications of the method, as well as the possibility of the increase and quality of the newly formed bone.

NEW METHOD APPLICABLE TO DENTAL EXTRACTIONS: EVALUATION OF PATIENT COMFORT

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Aim: the Magnetic Mallet® is a new method, which exploits magneto-dynamic impulses, which can be used in extraction surgery with the aim of best preserving the alveolus during avulsion. The aim of this study is to evaluate the patient's postoperative pain after dental extraction performed with this instrumentation.

Methods: 120 teeth considered "hopeless" after clinical and radiographic evaluation of 76 patients were extracted with the Magnetic Mallet®. Patients with medium-high risk (ASA-3 and ASA-4) and undergoing chronic therapy with NSAIDs were excluded from the study. After the avulsion, the patient was asked to quantify the pain and report it on the appropriate NPRS scale; moreover, he was required to register it at home in the following 24 and 72 hours. During the professional follow-ups at 7 and 21 days the perceived pain was re-registered.

Results: the data obtained report an average pain level immediately after extraction of 1.35±2.09, at 24 hours and at 72 hours of 3.4±2.95 and 2.29±2.51 respectively and 0.86±1,70 at 7 days. At 21 days, the mean pain value was 0.08±0.35.

Conclusions: the data obtained showed average pain values contained and potentially better than the traditional technique, demonstrating that the tooth extraction procedure with the magneto-dynamic technique is well tolerated by the patient. Split-mouth RCTs will be needed in the near future to evaluate these positive preliminary data.

EX-VIVO ANALYSIS OF CRACKS AND ROOT-END PREPARATION WITH PIEZOELECTRIC INSTRUMENTS

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Aim: the primary aim of this *ex vivo* study was to verify a correlation between ultrasonic root-end preparation and the formation of cracks.
Methods: the study was conducted on human teeth, extracted for periodontal reasons. After root canal treatment, roots were resected 3 mm from the anatomical apex by using a high-speed handpiece and carbide burs. The resected teeth were retro-prepared by using an ultrasonic tip (R1D, Piezomed, W&H, Bürmoos, Austria), setting the piezoelectric device at maximum power available for the tip. Time required for the retro-preparation was recorded. Before and after retro-preparation, all roots were photographed under a stereomicroscope and analyzed by two different operators to evaluate: (a) the presence and extension of dentinal cracks and (b) the morphology of root-end preparation. Finally, piezoelectric tips were analyzed by scanning electron microscopy (SEM) to evaluate morphologic changes after use.
Results: a total of 43 single roots (33 with one root canal, 10 with two root canals) were treated. Average preparation time was 1 minute and 54 seconds. None of the roots without initial cracks developed new cracks after retro-preparation. Quality of the preparation margins was fairly equal among the prepared specimens. None of the piezoelectric tips broke during instrumentation, and SEM analysis showed minimal surface wear of the tips after performing 11 retro-preparations.
Conclusions: within the limits of the present study, the tested piezoelectric system did not seem to represent a major cause for root crack formation. Pre-existing cracks may expand after ultrasound root-end preparation.

A MINIMALLY INVASIVE INTRAORAL APPROACH TO TREAT ODONTOGENIC MAXILLARY SINUSITIS

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Aim: the authors report their experience in managing odontogenic sinusitis with a minimally invasive intraoral surgical approach, as an alternative to Caldwell-Luc procedure or functional endoscopic sinus surgery (FESS).
Methods: the procedure, performed under local anesthesia, consisted of the removal of the odontogenic etiologic factor of sinusitis (endodontically or periodontally irreversibly compromised teeth, infected implants penetrated into the sinus, failure of sinus lift procedures) and the drainage of the purulent material through the alveolar crest. The maintenance of an intra-oral drainage until healing was confirmed by a CBCT. At that time, the drainage was removed.
Results: 14 patients (7 males, 7 females; aged 22-80 years) were successfully treated with this approach. After drainage removal, a spontaneous closure of the oro-antral comunication occurred in 12 patients, while in 2 patients the residual oro-antral communication was closed under local anesthesia with a buccal mucoperiosteal flap (Rehrmann flap).
Conclusions: results from this study (100% healing with no sequelae) seem to demonstrate that the minimally invasive intraoral approach here described to treat odontogenic sinusitis can be a successful alternative to more complex procedures such as the Caldwell-Luc approach and FESS. As compared to these latter, the described approach can be performed under local anesthesia on an outpatient basis, while the other procedures often need hospitalisation and sedation/general anesthesia.

AUTO-TRANSPLANTATION OF 2.8 IN AREA 1.6 AFTER CREATION OF THE ALVEOLAR SITE AND SINUS LIFT

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Aim: auto-transplantation is the transferring of an included, impacted or erupted tooth to an edentulous site in the same individual. The aim of the study is to describe the operative phases of the auto-transplantation technique of tooth 2.8 in area 1.6, after creating the recipient site ex-novo and performing the sinus lift.

Methods: it has been described a clinical case of a 56-year-old male patient with severly periodontal compromised tooth #2.8 and absence of #16 in arch. OPT revealed insufficient vertical height of the alveolar crest in area 1.6, so the sinus lift contextual to the creation of the receiving alveolus was necessary. The surgical procedure, performed under antibiotic therapy, involved the creation of the new alveolar site with a Trephine bur on an implant motor, sinus floor fracture and compaction with Summers osteotomes through a variation of the Ebanist's technique. After the extraction of #2.8, apicectomy and bioceramic application were performed. It was stabilized in infra-occlusion within the site through a steel braided metal ligature (0.10).

Results: at the end of the treatment, a successful sinus lift, without perforation of the Schneider's membrane, and stability of the transplanted element were achieved. Both clinical and radiographic results were considered satisfactory at 3 weeks postoperatively. Then the removal of the splint was conducted.

Conclusions: the stability of the transplant element and the choice of inlay rehabilitation confirm the auto-transplantation technique as a valid alternative to other complex implant-prosthetic treatments.

ANTIBIOTIC PROPHYLAXIS IN SWI PREVENTION, IN CASE OF MANDIBULAR THIRD MOLAR SURGERIES

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Aim: the aim of the present systematic review and meta-analysis is to evaluate the efficacy of antibiotic prophylaxis procedure, in the clinical management of mandibular third molar extraction, in order to prevent surgical wound infections (SWI).

Methods: both electronical and manual searches were carried out on online databases and paper journals. Two calibrated reviewers performed the search and selected the studies. The main outcome investigated was SWI. Studies related to antibiotic type and administration method from fixed and random models were analyzed. Surgical difficulty, whenever specified, was additionally examined.

Results: the 2726 surgeries performed in the 15 studies included in this review, (moderate degree of heterogenicity, with a $p < 0.1$), demonstrated that SWI can be prevented with antibiotic prophylaxis (RR = 0.29, heterogenicity = 0), specifically if administrated pre-surgically and when osteotomy is performed (heterogenicity = 0, NNT = 28). However, the literature doesn't fully support post-surgical antibiotic administration. Pre-surgical prophylaxis has been shown to be equally effective compared to pre- and post-surgical prophylaxis. In case of odontotomy, literature data have not demonstrated an advantage associated with the administration of antibiotic prophylaxis.

Conclusions: pre-surgical antibiotic prophylaxis appears to be an effective procedure in mandibular third molar surgeries, not only to prevent SWI, but also to lower: the amount of antibiotic administered, the risk of antibiotic resistance and the onset of other side effects.

VERTICAL BONE DEFECT MANAGEMENT - CASE REPORT

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Aim: the aim of this case report is to present the use of the modified minimally invasive surgery technique (M-MIST) with the concomitant use of biomaterials for the treatment of a vertical bone defect.

Methods: a patient with periodontal disease was treated with causal therapy, and after 6 months, the patient presented with a probing depth of 8 mm, which was not compatible with maintainability.

The patient underwent a regenerative surgical procedure using the M-MIST technique.

A flap was designed, and the micro-flap was raised using microscalers to access the defect. The defect was carefully treated and filled with deproteinized bovine bone.

To achieve primary closure, a Gottlow suture was performed using Prolene 6/0.

Results: the use of the M-MIST technique allowed for conservative treatment, resulting in reduced healing times and excellent aesthetic results. The M-MIST technique may not be applicable in cases where the infra-osseous defect extends to the lingual aspect, making the MIST technique the preferred choice for treatment.

Conclusions: the M-MIST technique is a minimally invasive and effective surgical option for treating vertical bone defects when combined with the use of biomaterials. The limited access to the defect requires the use of specialized instruments and sutures for optimal outcomes.

REVIEW OF NATURAL AND SYNTHETIC POLYMER IN BONE TISSUE REGENERATION WITH 3D PRINTING

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Aim: supporting the regeneration process of bone tissue at the defect site and eventually degrading in situ to be replaced by next-generation bone tissue is the goal of the ideal biomaterial. Nanocomposite biomaterials are a relatively new class of materials that incorporate a biopolymer and biodegradable matrix structure with bioactive and easily resorbable fillers of nanometer (<100 nm) size.

Methods: this article is a review of some polymeric nanocomposite biomaterials that are candidates for bone tissue regeneration.

These nanocomposites are classified into two groups: natural and synthetic polymers. Natural polymer-based nanocomposites include materials made on the basis of a natural matrix reinforced with nanoparticles or nanofibers. Several natural biopolymers widely used in the literature, chitosan (CS), collagen (Col), cellulose, silk fibrin (SF), alginate and fucoidan, were examined in this work.

Synthetic polymers that were examined in this literature review include polycaprolactone (PCL), poly (lactic-co-glycolic acid) (PLGA), polyethylene glycol (PEG), poly (lactic acid) (PLA), and polyurethane (PU)-based nanocomposites. A number of nanofillers, such as nano-hydroxyapatite (nHA), nano-zirconia (nZr), nano-silica (nSi), and graphene oxide (GO), were also examined.

Results: the influence of nanofillers on cell viability, both *in vitro* and *in vivo*, along with cytocompatibility and generation of new tissues was included. In addition, the characterization of nanocomposite materials by some commonly used analytical techniques, such as electron microscopy, spectroscopy and diffraction patterns, was highlighted. The physical properties of biomaterials, such as pore size, porosity, particle size and mechanical strength, which strongly influence cell adhesion, proliferation and subsequent tissue growth, were also analyzed. Nanofillers embedded in the polymer matrix impart important properties, increasing surface area and imparting higher mechanical strength and stability, improved cell adhesion, proliferation and differentiation.

Conclusions: the selection of nanocomposites is therefore crucial in the development of new materials for bone tissue regeneration in specific bone defects such as craniofacial defects. The effects of incorporating growth factors into the nanocomposite to control the generation of new bone are also important during the biomaterial design phase.

EFFICACY OF HEMOCONCENTRATES IN PATIENTS USING ANTICOAGULANT THERAPY: A SYSTEMATIC REVIEW

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Aim: this systematic review was aimed to evaluate the evidence concerning the hemostatic effectiveness of the autologous platelet concentrates (APCs) following dental extraction in patients undergoing anticoagulant therapy.

Methods: a literature search was conducted up to the end of December 2022 on PubMed, Scopus, and Cochrane Databases. Studies related to the use of APCs in patients undergoing dental extractions and being treated with anticoagulant drugs were included. No restrictions were applied concerning the type of APCs used and all the RCT studies published until December 2022 have been included. CCTs, cross-sectional, case report/series and animal studies were excluded. Outcomes were time of bleeding or time of haemostasis, postoperative pain and healing. The methodological quality of the included RCTs was assessed using the recommended approach for assessing the risk of bias in studies included in Cochrane reviews.

Results: the search resulted in 6 papers. The findings showed that when APCs were used in patients under anticoagulant therapy without discontinuing the therapy, they exhibited significantly less postoperative bleeding, short time of haemostasias, less pain and accelerated wound healing.
The methodological quality of most of the studies was moderate.

Conclusions: since studies included in the review have shown that APCs reduce time of bleeding, we can assume that discontinuing anticoagulant drug therapy is not necessary in dental extractions. Due to the methodological quality was moderate, further studies are necessaries to confirm these results.

THE ROLE OF CGF IN PATIENTS USING NOA UNDERGOING DENTAL EXTRACTION: PILOT STUDY

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Aim: repeated suspension of anticoagulant therapy may lead to an increased risk of thrombosis, as well as uncontrolled bleeding. The aim of this pilot study is to evaluate the possible haemostatic action of concentrated growth factor (CGF) in extraction surgery on non-suspended new oral anticoagulants (NOAC) therapy patients.

Methods: patients in NOAC therapy (excluding patients in OAT) with the need for simple extraction surgical therapy were selected. For each patient, the levels of hematocrit, creatinine, type of NOAC and administration were evaluated. Before surgery, 2 blood tubes were taken (Silfradent glass tubes, PV 200R 10 ml tube) and centrifuged (MEDIFUGE MF200 CGF). The formed CGF was then inserted at the level of the post-extraction alveolus and an X-shaped suture (Vicryl 4.0) was applied. The patient remained under observation for 30 minutes, in which bleeding (mild, heavy or severe) was assessed at t0 and subsequently at 5, 10, 15 and 30 minutes. After that, it was reevaluated at 3 days, 7 days and 14 days (with related suture removal). During the first follow-up (3 days) the patient was asked if he had experienced pain, bleeding and/or swelling after surgery. Comparable probe photographs were taken to monitor socket closure at every check. Antibiotic therapy, painkillers and mouthwashes based on Chlorhexidine were prescribed. If necessary, the patient was advised to apply Tranexamic Acid.

Conclusions: all treated patients presented CGF coagulation, effective haemostasis and a normal postoperative course. Slight bleeding was observed in only 1 patient on the evening of surgery. To obtain more statistically significant results, it is necessary to increase the sample number and compare the effects of normal hemostasis procedures with the split-mouth technique.

ANATOMICAL EVALUATION OF CBCTS OF THE INTERFORAMINAL ZONE

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Aim: aim of the study was to evaluate the anterior loop of the NAI and the mental foramen to give an indication for implant planning.
Methods: 100 CBCTs from a population aged between 18 and 80 years, 42M and 57F, were analysed. Patients were classified according to age, sex, degree of edentulism. Only files with FOV 12x9 were included. Linear measurements were performed at the centre of the ridge, using the central paraxial cut. Statistics were performed using JMP Trial 14 software. The area within 2 mm of the most mesial margin of the loop or, when absent, of the chin foramen was considered "safe zone".
Results: the anterior loop was found in 71%, extending with a range 0.2 to 4.2 mm, with a mean of 1.65 mm. The safe zone measured 40.4±4.6mm and tended to increase with age. A significant inverse relationship was observed between the length of the loop and the age of the patients; fully edentulous patients had a larger safe zone than partially and fully dentulous ones. The χ2-test showed no statistically significant differences between the considered variables.
Conclusions: bone resorption caused by tooth loss and ageing leads to an increase in the interforaminal distance and a reduction of the anterior NAI loop and a lack of identifiable anatomical landmarks. Thus, there was no safe zone as in 71% of the CBCTs analysed, the loop extends from 2 mm up to 4.2 mm. In the edentulous mandible, the reference for performing the osteotomy could be the genital tubercle, a radiographic and clinical landmark since it is palpable.

ODONTOGENIC CHERATOCYST RECURRENCE: FROM CONSERVATIVE TO RADICAL APPROACH

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Aim: the odontogenic cheratocyst is a benign locally aggressive lesion of the jaws with a high recurrence rate caused by a high epithelial cellularity and mytotic activity.
Methods: in 2015, a 60 y/o female patient was referred for the presence of an asymptomatic radiolucent cistic area associated with the two upper right premolars. The lesion was enucleated together with 1st molar extraction, since the latter was structurally and endodontically compromised. The histological report was cheratocyst. While the 1st molar was replaced with an implant, the surgical area was radiographically monitored. In 2018 a new osteolitic area was found in the same site. The enucleation was therefore performed with deep bone curettage, apicectomy and retrograde filling of the two premolars. In 2021, at the annual x-ray follow-up, the lesion reappeared, thus a block resection involving the two teeth was performed. At the same surgical time the bone defect was treated with DBBM and a resorbable collagen membrane. The histologic report showed complete removal.
Results: during the clinical-radiographic follow-up, a further implant was inserted in the first premolar site by the dentist and the surgical area appeared radiographically normally ossified.
Conclusions: enucleation can be the first approach to cheratocysts. If the follow-up shows a recurrence, the treatment should be more radical including peripheral curettage and the removal of the portions of dental roots that could prevent complete enucleation. Bone resection, even if more demolitive, represents the best solution in case of recurrence.

THREE DIFFERENT TECHNIQUES COMPARED IN THE SURGERY OF LOWER THIRD MOLAR

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Aim: the purpose of this study is to compare three ostectomy techniques in the extraction of lower third molars, that are traditional technique with rotary instruments and surgical burs, piezosurgery and sonic surgery and to evaluate post- operative pain.

Methods: a total of 30 patients underwent the surgery and divided in three different groups referring the three different techniques. All interventions were carried out by the same experienced operator, who also registered intraoperative data concerning ostectomy, tooth crown and root sectioning, as well as surgical time. At the end of the surgery, every patient was given a form to be filled out over the next seven days, in which he had to report how many painkiller tablets he took for each day.

Results: the average surgical time with the traditional technique was 12.6 minutes, 22 minutes with piezosurgery and 19.83 minutes with sonic surgery. The traditional technique was found to be faster than the new techniques, which however are more respectful of the tissues and lead to less discomfort for the patient.

Conclusions: in cases of medium-low difficulty, the operating times are not more dilated with the new techniques, so in these cases one could be inclined towards these techniques. In complex cases, on the other hand, the operating times would dilate excessively, therefore the traditional technique is preferable.

TWO-STAGE APPROACH TO LARGE JAW CYSTS: A MAXILLARY CASE REPORT

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Aim: odontogenic cysts are the most frequently diagnosed lesions of the jaws. Marsupialization and cystectomy are the two treatments for the surgical approach to these pathologies. Marsupialization puts the cystic lumen in communication with the oral cavity, to reduce the intra-cystic hydrostatic pressure thus progressively decreasing the volume of the lesion. Cystectomy is the complete cyst removal, with healing by primary intention. A two-stage surgical approach to a large dentigerous cyst inside the maxillary sinus is reported here.

Methods: a 18-year-old female patient was referred to the Department of Oral and Maxillo Facial Sciences, Sapienza of Rome. The orthopantomography showed a wide radiolucent area which completely occupied the left maxillary sinus, associated with the unerupted third molar. Marsupialization was initially performed to decompress the lesion, bring the tooth closer to the occlusal plane and reduce the dimension of the cyst to allow physiological aeration of the sinus cavity. An obturator was therefore manufactured to keep surgical access open during follow-up.

After two years follow-up cystectomy was performed under general anaesthesia for both the complete removal of the cyst and the unerupted third molar.

Results: histological analysis confirmed the radiographic diagnosis of a dentigerous cyst. One year later the orthopantomography showed complete bone healing.

Conclusions: two-stage approach is sometimes useful in the treatment of large jaw cysts to allow good healing and minimize surgical complications.

CORRELATION OF ORAL INFECTIONS AND SYSTEMIC COMPLICATIONS IN KIDNEY TRANSPLANT PATIENTS

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Aim: this retrospective study investigate a possible correlation between untreated oral infectious foci and onset of systemic complications in kidney transplantation (KT) patients, as dental clearance efficacy for preventing post-transplant complications is controversial.

Methods: patients scheduled for regular check-ups after KT were divided according to their dental status before KT (using as reference orthopantomography acquired prior to KT): Group Clear (Gr.C.) patients with complete dental clearance; Group Infected (Gr.I.) without dental clearance. Patients were divided according to their dental status prior to the transplant: Group Clear (Gr.C.) patients with complete dental clearance; Group Infected (Gr.I.) patients with no dental clearance. Medical complications were considered: fever, pneumonia, urinary tract infections, systemic infections, kidney rejection, death. Also divided into: early complications (within 100 days of KT) and late complications (after 100 days).

Results: 77 patients were enrolled: Gr.C.75% and Gr.I. 25%. 68% of Gr.I. patients developed early complications and 58% late ones. In Gr.C. 53% had early complications, and 40% late ones. Gr.I. patients had statistically significant increase in episodes of fever ($p = 0.03$), with higher relative risk of 3.66 in the first 100 days after KT.

Conclusions: within limitations of the present retrospective pilot study, a correlation between the absence of preliminary dental clearance and higher risk of developing a fever after KT was highlighted. Results encourage physicians continue research on this topic.

SURGICAL APPROACH OF DISPLACED UPPER THIRD MOLAR IN THE MAXILLARY SINUS: CASE REPORT

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Aim: the aim is to illustrate, via a case report and by reviewing the latest literature findings, how to approach and resolve in the most efficient way an oral surgery complication such as the iatrogenic dislocation of the third maxillary molar in the maxillary sinus, and when to refer the patient to an ENT specialist.

Methods: a patient was referred to our clinic with a dislodged third maxillary molar in the right maxillary sinus upon a failed extraction and retrieval attempt. After examination and study of radiographic exams we removed the tooth with the Caldwell-Luc technique of intraoral antrostomy and closed the oroantral communication left in the post-extraction alveolar socket. We then reviewed articles between the years 2018 to 2022 regarding foreign bodies removal techniques in the maxillary sinus.

Results: at the ten days follow up the patient was asymptomatic and there were no signs of residual communication left; the recovery was reported to be almost painless with minimal epistaxis.

Conclusions: this clinical case confirms that the most convenient technique is the Caldwell-Luc technique for objects displaced in the maxillary sinus. The patient should be referred to an ENT specialist for an endoscopic or trans-nasal FESS surgery in conditions like smaller foreign bodies near the roof of the sinus or in absence of an already existent oroantral communication.

MINIMALLY INVASIVE INTRAORAL APPROACH TO SUBMANDIBULAR LODGE

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Aim: the purpose is to describe the Minimally-Invasive Intraoral Approach (MIIA) performed on selected cases of abscesses and neck phlegmons of odontogenic origin, when the infection has not spread beyond the inferior mandibular margin. This technique allows to avoid cervicotomy by means of a direct approach to the abscess, draining it directly through the oral cavity.

Methods: the anatomical localization of the abscess and its spreading have to be pre-emptively evaluated with computerized tomography. We selected 57 patients with abscesses and neck phlegmons patients admitted at the DAE (Department of Acceptance and Emergency), from January 2018 to January 2020. We obtained our best results among all the patients selected for MIIA when positioning a drainage to improve the anti-gravity discharge of liquid from the residual cavity by contraction of suprahyoid muscles. Such mentioned drainage consists of a latex glove finger – Penrose similar – placed between the alveolar bone and the mucoperiosteal flap. Specific antibiotic therapy remains absolutely essential for the complete cure of the infection.

Results: the MIA technique has been used on a total of 12 patients (23%), where successful dental extraction and drainage of submandibular lodge was accomplished. The patients who underwent MIIA surgery have all perfectly healed and didn't suffer from any relapses during the follow-up.

Conclusions: the MIA consent in selected cases to lower the impact of the surgery, consequently reducing the length of hospitalization and cutting health costs.

SURGICAL EXCISION OF UNUSUAL SACKED NECK AND MEDIASTINUM ABSCESS OF ODONTOGENIC ORIGIN

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Aim: the most common cause of neck infections is odontogenic abscesses that can often be life-threatening and require a surgical drain associated with antibiotic therapy. We present a case of the surgical management of an odontogenic sack-shaped and walled abscess arising from elements 3.6, 3.7 and 3.8 that reached the laterocervical spaces and anterior mediastinum in a 28-year-old healthy woman.

Methods: the patient was admitted to our emergency department presenting with left submandibular swelling, fever, progressive dysphagia, trismus and dyspnea. She was given antibiotics and corticosteroid therapy.

We planned a double approach: an intraoral access - removing the teeth that probably caused the infection - and an extraoral one - performing a surgical drainage of the abscess in the neck.

Results: after the drainage of the deep space of the neck, we found a membrane containing the purulent material originating from the tooth roots of element 3.8, which stretched up from the submandibular and laterocervical region to the mediastinum, measuring 13 cm.

Conclusions: this case shows the importance of a multidisciplinary approach and of a complete diagnosis.

To the best of our knowledge, this is the first described case report of a dental abscess enclosed in a sack in the deep space of the neck and in the anterior space of the mediastinum.

TREATMENT AND OUTCOME OF MAXILLARY SINUSITIS ASSOCIATED WITH MRONJ

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Aim: medication-related osteonecrosis of the jaws (MRONJ) is defined as a pathologic condition affecting the maxillary and mandibular bones arising subsequently to pharmacological treatment with antiresorptive and antiangiogenic drugs. The purpose of the study was to evaluate the efficacy of conservative surgical treatment of maxillary sinusitis associated with MRONJ.

Methods: subjects diagnosed with MRONJ the maxillary posterior area with maxillary sinusitis, had undergone conservative surgery and had at least 6 months follow-up were included. All patients received medical-antibiotic therapy and then underwent conservative surgical treatment consisting of sequestrectomy, soft tissue debridement and bone curettage with limited or no extension. For maxillary sinusitis treatment, all patients underwent antral lavage.

Results: a total of 36 patients, mean age of 71.5±9.9 years (range 45-88), with 36 lesions, were enrolled. Six-months after conservative surgical therapy 31 lesions (86%) showed complete healing. Oro-antral communication hesitated in five patients and was treated with a removable prosthesis with obturator.

Conclusions: conservative surgical treatment of MRONJ lesions, with maxillary sinusitis, may represent a valid therapeutic approach determining a high number of complete healing cases. Conservative surgery should be encouraged at early MRONJ stages and after medical therapy failure.

ANTIBIOTICS PROPHYLAXIS IN DENTISTRY: A QUESTIONNAIRE BASED STUDY

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Aim: antibiotic (ATB) resistance is becoming a real issue among the population of well developed countries, as their prescription has widely increased between various categories of specialists, including dentists. The aim of the present study is to investigate if prescriptive protocols adopted for ATB prophylaxis before oral surgery and implantology by dental practitioners follow the American Heart Association Guidelines (2007), as no other more reliable guidelines seems to be available.

Methods: an anonymous questionnaire made of 10 questions was submitted online to dentists and dental hygienists between March and July 2020.

Results: 116 surveys were filled up, resulting that the most prescribed ATBs were amoxicillin with clavulanic acid (AC), amoxicillin (A) and clarithromycin for allergic patients. Two grams of AC one hour before surgery was the most diffused prescriptive protocols (66/116) for prophylaxis, despite the guidelines suggest two grams of amoxicillin. This prophylaxis was prescribed mainly to patients with mitral valve prolapse and history of bacterial endocarditis and heart transplant, which suggest that there is still confusion among clinicians regarding the conditions where ATB prophylaxis is actually needed. However, the most heterogeneous results emerged on prophylaxis associated to dental implants or prior to surgical third molar extraction.

Conclusions: collected data show that there are too many discrepancies among clinicians about the correct prescription of ATBs prophylaxis. Finally, unanimous evidence-based consensus on prescriptive modalities would be desirable in the next future.

IMPLANTS PROSTHETIC RIABILITATION IN PATIENTS WITH COMPLEX TRAUMA: A CASE REPORT

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Aim: this study aims to explain the main steps that characterize the implant-prosthetic rehabilitation in complex combined dental and maxillofacial trauma.

Methods: a 20-year-old patient reported an extensive facial trauma which also involved the alveolar process of the maxillary bone. The patient reported a maxillofacial fracture and the loss of teeth 1.3, 1.2, 1.1, and 2.1. A “Le Fort” type 2 fracture was also reported, with the malar bone involvement. After reduction and containment of bone fractures, through appropriate mounting plates, appropriate functional and aesthetic rehabilitation of the patient were replaced thanks to a temporary removable prosthesis. After 6 months, the patient performed numerous clinical investigations, aimed at a proper planning of implant-prosthetic rehabilitation of the upper dental arch.

Results: excellent, the patient was functionally and esthetically rehabilitated, thanks to good planning and management of the reported case.

Conclusions: with the planning of the case, as well as respecting the surrounding biological structures, the surgery of implants can be carried out with the most appropriate procedure.

PYOGENIC GRANULOMA IN A PREGNANT WOMAN: A CASE REPORT AND A REVIEW OF LITERATURE

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Aim: the aim of the study is to describe a clinical case of the surgical treatment of a pyogenic granuloma in a pregnant woman. The pyogenic granuloma represents an exuberant connective tissue proliferation due to an initialknown stimulus or a trauma, which usually occurs during the first trimester of pregnancy.

Methods: a 27-year-old pregnant woman at the third trimester came to the Department of Dentistry of the IRCCS San Raffaele Hospital with a sessile lesion. The patient was asymptomatic, but referred discomfort in normal oral activities. The intraoral examination led the surgeon to a diagnosis of follicular odontogenic cyst to beconfirmed by histological analysis.The treatment plan consisted in a surgical excision of the lesion. 2% lidocaine was performed as local anesthesia conforming the other guidelines; then the excision was executed using a n° 15 B-P scalpel, through palatal approach. As the lesion was sessile, the surgeon proceeded to the incision of the peduncle followed by a curettage of the gingival sulcus. The lesion was sent to the pathological anatomy laboratory for a histological examination.

A compression suture was performed to control bleeding. One week after the suture was removed.

Results: the histological examination confirmed the presumptive diagnosis of pyogenic granuloma, although the atypical timing of occurrence. One week later full healing aspect was found.

Conclusions: although the literature states that pyogenic granuloma is a benign condition typical of the first trimester of pregnancy and that it regresses spontaneously, the diagnosis of epulides in subsequent trimesters should not be excluded.

RHINO-IMPLANTS FOR THE REHABILITATION OF SEVERE MAXILLARY ATROPHY: A CASE REPORT

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Aim: rhino-implants have been recently introduced as an alternative to bone reconstruction techniques in case of severs atrophy and hyper-pneumatization of maxillary sinus.

Methods: a 75 years old woman, completely edentulous with a hyper-pneumatizazion of bilateral maxillary sinus has been fully rehabilitated with 2 rhino implants and 2 standard implants. Surgical procedure has been performed under local anesthesia. Implant sites were prepared with dedicated burs and magneto-dynamic technique. Two 20-mm length and 4-mm diameter implants (Rhyno Implants, Btk) were placed medial and distal impacting the lateral wall of nasal cavity and two standard implants 14-mm length and 3.3-mm diameter implants (Bt-Klassic, Btk) where placed in the middle with an insertion torque >40 Ncm. Flaps were sutured with 4.0 vicryl and an impression was then taken to immediately load the implants. A provisional prothesis was delivered after 24 hours.

Results: the post-operative recovery was uneventful, and patient was clinically and radiographically examined just after implants placement and 3 months after. 3 months after a definite metal-ceramic with titanium bar replaced the provisional one.

Conclusions: within the limitations of this case the use of rhino-implant used to immediately rehabilitate a fully edentulous and severely atrophic maxilla could reduce times and cost respect bone augmentation procedures with similar final esthetic result. However, the presence of an anatomic variation of infraorbital nerve call “canalis sinuosus” could be a contraindication of this technique.

EVALUATION OF POST-OPERATIVE DISCOMFORT IN SURGERY OF THIRD MOLARS

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The extraction of the third molar today represents a routine operation. Like any operation, there may be both intraoperative and postoperative complications and for these reasons it is important to know all the risk factors of the patient and perform an accurate preoperative evaluation. The purpose of this study is to evaluate the patient’s postoperative conditions using the PoSSe (postoperative symptom severity) scale.

The study was carried out through a four-year retrospective evaluation by two surgeons who carried out 433 extractions of the third molar. After one week from the operation to the control visit all the patients delivered the evaluation questionnaire in which reference was made to the postoperative pain, possible bleeding and edema.

The results suggest a close correlation between the intensity of symptoms in patients and edema according to the clinical report.

The three days following the surgery represent the worst days for the patients. They will show limitations in opening his mouth, pain, edema and difficulty in chewing, all factors that limit the patient’s relational skills. In conclusion, it was highlighted that the factors that mostly lead to postoperative discomfort in the patients are the use of cortisone and the duration of the operation, while the surgical technique that is used is not relevant.

Furthermore, the female gender seems to have a greater ability to manage postoperative pain.

MANAGEMENT OF TOOTH EXTRACTION IN HSAN TYPE IV PATIENTS: LITERATURE REVIEW AND CASE REPORT

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Aim: Hereditary Sensory Autonomic Neuropathy type IV (HSAN IV) is a rare autosomal recessive inherited disorder that affects the peripheral nervous system, mainly characterized by insensitivity to pain, self-mutilating behavior, anhidrosis, variable intellectual disability, impaired physical growth and delayed wound healing. Usually the sense of pressure, vibration and position is preserved. The purpose of this clinical report is to evaluate our approach on dental extractions on a patient affected by HSAN IV comparing it to other cases in scientific literature.

Methods: a 36-year-old female patient with HSAN IV, but without intellectual disability, presented at the Dentistry Department of Padua University Hospital for a dental consultation. Vitality pulp tests were performed in all the teeth as well as sensitivity tests. After a clinical and radiographic analysis, the right upper first premolar and the right lower second molar were found to be unrecoverable. The former was extracted without anesthesia and the latter was extracted with local anesthesia in two different times, sutures were placed.

Results: at the suture removal appointment one week later, the healing was good for both sites, while other cases reported post-operative complications like osteomyelitis. The patient reported no discomfort and no differences between the two sites.

Conclusions: in the scientific literature most patients with HSAN IV are treated under general anesthesia. With the patient's cooperation it is possible to perform simple oral surgery even without anesthesia or with nitrous oxide sedation.

SUSPECTED ORAL CANCER: A CLINICAL DIAGNOSTIC DECISIONAL TREE

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Aim: biopsy is the gold standard method for the diagnosis of oral cancer and it is the only definitive way to confirm its presence. It also helps with typing and staging cancer, crucial steps to define an appropriate treatment plan. This research aims to evaluate if frozen section biopsy, which provides an immediate diagnosis, can be more effective in the early diagnosis of oral cancer compared to formalin biopsy, which requires longer waiting times to obtain a definitive diagnosis. Besides, this study defines a decisional tree to choose the correct type of biopsy. Timing for oral cancer diagnosis has fundamental importance: diagnostic delay can influence the effectiveness of treatment and the patient's survival.

Methods: 10 patients with suspected oral carcinoma underwent two types of biopsies: one frozen section biopsy and one in formalin. 20 patients underwent a single biopsy in formalin. Patients who underwent a rapid histological examination biopsy received their diagnosis on the same day and were sent to the oncology departments to continue their diagnostic and therapeutic pathway; while patients who underwent a single formalin-fixed biopsy received their diagnosis on average after 20 days.

Results: the results show that performing a rapid histological examination biopsy could expedite the diagnosis and decrease diagnostic delay for patients with oral carcinoma.

Conclusions: although frozen section biopsy is not considered the definitive method to diagnose oral cancer, it can be utilized to provide a faster diagnosis and reduce diagnostic delay, improving the patient's prognosis.

SURGICAL THERAPY FOR MRONJ: EIGHTEEN-YEAR EXPERIENCE OF A SINGLE INSTITUTION

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Aim: medication-related osteonecrosis of the jaws (MRONJ) is defined as a pathologic condition affecting the maxillary and mandibular bones arising subsequently to pharmacological treatment with antiresorptive and antiangiogenic drugs. The purpose of the study was to evaluate the efficacy of conservative surgical treatment of MRONJ.

Methods: subjects diagnosed with MRONJ that had undergone conservative surgery and had at least 6 months follow-up were included. All patients received medical-antibiotic therapy and then underwent conservative surgical treatment consisting of sequestrectomy, soft tissue debridement and bone curettage with limited or no extension.

Results: a total of 361 patients, mean age of 69.3±10.9 years (range 29-97), with 377 lesions, were enrolled. Six-months after conservative surgical therapy 288 lesions (76.4%) showed complete healing. Stratification indicated complete healing and total resolution of disease for all 42 stage I lesions, improvement for 168 of the 213 stage II lesions, and for 81 of the 122 stage III lesions.

Conclusions: conservative surgical treatment of MRONJ lesions may represent a valid therapeutic approach determining a high number of complete healing cases. Conservative surgery should be encouraged at early MRONJ stages and after medical therapy failure.

THE EFFECT OF PLATFORM-SWITCHING ON PERI-IMPLANT MARGINAL BONE LEVEL: AN OVERVIEW

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Aim: the use of an abutment whose diameter is smaller than the implant platform appears to have a positive effect on the peri-implant marginal bone level (PMBL). The current overview aimed to summarize the findings provided by systematic reviews (SRs) and metanalyses (MAs) on the effect of different implant platforms on PMBL and to assess the methodological quality of the included SRs.

Methods: three electronic databases have been explored up to December 2022. SRs comparing platform switching (PS) and platform matching (PM) on PMBL were included.

The outcomes measured were the marginal bone loss and the implant failure rate. The methodological quality of the included SRs was assessed using the updated version of "A Measurement Tool to Assess Systematic Review" (AMSTAR-2).

Results: nineteen (19) SRs were included. Most of the included SRs argue that, in the short term, PS showed a statistically significant preservation of PMBL respect to PM. However, similar results in terms of implant failure rate were observed.

The methodological quality of the included SRs ranged between critically low (3 studies) and high (12 studies). The most common critical weakness in the included SRs was the absence of clearly a-prior established review methods and any significant deviations from the protocol.

Conclusions: PS seems to preserve PMBL. However, the current overview of SRs highlighted the need of high-quality SRs that have longer follow-ups, to quantify the effectiveness of the PS over time.

MANAGEMENT OF PATIENTS WITH COAGULATION DISORDERS UNDERGOING MINOR ORAL SURGERY

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Aim: the purpose of the present study was to analyze the management of dental extractions in patients affected by coagulation disorders in order to prevent bleeding intraoperative and postoperative complications.

Methods: this study included 17 patients with a diagnosis of a coagulation disorder, who had been subjected to a single or multiple dental extraction.

Recombinant activated Factor VII was administered in those patients who were affected by a deficit of factor VII ranged between 10,5% and 21%. The other patients were treated locally with tranexamic acid.

Results: a total of 50 teeth were extracted, 7 by surgical extraction and 43 by simple extraction. Of the 17 patients included 9 of them suffering from factor VII deficiency, 5 from factor V deficiency, 1 from Glanzmann's thrombasthenia and 2 from Haemophilia A. Pretreatment with recombinant activated factor VII was performed on a total of 8 patients with factor VII deficiency; the remaining 9 patients underwent tranexamic acid treatment. 1 hemorragic postoperative complication was observed.

Conclusions: surgical and no surgical extractions appear to be a safe procedure for patients affected by coagulation disorders when appropriate prophylaxis is adopted.

CONSERVATIVE APPROACH IN THE EXTRACTION OF IMPACTED MANDIBULAR THIRD MOLARS: A CASE REPORT

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Aim: the surgical procedure for the extraction of lower third molars requires proper planning and a conservative approach in order to avoid incurring complications due to the proximity of important neurovascular bundles. The purpose of this case report is to analyze the use of piezoelectric surgery in the extraction of deeply impacted third molars.

Methods: a 33-year-old male patient, in good general health, came to the dentistry department of San Raffaele Hospital reporting pain in the lower molar regions. Intraoral examination showed swelling and BoP. Through the evaluation of the orthopantomography (OPT), we observed the presence of 3.8 and 4.8 in deep inclusion. To accurately define the three-dimensional proximity with the contiguous anatomical structures a CBCT was prescribed and evaluated. The surgical procedures were performed under loco-regional anesthesia. Both teeth were removed setting up a mucoperiosteal envelope flap, preserving the interdental papilla. After osteotomy and odontotomy, performed using the piezoelectric handpiece, wisdom teeth were removed. After the extraction, we proceeded with the curettage of the alveolus and irrigation with saline solution. The flap was sutured using silk thread 3/0 performing horizontal mattress and simple interrupted suture.

Results: the results were monitored with follow-ups performed at 1 week, 3 months, 6 months, and 12 months in which a good healing of soft tissue was evaluated. The post-operative period was uneventful, in particular no nerve injuries were observed. In the last follow-up, 1 year after the surgery, good bone healing was assessed by a radiographic control.

Conclusions: the use of piezoelectric surgery for the extraction of wisdom teeth in deep bone inclusion reduces the risk of bone overheating and soft tissue damages, preserving important anatomical structures. Thanks to its micrometric cutting due to the effect of micro-vibrations, selective cutting and the possibility of keeping a bloodless surgical field, this technique seems to be reliable and predictable.

EPITHELIAL REMNANTS IN GINGIVAL GRAFTS: THREATS IN PERIODONTAL PLASTIC SURGERY?

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Aim: to highlight the real potential of epithelial remnants (ER) in de-epithelialized gingival grafts (DGG) in the development of epithelial cysts (EC) following surgical periodontal bilaminar techniques (BT) for root covering.

Methods: a literature analysis using PubMed® search engine with this string was conducted: << "Histological" and "Gingival Grafts" >>; inclusion criteria were: English language and human clinical studies. Studies considering post-operative biopsies were excluded.

Results: 192 articles were found. Of these, 7 articles histologically considering DGG at the moment of their application at the recipient sites were selected for an analysis of the failed de-epithelializations. Complications such as EC and gingival cul-de-sac following periodontal plastic surgeries for root covering have been described in literature for years as rare but possible events. Several authors have shown that ER are included in DGG in a high percentage of cases despite the de-epithelialization procedures. ER alone seem to be not sufficient to generate such complications of wound healing in grafting techniques. It is likely that other factors are implicated in the pathogenesis of these formations.

Conclusions: de-epithelialization procedures are strongly recommended for the success of BT for root covering; the high percentage of failed de-epithelializations in DGG appears to be in contrast to the low incidence of EC. ER in DGG seem to be slightly related to EC developed after BT surgeries.

BUCCAL FAT PAD: ANATOMY, FUNCTIONS AND ITS APPLICATION IN ORAL SURGERY

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Aim: the buccal fat pad (BFP) also named Bichat's ball, by the anatomist who described that structure, is a trigone-shaped adipose tissue located in the cheek. Its function, especially in adults, is a source of debate. Several protocols are known which propose the use of BFP in surgical interventions, among these, the best known is the closure of oro-antral communications (OAC). Moreover, other uses are known. The aim of this paper is to describe anatomy, functions and surgical applications of the BFP.

Methods: narrative review on definition, anatomical description, functions and applications of BFP was performed using PubMed Library. Original images of human cadaver dissection were used to describe the BFP anatomy. Data on surgical interventions involving BFP were collected in a table.

Results: BFP has a main body and four extensions and three lobes. The structure is made of non-lobular adipose tissue. It is independent of other fat tissues and easily tractionable. Because of its characteristics and regenerative potential, the BFP is widely used in several surgical interventions in oral surgery.

Conclusions: the BFP is a well-known structure and its applications in oral surgery are well documented. In addition to the closure of OAC, many other applications are well described in the literature. That's reflecting the high regenerative potential of BFP which make it a valuable aid in oral surgery.

LITERATURE ANALYSIS ON MANAGEMENT OF PATIENTS ON TAO THERAPY UNDERGOING ORAL SURGERY

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Aim: the aim of this study is a literature evaluation to define the correct management of patients on TAO therapy undergoing oral surgery.

Methods: a thorough literature analysis was conducted to evaluate the risk-benefit ratio of different options for managing patients on TAO therapy undergoing oral surgery, including interrupting the therapy 2 or 3 days before the surgery, temporary replacement with Heparin (bridge therapy), or continuing the therapy without modification. It is also important to evaluate the patient's INR and consult the patient's cardiologist before making any changes to the therapy. The current anticoagulants commonly used are Heparin and Warfarin.

While Heparin has a short half-life and is typically administered intravenously, Warfarin has a half-life of 36 hours and is taken on o.s.

Results: the management of patients on TAO therapy undergoing oral surgery is still a subject of debate. For patients undergoing low-risk surgery with normal renal function, interruption of therapy is not necessary. For high-risk surgery, therapy suspension for at least 48 hours is recommended, with no need for bridging therapy.

Conclusions: clinicians should be fully prepared to manage patients on TAO therapy and their possible complications. With proper evaluation and management, patients can undergo oral surgery safely and effectively. Dentists should always consult with the patient's caridiologist before making any changes to the therapy.

CBCT EVALUATION OF SURGICAL DECOMPRESSION EFFECTIVENESS IN JAW CYSTS

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Aim: Odontogenic cysts (OC) arise from the odontogenic epithelium and are located in jaw in the regions surrounding the teeth. This study aims to evaluate the effects of decompression in jaw cystic lesions, using CBCT analysis at time zero and before cystectomy; moreover it evaluates the new walls formation where solutions of continuity with extraoral districts were present.

Methods: twelve patients with jaw cystic lesions compatible with OC of inflammatory origin, with solution of continuity between cyst wall and extraoral districts (maxillary sinus, oral floor and nasal cavity) were selected.

A surgical decompression of the OC was performed, inserting a cannula and fixing it to the adjacent teeth. For five months patients daily performed saline solution washings, then a second CBCT was executed to perform oral surgery. Cystic sizes were measured calculating the volume in mm^3 using the program Mimics 24.0.

Results: data distribution was analyzed by Kolmogorov-Smirnov test, and T test for paired data ($p < 0.05$) was performed for data comparison. Results show a statistically significant ($p = 0.0147$) reduction in cystic lumen volume.

Conclusions: these results suggest that decompression can be an effective treatment to reduce size of cysts lesions when the dimension of the cysts creates a continuity solution between oral bones and extraoral districts, in addition this clinical procedure significantly reduces possible postoperative complications such as mandibular fractures and neurological damage.

MANAGEMENT OF THE NASOPALATINE NERVE IN THE EXTRACTION OF IMPACTED MESIODENS

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Aim: the authors present the assess the location, morphology and dimensions of the nasopalatine canal on three-dimensional CBCT images in order to manage and isolate the nasopalatine nerve during the extraction of impacted mesiodens in children.

Methods: three pediatric patients were treated with surgical extraction of the impacted mesiodens, accessible from the palatal side of the maxilla. They received mepivacaine 2% + vasoconstrictor (adrenaline 1:100.000) for the palatal anesthesia. The intraoperative and postoperative pain scores were evaluated. Cone beam computed tomography (CBCT) imaging were carefully analyzed regarding the nasopalatine canal location, morphology and anatomical dimensions and its relationship with the supernumerary tooth were assessed. The canal was adequately protected during the use of rotary instruments. Finally, the integrity of the nasopalatine nerve was evaluated after mesiodens extraction.

Results: the mesiodens was extracted successfully in all three patients with no intraoperative complications. Postoperative nerve complications were avoided due to nerve bundle preservation during surgery.

Conclusions: although there is a lack of evidence regarding the management of mesiodens extractions, knowing the precise position of the nasopalatine nerve prevents intraoperative bleeding and postoperative paresthesias, avoiding damage to these structures. It can be achieved by the CBCT imaging, which has shown that complex neurovascular anatomy in the anterior maxilla is not uncommon.

ZYGOMATIC AND REGULAR IMPLANTS FIXED ORAL REHABILITATIONS

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Aim: zygomatic implants have been proposed for severe maxillary atrophy to avoid further regeneration procedure for fixed oral rehabilitations. The aim of the present investigation was to evaluate through a systematic review and to compare the survival rate of zygomatic implants and regular implants survival rate through a meta-analysis.

Methods: the literature screening was performed in accordance with the criteria of the PICO guidelines on PubMed/Medline, EMBASE databases.

The articles were selected for qualitative analysis and risk-of-bias assessment. The rehabilitations with zygomatic implants in combination with regular implants were considered for the meta-analysis of implant survival rate.

Results: the paper screening identified a total of 137 articles. A total of 32 articles were considered for the qualitative description. A similar implant survival rate between zygomatic and regular implants.

Conclusions: zygomatic and regular implants showed a similar high long-term survival rate for fixed maxillary rehabilitations. Further studies are necessary to evaluate the marginal bone loss comparison of zygomatic and regular implants after long-term functional loading.

MUCOCELE ON LOWER LIP: A CLINICAL CASE

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Aim: mucocele is a common salivary gland disorder that manifests as a mucus extravasation phenomenon or as a mucus retention cyst. The aim of this study is to describe a clinical case of mucocele.
Methods: a 27-year-old woman came to the attention of the Dental Clinic of Department of Dentistry of San Raffaele Hospital, reporting a swelling on the lower lip; the patient referred that initially the lesion was small and, through time, the dimension increased gradually. During the intraoral examination, a round, solitary, swelling was detected on the inner surface of the lower lip in the left central incisor region. The lesion was 2-3 mm below the vermilion border and it extended below the lingual vestibule, measuring approximately 10-12 mm. The color of the swelling was the same of the adjacent mucosa, without alteration. The mucocele was treated under local anesthesia with an excision, using scalpel through a straight incision. The lesion was resected from its base and then sent for histological analysis. Then the surgical site was sutured.
Results: the lesion was presumptively diagnosed as a mucocele, based on the clinical features and history of lipbitinghabit. The histopathological report confirmed the diagnosis.
Conclusions: due to high chances of recurrence, management of mucocele is a challenging task. Surgical excision with dissection of surrounding zone is a successful approach with least relapse. Simple surgical excision is the treatment of choice with good results and prognosis during the time.

ALVEOLAR RIDGE AUGMENTATION WITH THE BONE INTO BONE TECHNIQUE

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Aim: barriers made of cortical bone of heterologous origin are now used as a possible substitute of non-resorbable membranes and bone blocks for the regeneration of bone defects. This report analyzes the effectiveness of these barriers when placed in a surgical slot, vestibular to the defect, using the new Bone into Bone (BiB) technique.
Methods: a group of 20 patients (test) were treated with the BiB technique, and 32 implants were placed. Bone samples were collected with trephine burs 8 months after surgery and submitted to histological and histomorphometric analysis. The linear horizontal changes between pre-operative and post-operative radiographs were measured on the CT scan. A group of 18 patients (control) was treated with guided bone regeneration technique by means of resorbable membrane (BioGide) and a mixture of heterologous (Bio-Oss) and autologous bone chips: the results obtained were clinically compared to the test group.
Results: the mean width of the ridge ranged from a pre-operative value of 4.89 mm to a post-operative value, measured 8 months after surgery, of 7.25 mm in the Test Group. The mean width of the ridge ranged from a pre-operative value of 3.43 mm to a post-operative value, measured 8 months after surgery, of 7.15 mm in the Control Group. Histological images showed mature, mineralized bone with lamellar structure.
Conclusions: by comparing the results of both groups, the BiB technique is an equally performing alternative to other regenerative approaches, as it provides several advantages in terms of ease of the procedure.

CONSCIOUSNESS OF PERI-IMPLANT PATHOLOGIES BY PATIENTS: A QUESTIONNAIRE BASED STUDY

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Aim: the use of dental implants showed highly satisfactory results regarding function, aesthetics, and the long-term success of prosthetic rehabilitation. Despite this, implants can be subjected to pathologies that could lead to their loss. These include mucositis and peri-implantitis. Their prevention strictly depends on adherence to maintenance therapy and the daily hygiene maneuvers performed by the patient. This work aims to investigate the level of consciousness of peri-implant pathologies and the importance of maintaining hygiene among patients with dental implants.

Methods: an anonymous and self-reported questionnaire was administered to patients with one or more dental implants loaded for at least one year from 1 December 2021 to 31 July 2022. The Ethical Committee of the Azienda Ospedaliera di Padova approved the study n. 292n/AO/22 dated 8 September 2022.

Results: 403 questionnaires were collected. The mean age of the sample was 63 years. A good percentage of patients had implants for more than five (39%) and ten years (34%). 80% had never heard of mucositis and/or peri-implantitis and 20% reported that hygiene does not influence the duration of the implants over time. 29% said they have never received specific instructions on the daily hygiene of their systems.

Conclusions: within the limits of the present study, poor knowledge of peri-implant pathologies and maintenance therapy by patients emerged.

SURGICAL AND ORTHODONTIC TREATMENT OF AN UNERUPTED MANDIBULAR CANINE: THE IMPORTANCE OF THE TEAMWORK

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Aim: the frequency of canine impact in the mandible ranges from 0.92% to 5.1% and usually is linked with an important esthetic and functional complain from the patient. This article reports a surgical-orthodontic treatment with an impacted mandibular canine in the mixed dentition that was successfully managed.

Methods: a 9-year-old patient was referred to our clinic by her dentist with the chief complaint of the absence of the tooth 43. The intraoral examination showed the presence of a mixed dentition, with the absence of the element 43. To better determine if the tooth was present a radiological exam was requested (CBCT) that revealed the inclusion of the element on the mandible bone in a position that, according with the orthodontic team, does not suggest a possibility of spontaneous eruption. For this reason, a combined approach was planned. A full thickness flap was raised and to expose the impacted tooth an ostectomy was made using piezoelectric inserts. After the crown of the tooth was exposed a Kobayashi ligature was placed with the use of composite resin and then attached to a lingual arch. The closure of the wound was mad by first intention on the peripheral part but the center was left open.

Results: the surgical approach and flap design permitted to avoid problems during the wound healing period, like traction during the movement of the lip or the total wound closure. Patient was then referred to the orthodontic team for the following steps.

Conclusions: this case show that a staged and combined approach and careful study of case can lead to manage even challenging case.

GUIDED APICTOECTOMIES USING A DRILLING TEMPLATE: A CASE REPORT

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Aim: apicoectomies are endodontic microsurgical procedures that require high precision. Nowadays, gold standard procedure uses provide for a certain degree of imprecision as it heavily relies on the clinician's experience. This clinical study aims to apply the Surgical Guided Approach, frequently used in Implantology, to Apicoectomies, thereby ensuring higher precision and, therefore, a lower amount of bone tissue loss as a by-product of the procedure.

Methods: the subject of this case was one 79-years-old female who reported discomfort on the 1.2 and 2.2 element. OPT shows a radiotransparent area in correspondence on those elements which were endodontically treated. A CT-Scan of the patient's maxilla was performed to make the surgical template. After two intrasulcular flaps were sculped and dissected with Prichard, the surgical dime was fitted. Using a Trephine burs with a stop was possible to remove the bone discs with teeth apexes. The root canals were disinfected and prepared for the retrograde sealing with Piezosurgery tool. After that Bio-ceramic seal was used for the retrograde fillings.

Results: the present case demonstrated a valid alternative for apicoectomies which allows greater precision and healthy tissue preservation.

Conclusions: the goal set was reached: we achieved a surgical template which allows to perform apicoectomies successfully maximising the precision and accuracy of the surgical act and minimizing bone tissue loss during the procedure.

EFFECT OF IBUPROFEN AND CELECOXIB IN PAIN CONTROL AFTER IMPACTED THIRD MOLAR EXTRACTION

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Aim: the aim of this study was to compare the efficacy of celecoxib and ibuprofen in control pain following surgical removal of impacted mandibular third molars.

Methods: eighty-two subjects who needed surgical extraction of an impacted mandibular third molar were selected. Subjects were randomly divided into three groups and were instructed to take one of the following treatments twice daily for 5 days after surgery: placebo (n = 28), ibuprofen (n = 27) or celecoxib (n = 27). The primary factor considered was postoperative pain, assessed using the visual analogue scale (VAS) score recorded by each patient. Other factors, postoperative swelling and maximum mouth opening values compared with preoperative values, were also chosen as secondary outcomes.

Results: treatment with celecoxib and ibuprofen, resulted in improvements in the primary factor compared with placebo. Also, patients in the celecoxib group showed a significant reduction in postoperative pain scores at 6 hours ($P < 0.001$), 12 hours ($P = 0.011$) and 24 hours ($P = 0.041$) after surgery. Regarding secondary outcomes, no significant differences were found between the groups at each follow-up session.

Conclusions: this study demonstrated that, compared with ibuprofen and placebo, celecoxib treatment achieved greater efficacy on the incidence and severity of postoperative pain.

AMINOGAM® TREATMENT OF POST-EXTRACTION TOOTH SOCKET HEALING IN PATIENTS WITH DM2: A RCT

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Aim: to evaluate use of Aminogam® gel (sodium hyaluronate combined with 6 aminoacids precursors of collagen) in post-extractive alveolus healing in type 2 diabetic patients.

Methods: 50 diabetic patients with high grade disease are enrolled in a randomized clinical trial. Patients of Group A receive Aminogam® gel (placed in socket by the patient for 7 days), while Group B is control. After non-surgical extraction following parameters are measured: maximum mesiodistal (MD) diameter, maximum oral vestibule (OV) diameter, and the maximum socket depth (SD). MD, OV, and SD are used to calculate the secondary endpoint Residual Socket Volume (RSV). Follow up is performed at 3, 7, 14, 21 days where the RSV is measured and a modified version of Masse's Healing Index Score is calculated. On day 3 a sample from the socket is taken to quantitatively evaluates 12 different human cytokines (GM-CSF, IFN-α, IFN-γ, IL-2, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12p70, IL-17A , and TNF-α.) using the MACSPlex Cytokine 12 Kit (Miltenyi Biotec). Pain is assessed using a VAS for 7 consecutive days.

Results: trial with patients is ongoing. The preliminary clinical results will be presented at the CDUO 2023.

Conclusions: from a previous study in the Department of Surgical Science it was shown that at day 7 and 14 Healing Index Score had statistically improved in the Aminogam® group, and the aim of this study is therefore to integrate this evaluation of improved healing with the study of cytokines.

ENDODONTIC SURGERY WITH ER:YAG LASER: A STEREOMICROSCOPIC EVALUATION ON *EX-VIVO* MODELS

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Aim: endodontic surgery is a treatment aimed to periapical healing, generally after the failure orthograde therapy. Apex resection is traditionally performed with diamond burs and ultrasounds with 45 degrees of angle of cut. The aim of the present study is to perform an *ex-vivo,* qualitative analysis on the cut surface using Er:YAG and diamond burs.

Methods: thirty extracted single-rooted teeth were collected, maintained at 37 degrees in saline solution and - after sectioning their crowns - were subsequently endodontically treated (step-back shaping technique, vertical condensation and carrier-based obturation). The samples were divided into 3 groups according to the cutting methods: 1. Diamond Bur (016, standard granulometry, Komet®) 2. Er:YAG laser with QSP mode (600 mJ, 10 Hz) 3. Er:YAG laser with SSP mode (300 mJ, 30 Hz). Roots, after a 45 degrees resection at 3 mm of the apex, were analysed under the stereomicroscope (SMZ25, NIKON®, Tokyo, Japan) with a 40X of magnification. Microscope pictures were taken of the various cuts and for each root it was calculated the presence on the surface of debris, homogeneity, and time of cutting too. It was also compared cutting time among the three groups.

Results: we did not observe a statistically significant difference among the samples. Erbium laser leads to a more homogeneous (70%) and linear surface than the bur (50%). Cutting time with SSP and diamond bur were comparable, while with the QSP mode it was longer.

Conclusions: according to the results of the present *ex-vivo* study, we can conclude that Er: YAG Laser is an excellent resource in endodontic surgery.

3D REPLICAS ACCURACY IN DENTAL AUTO-TRANSPLANTS SURGERY: AN *IN VITRO* STUDY

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Aim: accuracy assess of 3D stereolithographic tooth replicas used for dental auto-transplants compared to relatives natural teeth.

Methods: in the Department of Clinical and Experimental Medicine of Dental School (University of Foggia), 5 lamb skulls CBCTs were performed. After 8 single-rooted incisors extractions, linear and volume digital data were obtained. Data were converted in DICOM and STL formats necessary for 3D resina replicas printing. After measurements, the tooth was stored in a 0.5% sodium hypochlorite solution for 1 hour. Periodontal ligament and bone residues were removed and teeth were preserved in a 0.9% weight/volume NaCl solution. A robotic pyramid-based model of natural teeth and their replicas was used for each root examined.

Results: the CEJ Mesio/distal and buccal/lingual mean value error were 0.04 and 0.06 with a 4.17 (SD±0.0025) and 6.19 (SD±0.09) percentage, respectively. The root mean value linear error was higher in all specimens with 0.39 in M/A and D/A, 0.43 in B/A, and 0.40 in L/A measurements. The relative percentage root error was 39.42 (SD±0.11) in M/A, 39.22 (SD±0.099) in D/A, 43.11 (SD±0.09) in B/A, and 39.92 (SD±0.087) in L/A. An average error value of 9.8% was detected in the CEJ area, and a value of 45.54% for the volume.

Conclusions: the 3D replicas linear and volume results were inaccurate and the volume accuracy was deficiency (45%). Data confirmed the 3D replicas not be predictable to be used in dental auto-trasplants procedures able to reduce surgical time and increase the global treatment success rate.

B.O.I.L. TECHNIQUE COMBINED WITH A NEW MATHEMATICAL RULE: A 2-YEAR FOLLOW-UP CASE REPORT

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Aim: a current major challenge in oral implantology is to minimize the marginal bone loss around implants. Furthermore, the respect for the biological width is the key to avoiding complications such as peri-implant bone resorption. The solution could be a new mathematical rule based on soft tissues thickness for choosing the correct implant position in relation to the bone crest, following the Biological Oriented Immediate Loading (B.O.I.L.) protocol. The aim of this study was to present the clinical outcome of an immediate prosthetic fixed rehabilitation with Osstem ET III SA implants with 2 years follow-up.

Methods: a 57-years-old female with Stage IV and Grade B periodontitis was enrolled in this study. The correct position of seven different Osstem ET III SA implants was identified according to the mathematical rule Y=X-K: Y was the distance from the bone level to the most coronal part of the implant, X the thickness of the soft tissue and K was a constant related to the biological width, whose value was fixed at 3.

Results: the mean marginal bone level around the implants were 2.13±0.11 mm at T0, 2.05±0.15 mm at T6, T12, and T24. Most of the bone remodelling process occurred in the first 6 months of healing and subsequently, the bone levels remained constant and stable over time.

Conclusions: B.O.I.L. protocol can help implants insertion, ensuring the formation of the coagulum chamber, which is the key for socket healing.

THE VISTA TECHNIQUE FOR RETRIEVAL OF MAXILLARY IMPACTED CANINE: SURGICAL CONSIDERATIONS

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Aim: cases in which the VISTA technique has been applied for the treatment of buccally-impacted maxillary canines have been evaluated.

Methods: the protocol involved the following steps: anaesthesia; two soft tissue vertical incisions, the first at the level of the canine crown, and the second between first and second premolar; connection of the incisions with a sub-periosteal tunnel; insertion inside the tunnel of a metal ligature, to connect the button placed on the canine to a NiTi coil spring; placement of a mini-screw as a temporary anchorage device, in the homolateral inter-radicular space between the second premolar and the first molar, 5 mm far from the alveolar ridge; suturing.

Results: six maxillary and 4 mandibular canines have been treated. The mini screws have been used in 6 cases; in the remaining 4 the canines have been anchored to a power arm, welded on a molar bend in turn.

All mini screws have been placed in the maxillary space between the second premolar and the first molar, with exception of a mandibular case, where the screw was inserted at the level of the external oblique line.

Conclusions: the modified VISTA technique is an alternative method for the treatment of mesio-angulated vestibular canines especially in cases of deep impaction or when the application of the anchorage system is challenging: the mini screw provides maximum anchoring, the NiTi springs, together with the screw, enhance patient's compliance, and the incisions, distant from the gingival margin, avoid any periodontal involvement of the contiguous teeth.

MANDIBULAR FOLLICULAR CYST IN RADIOTREATED PATIENT IN THE CERVICOFACIAL DISTRICT

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Aim: the choice of surgical timing in the removal of a 4.8 follicular cyst, occasionally found in OPT, in a patient treated for oropharynx carcinoma and awaiting radiation therapy (RT).

Methods: cervicofacial RT involves radical infection clearance. Enucleation of a voluminous mandibular cyst results in a long healing recovery period of the bone, which is not compatible with the urgency of RT. Furthermore, there is also the weakening of corticals subjected by RT. Therefore, we decided to postpone the surgery 18 months after the end of RT, while monitoring the patient with clinical and radiological follow-up. Surgical treatment was performed under narcosis. An incision on the mandibular ramus and osteotomy was performed to remove the cystic lesion. Marsupialization was excluded to not expose the radio-treated bone.

Results: during RT (63 Gy), the patient was treated for a grade 2 mucositis and hyposcialia and also manifested an extensive erosion at the right retromolar trigone.

It was treated with aminogam and resolved in 2 months. The surgery was performed without complications and after 1 year there were no radiographical or clinical signs of osteoradionecrosis.

Conclusions: the planning of a radiotherapy treatment should be preceded by an odontostomatological examination with an OPT. If voluminous lesions are present, it is preferable to start with radiotherapy.

If complications were to arise before 18 months from the end of RT, with the appropriate protocols it's always possible to intervene.

CURRENT APPLICATIONS OF GUIDED ENDODONTIC SURGERY: A SCOPING REVIEW

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Aim: to synthesize the existing knowledge on the current applications of surgical guided endodontics by a scoping review.
Methods: reporting followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews. A literature search was conducted in the PubMed and Scopus databases to retrieve all clinical studies on the current applications of surgical guided endodontics. Two independent reviewers performed the data extraction. The studies satisfying the inclusion criteria were included for qualitative analysis.
Results: the initial search retrieved 355 articles, with 349 after duplicates removal; of these, 14 satisfied the inclusion criteria. Four studies were case series and 10 case reports. No randomized clinical trials and cohort studies were identified. Thirteen articles followed static surgery protocol while one dynamic. Overall, guided surgical endodontics reduced iatrogenic errors and chair time. No postoperative problems were found in all studies.
Conclusions: guided surgical endodontics exhibited promising results in the management of most endodontic cases, yet the elevated cost limits its widespread. High-quality randomized clinical trials and cohort studies with adequate follow-up are needed to determine the actual effectiveness of surgical guided endodontics over the free hand protocol.

MANAGEMENT OF LEUKOPLAKIA WITH DIODE LASER. THE RELEVANCE OF FOLLOW-UP DURING WOUND HEALING

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Aim: Oral leukoplakia (OL) is a white plaque lesion, classified as potentially malignant disorder. Approximately 1% of OL will transform into carcinoma every year. Management can be challenging as some OL will recur, but there are some advantages of using laser in surgical treatment (e.g., faster wound healing, reduction of bleeding, minimal invasiveness). We report a case of recurrent OL treated with diode laser.
Methods: a 68-year-old female no smoker patient was referred to the Department of Oral Medicine and Surgery of the University of Parma for a white plaque lesion of about 1.0 X 2.0 cm, not-ulcerated, not-bleeding, and painless, on the right lingual margin.
An excisional biopsy with scalpel was performed maintaining 0.5 cm resection margins, followed by histopathological examination.
Results: a diagnosis of leukoplakia with moderate dysplasia was rendered. At a 3-month follow-up visit a white lesion of about 0.5 X 0.2 cm was identified in the same subsite. Surgical excision was performed with diode laser. Histopathological examination confirmed the moderate dysplasia. An exophytic traumatic lesion occurred in the biopsy area 1 month after laser resection. Molar contact was observed and then we decided to perform an ameloplasty and a manufacture of a bite. As the lesion remained, it was surgically removed. Its histological examination revealed mucosal ulceration with frictional keratosis and chronic inflammation, without dysplasia. At a 3 months follow-up no further lesions were identified.
Conclusions: diode laser is probably one of the most useful tools in soft tissue surgery. Recent evidence suggests that recurrence rate of leukoplakia is somewhat lower after laser excision.

CHRONIC LIP EDEMA AND PAIN AFTER LIP AUGMENTATION: HISTOLOGY, SEM AND X-RAY SPECTROSCOPY

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Aim: the cosmetic dermal filler is increasing in the following years and lip augmentation procedures have become gradually popular. The aim of the present study was to evaluate an unusual case of chronic lip edema and pain after associated to lip augmentation procedure investigated by a histological, scanning electron microscopy and x-ray microanalysis.

Methods: a female patient, V.A., 53 years old, non-smoker was subjected to a lip injection with hyaluronic acid about ten years before. Few years after the injection, the patient reported multiple nodules on the lips, which were not painful at the time of their appearance. Over time, the lesions become painful first to the touch and then also spontaneously.

Results: a hyaluronidase injection was performed in the nodule, accompanied by a systemic antibiotic and steroids administration with no clinical improvement. After two months, one neoformation present in the lips was excised for histological evaluation and reported a chronic inflammatory component in which accumulation of amorphous matrix referable to foreign material was observed. The SEM evaluation showed some different electron-dense and electron-lucent areas, indicating an increasing of Ca and P concentrations on the surface by the X-ray spectroscopy (XPS). The patient showed an excellent compliance and after three months from the surgery, the subject reported no more swollen areas with painful nodules spontaneously or on palpation.

Conclusions: the filler complications represent a clinical occurrence that could emerge also in a very late phase from the treatment.

A SYSTEMIC AND ORAL ASSESSMENT OF COMPLICATIONS POST MARROW TRANSPLANTATION

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Aim: the treatment plan that should be carried out towards patients undergoing Haematologous stem cell transplantation (HSCT) requires a multidisciplinary approach. The purpose of our retrospective study is to evaluate how a proper clinical protocol can positively affect systemic and oral health, analyzing local and systemic complications that occurred one year after HSCT.

Methods: 79 patients were examined one year after HSCT, divided into a group A in which the infectious foci were completely removed prior to transplantation, and group B in which it could not be done on time. The clinical protocol included a detailed examination of the oral cavity, followed by the comparison of a post-transplant orthopantomography with one prior to HSCT. Finally, we analyzed the oncohematological medical reports to retrospectively detect systemic complications that occurred after transplantation.

Results: among all post-transplant complications taken into analysis, which includes chronic Graft versus Host Disease, disease relapse, infectious complications, dysgeusia, secondary carcinoma, complications related to the neurological, cardiovascular and pulmonary system and disorders linked to the oral cavity, no statistically significant difference was detected except for neurological disorders, which were found to be greater in group A ($p = 0.002$).

Conclusions: given the lack of precise guidelines, more studies should be performed regarding the role that a proper dental treatment and a prevention plan could play in pre-HSCT patients.

PRELIMINARY RESULTS OF STUDY ON THE USE OF L-PRF IN POST-EXTRACTION LOWER THIRD MOLAR

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Aim: autologous blood components for non transfusional use are obtained by centrifugation of a patient's venous blood. Leukocyte- and platelet-rich fibrin (L-PRF) can promote regeneration of damage tissue, increase angiogenesis, and reduce inflammation symptoms (as pain or swelling).
The purpose of the study is to evaluate if L-PRF accelerates wound healing process and stimulates the regeneration of hard and soft tissue in a post extractive socket of third inferior molar.
Methods: this study has a split-mouth design. Patients requiring extraction of bilateral lower third molars were selected at the Unit of Dentistry & Oral-Maxillo-Facial Surgery, Policlinico of Modena. Extractions were performed by the same operator and with the same surgical approach. All patients received a standard pharmacological therapy and followed the same postoperative instructions. Before extraction, it was established which site would receive L-PRF (test group) or collagen sponge (positive control group). Postoperative discomfort and soft tissue were evaluated up to 7 days. Clinical-radiographic outcomes related to hard tissue were analyzed at 3 and 6 months. Statistical analyses were performed to observe the differences between the two groups.
Results: we enrolled 8 patients and a total of 12 third lower molar were extracted. Five post extractive socket were treated with L-PRF (test group) and 7 with collagene sponge (positive control group). The VAS score, analgesic consumption, and trismus were lower in the test group patients. The alveolar crest thickness showed higher reduction in the control group. The distance between the distal bone peak and the CEJ of the second molar showed slightly higher bone peak values for the test group patients. There were no statistically significant differences between test and control group for any parameter analyzed.
Conclusions: the use of L-PRF in the post-extraction socket of lower third molars can be a valid aid in reducing pain symptoms and improving discomfort caused by swelling and trismus. L-PRF in the post-extraction alveolus of third molars also appears to have a beneficial effect on the periodontium of the second molar, both clinically and radiographically.

SURGICAL MANAGEMENT IN EXTRACTIONS OF MAXILLARY AND MANDIBULAR THIRD MOLARS: CASE REPORT

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Aim: an impacted tooth can be defined as a tooth that is prevented from erupting up to the occlusal level because of malposition, physical barrier or lack of space. The decision to surgically remove impacted third molars has no established absolute treatment protocols, but multifactorial consideration is required before contemplating the procedure.
The purpose of this case report is to document the surgical management of the extraction of impacted maxillary and mandibular third molars.
Methods: a 19-year-old female patient, came to the Dentistry department of San Raffaele hospital for a visit, the intraoral examination revealed incorrect position of the second molars in the arch, probably caused by dysodontiasis of the third molars.
The 1st level x-ray (OPT) confirms the dysodontiasis of the elements 1.8, 2.8, 3.8 and 4.8.
The extractions were performed in two surgical procedures to allow the patient to chew on the opposite side; the first element to be extracted was 4.8. After loco-regional anesthesia we made a full thickness mucoperiosteal envelope flap, followed by an access osteotomy, a coronotomy and an odontotomy. We revised the cavity, inserted fibrin sponges and sutured with 3/0 silk thread. In the same way, we extracted the 1.8 element, however the odontotomy it was not necessary.
In the second surgical procedure, elements 3.8 and 4.8 were extracted, following the same surgical method; in this case for the mandibular third molar we only performed the coronotomy without separating the roots, while for element 2.8 it was not necessary.
Results: a follow-up was carried out at 1 week, 3-6 and 12 months and showed good healing of the tissues.

Conclusions: the extraction of impacted third molars is a routine operation for oral surgeons, but knowledge of the anatomy and radiological evaluation are requirements for accurate planning of the operation. Any surgery is not free from more or less serious complications. The surgeon's ability lies in knowing how to manage the complications themselves in the most appropriate way.

LOWER THIRD MOLAR X-RAYS FOR DECEASED MIGRANTS AGE ESTIMATION: MESSINA ORAL SURGERY SCHOOL

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Aim: the aim of this study is to use the Demirjian method to estimate the age of deceased migrants by evaluating the radiological development of their lower wisdom teeth.
Methods: the study was conducted at the Department of Forensic Medicine of the Hospital Papardo (Messina) and involved the use of intraoral X-rays of the mandibular retromolar regions (right and left side) of 5 corpses found after the disembarkation on 07/24/2022. The X-rays were taken using a portable intraoral X-ray unit (VATECH VEX-P300), Rinn XCP-DS sensor holders and Molt mouth gag. The age estimation was performed by assessing the eruption stage and root development of lower third molars, which continue to develop after the age of 14. Intraoral periapical X-rays of the mandibular retromolar regions were taken of every corpse to check for the presence of lower third molars and to verify their roots' development.
Results: based on the analysis of the X-rays obtained, it was determined that 2 of the 5 corpses were of legal age while 3 were underage.
Conclusions: the study showed that the Demirjian method for dental age evaluation, which involves the analysis of lower third molars in their highest maturational stage, can be used to estimate whether a corpse is of legal age or underage. The method is reliable and can be useful in forensic investigations involving deceased migrants.

THE L-PRF ROLE IN THE REGENERATIVE TREATMENT OF INTRAOSSEOUS PERIODONTAL DEFECTS

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Aim: was to investigate the influence of the use leucocyte-and platelet-rich fibrin (L-PRF) as an intrabony defect filling material and also to compare the patients' perception about surgical therapy with and without the L-PRF application.
Methods: this was a parallel group, standard of care-controlled, randomized pilot trial. Patients in general good health, presenting with at least one deep intrabony defect were considered eligible for this study. Patients were randomly treated with (aG) or without (bG) application of L-PRF and were followed up to 1 year.
The full-mouth plaque score (FMPS), and full mouth bleeding scores (FMBS), the probing pocket depth (PD in mm), gingival recession (REC in mm), and clinical attachment level (CAL in mm) were recorded at baseline (before surgery), at three and six months (excluding PD and REC) and 1 year. Data on closure of the flaps, presence/absence of edema and/or hematoma were evaluated, and Patients were given a questionnaire (OHIP 14) about the subjective perception of intra- and post-operative pain and/or discomfort. The chair-time of each surgical procedure will be recorded.
Results: 14 patients representing 14 intrabony defects were split in the two branches of the study (aG and bG). No significant differences between aG and bG were found as FMPS and FMBS at baseline and along the study, and as PD, REC and CAL at baseline. One year after surgery, statistical significant differences were found between aG and bG as REC and CAL that were lower in aG.
The aG showed greater chair-time and discomfort during surgery, and lower discomfort and flap healing post-surgically.
Conclusions: L-PRF seemed to play a clinically positive role in reducing REC and consequently increasing CAL gain in the-

se periodontal defects. Moreover, produced a better healing process and reduce post-operative patients' discomfort. The intrasurgical measures were: distance between the cemento-enamel junction and the bottom of the defect (CEJ-BD), the distance between the cemento-enamel junction (or restoration margin) and the residual alveolar crest and depth of the 3-wall and 2-wall sub-components of the defect. Randomization will be performed by computer generated random codes.

POST-SURGICAL SWELLING: A NEW AUTOMATED TOOL FOR VOLUMETRIC ASSESSMENT

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Aim: this study aimed to introduce a new automated method of volumetric measurement for postoperative swelling.
Methods: patients undergoing CBCT for lower third molar surgery were enrolled. Bellus3D App was used to obtain facial scans before surgery (T0), three days (T1) and seven days after surgery (T2). Three-dimensional analysis was conducted using the software 3D Slicer. After CBCT orientation, automated segmentation of facial soft tissues was performed in order to obtain a 3D template for the surface registration of the T0 scan. For the comparison, T1 and T2 scans were registered on oriented T0. Pre- and post-operative swelling were analyzed using an innovative open source tool for volumetric measurements. Volumetric data were correlated with linear measurements of swelling and secondary clinical outcomes (pain, trismus and bleeding). Statistical analysis was performed setting $\alpha = 0.05$.
Results: in the comparison of T0-T1 models, volumetric data showed an increased swelling (3964.85±3989.78 mm^3) correlated with an increase linear difference (2.81±1.88 mm). At T0-T2 a decreasing trend of swelling was recorded with a volumetric difference of 3314.83±3247.76 mm^3 and a linear difference of 1.033±0.922 mm. Clinical outcomes confirmed this trend, a statistical significance was found with trismus at T0-T1 and with pain at T1-T2 ($p < 0.05$).
Conclusions: the use of an automated volume calculation tool improves significantly the post-surgical swelling assessment in order to avoid operator-dependent procedures and to overcome linear measurements.

EVALUATION OF GLYCAEMIA BEFORE AND AFTER SIMPLE TOOTH EXTRACTION IN PATIENTS WITH DIABETES

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Aim: to compare the effects of local anaesthesia with and without epinephrine on peripheral blood glycaemic response before and after simple tooth extraction in patients with diabetes.
Methods: this randomized clinical study included 82 patients with diabetes (type I, n = 25; type II, n = 57) with low-moderate surgical risk. Before the procedure, patients were randomly assigned to group A (local anaesthesia with epinephrine, n = 41) or group B (local anaesthesia without epinephrine, 0 = 41). Peripheral blood glycaemia was measured before and after the procedure with the GlucoTest® device. All patients received atraumatic extraction of 1 or 2 teeth followed by simple interrupted sutures.
Results: peripheral blood glycaemia after tooth extraction increased in 65%, decreased in 33% and did not show any variation in 2%. There was no significant difference between group A and group B.
Conclusions: in most diabetic patients, peripheral blood glycemia was reduced after the procedure regardless of the choice of local anaesthetic. These results suggest that simple tooth extractions may be safely performed in patients with diabetes and that hyperglycaemia may not be a common complication. Moreover, the choice of local anaesthesia with or without epinephrine may be guided by clinical needs and is not associated with significant hyperglycaemia.

SURGICAL CILIATED CYST OF THE MANDIBLE: A CASE REPORT AND REVIEW OF THE LITERATURE

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Aim: Surgical ciliated cysts (SCC) typically occur in the bony region of the jaws when there is a risk of respiratory epithelium implantation. This report describes a case of SCC affecting anterior part of the mandible.

Methods: a 39-year-old woman was referred to the department of oral surgery at San Raffaele Hospital in Milan due to the pain related to an existing exudative inflammation and swelling at buccal part of the anterior zone of mandible. The patient reported a previous rhinoplasty with osteocartilaginous nasal graft to perform the chin augmentation around 10 years earlier. The treatment plan was to perform a complete removal of the cystic lesions by opening a full flap access from the buccal part of the mandible preserving the aesthetic aspect. The 3 cystic lesions were removed intactly and the bone cavities were cleaned using a surgical bur in order to prevent any recurrence of the lesions. The patient has been returned after a week to remove the sutures and she was advised to continue a routine follow up with her dentist.

Results: based on the current literature review only 16 cases of mandibular SCC have been reported due to its rare incidence. A sample was sent for histological analysis and the presumed diagnosis was confirmed.

Conclusions: in order to prevent this kind of cystic lesion it is mandatory to use fully cleaned surgical instruments and avoid utilising autogenic graft with nasal/respiratory epithelium. As it is released in the latest version of WHO classification, in order to make a proper diagnosis other osteolytic cysts should be excluded.

SEMI-OCCLUSIVE CAD-CAM TI-MESHES FOR GUIDED BONE REGENERATION

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Aims: GBR is a widely used technique for the treatment of atrophic jaws with a good success rate in short and long term studies. However, this technique is not lacking of complications and a wide range of barrier devices has been tested for simplify and standardize GBR procedure. The aim of this study is to investigate clinical and histological features of a new GBR titanium CAD-CAM device called Semi-occlusive Titanium Mesh.

Methods: five patients with partial edentulism of the maxilla/mandible, with vertical/horizontal bone defects, were treated with GBR procedure in order to achieve implant- supported restorations.

The device used was a semi-occlusive CAD-CAD TI-mesh with a CAD-CAM laser sintered micro-perforated scaffold with 0.4 mm pore size.

8 months after GBR during re-opening surgery (T1), surgical and healing complications were evaluated and histological and histomorphometrical analyses of the regenerated bone were performed.

Results: a total of 5 patients with 6 treated sites were enrolled. One healing complications were recorded and classified as late exposure of the device 4 months after GBR. At 8 months well-structured new regenerated trabecular bone with marrow spaces was present. The percentage of newly formed bone was 30.37±4.64%, marrow spaces 56.43±4.62%, residual grafted material 12.16±0.49% and residual bone chips was 1.02±0.14%.

Conclusions: within the limitations of this study, the results show that semi occlusive Ti-Mesh could be used for vertical and horizontal ridge augmentations. Nevertheless, further clinical and histological studies are need.

DIFFERENTIAL DIAGNOSIS OF OSTEOLYSIS ASSOCIATED TO LOWER THIRD MOLAR: A RETROSPECTIVE STUDY

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Aim: radiolucent lesions associated with impacted third molar can show different diagnoses which need confirmation by histological examination.
In most cases, there is a tendency to attribute the cystic neoformation associated with the impacted third molar to a dentigerous cyst (DC) because of the frequent mechanism of pathological degeneration of the organ deputed to the formation of dental enamel, which occurs in the second and third decades of life in the included tooth. The aim of the present study is to identify and demonstrate the frequency of unexpected diagnoses of monocystic ameloblastoma (UA) or odontogenic keratocyst (OK) when by radiographic examination it is suspected as a dentigerous cyst (DC) because of its clinical and radiographic characteristics.

Methods: a retrospective analysis of biopsies received from 2000 to 2020 was performed, and the number of UA, OK, and DC cases was evaluated. Clinical and radiographic data were compared with histological examinations and anatomical location, and the number of preoperative UA and OK cases assumed to be DC was identified.
Results: a total of 607 biopsies were received. Of these, 491 were diagnosed and confirmed as DC (80.9%), 72 as OK (11.8%) and 26 as UA (4.3%) and 18 (3%) undetectable.
Conclusions: the retrospective analysis shows that a biopsy should always be considered in all cases in order to establish the correct pathologic diagnosis and to plan treatment, because radiolucent lesions associated with impacted third molar are often diagnosed as other odontogenic neoformations.

10 YEARS RETROSPECTIVE ANALYSIS ON PATIENTS AFFECTED BY MRONJ ATTENDING THE DENTAL SCHOOL

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Aim: the aim of this retrospective study is to evaluate the incidence of MRONJ related to the type of drug prescribed and to the underlying disease in patients attending the Oral Surgery section of the Dental School of Turin.
Methods: in this analysis a period of 10 years (2011-2021) was taken into account for a total of 292 osteonecrosis sites in 280 patients.
The patients were divided by age group, drugs, underlying diseases, arch affected by osteonecrosis, healing and treatment implemented. Then these factors were associated to the later development of MRONJ and to the to the effectiveness of the therapies implemented.
Results: from the data, based on the underlying pathology, it was possible to derive the incidence of MRONJ. Pathology developed in 15% of patients with breast cancer, 7% with prostate cancer and 4% with metabolic disorders. If we were to evaluate the incidence of MRONJ according to drugs assumed we would find the Alendronate having the highest incidence (23%), in fact this doesn't require a dental suitability certificate before starting therapy. On the other hand, usually patients are sent to our Faculty in occurrence of osteonecrotic problems, therefore the total number of patients taken in consideration are a lot lower than the prescriptions in the general population: the data emerged may be misleading related to the general population.
Conclusions: overall, despite the growing attention towards MRONJ in the last years, as a result of the increasing number of prescriptions of these drugs the cases of drug-related osteonecrosis show a positive trend.

ODONTOMA ASSOCIATED WITH FOLLICULAR CYST: A CASE REPORT

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Aim: both odontomas and follicular cysts are lesions frequently encountered in dental practice, but the simultaneous presence of both is rather rare. The purpose of this case report is to describe a case of odontoma associated with a follicular cyst located in the anterior sector of the mandible.

Methods: a 65-year-old woman went to the oral surgery department of the Policlinico Hospital in Milan for a visit aimed at evaluating a lesion present at the level of the mental foramen. On radiographic examination, a cystic lesion associated with a radiopaque mass involving the root apices of the lower incisors was observed. Over the years, the patient underwent two different CBCT scans, 10 years apart from each other. Thanks to these, it was possible to measure the dimensional increase that the lesion had over time, and this was decisive in the decision to proceed with surgical excision. Finally, the lesion was sent to the pathologist to confirm the initial diagnostic hypothesis.

Results: as proof of their odontogenic nature, odontomas can induce cystic proliferation. This lesion derives from the degeneration of the enamel organ after the partial or total development of the crown of the same odontoma. Although these changes are mentioned in the literature, they are rare in clinical practice.

Conclusions: despite their benign nature, it is appropriate to remove these types of lesions in order to avoid secondary complications and possible sequelae for the patient, with excellent postoperative prognosis.

MARSUPIALIZATION OF MANDIBULAR CYST: A CASE REPORT

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Aim: the authors describe the conservative treatment of a large oral mandibular cyst to minimize the risks of mandibular fracture and inferior alveolar nerve injury.

Methods: orthopantomography and Computer Tomography (CBCT) of a healthy 65 years old patient revealed a 3 cm radiolucent area from element 4.6 to 4.8 associated with the crown of an impacted mandibular third molar. A buccal full-thickness flap was detached after a linear incision of the alveolar mucosa, the cyst lining was exposed and partially removed performing an incisional biopsy. The flap borders of oral mucosa and the edges of the remaining cystic epithelium were sutured with PLG absorbable suture and the lumen was filled with iodine gauze that were removed after 7 days. The result of histologic exam confirmed the clinical diagnosis: dentigerous cyst. New gauze was inserted into the surgical pouch after disinfection with 0.2% chlorhexidine twice a week for six months and new CBCT exam revealed an evident reduction of cyst's size. The surgical enucleation of the follicular cyst was so performed with the extraction of the impacted third molar and the second molar under general anesthesia.

Results: an Orthopantomography after 7 months from the surgery revealed a good healing with trabecular bone formation and the disappearance of the radiolucent area. No adverse event was recorded.

Conclusions: the marsupialization of voluminous cystic lesions of the jaw aims to release the intraluminal pressure, allowing a gradual growth of the surrounding bone with progressive volume reduction before performing lower risk enucleation.

A FULL-DIGITAL CUSTOMIZED MESH APPROACH IN GUIDED BONE REGENERATION: SYSTEMATIC REVIEW

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Aim: the aim of the present systematic review is to analyze clinical application of digitally custom-made meshes related to guided bone regeneration (GBR) in oral surgery.

Methods: an electronic search of the online databases PubMed, Scopus, and Web on Science was performed using the following MeSH terms combinations: "GBR AND mesh AND 3D printing" or "CAD/CAM AND mesh" or "GBR AND custom AND mesh". The search was carried out, considering articles published from January 2013 to January 2023. 143 articles were examined, and 15 studies were selected for this review.

Results: 4 studies underlined the achievement of satisfactory aesthetic outcomes. 6 studies suggested customized mesh application in case of severe bone defects. 3 studies highlighted better bone regeneration obtained. 1 study stated that customized meshes alone don't seem inferior to customized meshes covered by collagen membranes in terms of healing complications and regeneration rates. Only 1 study expressed that custom-made mesh could lead to important post-operative morbidity.

Conclusions: 14 studies noticed positive clinical outcomes of digital customized mesh application during GBR procedures, being aesthetic results, better bone regeneration, and their versatility related to all types of bone defects, even severe ones. Only 1 study highlighted important post-surgical mesh exposure, suggesting a cautious approach to this procedure when designing the mesh, to avoid flap tension that may cause mucosal rupture.

AUTOLOGOUS BIOMATERIAL GRAFT WITH TOOTH TRANSFORMER® TECHNIQUE FOR BONE REGENERATION

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Aim: the loss of a tooth, which occurred for various reasons, causes bone resorption if alveolar preservation strategies are not implemented. The restoration of an adequate bone volume is fundamental to create a site that allows the subsequent implant-prosthetic rehabilitation. The objective of this study is to verify the effectiveness of the use of autologous material deriving from the tooth with the aid of the Tooth Transformer® in guided bone regeneration. This system reduces the mineral component of the dentin and exploits the BMPs with high regenerative power.

Methods: patient, edentulous in area 2.6, intends to rehabilitate the area using implantology. Due to the lack of sufficient bone, a GBR of the site is performed in the first surgical phase, through the use of the compromised element 3.8, previously extracted, as autologous material to be affixed for the grafting through the Tooth Transformer®. After 4 months, the surgical site was reopened and the implant fixture was inserted which, after 4 months, was loaded.

Results: the result obtained demonstrates the effective regenerative power of the Tooth Transformer® method which ensures high predictability of therapeutic success. At the end of the regeneration, 9.82 mm of bone was obtained which allowed to an adequate implant placement.

Conclusions: the autologous material guarantees a natural high wettability which determines an increase in osteoblastic maturation and an increase in the production of local growth factors.

EVALUATION OF POST-OPERATIVE MORBIDITY AND PALATAL WOUND HEALING AFTER IMPLANT UNCOVERING

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Aim: the aim of our study was to evaluate the efficacy of the L-PRF in modulating the healing by secondary intention of the surgical wound resulting from fixture uncovering, assessing the patient's post-operative condition. The purpose of this case series is to evaluate the healing and post-operative discomfort of the patient, after implant uncovering using APF and L-PRF bandage at the palatal aspect.

Methods: 40 maxillary implants were recruited. The inclusion criteria: not having systemic diseases; not being pregnant/lactating; not-smoker; FMPS and FMBS <20%; width of the buccal keratinized gingiva <2 mm.

The flap was detached and elevated to partial thickness beyond the muco-gingival junction buccally. A double layer of L-PRF was applied to the surgical wound and stabilized with compression sutures. The primary outcome of this study was the complete re-epithelialization of the surgical wound (CWE). Then were evaluated: post-operative discomfort (D); Modification of patient's feeding habits (CFH); use of analgesics in the first week (AU) and alteration of sensitivity (AS). The AU was calculated based on the sum of analgesic administrations at the end of the week, to indirectly quantify the patient's pain.

Results: results demonstrated that within 2 weeks 5 of 20 (25%) surgical sites presented CWE, while within 3 weeks all sites achieved complete healing.

Likewise, all secondary parameters showed a favorable evolution within 2 weeks, and all patients reported no discomfort and changes in feeding habits after the second week. After the first week of examination, no patient reported the use of analgesics.

Conclusions: the following study aims to present a new L-PRF mediated dressing technique associated with APF to promote, based on the biological properties of L-PRF, the healing of the surgical wound around the implants and reduce the patient's postoperative discomfort.

AUTOLOGOUS DECIDUOUS TOOTH-DERIVED MATERIAL FOR GBR PROCEDURE

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Aim: several techniques were described to increase bone volume with guided bone regeneration (GBR) procedures. Among the autogenous biomaterials, some authors proposed the use of autogenous dentin, retrieved from teeth, using Tooth Transformer®. The aim of this case report is to prove the quality of this biomaterial retrieved from deciduous teeth in guided bone regeneration procedures.

Methods: the subject of this case report was one 24-years-old female with vertical defect requiring bone augmentation where she had 1.1 element. Due to the lack of bone, it was necessary to perform a GBR procedure using autologous deciduous tooth-derived material made by Tooth Transformer®. After 6 months, we placed a 3.25 x 11.5 mm implant with flapless technique using a surgical guide which helped us to place the implant in the correct position for the prosthetic emergency. Immediate loading of the implant was performed using a resin crown.

Results: the present case demonstrated that deciduous teeth could be used as a source of bone substitute material, with good results in terms of integrations.

Conclusions: concluding we can state that using autologous deciduous tooth-derived biomaterial could be a good alternative since there is a less biological cost than others autologous materials need.

DIAGNOSTIC PROCESS OF RADIOTRANSPARENT LESIONS OF THE JAWS WITH DIFFERENT ETIOLOGY

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Aim: osteolytic lesions of the jaws are often asymptomatic and can be diagnosed only thanks to routine radiographic examinations or evident swelling. An accurate diagnosis is essential for the correct treatment and reduction of the risk of complications and/or progression of the disease. The aim of this report is to highlight the importance of histological examination when osteolytic lesions have similar clinical features.

Methods: a 13-year-old woman was referred with complaint of mild pain in the region of 46. Intraoral examination revealed a light swelling on 47. The radiographical examination showed osteolytic lesions apical to teeth 46 and 47. The vitality test was negative for 46, uncertain for 47. Therefore, the lesion on 46 was confirmed to be an acute apical periodontitis, meanwhile the one on the 47 required further investigations. The CT scan highlighted the relationship of the lesion with the mandibular canal and the perforation of the lingual cortex which allowed the FNC.

Results: FNC assumed the diagnosis of giant cell granuloma, so the treatment of the osteolytic lesions was different. The lesion on tooth 46 was treated with endodontic therapy. 47 was extracted and lesion was excised and later analysed by histological exam that confirmed the presumptive diagnosis of giant cell granuloma.

Conclusions: giant cell granuloma is a benign tumor that prefers the mandible and women under the age of 30. Its surgical removal is necessary and the post-operative phase requires careful follow-ups. The presumptive diagnosis must always be confirmed by histological examination.

CONSERVATIVE SURGICAL MANAGEMENT OF AN IMPACTED MANDIBULAR THIRD MOLAR: CASE REPORT

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Aim: mandibular third molar impactions are frequent. In many cases, teeth in dysodontiasis are interested by different kinds of disorders, such as caries, pericoronitis, or periodontitis. These pathological conditions are the reason why surgical extraction is recommended.

The purpose of the present case report is to document the extraction of an impacted mandibular third molar in position 4.8 using a conservative approach.

Methods: a 70-year-old patient presented with pain and swelling in the lower right jaw.

Through the evaluation of a orthopantomography (OPT) and CBCT we observed the presence of 4.8 in deep inclusion near the inferior alveolar nerve (IAN).

Based on these radiographic and clinical considerations, the patient underwent treatment through the extraction of the impacted teeth.

Under loco regional anesthesia, an intrasulcular incision was made and a full-thickness mucoperiosteal flap was raised to preserve the interdental papillae and the periosteal vascular-nervous structures, minimizing any postoperative pain and swellings.

After osteotomy and odontomy the wisdom tooth was removed. Subsequently, the alveolus is curetted and irrigated whit a saline solution.

Finally, the flap was sutured using silk thread 4/0 performing horizontal mattress suture.

Results: clinical checks were carried out at 1 week, 3, 6 and 12 months.

The patient reported no complication of paresthesia and significant tissue regeneration was observed.

Conclusions: through careful planning of the case, appropriate surgical technique, correct management of soft and hard tissues and close attention to anatomical structures, it was possible to perform an extraction of a lower impacted tooth safely and minimizing the risk of postoperative complications.

A NEW MAGNETIC RUBBER DAM AS A MEMBRANE IN GUIDED BONE REGENERATION: AN *IN VITRO* STUDY

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Aim: GBR is a surgical technique that allows bone regeneration using membrane barrier. This study aims to analyze the intensity and the action on cell viability of a magnetic static field (SMF) generated by a custom-made rubber dam with neodynium-iron-boro powder magnetized in addition to its effect on timing of bone healing.

Methods: the study involves three six-wells (1,2,3) with different incubation time (24h; 48h; 72h) containing:

1: cells exposed to SMF (with the magnetic dam);

2: only cells;

3: cells with normal dam.

The device is made of three layers of hygienic dental dam with size 2x3 cm and thickness of 0,15 mm. The sheets are fused together with some magnetic dust inside.

Results: the Intensity of the SMF turned out to be particularly low depending on the mass of the magnet (750G, 400G, 900 G on the three sites), but, despite its small size, it's capable of affecting the surrounding tissue. An analysis of cell viability during 24h shows no statistically significant differences compared with control; while after 72h there was a decrease in cell proliferation compared with control and the well with unmodified dam.

Conclusions: stimulation with SMF seems to have a negative effect on proliferating cells while leading to an increase of differentiation, activation and mineralisation.

Further studies should be done to investigate the cytotoxicity of magnetised membrane and its action on osteoprogenitor cells.

PROGRAMMED RELEASE INTRAOSSEUS ANESTESIA IN IMPACTED THIRD MOLARS SURGICAL EXTRACTION

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Aim: to compare two anesthetic techniques during all phases of surgical extractions.

Methods: 39 patients were enrolled; each patient is both a case and control: the impacted two third molars and the procedure anesthetic was random assigned to one site or contralateral; sides were divided into two groups: group 1 was treated with a conventional method (traditional inferior alveolar nerve block IAN) while group 2 was treated with alternative method (computerized intraosseous anesthesia).

Results: traditional technique is faster in execution compared to alternative method, which takes 3 minutes to be administered; but to obtain the onset of IAN block it is necessary to wait for an average of 6 minutes, while the latency of intraosseous anesthesia is virtually zero. Vincent's sign and lingual nerve anesthesia occurred in 100% of cases for group 1 while in group 2 only 13% (4 cases lingual anesthesia occurred).

Duration of perceived anesthetic effect for group 1 was on average 192 minutes, while for group 2 of 127 minutes ($p < 0.001$). The difference between the heart rate Δ of group 1 and group 2 is statistically significant in group 2. There were no postoperative complications reported nor for cases treated with technique conventional anesthesia or for those treated with intraosseous technique. Patients preference marked a 67% preference for the alternative technique, 20% for the traditional,13% indifferent.

Conclusions: in the treatment of impacted lower third molars, the obtained results demonstrate that intraosseous anesthesia is a viable alternative to standard anesthesia.

SURGICAL APPROACH OF TONGUE EARLY CANCER WITH ND: YAG LASER, HA AND PERICARDIUM MEMBRANE

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Aim: this paper describes the management of an *in situ* carcinoma of the tongue margin treated by surgical excision performed with Nd:YAG laser in combination with the application of hyaluronic acid (HA) and a resorbable porcine pericardium membrane. Advantages of using HA are linked to its hygroscopic, viscoelastic, bacteriostatic, anti-inflammatory, anti-oedematous and osteoinductive nature. Furthermore, HA stimulates clot formation, induces angiogenesis and increases osteogenesis. The resorbable membrane, in addition, allows adhesion, spreading, differentiation of stem cells and promote rapid tissue repair. The case concerns a 49-years old male patient presenting a non-homogeneous leukoplakia on the right tongue border without any symptom, moreover no tobacco or alcohol history is present. The biopsy reveals a *in situ* carcinoma.

Methods: after loco-regional anesthesia, excisional surgery of the lesion is performed with Nd:YAG laser (10Hz; 3.5W). Subsequently, HA gel is applied to the surgical site. The last step involves the placement of a resorbable porcine pericardium membrane, previously hydrated with saline and shaped to the profile of the surgical defect.
The membrane is then secured with resorbable sutures Vicryl 5.0.

Results: the follow-up shows rapid and good healing of the surgical site with no functional impairment. The patient reports no post-operative pain and denies the recourse to NSAIDs.

Conclusions: the properties of HA and resorbable membrane make their application ideal for soft tissue procedures in oral cavity and in regenerative surgery.

EFFECTIVENESS OF AUTOLOGOUS PLATELET CONCENTRATES IN SINUS ELEVATION SURGERY: AN OVERVIEW

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Aim: maxillary sinus lift is a predictable procedure for the rehabilitation of the posterior maxilla. The current overview aimed to summarize the findings provided by systematic reviews (SRs) and metanalyses (MAs) on the effectiveness of autologous platelet concentrates (APCs), as solely grafting material or with biomaterials in sinus lift surgery, and to assess the methodological quality of the included SRs.

Methods: PubMed, Scopus and Cochrane Library have been explored up to 31st October 2022. SRs and MAs discussing the effectiveness of APCs in sinus lift were included. Clinical outcomes as survival rate, implant stability, implant failure, postoperative complications, radiographic outcomes, as bone gain, bone volume and bone density, and hystomorphometric outcomes were considered. The methodological quality of the included SRs was assessed using the updated version of "A Measurement Tool to Assess Systematic Review" (AMSTAR-2).

Results: twenty-eight SRs meet the inclusion criteria. In short-term period, positive clinical outcomes, new bone formation and absence of biological complications were observed when APCs were used on their own or in combination. Nevertheless, no favorable additional effects in long-term period were observed. The methodological quality of the included reviews ranged between critically low (3 studies) and high (9 studies).

Conclusions: the current overview of SRs pointed out the need of high-quality SRs evaluating the role of APCs in sinus lift through network MAs, in order to identify the most powerful material for the sinus augmentation surgery.

PIEZOELECTRIC OSTEOTOMY FOR DISTRACTION OSTEOGENESIS OF ANKYLOSED PERMANENT FRONT TEETH

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Aim: the aim of this study is to describe a long-term follow-up of a case series of ankylosed permanent front teeth (APFT) repositioned by orthodontic displacement of a dento-alveolar block according to distraction osteogenesis procedure.
Methods: five patients in permanent dentition who needed orthodontic treatment with fixed appliances, with a chief complaint of irregular teeth eruptions in the anterior area and an APFT, were enrolled in the present study. Before the surgery, the space for the repositioning of the ankylosed tooth was orthodontically created. Intraoperatively, a mucoperiosteal flap was elevated and two vertical osteotomies were connected with a single horizontal osteotomy, both performed with a piezoelectric surgery device; the flap was then replaced in its original position and sutured. After 10 days from the surgical procedure, the distraction device was bonded to the maxillary teeth. Following a latency period of 4 days, the distraction of the dento-alveolar block was started and the movement of the ankylosed treated tooth over time were recorded.
Results: at the 24-month follow-up, the maxillary anterior gingival margins were improved, alignment and leveling were completed in both arches. A slight relapse (0.5 mm) was observed after 1 year and then stable in the long term.
Conclusions: this study indicated the effectiveness of the combined surgical-orthodontic approach using osteotomy performed with a piezoelectric surgery device and segmental alveolar bone distraction for the treatment of APFT.

AUTOLOGOUS PLATELET CONCENTRATES IN THE PREVENTION AND TREATMENT OF MRONJ: AN OVERVIEW

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Aim: medication-related osteonecrosis of the jaw (MRONJ) is a progressive bone destruction in the maxillofacial region in patients under current or previous treatment with antiresorptive and/or angiogenic agents. The current overview aimed to summarize the results provided by the systematic reviews (SRs) and meta-analysis (MAs) on the effects of autologous platelet concentrates (APCs) in treatment and prevention of MRONJ and to evaluate the methodological quality of the included SRs.
Methods: three electronic databases have been explored. SRs concerning the effects of APCs on the prevention and treatment of MRONJ were included up to November 2022. Clinical outcomes as the incidence of MRONJ, soft and hard tissue healing and transition from a severe to a milder state of osteonecrosis were considered. The methodological quality of the included SRs was evaluated using the version of "A Measurement Tool to Assess Systematic Review" (AMSTAR-2).
Results: thirteen (13) SRs were included. When APCs were applied before after tooth extraction, no differences in the incidence of MRONJ were observed. When APCs were associated to surgery, they showed no difference in complete healing and transition from severe to mild state, except for the reduction of healing time and improvement of quality of life. The methodological quality of the included reviews ranged from low (3 studies) to high (2 studies).
Conclusions: the review showed the need for high-quality SRs that are eligible for meta-analysis, in order to determine the contribution of APCs in the prevention and treatment of MRONJ.

MULTIDISCIPLINARY APPROACH TO PERSISTENT ODONTOGENIC CHRONIC PANSINUSITIS: CASE REPORT

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Aim: sinusitis is an acute or chronic inflammatory process affecting mucous membranes of paranasal sinuses. Odontogenic sinusitis may be due to an odontogenic infection or to the presence of foreign bodies within maxillary sinus (e.g. implant fixtures). A case of recurrent chronic odontogenic pansinusitis was surgically treated to have simultaneous removal of implant fixtures protruding into the right maxillary sinus and Functional Endoscopic Sinus Surgery (FESS).

Methods: a 70-year-old female with history of chronic sinusitis, already subjected to right maxillary sinus FESS, reported nasal suppuration and headache. Panoramic and CT scans showed a chronic-hyperplastic sinus inflammation of right maxillary, ethmoidal, sphenoid and frontal sinuses, associated to the presence of two implant fixtures positioned about 10 years earlier and protruding into the maxillary sinus. Firstly, medical therapy was carried out, but the symptoms were not resolved. Considering the potential aetiological role of the fixture and the need to restore the physiological conditions of the paranasal sinuses and nose, a complete endoscopic right sinus surgery and contextual removal of implants were performed.

Results: during surgery inflammatory tissue around the implants was and sent for histopathological examination; microbiological exam was positive for *Staphylococcus Epidermidis*. The patient was followed-up at 7 days, 1 month and 3 months.

Conclusions: pain was reduced after surgery, with local good healing and absence of complications. When facing sinusitis potential need and benefits from a multidisciplinary approach should be considered.

IMMEDIATE IMPLANTS WITH LATERALIZATION OR TRANSPOSITION OF THE INFERIOR ALVEOLAR NERVE

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Aim: in inferior jaw, vertical reconstructive procedures are less predictable and more invasive due to the bone quality and the inferior alveolar nerve position. Indeed, partially edentulous patients in the posterior and premolar area are very challenging for clinicians.

This retrospective study aims to evaluate advantages, complications, and follow-up of implant placement with immediate loading without reconstructive materials but using the inferior alveolar nerve transposition or lateralization with or without recission of the incisal nerve respectively.

Methods: patients with a follow-up of 4 years and implant placed by these techniques were included in the evaluation. Patients affected by severe systemic diseases were excluded from the study.

Results: eight patients were analyzed. Patients showed few short term post-surgical compliances after the surgery and the implant survival rate was 100%. The quality of native bone was higher than reconstructive bone even if it is done by autologous bone because any types of graft have a percentage of resorption. Using these surgical approaches all the native bone has been utilized for the implant stability without the risk of non-absorbable bone substitutes. Moreover, this implant therapy could be considered acceptable in terms of implant success and survival rates compared to other studies of literatures and even the gold standard to perform only one surgery with an immediate provisional loading.

Conclusions: the implant placement with immediate loading in mandibula in partially edentulous patients could be considered as a good surgical and clinical approach without reconstructive procedures but using the inferior alveolar nerve transposition or lateralization.

UNICYSTIC AMELOBLASTOMA MIMICKING A SOLITARY BONE CYST: REPORT OF THE CONTROVERSIAL CASE

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Aim: ameloblastoma is a locally invasive benign tumor, characterized by slow growth ad painless swelling, causing expansion of cortical bone. The same features are present in the unicystic variant, which has typically unilocular radiographic appearance, macroscopically cyst nature and relatively better response to conservative treatment. The unicystic variant accounts for 5 to 22% of ameloblastomas. Gold standard treatment is surgical, conservative or radical based on the clinical and radiographical features of the tumor.

Methods: a 38-year-old male patient was referred to the Department of Oral Medicine and Surgery of the University of Parma in November 2021 for a suspected asymptomatic cyst located adjacent vital teeth (45-46). The CBCT highlighted a radiolucent area of about 12.1 mm x 9.3 mm with well-defined margins.

Results: an excisional biopsy was schedule, but during surgery the cavity appeared empty, leading to an initial diagnosis of a solitary bone cyst.

After 10 months of follow-up, the volume of the cavity was radiographically increased in size. Eventually, a more radical surgery was performed in December 2022 with a suspected diagnosis of unicystic ameloblastoma. Small tissue fragments of the cyst wall (cystic lining type) were taken to perform the histopathological examination.

The histological analysis confirmed the definitive diagnosis of unicystic ameloblastoma.

Conclusions: the aim of this case report is to draw attention to the complexity of clinical diagnosis and the importance of a precise histological diagnosis to perform the right treatment.

THE IMPLANT STABILITY AND BONE HEALING USING NEW STATIC MAGNETIC COVER SCREWS: A ISQ STUDY

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Aim: evaluate the effects of static magnetic fields (SMFs) generated by cover screws on implant stability using resonance frequency analysis (RFA) and surrounding soft tissue health over a 90-days observation period.

Methods: five patients ranging 60-65 years were enrolled with partial or full edentulism, who have elected to receive dental implants for fixed prosthetic rehabilitation in 3.6 and 3.7 area. After implant placement, one implant was supplied with titanium cover screw (control, G1) while the other with static magnetic Supercharged® cover screw (test, G2) for the next 50 days. During the follow-up visits at 0, 7, 14, 21, 50, and 90 days a RFA was performed with Osstell Mentor to investigate the stability of G1 and G2.

Analysis and multiple comparisons were performed to identify the time points in which the difference from baseline was significant.

Results: this result showed how all the differences in the stability values were significantly higher in G2 compared to the baseline in all the times considered. During the follow-up visits, the soft tissues around the implants of both groups were healthy.

Conclusions: SMFs caused more noticeable increase in implant stability and less bone loss during the initial week of healing.

Although this study can be considered as pilot, SMFs might be used to speed up the osteointegration of implants.

HUMAN OSTEOBLASTS BEHAVIOR AND BONE DEPOSITION ONTO INNOVATIVE LASER TITANIUM SURFACES

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Aim: evaluation of the osteoblasts behavior and bone deposition onto two different innovative laser titanium surfaces (L1-L2) compared to sandblasted and acid-etched (SBAE) surfaces.

Methods: human osteoblasts (hObSCs) from adipose stem cells (hASCs) were sorted by flow cytometric analysis and induced to differentiate. The osteogenic differentiation was detected by alizarin red staining, and the ALP was evaluated with WB and RT-PcR analysis. The hObSCs were cultured onto L1 and L2 and compared to SBAE. The osteoblasts behavior was evaluated with MTT, SEM, EDAX, osteogenic markers with RT-PcR, and WB analysis of MEPE, ALP and OCN.

Results: the values of ALP mRNA and protein expression increased in the hObSCs. Alizarin red staining assay confirmed the osteogenic differentiation. Profilometric and SEM analysis showed relevant differences between SBAE, L1 and L2 specimens.

After 20 days of culture, SBAE specimens showed few hObSCs and isolated sites of bone matrix deposition. L1 specimens showed a monolayer of hObSCs with initial bone deposition. On L2 surfaces, were found flattened large stellate cells, cellular interconnections with titanium and a higher bone matrix deposition compared to SBAE and L1 specimens.

Conclusions: the innovative laser titanium surfaces showed high biocompatibility with hObSCs cultures and the absence of impurities. During the early phases of osteointegration, the titanium surface has an important role in the cell adhesion and bone deposition.

SOCKET PRESERVATION WITH CALCIUM SULFATE HEMIHYDRATE IN PATIENTS WITH TYPE II DIABETES

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Aim: to evaluate the efficacy of socket preservation with medical-grade calcium sulfate hemihydrate (CSH) after tooth extraction in patients with type II diabetes.

Methods: this single-blind randomized clinical trial included 42 teeth of 16 patients with type II diabetes and need for tooth extraction. Before the procedure, cast models were poured to make customised clear resin trays. After atraumatic tooth extraction, the socket was randomly assigned to the experimental (E, n = 22) or the control group (C, n = 20). To measure socket depth in 6 sites, the tray had 6 holes for the insertion of an anaesthesia needle with an endodontic stop (T0). The socket was filled with CSH (Surgiplaster G170) in the E group and with re-absorbable gelatin sponge (Cutanplast®Dental) in the C group. A collagen membrane (Condress®) and sutures (removed after 1 week) were placed in all patients. Depth measurements were repeated after 1 month (T1) and after 3 months (T2) under local anaesthesia with the same tray. Mean socket depth was compared with ANOVA.

Results: new bone formation in tooth sockets was significantly increased in the E group compared to the C group ($p < 0.05$) for all 6 depth measurements, at both T0/T1 and T1/T2.

Conclusions: in patients with type II diabetes, the use of calcium sulfate hemihydrate to preserve the tooth socket produced better results than gelatin sponge. Even though more research is needed, this study suggests that CSH may be a cost-effective choice for socket preservation in type II diabetes.

ASSOCIATION BETWEEN ALZHEIMER'S DISEASE AND PERIODONTITIS: A PILOT OBSERVATIONAL STUDY

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Aim: recently the correlation between systemic pathologies and the development of periodontal disease has been demonstrated, such as cardiovascular disease and diabetes. We aim to investigate a possible association between periodontal and Alzheimer's disease.

Methods: patients with a diagnosis of Alzheimer's disease underwent periodontal and neurological evaluation. Periodontal status was estimated through bleeding on probing and plaque index (BoP and PI), and neurological status was evaluated through Mini-Mental State Examination (MMSE) and cerebral vasculitis disease.

Results: thirteen patients were recruited in this study: 9 men and 4 women, with a mean age of 78.85±8.58. Regarding the BOP, 15.38% have bleeding <10%; 30.76% have between 10-30%; 58,84% have >30%. Regarding the PI, 38.46% have <50% and 61.53% ≥50%. Regarding the neurological examination, patients underwent MMSE with an average of 22.73±5.97. Of these, 23.07% have <18 points (severe impairment of cognitive abilities); 30.77% have 18-24 points (moderate or mild impairment); 46.16% have ≥25 points (normal cognitive abilities). Furthermore, 61.53% of the patients included in the study are affected by cerebral vasculitis.

Conclusions: based on our findings and considering that inflammation underlies the pathogenetic mechanisms of both diseases, the control of the inflammation through systemic and periodontal therapies can improve the localized inflammatory insult and slow down the progression of Alzheimer's disease.

SURGICAL TREATMENT OF A MANDIBULAR CYST: LITERATURE REVIEW AND CASE REPORT

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Aim: the aim of this study is to describe a conservative approach to treat a big odontogenic osteolytic lesion in a retromolar area.

Methods: a 63 years-old woman in healthy conditions was referred to the San Raffaele Oral Surgery Department. She complained pain related to a swelling zone in the retromolar area. The area was evaluated by two x-ray exams (OPT and CBCT) highlighting a multilocular osteolytic area. A biopsy was planned, and it was performed by an incisional technique. The sample was fixed in 10% buffered formalin and sent to the pathologist. Then it was processed by hematoxylin-eosin staining. A conservative treatment was chosen applying a 60 G plastic tube into lesion to provide a drainage and fixing it to the mucosa using a 2.0 silk suture. The patient was instructed to rinse daily the lesion's cavity using a 0.2% chlorhexidine solution connecting a syringe to the drainage tube for 9 months. The drain was removed after 12 months.

Results: the OPT and CBCT in the follow-up process demonstrate how the decompression technique allows healing while avoiding invasive techniques.

Conclusions: according to the literature, a conservative approach can be used to treat several osteolytic lesions. This kind of approach allows the cystic lesions to heal without invasive and invalidating techniques. A particular attention must be paid in the follow-up process to avoid recurrences; moreover, the patient must be compliant in following the rinse protocol and careful during speaking and heating to prevent fractures due to the weakness of the bone.

SCHWANNOMA ARISING FROM INFERIOR ALVEOLAR NERVE: A RARE CASE REPORT

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Aim: Schwannomas are benign nerve-sheath neoplasms composed almost entirely of Schwann cells and appear most frequently on the auditory nerve or peripheral nerves. They arise in the oral region infrequently. The aim of this study was to report a rare case of schwannoma derived from the inferior alveolar nerve.

Methods: a 34-year-old woman referred to us with complaint of pain and paresthesia of lip and chin evolving for 6 months. Extraoral examination revealed no facial asymmetry. Intraoral examination showed a healthy-looking mucosa, with absence of swelling, redness and pain on palpation. The teeth 3.4, 3.5, 3.6, 3.7 were absent. The OPT showed a well-defined radiolucent unilocular lesion in correspondence with left mental foramen. CT scan with contrast revealed the presence of the mental foramen dilated by solid expansion of about 12 mm, with erosion of the roof of the mandibular canal. So, an incisional biopsy was planned.

Results: the histopathological examination showed fibrous tissue with an intense inflammatory infiltrate mainly lymphocytic and nervous structures positive to the immunohistochemical staining for S-100 protein. The absence of high mitotic indices and necrosis confirm the diagnosis of benign schwannoma. The patient recovered a normal sensory function 3 months post-operatively.

Conclusions: Schwannoma arising from inferior alveolar nerve remains very rare.

This tumor requires a thorough anamnesis, clinical examination, imaging, and pathological examination. The positivity for S-100 protein in immunohistochemical staining can help the final diagnosis.

ALTERNATIVE TRANSINUSAL APPROACH FOR ECTOPIC IMPACTED UPPER THIRD MOLAR

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Aim: the treatment of maxillary ectopic third molars could be affected by surgical difficulties and complications. Different approaches have been described in literature such as trans-oral and Caldwell-Luc technique, extra-oral accesses, and endoscopic procedures. The aim of the present investigation was to evaluate an alternative approach for unusual impacted third molar by a transinusal surgical procedure trough a systematic review and a case report.

Methods: the literature screening was performed in accordance with the criteria of the PICO guidelines on PubMed/Medline, EMBASE, Cochrane. The clinical case, instead, shows a 38-year-old female subject with no relevant medical history with symptomatic impacted ectopic third tooth placed in the postero-lateral maxilla.

Results: the screening showed a total of 34 manuscripts. Two cases reported a wait-and-see approach, while the surgical removal was the most common treatment. The subject was treated by a trans-sinusal and a lateral antrostomy to achieve the ectopic tooth removal. No complications or events were reported during the surgery and the post-operative healing.

Conclusions: the ectopic maxillary third-molars found into the maxillary sinus represents a very rare clinical presentation that could take advantage from an in-chair intraoral transinusal pathway removal reducing the invasiveness, the morbidity and the healing of the surgical site in comparison to other surgical techniques.

USE OF L-PRF IN PATIENT WITH MEDICATION-RELATED OSTEONECROSIS OF THE JAW: CASE REPORT

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Aim: the aim of this study is both to highlight the outcomes of the use of L-PRF in patients with Medication–related osteonecrosis of the jaw (MRONJ) and to invite the clinicians to further research this surgical treatment in the case of MRONJ.

Methods: CARE Guidelines were followed to improve the reliability of this case report. A Caucasian forty–seven–year–old lady came to our observation complaining of jaw pain in the III quadrant after the extraction of tooth 3.6. The diagnostic process described by the "S.I.C.M.F." and the "S.I.P.M.O." was used to define the grade of the case, which resulted in a 3b. A 3-month drug-holiday before surgery was prescribed to the patient. During the procedure, both intra-oral and extra-oral approaches were performed.

Results: 3-month after surgery the fistula had not yet closed so we continued to medicate with H_2O_2 and saline solution once a week until its closure occurred about 6 months after surgery.

The 10-month follow-up showed the complete healing of the wound, the absence of any symptomatology related to MRONJ, and no radiographic evidence.

Conclusions: although the knowledge of MRONJ is increasing, there are still no protocols for the treatment with L-PRF. The literature and our clinical experience suggest that this technique could be a good option for the management of severe MRONJ, with the objective of conducting new and more consistent studies on the subject.

MAXILLARY ELEMENT EXTRACTION WITH MAGNETIC MALLET®: PRESENTATION OF A CASE REPORT

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Aim: considerations and indications for extraction of maxillary dental elements by magneto-dynamic technique using a new magneto-dynamic device: Magnetic Mallet®.

Methods: 50 maxillary teeth in 35 patients were extracted, 20 men and 15 women, average age 49.12±20.62. Eight of the patients underwent multiple extractions. The extractions were mainly performed due to periodontal disease and destructive caries. The insert was inserted into the gingival sulcus and dislocation was circumferential starting from the mesio-vestibular portion at a rate of 1 stroke per second. The inclination of the insert was variable from 0° to 45° depending on the tooth to be extracted. Clinical and socket healing, by endoral radiographs, was assessed at 21 days.

Results: the most frequently used inserts were EXTR2 and EXTR3. Clinical evaluation of soft tissue at 21 days showed good tissue response.

Radiologic 'survey revealed an increase in bone radio opacity of the post-extraction socket probably to be referred to bone compaction during extraction.

Only one of the 35 patients had a complication characterized by postextraction alveolitis that was resolved without sequelae for the patient.

Conclusions: magneto-dynamic technology, applied to upper jaw dental extractions, proved to be an effective technique by simplifying the dislocation steps, little traumatic for the patient and easy for the clinician.

GINGIVAL ENLARGEMENT: A BIOLOGICAL COMPLICATION OF PERI-IMPLANTITIS?

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Aim: our aim is to describe a case of oral nodular fasciitis (NF) associated with implants in a woman patient.

Methods: we report a case of a patient who was referred to the Unit of Oral Surgery at Policlinico "G. Martino" of Messina for the presence of a rapidly evolving lesion on the alveolar mucosa of the 3° quadrant.

Case presentation: a 57-year-old woman come to our attention referring from 10 days the presence of an asymptomatic neoformation in the left lower jaw region. The patient referred that she is suffering from hypertension and a brain aneurysm. She was assuming double anti-aggregation drugs. The intraoral examination revealed a white and red swelling lesion of fibro-elastic consistency, measuring 4 cm x 3,5 cm, on the alveolar mucosa of the 3° quadrant. The lesion was not associated with pain, but mild discomfort during phonation, deglutition and mastication. The radiographic examination highlighted the presence of two implants underlying the lesion. Given the rapid evolution, the diagnosis of sarcoma or pyogenic granuloma was suspected. The incisional biopsy was performed, and the diagnosis of a hyperplastic lesion excluded the malignity of this neoformation. Therefore, the surgical excision was performed, and the final diagnosis of NF was made. The patient is currently under follow-up at our hospital.

Conclusions: NF is a rapidly proliferating fibroblastic lesion that can present as a tumor-like mass. It can be difficult to distinguish NF only through a physical examination; the biopsy is essential for a definitive diagnosis of this disease.

DIGITAL GUIDED SURGICAL APPROACH IN IMPACTED SUPERNUMERARY TOOTH EXTRACTION

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Aim: the aim of this study is to propose a digital guided surgical approach to remove impacted supernumerary tooth in posterior mandibular region. The digital workflow could enhance precision and accuracy during the surgery to prevent iatrogenic injury and to improve postoperative healing. using diagnostic technologies such as Cone Beam Computed Tomography (CBCT), 3D planning softwares and 3D printing technologies (CAD/CAM).

Methods: we describe a case-report of a impacted supernumerary tooth removal treated by the Oral Surgery Unit of University of Messina. Digital workflow was used to produce surgical templates, following different steps. After collection, radiographic data were imported into dedicated software. Dental arches three-dimensional rendering STL file and DICOM CBCT file were imported into virtual planning software. Impacted supernumerary tooth position was established after matching digital models and TC.

Results: one week later, good clinical soft tissue healing was observed. There were no postoperative complications and the healing process took place without any problems. Six months and one-year follow-up showed good clinical soft tissue healing. The proposed workflow helped the surgeon in pre-operative and intraoperative stages through accurate virtual planning and surgical guides realization. The use of customized 3D templates allowed better control of the osteotomy plans, flap management and faster surgical steps execution.

Conclusions: pre-surgical digital planning with 3D systems can provide useful intraoperative guidance and could help to further increase the accuracy of the procedure. The use of the digital guide plate made the impacted supernumerary tooth removal less invasive, faster and more accurate, whereas the flap design and osteotomy were more conservative. Furthermore, it allowed more favorable postoperative and better tissue healing.

A SCOPING REVIEW ON THE APPLICATIONS OF TRIBOLOGY CONCEPT IN DENTAL COMPOSITES RESEARCH

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Aim: a growing interest has developed in tribology application in medical biomaterials, such as resin composites used in restorative dentistry. Yet, the keywords "tribology" and "biotribology" are little applied in the pertinent publications. The aim of this scoping review is to provide an overview of tribology applications in dental composites research and to identify knowledge gaps and address future research.

Methods: this scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews and answered to the research question: "What is the application of tribology concept in dental resin composites research?". A literature search was conducted on PubMed and Scopus databases and the *in vitro*, animal and human studies investigating the tribological behavior of resin composites were included for qualitative synthesis. Two independent reviewers performed the studies' selection and data extraction.

Results: the search identified 163 potentially relevant studies. After removal of duplicates and articles not fulfilling the inclusion criteria, 17 laboratory studies met the eligibility criteria. No human/animal studies were identified. The majority of studies on dental tribology were published in the research areas of mechanical engineering/nanotechnology and differed in several methodological aspects, including macroscopic and microscopic techniques to investigate tribological and mechanical properties of the tested materials.

Conclusions: the preponderant engineering approach and the lack of standardized testing make the laboratory findings poorly informative for clinicians. Future research should focus on the tribological behavior of dental materials composites by means of an integrated approach, i.e., engineering and clinical, for improving development and advancement in this field of research.

INFLUENCE OF A CHLORHEXIDINE-BASED GEL ON CHROMATIC VARIATIONS OF TWO COMPOSITE RESINS

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Aim: the aim of this *in vitro* study is to evaluate the discoloration induced by a Chlorexidine (CHX)-containing gel of two different composites: paste and flow.

Methods: twenty composite samples (8x6x5 mm) were prepared through a silicon stamp in order to obtain reproducible specimens. Samples were divided in 2 groups (n = 10): paste composite (PC-Premise, Kerr) and flowable composite (FC-Premise Flow, Kerr).

After polymerization, and polishing and finishing procedures, samples were incubated in distilled water (dH_2O) for 24 hours, and then the initial color (L*, a*, b*, C, h) was measured through a spectrophotometer (VITA Easyshade V). Specimens underwent the CHX/tea coloration model cycle based on immersion in human saliva for 2', covered by a layer of 0.50% CHX gel for 2', and immersion in black tea for 1h.

These procedures were repeated 6 times. After rinsing and drying, sample color values (L*, a*, b*, C*, h°) were measured, and color variation was calculated using both CIELAB (ΔEab) and CIEDE2000 (ΔE00).

Results: ΔEab and ΔE00 were calculated using the respective formulas. FC showed a higher ΔEab and ΔE00 (2.95+-1.3/1.53+-0.6), than PC samples (1.84±0.7/1.34±0.5). This difference was not statistically significant (p >0.05).

Conclusions: based on the results of this preliminary study, it can be concluded that flowable composites are more subject to discoloration after CHX-gel use.

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EFFECTS OF CYCLING LOADING ON SURFACE ROUGHNESS OF HIGHLY-FILLED FLOWABLE COMPOSITE

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Aim: the aim of this study is to evaluate the difference in surface roughness, before and after occlusal wear, between traditional composites and highly-filled flowable.

Methods: eighty samples were divided in 4 groups (n = 20): CMF (Clearfil Majesty ES flow superlow, Kuraray), GUF (Gaenial Universal Injectable, GC), CM (Clearfil Majesty ES-2, Kuraray), and GA (Gaenial A'CHORD, GC). Samples (8x6x5 mm) were created through several 2 mm-layers of composite, each of them polymerized for 10".

Specimens were stored at 37°C for 24 hours to ensure polymerization, were polished and ultrasonically cleaned for 3' in dH_20, and then preserved in a without-light box. Surface roughness was measured with a roughness tester (SJ-201, Mitutoyo) placed 3 times randomly on the specimens surface, before and after cyclic loading (Chewing Stimulator CS4.4, Mechatronik).

Results: the initial average value was: 0.27μ(±0.13) for CMF, 0.25μ(±0.14) for GUF, 0.5μ(±0.29) for CM, and 0.47μ(±0.25) for GA. The final average value was: 0.66μ(±0.12) for CMF, 0.6μ(±0.12) for GUF, 0.79μ(±0.15) for CM, and 0.8μ(±0.14) for GA. The average differences between initial e final values were: 0.4μ(±0.19) for CMF, 0.36μ(±0.18) for GUF, 0.29μ(±0.2) for CM, and 0.33μ(±0.27) for GA. No statistically significant differences were found between CMF-CM ($p = 0.1$), GUF-GA ($p = 0.71$), CMF-GA ($p = 0.37$) and GUF-CM ($p = 0.3$).

Conclusions: the surface roughness of highly-filled flowable composites seems to be comparable to traditional paste composites.

FLUORIDE AND CALCIUM RELEASE FROM ALKASITE AND GLASS IONOMER RESTORATIVE DENTAL MATERIALS

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Aim: the aim of this investigation was to evaluate the effect of pH and temperature on the ion (F^- and Ca^{2+}) release of a resin-based material containing alkaline fillers (*Cention N Forte* - CN) and a self-setting high-viscous glass ionomer cement (*Equia Forte HT* - EF).

Methods: dental materials specimens, prepared according to manufacturers' instructions, by light curing for CN and self-reaction modalities for EF, were immersed in 3 different pH environments (4.8, 6.8, and 8.8), stored at 4 temperatures (0,18, 37, 44 °C) and analyzed after 24 hours, 7 and 28 days. Cumulative F^- and Ca^{2+} releases were analyzed by ion chromatography, mass spectrometry with inductively coupled plasma. Statistical analyses were performed by Stata 14.0 program and the level of significance was set to 0.05.

Results: in both materials, for all three pH values, the highest release was recorded after 28 days. F^- concentrations ranged from 0.15 to 10.08 mg/L and from 0.11 to 32.56 mg/L, for CN and EF, respectively. Ca^{2+} concentrations were in range 0.13-14.31 mg/L for CN and 0.27-29.57 mg/L for EF. Significant difference by temperature in F^- and Ca^{2+} release ($p < 0.05$) was detected for both materials, with higher amount at 44°C and 37°C. Therefore, the temperature storage influenced ion release and the high-viscous glass ionomer showed the maximum values.

Conclusions: both materials efficiently behave as F^- and Ca^{2+} releasing dental filling materials. Moreover, they showed different but stable bioactivity, so they can contribute to the dental remineralization process and secondary caries prevention.

INFLUENCE OF CURING TECHNIQUE ON CHEMICAL AND AESTHETIC PROPERTIES OF RESIN CEMENTS

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Aim: this study aims to evaluate the effect of two curing techniques on degree of conversion (DC), translucency (TR), color (C) and C stability of different resin-based luting agents (RLA).

Methods: light-cure Nexus Third Generation (NX3L), dual-cure Nexus Third Generation (NX3D), light cure RelyX Veneers (RXL), dual cured RelyX Ultimate (RXU), and Enamel Plus Flow (MF) were evaluated. For each tested material, 30 samples were made and divided into two groups: Group P1, cured for 40 sec; Group P2, initially cured for 5 sec. and, after 20 sec., cured for additional 40 sec. Then, samples of each group were randomly assigned to 3 groups (n = 5), according to the following chosen analyses: DC for assessing chemical properties at 5 min., 1 and 2 days after curing; TR and C after immersion in distilled water at 1 and 7 days; moreover, color stability was assessed after exposure to a coffee solution for 7 days. Data were analysed by two-way ANOVA and Tukey's HSD test ($p = 0.05$).

Results: P1 and P2 reported no differences in DC at each time points ($p < 0.05$). However, the two curing techniques influenced the color of RXD since it showed a perceptible difference in both TR and C ($p < 0.05$). The curing technique also influenced the color stability of RXL and RXD making them more susceptible to coffee staining ($p < 0.05$).

Conclusions: although P1 and P2 did not change the DC, they influenced the colorimetric properties of the tested RLAs, in particular of RXL and RXD. For this reason, P1 can be recommended when using RXL and RXD.

REMINERALIZATION POTENTIAL OF THREE FLUORIDE TOOTHPASTES ON WSLS: A MICROANALYTIC APPROACH

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Aim: this *in vitro* study aims assessing the remineralization potential of three fluoride-based toothpastes in permanent teeth with white spot lesions (WSLs). A multidisciplinary approach based on Raman Microspectroscopy, Computed X-Ray Microtomography, Scanning Electron Microscopy, Energy-Dispersive X-ray Spectroscopy and Vickers Microhardness was exploited.

Methods: N = 12 permanent molars with natural WSLs in the proximal-vestibular zone were divided into 4 groups (n = 3), treated with toothpastes 1450 ppm F^- coupled with different active ingredients: HAF (hydroxyapatite with fluoride); SMF (sodium monofluorophosphate with arginine); SF (sodium fluoride); and CTRL (untreated group). Samples were submitted for 7 days to a pH cycling, with two daily treatment exposures (2 min each time). Surface micromorphology, chemical/elemental composition, mineral density (MD), and microhardness were evaluated. Statistical analysis was performed (One-way ANOVA, followed by t-Test; Graphpad Software).

Results: a significant remineralization of WSLs was observed in all treated groups respecto to CTRL ($p < 0\text{-}05$). HAF and SF displayed higher microhardness than SMF and CTRL, higher phosphates amounts, higher crystallinity, and lower C/P. Ca/P pinpointed significant differences ($p < 0.05$) between treated groups and CTRL, while no differences were found among treated groups ($p > 0.05$). The highest MD and the smoothest surface morphology were found in SF.

Conclusions: SF and HAF toothpastes have comparable capability in hardness recovery, showing a good remineralizing potential according to both micromorphological and chemical/elemental analyses. The use of these toothpastes could represent a preventive, therapeutical and effective treatment for WSLs, especially in young and un-cooperative subjects.

A TEACHING TECHNIQUE FOR DIRECT POSTERIOR RESTORATIONS: ESSENTIAL LINES

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Aim: traditional methods able to replicate dental anatomy in composite direct posterior restorations usually need a long learning time. As an alternative to the classic layering method using traditional composites, Essential Lines technique has been recently introduced. It consists of various steps, including the use of bulk-fill composites and simple occlusal drawn lines that facilitate the restoration's execution also reducing its timing. This study is aimed to validate the simplicity of Essential Lines technique by administering a questionnaire to record the opinion of young practitioners who have been taught this technique.

Methods: an anonymous questionnaire entitled "Technical evaluation of Essential Lines" was created, consisting of 10 multiple choice questions, with an evaluation score from 1 to 5, where 1 is the minimum and 5 the maximum. For the assessment, the questionnaire was administered via Google Form platform to the students of the Dental School of Università Politecnica de Marche and to recently graduated dentists that learned this technique during their degree course.

Results: 77.4% of the interviewed people found the Essential lines steps extremely reproducible; 3.2% of them did not find the technique useful and would not recommend it to a colleague; 54.8% were extremely satisfied with the training and confirmed the easiness of reproducing the occlusal anatomy in posterior regions. Most of the questions about the utility of bulk-fill composites and the practice-kit received a score of 4, demonstrating how helpful and fast they were in learning the Essential Lines technique. Only 3.2% of participants did not complete the restoration in 15 minutes.

Conclusions: the Essential lines technique can be considered a valid method to teach a feasible and reproducible way to perform direct posterior restorations.

COMPARISON OF THREE DIFFERENT CURING STRATEGIES ON THE COLOR STABILITY OF COMPOSITE RESINS

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Aim: the objective of this study was to evaluate the effects of 3 different curing methods on the colour stability of composite resins using a coffee pigment solution.

Methods: three different composites were used placed on 8 x 2 mm Plexiglas cylinders. The 120 samples were divided into 4 groups according to the polymerization strategy: control group, in which a single photopolymerization was performed for 40s; group 1 in which a polishing procedure was added; group 2 in which an additional photopolymerization was performed after the polishing procedure; group 3, photopolymerization was performed using glycerin and then the polishing maneuvers were performed. The samples were soaked for 7 days in coffee solution. After the 7 days in the solution: A first color measurement was taken immediately after polymerization, the measurement was performed using a dental spectrophotometer, the second measurement was taken after 7 days in the coffee solution. Three parameters (L,a,b) were evaluated and used to derive the ΔE. A descriptive statistic of the different groups and a one-way ANOVA was performed for comparison between the different groups and the control. The p-value was set <0.05.

Results: a descriptive statistic of the different groups and a one-way ANOVA was performed for comparison between the different groups and the control. The p value was set <0.05.

Conclusions: finishing and polishing should be performed in order to maintain aesthetic properties by providing less discoloration in composite resins.

MEETING POINTS BETWEEN CONSERVATIVE AND ORTHODONTICS IN THE AGENESIS OF LATERAL INCISORS

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Aim: agenesis of the maxillary lateral incisors is the third most frequent one after that of the eighth and second lower premolars. The upper lateral incisor is directly involved in smile aesthetics and its mono or bilateral absence requires a multidisciplinary dental intervention. The two treatment options are orthodontic opening or closing of the spaces.
The aim of the study is to analyse non only the tip and the torque positions but also the rotation of the canine crown replacing the missing teeth in case of bilateral agenesis considering the greater convexity of the buccal surface compared to that of the central incisor, in anticipation of conservative camouflage.

Methods: literature review and *in vitro* reconstructions on moulded models were performed.
Results: it is evident from the literature review that there is little attention paid to canine crown rotation in replacement cases. Through the *in vitro* reconstructions on printed models, it was possible to demonstrate that the positioning of the canine in the best rotation, compared to the traditional one, allows a greater preservation of the patient's dental tissue, respecting the principle of Minimal Invasive Dentistry.
Conclusions: this work proves to be an *in vitro* evaluation from which becomes apparent the need for new studies to obtain more precise indications.

BONDING PERFORMANCES OF DUAL-CURE ADHESIVE RESIN CEMENTS

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Aim: to evaluate the shear bond strength (SBS) of two adhesive dual-cure resin cements to dentin and composite substrates.
Methods: two resin cements (EP, Estecem II Plus, Tokuyama and VAR, Variolink, Ivoclar Vivadent) with dual-cure (DC) or self-cure (SC) polymerization mode and their respective universal adhesives (UB, Universal Bond II and ADH, Adhese universal DC) were used for the study. Regarding the bonding substrates, human molars were cut in half longitudinally to expose dentin, while composite overlays (Estelite Posterior, Tokuyama, 4x4x3 mm) were created in two 2mm-incremental layers using a silicone mold. Dentin blocks (D) and composite overlays© were embedded in acrylic resin, leaving one of the surfaces available for bonding. The following adhesive/resin cement combination were used for luting purposes (n = 20): 1) UB/DC EP; 2) UB/SC EP; 3) ADH/DC VAR; 4) ADH/SC VAR. Specimens were submitted to SBS test until detachment. Data were statistically analyzed ($p < 0.05$).
Results: cement (ER >VAR), polymerization (DC >SC), substrate (D >C) and the interaction between factors significantly influenced the results. When DC, ER resulted in higher SBS compared to VAR ($p < 0.05$), while no differences were observed between the two cements in SC mode ($p = 0.81$).
Conclusions: ER cement combined with the recent SC universal adhesive showed better bonding performance in DC cementation mode, compared to a conventional adhesive cement.

EFFECT OF IMMEDIATE AND DELAYED DENTINAL SEALING ON CORONAL BOND STRENGTH: 5-YEAR OUTCOME

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Aim: to investigate the effects of immediate (IDS) and delayed (DDS) dentinal sealing on coronal dentin bond strength at baseline and after 5 years of storage in artificial saliva.

Methods: molar coronal dentin surfaces were selected and divided in groups (N = 10) according to the following adhesive procedures:

G1: 3-step etch-and-rinse (ER) adhesive.

G2: Universal adhesive with MDP in ER mode.

G3: Universal adhesive with MDP in self-etch (SE) mode.

G4: Universal adhesive without MDP in ER mode.

G5: Universal adhesive without MDP in SE mode.

After adhesive application resin composite buildups of 4 mm were made and specimens were sectioned to obtain 1-mm-thick sticks in accordance with the μTBS protocol. Sticks were stressed to failure at baseline and after 5 years. Each specimen was observed under a stereomicroscope to determine the failure mode: adhesive (A), cohesive (C) or mixed (M).

Data were statistically analyzed using analysis of variance (ANOVA) and Tukey post-hoc test. Chi square test was used for failure mode analysis. Statistical significance was set for $p < .05$.

Results: all the investigated factors (adhesive system, treatment, sealing and storage) significantly influenced μTBS, with the ER performing better than SE, IDS giving higher bond strength values than DDS and storage over time significantly affecting μTBS.

Conclusions: based on the obtained data, immediate dentinal sealing of the coronal surface achieved higher bond strength results both immediately and over time. Further studies are needed to confirm the obtained outcomes.

ACCELERATED FATIGUE RESISTANCE OF 3D PRINTED *VS* MILLED OCCLUSAL VENEERS

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Aim: to evaluate the biomechanics of the cement layer and different restorative materials (3D printed and milled) through accelerated fatigue.

Methods: a human second mandibular molar was prepared with anatomical reduction for an occlusal veneer restoration. After digitalization, 8 identical models of the prepared tooth were 3D printed (SolFlex 170, V-Print Model 2.0, Voco). All the obtained casts were individually scanned (Cerec Primescan, Dentsply Sirona), and restorations were designed with identical occlusal surfaces and uniform 1mm-thickness. Four restorations were 3D printed (Irix Plus, DFAB, DWS), four were milled (Grandio Blocks, Voco) with a chairside milling unit (Cerec MC X, Dentsply Sirona).

Surface pretreatment was performed as follows, for both restorations and casts: sandblasting (30 μm Cojet Sand, 3M), Silane (Porcelain Silane, BJM LAB), Universal adhesive (Universal Bond Quick, Kuraray Noritake). Then a dual curing self adhesive cement was used to cement all restorations with standardized pressure (Panavia SA, Kuraray Noritake). Cement excesses were removed before 3 min light-curing (VALO 1400mW/cm^2). Accelerated fatigue was performed with Instron Machine, MTS, as follows: 200N-5000 cycles, 400N-5000 cycles, 400N-5000 cycles, 600N-5000 cycles, 600N-5000 cycles, 800N-5000 cycles. Samples were tested up to fracture and n° of cycles were recorded, as well as fracture pattern.

Results: Kaplan-Meier survival estimates showed that the 3D printed material performed significantly better than the milled material. Fracture pattern showed that 3D printed samples were more prone to wear and failure due to complete consumption of the material. On the other hand, milled material had more catastrophic failures with complete fracture of both the restoration and the substrate.

Conclusions: tested 3D printed material showed promising performances both on fatigue resistance and failure patterns. Further studies are necessary to confirm the results obtained and evaluate their interfacial behavior.

ANTERIOR TEETH SHAPE MODIFICATION AFTER ORTHO TREATMENT TROUGH 3D-PRINTING TECHNOLOGIES

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Aim: the aim of this case report is to demonstrate the use of a digital workflow in achieving an aesthetically pleasing outcome for a patient who underwent orthodontic treatment and has lateral incisor agenesia.

Methods: a 20-year-old male patient visited the Restorative Department of the Dental School Lingotto, University of Turin, after receiving a two-year-long orthodontic treatment to correct malocclusion, microdontia, and lateral incisor agenesia. Due to the altered Bolton Index, multiple diastemas were present, and the canines were positioned as lateral incisors. As a result, indirect hybrid ceramic adhesive restorations were planned after Digital Smile Design (DSD) evaluation. After minimal preparation of teeth 1.3, 1.1, 2.1, and 2.3 to remove enamel undercuts, an intraoral scan was performed using Trios 3. The CAD fabrication of minimal veneer restorations was performed in cut-back mode, followed by importing the stl file to NAUTA software, which was used to set up the procedure for 3D printing. The restorations were printed using a hybrid ceramic (IrisMax, DWS) with a D-Fab 3D printer (DWS). The veneers were then luted, and enamel layers with characterization were completed directly.

Results: the all-digital workflow employed in this case proved to be effective in achieving morpho-functional restoration using minimal thicknesses. The artifact was optimally fitted and anatomically adapted.

Conclusions: the use of 3D printing technologies in indirect restorative care represents the future, and the digital workflow can assist multidisciplinary approaches in orthodontic patients with altered Bolton indices or requiring shape modifications.

EFFECT OF OCCLUSAL CORRECTIONS ON LITHIUM DISILICATE WEAR RATE

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Aim: analyze the effect of different surface treatments on wear rate under cyclic fatigue in lithium disilicate glass-ceramic crowns. The null hypothesis tested is that there will be no difference between the different surface treatments on volume loss.

Methods: initial LiSi Block was selected for milling flat-surfaced identical single- crown restorations which were cemented onto the replicated acrylic preparations. Thirty samples were randomly assigned to 3 different groups: No Intervention (group 1), Fine grit Shaped Diamond Bur (group 2), and Fine Grit Shaped Diamond Bur + Polish (group 3). A chewing simulator (SD Mechatronik) was used for fatigue cycle mechanical aging of the specimens under wet conditions. After every fatigue cycle, for a total of two cycles, the evolution of the volume loss was analyzed with a 3D laser profilometer (LAS-20). SEM analysis of worn scars were done. Data obtained were statistically analyzed with a one-way ANOVA test and Bonferroni post-hoc test.

Results: statistical analysis showed that group 2 and group 3 had a significantly higher wear rate than group 1 ($p = 0.00001$).

Conclusions: the initial null hypothesis was rejected since any kind of occlusal correction increases the wear rate of lithium disilicate.

ACCELERATED FATIGUE RESISTANCE OF ENDOCROWNS *VS* OVERLAYS IN NON VITAL MOLARS

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Aim: the aim of this *in vitro* study was to evaluate the effect of different adhesive restorative solutions with and without the support of intraradicular retention on the fatigue strength of endodontically treated molars. The null hypothesis is that the core restoration and the restorative material do not influence the accelerated fatigue strength.

Methods: intact molars extracted were selected and endodontically treated. A standardized MOD cavity was prepared. Specimens were then divided into 2 groups (n = 20 each):

group A: core build-up with composite supported by 1 fiber post (FP1) and adhesive overlay;

group B: pulpal chamber seal with flowable composite for endocrown (EDC).

After scanning with an intraoral scanner, restorations were milled using two different materials: hybrid ceramic (HC, n = 10) and lithium disilicate (LD, n = 10). After luting with an adhesive standardized procedure, accelerated fatigue was tested trough a Universal Machine. After fracture, representative samples were analyzed with an optical microscope and SEM. Data were statistically evaluated with a Kaplan-Meyer survival test ($p < 0.05$)

Results: the worst fatigue resistance was obtained with HC endocrowns, while the other tested solutions performed similarly.

Conclusions: based on the obtained results, the null hypothesis was rejected since both the core restoration and the materials significantly influenced the survival rate of indirect adhesive solutions to restore non-vital molars.

EVALUATION OF FLOWABLE *VS* COMPOSITE IN DEEP MARGIN ELEVATION: A RETROSPECTIVE STUDY

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Aim: to retrospectively evaluate the periodontal response when different composite materials were employed in deep cervical margin relocation (DMR) to restore class 2 cavities. The null hypothesis tested was that there are no differences between flowable and non-flowable materials.

Methods: 42 patients, with at least one deep interproximal caries in posterior teeth, were selected. Initial periodontal records (PPD, REC, PI, and BoP) were recorded. In all patients, after caries debridement, a gingivectomy without osteoplasty was performed to expose the cervical margin. Since the distance between the alveolar ridges and cervical margins was 2 mm, sutures were done and rubber dam was positioned again. After bonding procedures (enamel pre-etching for 15 sec; two-step self-etch application), patients were randomly divided into 2 groups: according to the material employed for the relocation: Group 1 with a high-viscosity flowable composite, Group 2 with a nanofilled composite. Restorations were completed through a centripetal build-up technique. Two independent, blinded, and calibrated operators performed follow-up visits after mean 5 years of clinical function. Data were analyzed with a chi-square test and Kaplan-Meyer ($p < 0.05$).

Results: a statistically significant difference between the two groups was observed, with nanofilled composites performing better than a flowable composite, which showed higher BoP and PPD.

Conclusions: since 5 years after the DMR, flowable composite showed a worse periodontal response than nanofilled resin, thus the null hypothesis was rejected.

COLOR MATCHING OF ONE-SHADE COMPOSITES: AN *IN VIVO* STUDY

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Aim: to compare optical integration of one-shade composites (Venus Pearl One, Kulzer; Omnichroma, Tokuyama; Clearfill U, Kuraray) when restoring NCCL. The null hypothesis is that there are chromatic differences one-shade and conventional composites.

Methods: patients who need direct composite restorations in NCCL were enrolled for this study. An initial Lab measurement (t0) with Easy Shade was performed. Once the cavity has been created after rubber dam placement, the adhesive procedures were carried out and the restorations were randomly performed with 4 different materials according to the composite selected: Venus Pearl One, Kulzer; Omnichroma, Tokuyama; Clearfill Majesty ES-2, Venus Pearl A3. Patients were recalled after 14 days (t14), to calculate Lab of the restored tooth and a Delta t14-t0 was performed. Data obtained are statistically evaluated with One-way ANOVA and Bonferroni post-hoc test.

Results: 10 patients per group were treated. The obtained results showed that Venus Pearl had a significantly better chromatic integration than other materials tested ($p = 0.0001$). Any materials showed a clinically satisfying chromatic integration.

Conclusions: based on the obtained results the initial null hypothesis was rejected since one-shade composites had different chromatic behavior when restoring NCCL cavities. An increased number of patients should be treated to confirm these results.

3-BODY WEAR OF 3D PRINTED *VS* MILLED COMPOSITES: AN *IN VITRO* STUDY

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Aim: to evaluate the 3-body wear behavior of 3D printed *vs* milled materials in an acidic medium. The tested null hypothesis will be that the different materials are not able to equally resist to abrasive wear independently of the acidic medium.

Methods: the analyzed materials are 2 CAD/CAM milled composite (Cerasmart, GC; Grandio Block, Voco), a PICN (Vita Enamic, Vita) and a 3D printed composite (Iris Max, DWS). Square-shaped specimens of 2 mm thickness are obtained by using a cutting machine (Micromet, Remet) under water cooling or printed using a 3D printing machine (D-Fab, DWS). Once the specimen surface is finished with abrasive papers at sequential grit, they are fixed on the rotative wheel of the ACTA machine with a resin-based support. The wear test are performed with specimens continuously immersed in different mediums: pH 5.8 (distilled water), pH 3.3 (Redbull) and SEM analysis were performed.

After the wear test the volumetric loss are evaluated through a 3D laser scanner. The obtained data are statistically analyzed through a 2-way ANOVA test and Tukey post-hoc test.

Results: after 3 body-wear test IrisMax showed significantly lower volume loss than other materials ($p = 0.00001$), while acidic medium induced an increased wear ($p = 0.0007$).

Conclusions: since 3D printed material had a lower wear rate than CAD/CAM ones independently of the acid medium, the initial null hypothesis was rejected.

CEMENT GAP WITH 3D PRINTED *VS* MILLED OCCLUSAL VENEERS: A MICROCT STUDY

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Aim: to evaluate the cement layer thicknesses in different manufacturing techniques through the use of the microCT.
Methods: a second mandibular molar was prepared with anatomical reduction for an occlusal veneer restoration. After digitalization, 16 identical models of the prepared tooth were 3D printed (SolFlex 170, V-Print Model 2.0, Voco). All the casts were scanned (Cerec Primescan, Dentsply Sirona) and restorations were designed with identical occlusal surfaces and uniform 1mm-thickness. Half of the restorations (n = 8) were 3D printed (Irix Plus; DFAB, DWS) and half were milled (Grandio Blocks, Voco) with a chairside milling unit (Cerec MC X, Dentsply Sirona). Surface pretreatment was performed as follows, for both restorations and casts: sandblasting (30 µm Cojet Sand, 3M), silane (Porcelain Silane, BJM LAB), Universal adhesive (Universal Bond Quick, Kuraray Noritake). After that, a dual curing self adhesive cement was used to cement all restorations, with standardized pressure (Panavia SA, Kuraray Noritake) and 3 min light-curing (VALO, 1400mW/cm2). Micro-CT scans were taken to obtain high-quality 3D images (15 µm resolution), that were linearly analyzed to collect data of internal (24 points per sample) and marginal (16 points per sample) adaptation.
Results: no significant differences were found for marginal adaptation ($p = 0.154$), with an average of 0.11±0.067 in the 3D-printed group and 0.098±0.063 in the milled group. However, a significant difference was reported for internal adaptation ($p < 0.01$), with the 3D-printed group performing better.
Conclusions: the study showed that different manufacturing techniques have a significant influence on cement layer thickness in internal adaptation of different restorative materials.

RANDOMIZED CLINICAL TRIAL ON CAD-CAM CHAIRSIDE ADHESIVE CROWNS: 3 YEARS REPORT

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Aim: to evaluate the clinical performance of full-crown adhesive indirect restorations made with different materials obtained with a CAD/CAM chairside system.
Methods: following inclusion and exclusion criteria, patients who needed an indirect adhesive restoration were recruited and treated following a standardized procedure. After cavity debridement, a coronal build-up with a bulk material was performed after adhesive system application. The adhesive full-crown preparations were performed, considering a uniform thickness of 1.5 mm, except of the margins and an intraoral scan was performed. Patients were randomly divided in 3 groups, according to the CAD/CAM material employed: Grandio Blocks (G1); Cerasmart (G2); E-Max CAD (G3). Indirect crowns were milled using CEREC MCXL. Standardized luting procedures were performed following the study protocol. Patients were recalled after 12, 24 and 36 months and restorations were evaluated following USPHS criteria. 101 patients with 109 restorations totally (G1 = 38; G2 = 38; G3 = 33), with a mean follow-up of 37,6 months were evaluated after 3-years. Kaplan-Meier curves were plotted to show each variable differences on the restoration survival.
Results: USHPS scores showed a satisfying clinical behavior of all performed full-crown adhesive restorations, independently of the material employed. The Kaplan-Meier plot showed a comparable clinical performance between the 3 tested materials.
Conclusions: the present study results showed a good clinical behavior of CAD/CAM resin-based materials when employed as full crowns.

RADICULAR BOND STRENGTH PRESERVATION WITH UNIVERSAL CEMENTS: 5 YEARS OUTCOME

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Aim: the aim of this *in vitro* study was to evaluate the stability of radicular bond strength with simplified adhesive approaches. The null hypothesis is that bond strength is not affected by adhesive technique, root portion and aging.

Methods: similar single-rooted teeth were selected and endodontically treated after anatomical crown removal. Fiber posts were then luted through different adhesive techniques (n = 20 each): universal adhesive (UA) in etch-and-rinse mode (Group 1), UA in self-etch mode (Group 2), self-adhesive cement (Group 3). After light-curing, specimens were sectioned in 1 mm thick slices, and the bond strength was measured through push-out test immediately (n = 10 per group) and after 5 years of storage in artificial saliva (n = 10 per group). Data were statistically analyzed with Three-way ANOVA test and Tukey post-hoc ($p < 0.05$).

Results: ANOVA test showed a significant difference between aged and non-aged specimens ($p = 0.0009$), independently of the adhesive technique employed. Nor the adhesive approach or the root portion statistically influenced the radicular bond strength.

Conclusions: the null hypothesis was partially rejected since the aging process significantly reduce the radicular bond strength. Simplified adhesive techniques similarly perform in term of fiber post bond strength.

SPECTROPHOTOMETRIC EVALUATION OF RESIN INFILTRATION IN WSLS: 3 YEARS FOLLOW UP

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Aim: white spots are defined as areas of demineralized enamel that are white, opaque and clearly distinguishable from the surrounding healthy enamel. Treatment for WSLs is important for both aesthetic and clinical reasons. For their resolution, several authors have proposed the application of remineralizing agents. The aim of this clinical study is to evaluate the stability of the color change of the lesion after 3 years of using the resin infiltration technique.

Methods: forty unrestored, idiopathic, or post-orthodontic, cavitating-free WSLs were treated with the resin infiltration technique. The color of the WSLs and adjacent healthy enamel (SAE) was evaluated using a spectrophotometer before and after the treatment (T0, T1), after 12 months (T2) and 36 months (T3). The Wilcoxon test was used to evaluate the significance of the variation of color ΔE between time intervals.

Results: comparing the color difference, the ΔE value decreased significantly from T0 to T1 in 95% of the treated lesions. 100% of the samples showed no variation of ΔE between T1 to T2 and between T2 to T3. The correlation between the period of onset of the lesion and ΔE between T0 and T1 was not statically significant.

Conclusions: evaluating the results obtained, the resin filtration technique has been shown to be effective in resolving WSLs. However, more research is needed to evaluate the long-term stability of the results and the effects of the chemical composition of the resin used.

EFFECT OF LIGHT-CURING PROTOCOL ON MARGINAL CONTINUITY OF ADHESIVE CROWNS

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Aim: to investigate the marginal continuity of dual-curing cements when submitted to different curing protocols. The null hypothesis tested were that marginal continuity was not influenced by tooth surface pre-treatment and different curing protocols.
Methods: single-rooted teeth (n = 96) were prepared for a full-crown with chamfer margin, which were milled with lithium silicate. Crowns were luted using an universal dual-curing cement with different approaches (n = 48 each): self-adhesive mode(G1); adhesive mode(G2).
Samples were then divided in 4 subgroups (n = 12 each) according to the light-curing protocol employed: 20s per side (S1); self-cure of the cement (S2); tack-cure plus 20s per side after excess removal (S3); 60s per side (S4).
Specimens were scanned using a Micro-CT before and after 10.000 cycles of thermocycling to reveal interfacial gap progression. Data were statistically analyzed with three-way ANOVA and Tukey tests ($p < 0.05$).
Results: three-way ANOVA test showed that the core sandblasting ($p = 0.0036$) and the curing technique significantly influence external gap ($p = 0.00001$).
Tukey test revealed that the self-curing process was significantly better than all the other tested techniques, while the tack-curing showed worse external and internal gaps and worse absolute discrepancy than 20s and 60s light-curing processes.
Conclusions: tack-curing technique seems to negatively affect the marginal discrepancies when luting lithium silicate adhesive crowns, while the self-curing process showed the lowest gaps.
Therefore, the first null hypothesis was rejected.

INFLUENCE OF DIFFERENT SHADES AND THICKNESS ON DEGREE OF CONVERSION OF BULK-FILL COMPOSITE

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Aim: the study aims to evaluate the influence of thickness and shades on polymerization by evaluating the degree of conversion (DC) of Bulk-fill resin composites.
Methods: in this *in vitro* study, four shades (Universal, A1, A2, A3) of a bulk-fill flowable composite (SDR® flow+, Dentsply) were tested. 36 specimens were prepared bulk-filling mold with different thicknesses (2 mm, 4 mm, 8 mm) and light-cured according to the manufacturer protocol. The DC was measured after 24 hours with Fourier Transform Infrared Spectroscopy with attenuated total reflectance (ATR-FTIR) at the top and bottom of disk-shaped samples. Statistical analysis was performed.
Results: DC measured at the top of samples ranged between 74.95% (U) and 68.34% (A2), while bottom DC ranged between 62.04% (A2, 2 mm) and 44.92% (U, 8 mm). Differences were observed among shade and depth groups ($p < 0.05$). The means bottom to top ratio ranged between 82,51±3,1 and 66,31±3,6.
Conclusions: the results showed that both variables influenced polymerization, with depth having a greater impact. The color and translucency characteristics of the analyzed composite material were also influenced by thickness, so, as chroma increases, there may be a reduction in the ability of light to pass through the material. Knowledge of polymerization and material characteristics is important for achieving better restorations with BFRCs. *In vitro* studies evaluating primarily shrinkage stress polymerization and clinical trials are necessary.

DEVELOPMENT OF NEW MATERIALS FOR ROOT CANAL IRRIGATION IN ENDODONTICS: "ENDOGEL"

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Aim: the idea behind the study project comes from research carried out on materials in the aesthetic field for facial scrubbing, that penetrate the skin pores to eliminate impurities.
The goal is to create an irrigation root canal gel based on HA, SiO2 and biguanide agents, capable of drastically reducing the microbial load while simultaneously improving the performance of the mechanical reaming, in respect of the biological tissues and the organism.
Methods: significant differences among groups were assessed through two-way ANOVA by using GraphPad Prism 8.0, and the comparisons between the means were calculated by the student t-test. The data are expressed as means ± standard deviation (SD) of three independent experiments.
Results:
1. The Alamar Blue test shows that the gel is well tolerated by the cells, after 6 hours of application, the *vitro* cell viability is still 77%.
2. Bacterial growth is totally inhibited in liquid soil, in fact the addition of *E. faecalis* does not cause any increase in O.D. (which instead for *E. faecalis* alone are higher).
3. The plate activity shows a 1 cm halo of bacterial growth inhibition.
Conclusions: the gel has a thixotropic effect, chemical stability, cleaning and lubricating action, simplified penetration and biocompatibility. It can be used in combination with physiological solution, as an alternative to sodium hyplochlorite and EDTA.

A MECHANICAL COMPARISON OF TWO NICKEL-TITANIUM ENDODONTIC INSTRUMENTS

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Aim: the aim of this study was to explain the mechanical differences between Direct Gold (DG) and ProTaper Gold (PTG) determining the cyclic fatigue, torsional resistance and bending resistance.
Methods: 160 instruments were selected: 80 DG and 80 PTG (20 S1, 20 S2, 20 F1, 20 F2). Every type of instruments was submitted to each mechanical tests. The cyclic fatigue, torsional and bending tests were performed at a pre-set temperature of 25°C±1°C.
The cyclic fatigue test was performed in an artificial canal characterized by a curvature of 90°and 2-mm of radius of curvature. Time to fracture and the fragment length (FL) were recorded. During the static torsional performed by blocking the tip at 3 mm, Torque to Fracture (TtF) and FL were recorded. The fracture surface of 5 randomly selected fragments from each test was examined through a Scanning Electron Microscopy (SEM). 20 instruments for type were submitted to a bending test at 6 mm from the tip at 45° and the force generated (grams) to bend each was recorded. Recorded data of mechanical and metallurgical tests were statistically analyzed using a one-way analysis of variance (ANOVA) test with significance set to a 95% confidence level.
Results: all instruments of PTG systematics showed better results in terms of bending and cyclic fatigue resistance ($p < 0.05$), while in terms of torsional resistance DG systematics showed a higher torsional resistance than PTG systematics.
Conclusions: PTG systematics should be preferred in case of curved canals, whilst DG should be preferred in case of higher torsional load during instrumentation.

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PERICERVICAL DENTIN PRESERVATION: A MICRO-CT STUDY ON DIFFERENT ENDODONITC SYSTEMS

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Aim: the aim of the present work was to analyze the volume of the pericervical dentin after shaping using three different systems of mechanical instrumentation through the analysis of micro-computed tomography (μ-CT).

Methods: fifty mandibular molars were selected from a pool of teeth extracted for periodontal or orthodontic reasons and stored before and after preparation in a 0.5% w/w chloramine solution. Subsequently, samples were pre-treatment scanned using a pixel size of 9.5 μm, with angular steps of 0.4° on 180° of rotation of the sample, with an exposure time of 10s per projection, with a maximum time of 5h per scan. The 3D measurements were calculated based on a volumetric model of the root canal extending from the pulp chamber approximately 2 mm towards the apical region, for evaluation of the pericervical dentin region. Samples with similar volume value of the area of the region of interest (3.14x102 mm^3±0.5) were selected. The forty-five samples were selected and divided into three groups (n = 15) according to the shaping systems: Group I, Protaper Gold; Group II, Protaper Ultimate; Group III, BlueShaper. Then, the post-treatment scan was performed, using the same parameters used for the pre-treatment scans, and scans were compared to assess the remaining dentin thickness.

Results: all the systematics of the three groups were effective in shaping the specimens, with a similar amount of dentin volume removed and a low risk of errors in the used technique. Nonetheless, Group I showed a greater reduction in the thickness of the pericervical dentin than Groups II and III, which instead showed a minimal reduction, thus respecting the root anatomy.

Conclusions: despite the limitations of the study, the Protaper Ultimate and BlueShaper systematics would seem to be more conservative than that of the Protaper Gold.

EFFECTIVENESS OF CONTINUOUS CHELATION IRRIGATION PROTOCOL: A SCOPING REVIEW

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Aim: the current review aimed to answer the following research question: "Does continuous chelation irrigation protocol compared to sequential chelation, result in better smear layer and hard tissue debris removal, antimicrobial efficacy and dentine erosion during root canal treatment"?

Methods: this scoping review was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews. Literature search was conducted on PubMed and Scopus to identify all laboratory-based studies evaluating smear layer and hard tissue debris removal or, antimicrobial efficacy, or dentine erosion induced by continuous chelation compared to sequential chelation in extracted permanent teeth. Two independent reviewers performed the literature search, study selection, and data extraction. The irrigants used, outcomes reported, outcome measurement, and main findings were recorded using a standardized form.

Results: a total of 77 potentially relevant studies were identified. Finally, 23 *in vitro* studies met the eligibility criteria for qualitative synthesis. Seven studies focused on the smear layer/debris removal outcome, 10 on antimicrobial activity, and 10 on dentine erosion. In general, the continuous chelation protocol was equally or more effective in the cleanliness of root canals and antimicrobial activity compared with sequential. In addition, etidronate solutions seemed to be milder chelating agents compared to those with EDTA, thus resulting in reduced or no dentine erosion and roughness modification.
Yet, the methodological differences among the included studies limit the generalizability of the results.

Conclusions: the continuous chelation seems to be equally or more effective in smear layer/debris removal, antimicrobial activity and reducing dentine erosion when compared with the traditional sequential protocol. The laboratory studies cannot completely replicate the conditions of oral environment. Thus, when the outcome is appropriate, high-quality randomised clinical trials should be conducted to support the current findings.

REGENERATIVE ENDODONTIC PROCEDURES IN NECROTIC PERMANENT TEETH: CLINICAL STUDY

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Aim: necrotic permanent teeth with immature apex are traditionally treated with apexification, but this approach doesn't allow root maturation with an increased risk of root fracture over time. Regenerative endodontic procedures (REP) allow the regrowth of a vascularized tissue inside the canal with thickening of the dentin walls. This study aims to evaluate the clinical efficacy of REP.

Methods: a clinical observational study on 90 patients with necrotic permanent tooth with immature apex was performed following the REP clinical protocol published according to international guidelines. A follow-up was carried out to evaluate the prognosis at T1 (3 months), T2 (6 months), T3 (1 year) from the treatment. The clinical evaluations included: symptoms, periodontal probing, remission of the fistulous tract and a possible dyschromia of crown. The radiographic evaluations included: healing of periapical lesions, thickening of the root walls and lengthening of the root. The clinical results were collected in an anonymous database, which was analyzed with ANOVA test ($P < 0.05$).

Results: most patients who underwent REP showed the disappearance of symptoms and clinical signs of infection, with a high percentage of thickening of the root walls. The REP presented a good long-term prognosis with an increase in thickening of the root canal walls.

Conclusions: REP seem a valid alternative to apexification for the treatment of necrotic teeth with immature apex.

DIAGNOSIS, EVALUATION AND THERAPY OF ROOT RESORPTION: AN OBSERVATIONAL STUDY

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Aim: evaluation of root resorptions' characteristics through Cone Beam Computer Tomography (CBCT) at the diagnosis. The evaluated parameters were the most present type of resorption, the most involved teeth, the main risk factors, and the clinical and radiological characteristics of the defect.

Methods: the study proposed is a clinical observational study on 92 patients referred for the suspect of internal and external root resorption with CBCT. The radiographic analysis was carried out using two dedicated softwares Materialise Mimics 24.0 (Materialise NV, Leuvren) and Geomagic. The radiographic evaluation included the tooth involved, the type of resorption (internal, external or external cervical resorption), the location on the root, the maximum extension of the defect in in the three planes of space, the volume of the defect, the presence of osteosclerosis and the pulp involvement. The evaluation of patient data included age, gender, risk factors in accordance with the literature, clinical symptoms, signs of chronic apical periodontitisand the proposed clinical treatment.

Results: the most frequent resorption was the external and the most involved teeth were the upper incisors. In accordance with the literature, orthodontics and trauma were the most risk factors and most patients didn't present clinical symptoms despite a pulpal involvement.

Conclusions: the CBCT appeared fundamental for the correct diagnosis of the root resorptions and the careful evaluation of the risk factors appeared mandatory for the prevention of these pathologies that often lead to tooth extraction.

MECHANICAL PERFORMANCE OF 3 SINGLE-FILE RECIPROCATING INSTRUMENTS: A COMPARATIVE STUDY

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Aim: the aim of this study was to assess the mechanical properties of three different reciprocating instruments: Reciproc (VDW, Munich, Germany), Reciproc Blue (VDW, Munich, Germany) and Direct-R Gold (Direct Endodontics, Paris, France).
Methods: total of 60 nickel-titanium files from 3 different reciprocating systems were mechanical evaluated throughout cyclic fatigue, torsional and bending static tests. Mechanical performances of the selected file were examined by subjecting each specimen to Cyclic Fatigue test (90° 2 mm [seconds]) and Torsional test (3 mm from the tip [Ncm]) and Bending resistance tests (3 mm at 45°[g]). One-way analysis of variance and the post hoc Tukey test were performed with the significance level set to a 95% confidence level.
Results: direct-R Gold showed the best mechanical performances in terms of Cyclic Fatigue and Torsional Resistance ($P < .05$).
Direct-R Gold shows the same results as Reciproc Blue in terms of Flexibility ($P > .05$).
Reciproc has the worse Cyclic Fatigue performance ($P < .05$) and shows the same results as Reciproc Blue in term of Torsional Resistance ($P > .05$).
Conclusions: within the limitations of this study, Direct-R Gold file showed the best mechanical performances in terms of Cyclic Fatigue and Torsional Resistance; Reciproc file showed the worse mechanical performances in the three parameters.

ENDODONTICS' ROLE ON THE CHEMICAL, MECHANICAL, AND BONDING PROPERTIES OF RADICULAR DENTIN

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Aim: to assess the bond strength and the morphologic characteristics of the hybrid layer (HL) at the resin-dentin interface (R-Di) between root canal dentin and two resin cements in endodontically treated root canals and naturally aged re-treated teeth. The chemical and mechanical properties of the dentinal interface were also evaluated.
Methods: fiber posts were luted either with self-etch (SERc) (Universal Bond + DC Core Plus) or self-adhesive (SARc) (iCEM) in endodontically treated or re-treated teeth. Each radicular slice was submitted to push-out test. Each specimen was also tested with nanoindentation and raman spectroscopy to assess, respectively, the mechanical and chemical characteristics. RD-i morphology was evaluated through confocal laser scanning microscopy (CLSM).
Results: bond strength was jeopardized in RCR-T teeth, while the type of cement had no influence. HL thickness was also hindered in RCR-T teeth and SARc produced a thinner HL compared to SERc. The aged re-treated samples showed also increased micro-hardness, behaving as a more brittle material, increased mineral to collagen ratio and collagen cross-linking ratio.
Conclusions: as SARc showed similar bond strength values compared to SERc, it can be suggested that simplified single-step luting systems may be a reasonable option for the fiber post luting in RCT aged teeth with a heavily modified substrate.

SMEAR LAYER AND DEBRIS REMOVAL COMPARING TRADITIONAL SYRINGE IRRIGATION AND 3D CLEANING

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Aim: this study assesses the difference in smear layer removal using the 3D cleaning technique and traditional syringe needle irrigation.
The 3D cleaning technique includes the ultrasonic activation of intracanal-heated NaOCl.
Methods: our current study used single-rooted human mandibular premolar teeth to test the earlier-mentioned technique (n = 30). Initially, an endodontic access cavity was performed. Consequently, specimens were randomly distributed into three study groups according to irrigation protocol. The groups were Group 1, where the traditional syringe needle irrigation system was applied; Group 2, where the 3D cleaning technique was performed; and Group 3, in which teeth remained uncleaned as it was regarded as the control group.
Once the experiment was completed, the teeth were decoronated at the cementoenamel junction (CEJ) and examined using scanning electron microscopy (SEM). Debris and smear layers were viewed in 1000× magnification and scored.
Results: statistical analysis was performed with a standard statistical software package (SPSS, version 28.0; SPSS IBM, Armonk, NY, USA). Data were analyzed with a nonparametric analysis of variance (Kruskal–Wallis ANOVA) among the groups tested and among the thirds of the canals. The level of significance was set at $p < 0.05$. A statistically significant ($p < 0.05$) lower mean smear layer and debris score was observed in both study groups compared to the control group. Group 2 showed better results compared to Group 1.
Conclusions: the present study concluded that the 3D cleaning technique is an effective irrigation method for removing debris and smear layers. Future research, such as CLSM (Confocal Laser Scanning Microscopy) and Histological study, should be employed to confirm this study's conclusion.

SMEAR LAYER AND DEBRIS REMOVAL FROM POST SPACE COMPARING DIFFERENT IRRIGATION TECHNIQUES

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Aim: post space objectives include eliminating or decreasing smear layer and debris along the Root canal. This study evaluates the dissimilarity in smear layer and debris removal utilising the 3D cleaning procedure and traditional irrigating technique. Moreover, defining the 3D cleaning technique comprises the ultrasonic activation of EDTA solution heated directly inside the post-space preparation.
Methods: 30 lower premolars were used. Initially, an endodontic access cavity was performed. Then, specimens were randomly distributed into three study groups according to irrigation protocol. The groups were Group 1, where the 3D cleaning technique was performed; Group 2, where the traditional irrigation with EDTA was applied; and Group 3, where teeth remained uncleaned, using only saline as an irrigant. The latest group was considered the control group. After concluding the tests, the teeth underwent a decoronation at the CEJ level and were analysed via SEM. In detail, the magnification was used to evaluate and score the smear layer and debris.
Results: statistical analysis was completed using the classic statistical software pack. Then, data were interpreted with a non-parametric analysis of variance (Kruskal–Wallis ANOVA) among the groups experimented. The significance level was decided at $p < 0.05$.
Furthermore, a statistical significant ($p < 0.05$) lower mean smear layer and debris score was found in both examination groups compared to the control group. Group 1 demonstrated greater results compared to Group 2.
Conclusions: the current research concluded that the EDTA 3D cleaning technique is an effective irrigation technique for clearing debris and smear layers in the post space. Future research, such as push-out bond strength, should be used to verify this research's conclusions.

HUMAN MILK OLIGOSACCHARIDES (HMOS) IN ENDODONTICS: *IN-VITRO* STUDY ON *E. FAECALIS*

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Aim: endodontic root treatments aim at the resolution of the infectious process. Despite the best efforts in order to reduce the bacterial load in the endocanalar system, the complete sterilization of the root canals is not yet achievable. Pre-clinical and clinical studies evaluated various disinfection techniques such as laser and natural products. Human Milk Oligosaccharides (HMOs) are prebiotics found in breast milk with antibacterial properties against Gram+ bacteria, such as Streptococci. In this experiment we investigate the antimicrobial effect of two HMOs (2'-fucosyllactose and Lacto-N-neotetraose) on *Enterococcus faecalis.*

Methods: the coronal portion of the extracted teeth was removed and the roots were embedded in silicone.

The samples were sterilized using an autoclave. Glide path was created and a kfile 25 was inserted at working length. The infection of the canals was performed via an *E. faecalis* suspension, injected using a tubercolin syringe.

Canals were treated using sodium hypochlorite, EDTA and the X1, X2 and X3 instruments.

The case canals were rinsed with a solution of 2'-fucosyllactose and Lacto-N-neotetraose for 60 seconds. Harvesting consisted of sampling with sterile paper cones. Microbiological analysis was conducted.

Results: a significant reduction of *E. faecalis* was shown in the case group, suggesting the antimicrobial effects of the oligosaccharides.

Conclusions: the experiment suggested the efficacy of these two HMOs on *E. faecalis*. Given the wide range of compounds that are part of HMOs, further studies with different compounds and different bacterial biofilms are required.

ENDODONTIC MICROSURGERY'S UNDERGRADUATE TRAINING WITH VIRTUAL REALITY SIMULATION

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Aim: the latest progress in virtual reality and haptic technology are transforming the world of dental education. Pre-clinical dental training is important to gain familiarity with difficult surgical techniques, to implement personal skills and to acquire knowledge of the oral anatomy. This study aims to evaluate skill acquisition in endodontic microsurgery through haptic VR training for undergraduate students.

Methods: an exercise that focused on the essential feature of endodontic microsurgical preparation was conceptualized and developed. Ten undergraduate students were selected to perform the exercises both on virtual typodont and virtual patient. Each exercise has been performed 4 times during a 4 week program.

At the end of the 4 week each student had to perform the exercise without the target suggestion from the simulator. Feedbacks from the simulator were recorded for each attempt and the performance were compared.

Results: a t test was performed which showed a significant difference ($p < 0.05$) between the first and the last simulation both in accuracy and target progress for the osteotomy exercise while there was no difference in the apicoectomy exercise, although a better trend is evidenced.

Conclusions: this study gives a proof that it is possible to provide reliable and clinically relevant qualitative feedback with VR simulator. This illustrates the importance of implementing digital teaching in the dental curriculum.

TWO-YEAR HEALING SUCCESS RATES AFTER 3D CLEANING TECHNIQUE: A MULTICENTER CLINICAL STUDY

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Aim: this prospective multicenter clinical study aims to evaluate healing rates for teeth after root canal treatment utilizing the 3D cleaning technique and to report predictive values for success.
Methods: ninety patients were included. All patients were treated with the 3D cleaning protocol. Four endodontists performed the clinical procedures and follow-up evaluations. Each patient was assessed for any clinical signs or symptoms. Afterwards, two trained, blinded, and independent evaluators scored the subject's periapical radiographs. This score was made by checking for the presence or absence of apical periodontitis using the periapical index (PAI). Then, the teeth were classified as healing or healed and were considered a success based on a cumulative success rate of healing.
Results: 90 patients were evaluated at two years with a follow-up rate of 97.7%. The cumulative success rate of healing was 95.4%. Eight predicting aspects were identified by employing bivariate analyses. Then, using logistic analyses, the two prognostic significant variables directly correlated to healing were the preoperative presence of periapical index.
Conclusions: in this two-year clinical study, the cumulative success rate of healing was 95.4% when patients were treated with the 3D cleaning protocol.

IN VITRO EVALUATION OF THE EFFECT OF DIFFERENT KINEMATICS ON APICAL DEBRIS EXTRUSION

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Aim: to compare the amount of extruded debris associated with different motions using a single file system.
Methods: Fifty mandibular first molar teeth with moderate to severe curvature in the mesial root were randomly divided into 5 groups (n = 10) according to the motion tested: Optimize Torque Reverse (OTR), TF Adaptive Motion (TFA), continuous rotation (CR), reciprocation motion (+150°, -30°) (REC), Jeni motion (Jeni). One Curve single file 25/06 (Micro-Mega, Besançon, France) was used in all experimental groups. The root canals were irrigated with 2.5% NaOCl, and the extruded debris were collected at pre-weighted glass vials. The glass vials were kept inside an incubator for one week at 70°C to dry out the irrigating solution. The extruded debris was quantified by subtracting the pre-instrumentation from the post-instrumentation weight of the glass vials. The time required for each instrumentation procedure was digitally recorded. All data were analyzed statistically with one way ANOVA and post-hoc Tukey test ($P < 0.05$)
Results: a motions extruded apically debris with Jeni mode caused significantly less debris extrusion than TFA, REC and CR ($P < 0.05$) while no significant difference emerged compared with OTR. No significant difference was detected between TFA, REC and CR. Preparation time was not significantly different among the tested kinematics.
Conclusions: within the limits of the present study, all the kinematics produced apically debris extrusion, with Jeni reporting a similar amount of debris compared with OTR and significantly less than TFA, REC and CR. Preparation time was similar for the all the tested kinematics.

EFFECTS OF BRUSHING MOTION ON THE CUTTING EFFICIENCY OF TWO NITI FILES: A MICRO-CT STUDY

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Aim: to assess the cutting efficiency of two heat-treated endodontic files with a brushing motion in oval-shaped canals.
Methods: ten intact lower molars with a single oval distal canal were selected and randomly divided into two groups according to the system used for shaping: 2Shape (Micro Mega, Besançon, France) and Hyflex CM (Coltene, Cuyahoga Falls, OH, USA). The shaping procedure was performed in two parts: a first shaping according to the manufacturer's instructions and final shaping using 5 brushing motions on the distal, lingual, and buccal walls, avoiding the danger zones. Micro computed tomography (micro-CT) scans before and after the brushing motion were superimposed at all three levels: coronal, middle, and apical.
Canal changes in buccolingual (ΔBL) and mesiodistal (ΔMD) dimensions were measured. Data were statistically analyzed by repeated-measures analyses of variance and the student t-test with P <0.05.
Results: as concerns for ΔMD, there was no significant difference between the 2Shape and Hyflex CM in the apical and coronal thirds. However, the cutting efficiency was significantly greater with the 2Shape in the middle third (P <0.05). As for ΔBL, no statistically significant difference emerged between 2Shape and Hyflex CM comparing the anatomical thirds, while 2Shape had a significant higher cutting efficiency considering the total BL diameter (P <0.05).
Conclusions: under the limits of this study, the shaping procedure with 2Shape and brushing motion resulted more efficient than the Hyflex CM in the midroot levels in terms of ΔMD, and in total canal space for ΔBL. Both files ensured an effective mechanical preparation.

CYCLIC FATIGUE RESISTANCE OF NITI INSTRUMENTS IN DIFFERENT CURVATURES AND TEMPERATURES

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Aim: to compare cyclic fatigue resistance of different nickel-titanium instruments inside single and double-curved canals at different temperatures in a dynamic model.
Methods: a total of 160 HyFlex EDM #20.05 (HEDM, Coltene/Whaledent, Altstätten, Switzerland), VDW.ROTATE #20.05 and #25.06 (VDW, Munich, Germany), Mtwo 25.06 (VDW) were divided in 4 groups (n = 10) for the dynamic cyclic fatigue resistance tests according to curvature (single and double) at room (20°±1°C) and body temperature (35°±1°C). Single curved canal with 60° of angle of curvature and 5 mm of radius was used. The coronal curve of the double curved canal had 60° of angle of curvature with 5 mm of radius, the apical curve 70° with 2 mm radius. A continuous back and forth axial oscillation motion was performed with an amplitude of 3 mm/s for the dynamic test. The number of cycles to fracture (NCF) was calculated and the length the fragments was measured. The surfaces of the broken files were observed under a scanning electron microscopy (SEM). Data were analyzed statistically using two-way analysis of variance and the Bonferroni multiple comparison post hoc test with the significance level at 0.05.
Results: fatigue resistance of all instruments decreased at body temperature in single and double curvatures (P <0.05). HEDM showed higher resistance compared with other files in all testing conditions (P <0.05), while no differences emerged between Mtwo and VDW.ROTATE #25.06.
Conclusions: with the limitations of a *vitro* study, temperature impaired cyclic fatigue resistance of all NiTi files except for HEDM for which no difference emerged between room and body temperature in double curvature. Double curvature negatively affected cyclic fatigue resistance of all files except for VDW.ROTATE #20.05 at body temperature for which no significant difference emerged between the two tested curvatures. HEDM instruments exhibited the highest cyclic fatigue resistance in all testing conditions.

MICRO-CT STUDY ON SHAPING ABILITY AND ACCUMULATED DEBRIS BY DIFFERENT KINEMATICS

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Aim: the aim of this study was to determine through micro-CT the shaping ability and accumulated hard tissue debris generated by different kinematics.
Methods: thirty mesial roots of mandibular molars were pre-scanned through micro-CT evaluation and randomized to one of the five experimental groups (n = 12), according to the kinematics used for canal preparation: Continuous Rotation (CR), Reciprocation (REC), Optimum Torque Reverse (OTR) motion, Jeni and Jeni with no pecking. After root canal preparation with HyFlex EDM (Coltene/Whaledent, Allstätten, Switzerland) up to ISO size 25 and .08 taper achieved, the samples were then scanned and the matched images of the mesial canals, before and after preparation, were examined to determine the untouched surface canal areas, the amount of hard accumulated debris and to assess the canal transportation and the centering ability. Data were analysed by using Kruskal-Wallis test and Dunn post hoc test for multiple comparisons with a significance level set at 5%.
Results: no significant differences emerged between the tested kinematics regarding the untouched canal surface areas, hard-tissue debris accumulation, canal transportation and centering ability. Jeni with pecking resulted in significantly less centered root canal preparation than Jeni without ($p < 0.05$).
Conclusions: wroot canals prepared were found to present similar untouched canal surface areas, hard-tissue debris accumulation and shaping ability independently from kinematics. All motions generated an acceptable mechanical preparation of the mesial canals of mandibular molars and none of them was able to keep the root canals completely free from packed hard tissue debris.

EVALUATION OF APICALLY EXTRUDED IRRIGANT WITH TWO SONIC ACTIVATION SYSTEMS: *IN VITRO* STUDY

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Aim: literature has demonstrated in detail how much activation procedures, which take place inside endodontic spaces, can increase irrigants efficacy. Furthermore, the issue linked with apical extrusion of sodium hypochlorite during endodontic procedures is equally well documented. Despite this, the safety of sonic activation systems during irrigation in apexes with different dimensions has never been analyzed. The aim of this study is to evaluate the quantity of irrigant extrusion during sonic activation, compared with conventional irrigation methods.
Methods: a model has been created in order to analyze the quantity of irrigant extruded from apexes with dimensions ranging in between 30 and 130 hundredths of millimeter. Two different sonic activation systems (EDDY® and EndoActivator®) have been investigated. Positive pressure irrigation and passive irrigation with EndoVac® have been used as a control.
Results: in all diameters EDDY® and EndoActivator® have caused less sodium hypochlorite extrusion, if compared with traditional positive pression irrigation. However, the aforementioned sonic irrigation systems, had more extrusion than passive irrigation.
Conclusions: this study reveals that, even in apexes with large diameters, sonic activation systems have less risk of causing sodium hypochlorite accidents if compared with positive pressure irrigation.

ACCESS CAVITY TRAINING USING IN-HOUSE 3D PRINTED TEETH AND DIGITAL SCANNING

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Aim: student learning during pre-clinical training is a critical component of dental education. New technologies, such as 3D printers, intraoral scanners and mesh processing software, can be used to implement endodontic training in a simple and economical way. The aim of the study was to investigate students' satisfaction with a new learning method adopted in access cavity exercises based on 3D technologies.

Methods: replicas of teeth 11 and 36 were printed with 3D printer FORM2 (Formlabs), using Model V2 resin, from .stl files found on the web. The artificial teeth were used for access cavity exercises by students attending 2022-2023 Endodontic course at Parma University. The prepared teeth were scanned with Omnicam (Dentsply Sirona) and visualized in Meshlab software to align the student's and the teacher's prepared tooth for self-assessment purposes. Students were asked to answer an anonymous questionnaire about their experience with this new teaching method.

Results: student feedback was positive: 73% found access cavity assessment by scanning more useful compared to traditional visual inspection and 57% reported that they had better understanding of errors and mishaps. Most of the students (84%) found that the 3D printed teeth had a pulp morphology easy to understand and only 3 students (16%) found difficult to locate anatomical references for a correct access cavity opening. Students also stated that the 3D printed teeth were too soft and did not provide a realistic tactile sensation.

Conclusions: in-house 3D printed teeth in pre-clinical training can help to overcome some of the drawbacks associated with extracted teeth, such as limited availability and cross-infection. However, the material used in the printing process needs to be improved to ensure a better tactile sensation and a better understanding of the endodontic morphology. The use of intraoral scanners and mesh processing software could improve student self-assessment.

INTENTIONAL REPLANTATION: SURVIVAL OF SINGLE-ROOTED *VS* MULTI-ROOTED TEETH

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Aim: the technique of intentional replantation can provide a second chance to save teeth that would be destined for extraction. Therefore, the present systematic review aimed primarily to estimate tooth survival after intentional replantation and secondarily to compare treatment outcomes in single-rooted and multi-rooted teeth.

Methods: the study protocol was developed before the analysis according to the Preferred Reporting Items for Systematic Review and Meta-Analyses guidelines. Articles were electronically searched in PubMed/MEDLINE, the COCHRANE library and Google Scholar by two independent reviewers, and those that met the eligibility criteria were included. A statistical analysis using the chi-square test with a p-value of <0.05 was performed on the reported outcomes of intentional replantation.

Results: a total of 44 single-rooted replanted teeth with five failures (11.36%) and 42 multi-rooted replanted teeth with six failures (14.28%) were reported in the literature, corresponding to a survival rate of 88.64% and 85.57%, respectively. The overall survival rate for the replantation procedure was 86.7%.

Conclusions: intentional replantation can be considered a safe therapeutic choice for both single-rooted and multi-rooted teeth, with a high survival rate and predictability, provided it is performed correctly and in accordance with basic biological principles, especially with regard to extra-oral environmental time.

ODONTOGENIC-RELATED GENE EXPRESSION: A STEP FORWARD TO DENTIN-PULP COMPLEX REPAIR

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Aim: human stem cells within dental pulp might be a potential source of odontoblasts in response to injury and might be applied in the repair of dental structures. The aim of the present study was to assess the expression of odontogenic-related genes and differentiation markers of human Dental Pulp Stem Cells (hDPSCs) cultured in presence or not of calcium-based materials.

Methods: hDPSCs obtained from a third molar of a young patient were cultured to evaluate their differentiations toward odontoblastic pattern. Odontogenic-related gene expression [i.e. OCN, MEPE, DSPP, DMP-1, GAPDH] and alkaline phosphatase activity (ALP) were evaluated in presence of growth medium (GM), odontoblastic-induction medium (OIM), and different concentrations (1 or 10µg/ml) of calcium carbonate (CaCO3), calcium hydroxide ($Ca(OH)_2$), and mineral trioxide aggregate (MTA). In addition, Alizarin red assay was performed to evaluate the ability to form mineralized matrix.

Results: hDPSCs expressed during their differentiation an upregulation of odontoblastic cell-related genes and an enhancement of ALP activity as well as presence of calcium deposits. This trend was greater in presence of calcium-based materials, mainly with MTA, supporting the hypothesis that these materials are effective for dentinogenesis.

Conclusions: odontoblast-like cells were able to preserve most of the physiological, biochemical, and genetic features of odontoblasts, representing a potential source for dentin-pulp complex repair.

APPLICATION OF A 3D NAVIGATION SYSTEM IN MICROSURGICAL ENDODONTICS: CASE REPORT

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Aim: the objective of this case report is to validate the application of dynamic navigation systems in microsurgical endodontics.

Methods: after previous renewal of the existing restoration and non-surgical retreatment, microsurgery was carried out using the Navident system. CBCT dicom data and stl files obtained from intraoral scans were uploaded into the software. The digital planning defined the direction and depth of the ostectomy with 5.2 mm cilindrical bone mill drill. On the day of surgery an optic support was placed adhesively at the mandibular level, detected by the Navident camera.

The handpiece was calibrated through 6 landmarks indicated on the screen. Subsequently, the core drill was also calibrated. A mucoperiosteal flap was made from the element 3.7 to element 3.4 with medial release incision. The 5.2 bone mill drill used with dedicated surgical motor Kavo conducted an osteotomy which allowed a selective access to the mesial root. The root end was resected around the broken instrument and removed with low power ultrasonic tip. The retrocavity was prepared and filled with BC RRM fast set putty. A collagen sponge was placed into the cavity to support the cortical block. The flap was repositioned and sutured with 6.0 PTFE suture.

Results: the 1 year follow up images demonstrate the occurred healing process.

Conclusions: 3D navigation allowed to create a precise and targeted osteotomy. Correctly sized bone and optimal repositioning of the cortical block allowed to enhance the repair process. The use of 3D navigation seems to be a valuable aid in complex cases.

CLINICAL MANAGEMENT WITH DIFFERENT STRATEGIES OF TWO ROOT RESORPTIONS ON ADJACENT TEETH

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Aim: this case report illustrates the clinical management of multiple invasive cervical and root resorptions. Root resorptions represent an insidious clinical status, and the clinician should plan a therapeutic process constantly accompanied by periodic follow-ups.

Methods: the case refers to a young healthy patient diagnosed with an external invasive cervical resorption of tooth 2.2 and multiple root resorptions, both at the middle and apical third, referred to 2.1. The history revealed that the 2.1 had been treated two years earlier elsewhere for a previous EICR with a composite resin restoration and a removable orthodontic treatment to correct the inclination of the tooth. The complexity of the issue and the proximity between the involved elements required a deferred treatment approach between the two elements. 2.1 was treated with intentional reimplantation. In a later stage, 2.2 was treated by a surgical approach and the restoration of the defect with a Silicate Root Repair Material.

Results: the two-year follow-up shows good stability of soft and hard tissues, as well as the absence of symptoms on both teeth. The RRM appears radiographically well-integrated. The resolution of the case with a conservative approach made it possible to procrastinate the more invasive implant-prosthetic therapies on a young patient preserving the periodontal tissues.

Conclusions: thanks to the new biomaterials, it is possible to manage cases of advanced resorptions. Due to the complexity of the pathology, these cases need to be followed by periodic clinical and radiographic follow-ups.

THE CHALLENGE OF ENDO-PERIO LESIONS: A CASE REPORT

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Aim: it might be difficult to distinguish between periodontal and endodontic issues, so treating endo-perio lesions is a very tough assignment for dentists.

In this study, we analyze the case report of a patient for which endodontic treatment was scheduled before periodontal therapy.

Methods: a 40-year-old male patient, who is a current smoker and who complained of discomfort and pus discharge from the third quadrant is the subject of this case report.

He has M1 mobility, purulent exudate, and spontaneous gingival bleeding on the 3.7 tooth; he has positive familiar anamnesis for periodontal disease. On the distal root, a deep periodontal pocket measuring 10 mm was found, and the furcation was also involved.

An endo-perio lesion may be seen on the radiograph, with an enlarging periodontal pocket and a significant amount of radiolucency in the periapical region of the distal root that extends to the furcation.

The damaged element's pulpal necrosis was verified by the cavitary and cold tests. It was immediately treated with NiTi rotary instruments and warm vertically compacted gutta-percha obturation technique.

Afterward, two sessions of scaling and root planing are completed, followed by the topical application of antibiotics to the periodontal pocket.

Results: a periapical radiograph, taken after a year, reveals that the lesion has healed, the bone defect has mineralized, the periodontal probing depth has improved, and the furcation is no longer involved.

Conclusions: the correct diagnosis and therapy of the endo-perio lesion led to the successful resolution of a complex dental problem.

ENDODONTIC THERAPY *VS* SURGICAL THERAPY IN THE TREATMENT OF LARGE MAXILLARY CYSTS

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Aim: inflammatory periradicular cysts origin from Malassez's residual cells developing under the influence of periapical inflammation. These cysts are most frequently found in anterior maxillary region and they can be distinguished in true cysts (entirely coated by epithelial tissue) and Pocket Cysts (coated by epithelial tissue in continuous with the roots). In the last case the lesion could heal after an endodontic treatment.
Methods: 67-year old woman without any symptoms but with a vestibular fistula in the 23/24 region. From the orthopantomography it is possible to deduct a bone rarefaction apical to the aforementioned elements and not underlined in the report. The CBCT exam shows an erosion of both the entire palatal wall and the nasal one. The proposed treatment (before a prospective surgical treatment) consists of an endodontic treatment of elements 23 and 24.
Results: after the endodontic treatment, healing of the fistula and normalization of the palatal mucosa have occurred. Another CBCT after 1 year from the treatment illustrates a complete healing of the palatal and nasal walls.
Conclusions: some periapical lesions, in particular Pocket Cysts, can respond positively to endodontic treatment. This therapy is particularly effective on patients with demanding surgery approaches. However, due to the fact that no histopathological exam is available, the patient should be followed up constantly.

MANAGEMENT OF SEVERE CURVATURES WITH THE HYBRID CRYSTALLOGRAPHIC PHASES APPROACH

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Aim: to discuss the clinical shaping approach for root canal treatment (RCT) of teeth with severe curvatures using the hybrid crystallographic phases approach.
Methods: 6 teeth with severe curvatures requiring RCT were selected and treated by adopting an innovative instrumentation technique based on the alternating use of austenitic and martensitic instruments. Three different instruments have been selected, increasing their amount of martensite contemporaneously with the increase of their metal mass: Mtwo 10.04 (conventional NiTi), X1 17.04 (slightly martensitic) and EOF Primary (martensitic).
Results: the presented clinical approach highlights the advantages of metallurgical and mechanical properties of NiTi alloy, both for martensitic and austenitic phases, adapting the heat treatments to the clinical case. Increasing the diameter and taper, the instruments are more susceptible to flexural stress, while the smallest ones have a lower torsional resistance. For this reason, it is reasonable to exploit the stiffness of austenite in the first phases of RCT when smaller instruments are used, to prevent torsional failure. Progressively increasing the instruments' size, the increased quantity of martensite ensures higher cyclic fatigue resistance and flexibility, despite the increased mass.
Conclusions: the proposed protocol seems to enhance the properties of the NiTi alloy, overcoming the main limitation of endodontic instruments in the management of severe curvatures.

RADIOLUCENT AREAS MIMICKING ENDODONTIC LESIONS: A CASE OF SECONDARY HYPERPARATHYROIDISM

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Aim: to report mandibular radiolucent areas mimicking endodontic lesions in a patient affected by secondary hyperparathyroidism.

Methods and results: a 36-year-old Asian woman was referred to Clinica Odontoiatrica of Brescia for a dental visit because of a kidney transplant. The patient's medical history included chronic renal failure, hypocalcemia and secondary hyperparathyroidism. Panoramic and periapical radiograph showed periapical radiolucencies associated with mandibular teeth 36, 45 and 46. Elements 45 and 46 were affected from deep carious lesions but both were vital and normal responders to electrical test. Medical history and clinical/radiological examination leaded to suppose secondary hyperparathyroidism was the aetiology of periapical radiolucencies mimicking endodontic lesions. During carious tissue removal, pulp horn of 46 was exposed; root canal treatment for tooth 46 and direct restoration for tooth 45 were performed.

After 18 months, teeth 36, 45 and 46 were asymptomatic; a periapical radiograph showed periapical lucencies of 45 and 46 teeth were diminished.

No change in the status of the patient's systemic disease was assessed.

Conclusions: secondary hyperparathyroidism can present with periapical radiolucencies mimicking endodontic lesions. Medical history and clinical examination are decisive to establish a correct diagnosis and a conservative treatment plan.

RETRIEVABILITY OF TWO BIOCERAMIC SEALERS: AN *IN VITRO* STUDY

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Aim: to evaluate the retrievability of two different bioceramic sealer with and with not solution.

Methods: a total of 40 teeth with straight canal were decoronated to a standardized root length. Canals were instrumented to 50.06 and randomly divided into two experimental groups (BC: EndoSequence BC Sealer; NEO: NeoSEALERFlo). The apical 3 mm was obtured only by sealer. After storage for 2 weeks at 37°C and 100% humidity, the teeth were retreated using a rotary instrument (Hyflex Remover, Coltene, CH) in association with or without NaCl, to evaluate the best approach. Time to reach WL and Patency was measured with a chronometer (s). Data were analyzed using Kruskal-Wallis' and Mann-Whitney's tests.

Results: success rates for apical patency in BC and NEO were 100%. Removal time of bc sealers was better with no solution ($p = 0.009$). Time to reach WL was longer for BC Group (180.5±248.6 s) than NEO Group (61.2±25.1 s).

Discussion: the difficulty during non-surgical endodontic retreatment is to restablish the patency and to reach the WL. In this study, apical patency was obtained in all the samples and removal of bioceramic sealer was well performed, especially if no solution was used.

According to literature, bioceramic sealers are difficult to retreat. In the light of our results, it is not excluded that bioceramic sealer could have different setting time and physical properties when used *ex vivo*.

Conclusions: Hyflex remover is efficient in retreat BC and NEO sealers. Their retreatment is more effective when no solution is used.

INFLUENCE OF THERMOMECHANICAL COMPACTION ON THE MARGINAL ADAPTATION OF 4 HYDRAULIC SEALERS

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Aim: to evaluate the behavior of four different endodontic sealers using a single-cone technique or through thermomechanical compaction, by evaluating the marginal gap existing between the obturation materials and the dentinal walls.

Methods: a total of 104 single-rooted, straight canal teeth were selected and divided into four groups according to the selected endodontic sealer ((AH) Plus Bioceramic Sealer (AHP), EndoSequence BC Sealer HiFlow (ES), C-Root SP (CR), and GuttaFlow Bioseal (GF)). Each tooth was decoronated and instrumented with the HyFlex EDM/CM systematics up to 30.04. After irrigation procedures, the teeth of each group were divided into two subgroups and obturated according to the two above-mentioned obturation techniques. After the required sealer setting time, each tooth was sectioned in three parts at 3, 6, and 9 mm from the apex, and each section was observed with a scanning electron microscope. The marginal gap of each sample was measured using G* Power Software v 3.1, and the statistical analysis was performed using the Kruskal-Wallis test, followed by a post hoc Dunn's test.

Results: there were not any statistically significant differences in terms of the marginal gap between the two different obturation techniques for each sealer, except for the middle third of root canals, where a statistically significant difference was found for AHP, ES, and GF sealers.

Conclusions: the thermomechanical compaction of hydraulic sealers and gutta-percha guarantees better sealing than the single-cone technique when the root canal shape is not rounded.

ANALYSIS OF GAPS AFTER APICOECTOMY IN SINGLE POINT AND BIOCERAMIC SEALER TREATED TEETH

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Aim: to evaluate in an *ex vivo* study by scanning electron microscopy (SEM) the presence of gaps between the obturation materials and the dentinal walls on the cutting surface after apicoectomy.

Methods: twenty human mono-rooted teeth were instrumented (Rotate, VDW) and filled with gutta-percha single cone technique (SCT) using and a bioceramic sealer (BCS) (AH Plus, Dentsply Sirona). Teeth were divided into two experimental groups (n = 10): G1- root end cutting surface uncoated; G2- root end cutting surface coated with the same bioceramic material. Samples were wet stored at 37°C. After 12 hours apicectomy was performed 3 mm from the apex with a high-speed bur under cooling water and the roots were processed to the SEM observation. Samples were mounted on aluminum stub coated with double-side carbon tape and analyzed with a Scanning Electron Microscope (FEI Quanta 250) in low vacuum conditions (130 Pa) using secondary electrons and an acceleration voltage of 30 kV, at a working distance of 10 mm.

Results: a low mean percentage of micro-gaps was found in G1, but there was no statistical difference in comparison with G2. Voids were localized between the sealer and the dentin walls. The contour of gutta-percha cone was unaltered.

Conclusions: in case of gaps, BCS used to cover the cutting surface could be used to fill them.

A NEW CLEANING PROTOCOL IN ENDODONTIC SURGERY: AN *EX VIVO* STUDY

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Aim: to enhance cleaning during retro-preparation in endodontic microsurgery.
Methods: fourty mandibular premolars were instrumented, filled with a single cone technique, then retro-preparation was performed and assigned to experiment A. In group A1, after retro-preparation, the retro cavity was cleansed with 2 ml of sterile saline via a 30-gauge endodontic needle. In group A2, the retro cavity was cleaned with 2 ml of sterile saline using a 30-gauge endodontic needle after the retro preparation. Subsequently, in group A2, 17% EDTA gel and 5.25% gel was introduced into the cavity and then activated ultrasonically. After the irrigation protocols, the specimens were decalcified for histological evaluation.
Results: in the experiment, the amount of hard tissue debris was significantly greater in group A1 compared to group A2 ($P < 0.05$).
Conclusions: the samples in group A2 where the new protocol was performed, showed statistically significant results.

TORSIONAL EVALUATION ON DIFFERENT BENDING CONDITIONS OF TWO NI-TI ROTARY GLIDE PATH

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Aim: comparing the torsional resistance of two different glide path files, the Mtwo (10.04) and the Hyflex EDM Glide Path files (10.05), under different bending conditions.
Methods: thirty Mtwo 10.04 files and thirty Hyflex EDM glide path files 10.05 were used in the present study (N = 60) and divided into 3 test groups of 10 files. A customized device made of a mobile structure with a connection that holds the handpiece, and the artificial canal was used for the experiment to make the measurements repeatable. These canals were created with a 90° curvature, a 60° curvature, and lastly a straight canal. Each instrument was rotated at 300 rpm with a maximum torque value of 5.5 Ncm with the apical 3 mm firmly secured in a vise. The torque to fracture and the time to fracture were recorded by the software integrated in the handpiece and evaluated through statistical analysis.
Results: statistical analysis did not find significant differences in the values of torque to fracture (TIF) between these 3 groups.
Conclusions: the results of the present study should be explained by the flexural rigidity, for Hyflex EDM Glide Path 10.05 is influenced by the combination of rectangular cross-sectional shape and CM Wire and S Shaped cross-sectional design and Austenitic NiTi for the Mtwo 10.04. These combinations of characteristics could justify the results of the present study, the absence of difference between an austenitic and a martensitic file on the torsional resistance under different bending conditions.

ASSESSMENT OF ROOT CANAL DISINFECTION WITH A NOVEL AUTOMATED DEVICE: A PRECLINICAL STUDY

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Aim: the cleanliness of the root canal is a key factor for the success of the endodontic treatment. Therefore, the aim of this study was to evaluate the cleanliness and disinfection potential using a novel automated device compared to standard irrigation techniques.

Methods: twenty-one extracted single-rooted teeth were shaped to a 30 size and 0.6 taper. Then, teeth were randomly allocated into three groups: group I, Manual irrigation (MI); group II, Automated irrigation (AI); group III, Passive ultrasonic irrigation (PUI).

The specimens were examined under scanning electron microscopy (SEM) and separate evaluations were undertaken to assess debris and smear layer.

Results: the study results showed a significant difference ($p < 0.05$) in the scores among the groups and at various assessed levels (apical, middle, coronal). The recorded debris scores were higher at apical levels which were around 3.48±0.36, 2.64±0.32, and 1.22±0.24 in MI, AI, and PUI groups, respectively. The recorded smear scores were also higher at the apical level, specifically 3.02±0.25, 2.70±0.21, 1.15±0.19 for each group respectively. There wasn't a significant difference ($p = 0.15$) in the scores among the various levels within PUI group.

Conclusions: within the limitation of the present study, it could be concluded that PUI activation has shown to be more effective than MI and AI, although the latter has proven to be better than MI.

THE VAPOR LOCK EFFECT ON ENDODONTIC DISINFECTION: AN *IN VITRO* STUDY

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Aim: the physicochemical phenomenon of apical vapor lock can affect endodontic space disinfection efficacy preventing to the irrigant solutions reach the working length. This *in vitro* study is aimed at evaluating the formation and the extention of vapor lock during routine procedures of endodontic therapy.

Methods: 8 single-rooted teeth, extracted for periodontal reasons, were decrowned at 17 mm from the anatomical apex and placed in a closed system which allowed to confirm apical patency and to prevent irrigants extrusion. After cleaning and shaping procedures, a contrast medium mixed with 5% sodium hypochlorite was delivered 1 mm from the working length by using a 30 G needle. The statistical, quantitative and quality analysis were subsequently, for each canalar third, performed on the basis of data obtained by 3D scans.

Results: in the apical third of the samples was detected a total of 17 bubbles (mean 2.125 and SD 0.99 values). The cross-comparison relating to the canalar volume occupied by the vapor lock in the apical third (84.084%) showed a significant (P-value 0.0001) difference with the coronal third (7.773%) and a highly (P-value <0.0001) difference with the middle third (3.768%).

Conclusions: the obtained data, referred to the use of NaOCl delivered inside the canal by passive irrigation with manual devices, confirmed the presence of bubbles located especially in the apical area linked to the vapor look phenomenon. Could be interesting to test different solutions and activation techniques in order to avoid vapor lock or effectively remove the air bubbles.

SHOULD THE PRE-ENDO PROXIMAL WALL RECONSTRUCTION BE REPLACED AFTER ENDODONTIC PROCEDURES?

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Aim: this laboratory study aims to evaluate if irrigating protocols during endodontic treatment can influence the retention of pre-endo resin composite reconstructions.

Methods: human molars were embedded in acrylic resin and the deep dentin surfaces exposed. Adhesive procedures were performed at the periphery to simulate proximal pre-endo reconstructions with a universal adhesive (iBond universal, Kulzer) and composite (Venus Pearl, Kulzer). The specimens were randomly assigned to one of the following irrigating protocols (n = 20): C: No treatment; SH: 5.25% sodium hypochlorite for 10 min + final water rinse; CHX: The same as SH + final 2% chlorhexidine rinse for 2 min; EDTA: The same as SH + final EDTA rinse for 2 min. The shear bond strength test (SBS) was performed after 24 h or 10.000 thermocycles (TC; 5-55 °C, 30s dwell time). Data were statistically analyzed ($p < 0.05$).

Results: the irrigating solution, ageing and their interactions statistically influenced the results ($p < 0.001$). At baseline, EDTA recorded the highest SBS values, with no differences between CTRL, SH and CHX ($p < 0.05$). TC statistically decreased the bonding values in all groups and no differences were observed irrespective of the irrigating protocol ($p > 0.05$).

Conclusions: the irrigating solutions did not influence the bonding performances of resin composite restorations. Clinically, this would translate in the possibility to maintain the pre-endo proximal wall for the final coronal restoration. However, further studies are warranted.

3D EVALUATION OF THE ROOT APEX OF PERMANENT MAXILLARY PREMOLARS: A MULTICENTRIC STUDY

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Aim: modern endodontics has advanced radically in the recent years, and recently, it has been focused on the concept of minimally invasive treatments. This study aimed to evaluate the sections of the root apices at 1 mm from the radiographic apex using a high-resolution CBCT.

Methods: the current study was performed in three different dental centers. One hundred maxillary permanent premolars (50 first and 50 s premolars) were analyzed using measurement software of the CBCT radiographic pictures. The mesio-distal (M-D) and bucco-palatal (B-P) sections were measured at 1 mm from the radiographic apex of each root. The section of 0.3 mm or less, 1 mm from the anatomical apex of the upper premolars, was decided as the limit value. All values were statistically analyzed.

Results: the mean value in the 304 sections analyzed was 1.03 (±0.37). Only 19 sections (6.3%) had measurements less than or equal to 0.3 mm. All these 19 sections were from first premolars ($p = 0.002$).

Conclusions: based on the data obtained, the authors recommend performing conservative shaping when endodontically treating first maxillary premolars, especially when a preoperative CBCT to evaluate the actual apical dimensions cannot be acquired.

VITAL PULP THERAPY ON PERMANENT MATURE TEETH: A PRELIMINARY OBSERVATIONAL STUDY

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Aim: vital pulp therapy (VPT) has been recently suggested as an alternative clinical procedure to treat symptomatic mature permanent teeth presenting deep caries lesions, in order to maintain the pulp vitality over time and to avoid or post-pone root canal therapy (RCT). Therefore, the aim of the present clinical observational study was to assess the success rate of mature permanent teeth underwent full pulpotomy.

Methods: systemically-healthy subjects presenting deep caries lesions approximating/involving the pulp of mature permanent teeth and with signs and symptoms of reversible pulpitis, underwent full pulpotomy using hydraulic calcium-silicate based cements. After final restorations, dental elements were clinically and radiographically followed-up to assess the success rates over time. All treatments were performed at the Dental Clinic of University of Naples Federico II.

Results: five clinical cases were followed for different time intervals (3 to 12 months) and a 100% of clinical and radiographical success rate was reported.

Conclusions: within the limitation of the present study, it could be concluded that VPT, especially full pulpotomy, should be considered as a valid non-invasive treatment in mature permanent teeth with signs and symptoms of reversible pulpitis. However, a larger sample size and a longer follow-up period are needed to confirm the preliminary obtained results.

ROOT CANAL ROTARY INSTRUMENTATION BY TWO NI-TI ENDODONTIC INSTRUMENTS. A 3D-FEA STUDY

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Aim: the aim of this investigation was to calculate the stress distribution in the root dentine canal during mechanical rotation of different NiTi endodontic instruments by means of 3D FEA.

Methods: one conventional NiTi instrument F6 Skytaper 25/06 in comparison to a heat treated NiTI, Protaper Next 25/06 were considered and analyzed. The instruments' flexibility (reaction force) and geometrical features (cross section, conicity) were previously investigated. For each instrument, dentine root canals with two different elastic moduli (18 GPa and 42 GPa) were simulated with defined apical ratios. Four different CAD instrument models were created, and their mechanical behaviors were analyzed by a 3D-FEA. Static structural analyses were performed with a non-failure condition in a linear elastic behavior.

Results: all the instruments generated a stress area concentration at approx. 7 mm from the apex. The maximum values were found when instruments were analyzed in the highest elastic modulus dentine canal. Strain and von Mises stress patterns showed a higher concentration in the first part of curved radius of all the instruments. Conventional Ni-Ti endodontic instrument demonstrated higher stress magnitudes and it showed the highest von Mises stress values in 18 and 42 GPa dentine canals. Heat-treated endodontic instrument with higher flexibility values showed a reduced stress concentration map.

Conclusions: Protaper Next 25/06 displayed the lowest von Mises stress values of respectively 35.73 and 44.30 GPa for sound (18 GPa) and mineralized dentine (42 GPa).

BOND STRENGTH AND MMPS ACTIVITY OF RADICULAR DENTIN OBTURED WITH BIOCERAMIC SEALERS

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Aims: evaluation of radicular bond strength and dentinal MMPs activity with different endodontic sealers, filling techniques and adhesive protocols.

Methods: 48 extracted, caries-free, single-rooted teeth were selected and shaped with Proglider, ProTaper Next X1-X2. Samples were randomly divided in four groups: warm filling with ZoE sealer; cold filling with resin based sealer; cold filling with bioceramic sealer; warm filling with bioceramic sealer. After 7 days, an 8 mm post space was prepared, and each group was divided into 2 subgroups according to the adhesive procedure (SE *vs* ER) employed for cementation with dual resin cement. Samples were analyzed with micro push-out test at T0.

Eight additional non-carious multi-rooted teeth were prepared in accordance with the described groups for in situ zymography analysis at T0. A 3-way ANOVA, post-hoc Tukey were used to test the three factors and one-way ANOVA to evaluate the differences within each variable ($\alpha = 0.05$).

Results: radicular bond strength was significantly influenced by adhesive protocol and ageing ($p < 0.05$) in accordance with MMPs activity analysis. In addition, obturation technique demonstrated a significant impact on enzymatic activity, while no differences were found for endodontic sealers.

Conclusions: the results showed that bioceramic sealers should not alter the radicular dentin bond strength and endogenous enzymatic activity. The heat produced during the root canal obturation might modify the internal enzymatic activity. ER technique increase the enzymatic activity and reduce the radicular bond strength.

SURGICAL GLUE ON HEMORRHAGE CONTROL IN ENDODONTIC MICROSURGERY: RANDOMIZED CLINICAL STUDY

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Aim: one of the major concerns during periapical microsurgery is the attainment of adequate hemostasis. The use of a medical glue for the bleeding control has been proposed for several surgical procedures. However, no data are available about the use of a specific surgical hemostatic glue for the management of the endodontic microsurgical field. Moreover, a reduced operative time and bleeding may affect the postoperative patients' quality of life. The aim of this randomized controlled study is to evaluate the influence of a surgical hemostatic glue on the bleeding and postoperative patients' quality of life (QoL) compared to traditional hemostatic solutions.

Methods: the eligibility criteria included patients who were medically fit for oral surgical procedures with the diagnosis of symptomatic/asymptomatic apical periodontitis in endodontically treated teeth. Recruited patients were randomized equally to both the surgical glue and the control groups. Hemorrhage control during surgery was assessed by the surgeon and two evaluators. The quality of life of patients was analyzed for limitations of oral and general functions and other symptoms, while for pain assessment a VAS scale was used.

Results: it was observed that with the use of surgical glue, hemorrhage control can be achieved in patients with large periapical lesions, positively influencing operative time and postoperative patients related quality of life.

Conclusions: the results give positive outcomes regarding hemorrhagic control with surgical glue, especially in case of large periapical lesions. However, more patients will be required to confirm the preliminary results obtained.

CORRELATION BETWEEN TEMPOROMANDIBULAR DISORDERS AND NECK PAIN IN PATIENTS WITH PRIMARY HEA

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Aim: to assess the correlation underpinning different clinical conditions as painful temporomandibular disorders (TMD) and neck pain in patients affected by primary headaches.

Methods: the present retrospective study analyzed data from medical records of patients with diagnosis of migraine, tension-type headache (TTH), or and other primary headaches, referring to a University Hospital over a 10-year period. Visual analogue scale (VAS) was used to evaluate the intensity of the TMD and neck pain. A machine learning approach was used for automated classification of TMDs and headache using all the VAS scale of TMD and cervical neck pain.

Results: a total of 300 patients (72 male, 228 female), mean aged 37.78±5.11 years, was included. The 72.22% of patients with migraine showed to have a diagnosis of TMD higher than patients with TTH (63.37%) and significantly higher than those with other primary headaches (55.17%; p = 0.030). Patients with migraine had a TMD VAS (6.03±2.11) significantly higher than TTH patients (4.39±1.68; p = 0.002) and other primary headaches patients (5.54±1.59; p = 0.003). Furthermore, migraine patients showed a neck pain VAS (6.65±3.01) significantly higher than TTH patients (6.19±1.52; p = 0.030) and other primary headaches patients (5.21±1.44; p = 0.001). The machine learning analysis focused on type of primary headache demonstrated that a higher TMD VAS was correlated to migraine, whereas a higher neck pain VAS was correlated to TTH or migraine. Nevertheless, arthrogenous and mixed TMD showed to be correlated to mild-moderate TMD pain (depending on neck pain intensity), whereas myogenic TMD was correlated to moderate-severe TMD pain.

Conclusions: taken together, findings of this machine learning study focused on patients with primary headache, reporting that a higher TMD VAS could be more correlated to migraine and a higher neck pain VAS could be more correlated to TTH or migraine. Further prospective studies could investigate the effects of an adequate treatment of TMD in improving outcomes in terms of headache and neck pain.

TEMPORAL SEQUENCE BETWEEN SLEEP BRUXISM EVENT AND CORTICAL AROUSAL: A PRELIMINARY STUDY

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Aim: Sleep bruxism (SB) episodes and masticatory muscle activity have been thought to be secondary to a sequence of events, including increased brain electroencephalographic activity and heart rate.

This study investigates the temporal intervals between these arousal related events and SB-related masseter muscle activity (MMA) in patients with sleep disorders.

Methods: patients presenting at least 30 SB episodes recorded through the signal of electrode on masseter muscle and laboratory polysomnography audio-video registration were included. The time intervals in seconds (s) between SB-related MMA and the following variables were computed: increased brain electroencephalographic activity, heart rate, mylohyoid and tibialis anterior muscles activity. Events were also categorized according to their temporal distribution with respect to MMA as contextual, antecedent (<5 s before), subsequent (<5 s after) or isolated (5 s earlier or later) ones.

Results: increased electroencephalographic activity was mainly contextual to MMA (64.5%), followed by antecedent (20.5%), subsequent (14%) and isolated events (1%). Increased heart rate was mainly subsequent to MMA (49%), followed by antecedent (29%), contextual (22%) and isolated events (0.20%). A statistically significant difference emerged for all the time intervals as duration in s and, also, according to their temporal distribution (p <0.0001).

Conclusions: these preliminary data do not support the hypothesis of a uniform sequence of arousal-related events in relation to MMA during SB events in patients with sleep disorders.

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BRUXISM ASSESSMENT IN OROFACIAL PAIN PATIENTS *VERSUS* CONTROLS: A PILOT STUDY

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Aim: Temporomandibular disorders (TMD) are a biopsychosocial condition, with a multifactorial etiology. Muscle overloading due to tooth clenching is associated with local ischemia, related to muscle pain sensitization. Sleep bruxism (SB) and awake bruxism (AB) are masticatory muscle activities characterized by clenching or teeth grinding and/or bracing the mandible that have been associated to orofacial pain and tooth wear. Despite several methods have been proposed for the assessment of SB and AB, their validity have not been proven and the relationship between bruxism and TMD is still controversial. The aim of this pilot study was to evaluate a possible correlation between the electromyographic activity of the masseter muscle and the presence of orofacial pain in patients with muscle TMD and controls.

Methods: 12 patients diagnosed with muscle TMD with DC/TMD and 12 healthy controls were registered for 24h with the dia-BRUXO device (Biotechnovations S.R.L.), a wearable single-channel electromyogram system located in a standardized position on the left masseter. The number of the masseter muscle activities were scored by the dia-BRUXO software.

Results: no significant differences were found between the two groups for all the parameters analyzed. The number of SB events per hour resulted lower in the TMD group (TMD group n = 3.9±2.5/h; C group n = 6.4±8.6/h), although not significantly. TMD group showed a trend of higher number of AB event per hour than controls (TMD group n = 8.9±10.2/h; C group n = 6.1±3.9/h) that do not reach the statistical significance.

Conclusions: no differences emerged between the two groups in the number of events. Preliminary results seem to suggest that subjects with muscle TMD may present a higher frequency of AB events than healthy controls. Larger samples and further studies are needed.

FUNCTIONAL CHONDROCYTES FROM HMSCS: COMPARISON OF DIFFERENT FACTOR ELUTING MATRICES

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Aim: disc removal is often the treatment of choice in cases of debilitating temporomandibular disorders. To date, there are no reconstructive techniques that can replace tissues that are ablated. The aim of this study is to evaluate the *in vitro* proliferation and maturation of human mesenchymal stem cells.

Methods: culturing on three-dimensional arrays composed of electrospun self-assembling peptides (SAPs), this material is impregnated with vascular endothelial growth factor and mitogenic factors that are gradually released from the degrading SAPs and combinations of supporting cells of stromal nature and endothelial cells. The best conditions that emerged in this screening will then be reproduced to prepare more mature and active cell preparations that will be tested, *in vivo*, on degenerating cartilage.

Results: in our study, the use of human mesenchymal stem cells *in vitro* is described, in which the 'activity regarding proliferation, migration, and differentiation into chondrogenic cells is evaluated under different experimental conditions.

Conclusions: the use of biomimetic nanomaterials with factor eluting qualities is perhaps the most ideal system to grow mature and stable chondrocytes with the goal of creating an implantable cartilage tissue.

EVALUATION OF MASTICATORY MUSCLE ACTIVITY IN PATIENTS WITH JUVENILE IDIOPATHIC ARTHRITIS

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Aim: to assess any differences in muscular activity in children with juvenile idiopathic arthritis (JIA) compared to children without JIA.

Methods: 50 patients affected by JIA (10 M, 40 F, mean age±SD = 11.12±2.85 years) and 69 healthy subjects (30 M, 39 F, mean age±SD = 10.0±1.7 years) were recruited. Patients in JIA group were further divided in two subgroups according to the presence of skeletal asymmetry (Symmetric JIA = 28; Asymmetric JIA = 22). The healthy group was divided according to the presence of dental unilateral posterior crossbite UPCB (healthy = 40; UPCB n = 29). The activity of the left and right anterior temporalis (AT) and masseter muscles (MM) was recorded during maximum voluntary clenching and chewing tasks. Electromyographic indices comparing the activity of paired muscle were computed via software to estimate the extent of asymmetric activity AT and MM. Between-group differences in standardised EMG indices were tested by means of an unpaired t test and one-way analysis of variance (one-way ANOVA). A Chi squared test was performed to examine whether the association between EMG indices and presence of JIA.

Results: no significant differences were found for analysed static (POC, TQ, BAR, ATTIV, ASIM, IMPACT) and dynamic (SMI) indices in all the comparisons, between JIA and CTR group and among the four subgroups. The Chi-squared test did not show any association between the assessed variables.

Conclusions: JIA does not contribute to an asymmetric activation of AT and MM during functional tasks.

SCORING OF TOOTH WEAR USING TWES2.0 ON DIGITAL COLOURED INTRA-ORAL SCAN

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Objectives: this study aimed to assess the reliability of the tooth wear scoring with Tooth Wear Evaluation System (TWES) 2.0 on digital coloured intra-oral scan records as compared to clinical assessment.

Methods: forty (40) participants (18 males and 22 females, mean age: 25.5 years) with no restriction on the amount of dental wear were included. TWES was used to grade the wearing of the occlusal/incisal, buccal and palatal/lingual surfaces. One operator (OP1) performed the assessment at chairside (clinical examination), which was considered as the "gold standard" assessment for the validity testing. Afterwards, to measure the interobserver agreement, two operators (OP1 and OP2) independently scored the degree of dental wear on the digital coloured intra-oral scans. Both OP1 and OP2 repeated the same assessments after 10 days to measure the intra-observer agreement.

Results: regarding the overall validity of the method, O1 showed slight to fair agreement, while O2 reported substantial agreement. Regarding the intra-observer reliability, O1 reported a slight agreement while O2 showed almost perfect agreement. Inter-observer reliability supported slight or fair agreement between operators.

Conclusions: the validity and reliability in the use of TWES 2.0 on digital coloured intra-oral scan was extremely dependent on the ability of the operator. A dedicated training seems to be necessary before using this method.

EFFICACY OF A FORCE-SENSING ORAL APPLIANCE IN THE DETECTION OF BRUXISM EVENTS

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Aim: due to the necessity of a more objective diagnosis of bruxism, this study aims to evaluate the efficacy of a force-sensing oral appliance in a home environment, that is more practical, comfortable and low-cost.

Methods: 23 subjects were evaluated in a single session and simulated bruxism events were measured simultaneously with the oral appliance and an electromyograph (EMG). The device used (AesyBite Discover, manufactured by Aesyra SA) is a nightguard endowed with four pressure sensors, customized by low-temperature thermoforming directly on the upper dental arch of the user. Four EMG electrodes recording the temporalis and masseter muscles were placed bilaterally. The subjects were instructed to execute a sequence of 20 bruxism-related and 20 bruxism-unrelated events; the data were recorded in order to compare the two techniques.

Results: in the sample studied, a strong correlation was found between the two methods in detecting events ($r = 0.89$) and measuring their duration ($r = 0.88$) and intensity ($r = 03$).

Conclusions: the force-sensing oral appliance has the potential to detect teeth clenching and grinding events and could be more comfortable and easier to use than polysomnography with EMG, which is, to date, the gold standard for the diagnosis of bruxism.

OCCLUSAL TACTILE ACUITY AND ELECTROMYOGRAPHIC ACTIVITY OF THE MASTICATORY MUSCLES

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Aim: to compare occlusal tactile acuity (OTA) and electromyographic activity of the masticatory muscles in healthy subjects, and whether there are differences between the right and left sides of the face.

Methods: twenty healthy subjects (16 females and 4 males) were recruited. The OTA was tested with 10 different thicknesses: 9 aluminium foils ranging from 8 µm to 72 µm with a constant increment of 8 µm, and 1 sham test (without foil). The participants were instructed to close their mouth once and to report whether they felt the foil between their molar teeth. The occlusal sensitivity was tested for two times, before (T0) and after the temporal and masseterin electromyography (T1). Asimmetry index (ASIM) is used to compares differences between the right muscle pair with the left. Difference was evaluated for each foil thickness and ASIM and, after Bonferroni correction, statistical significance was set at ($p < 0.005$).

Results: significantly increased OTA was observed in subjects for the thicknesses 16 µm, while no significant differences were found for the larger thicknesses tested (from 8 µm to 72 µm) ($p > 0.005$), no statistically significant differences were found between right and left side.

Conclusions: the results of the present subjects have an increased occlusal sensitivity for thickness 16 µm after performing electromyography (T1).

CORRELATION BETWEEN TEMPOROMANDIBULAR DISORDERS AND VITAMIN D DEFICIENCY. REVIEW

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Aim: the aim of this study was to analyze the correlation between vitamin D (VD) insufficiency and temporomandibular disorders (TMD) and possible therapeutic implications.
Methods: the search was performed within the "PubMed" database using the MeSH terms "Temporomandibular Joint Disorders" [Majr] and "Vitamin D" and produced 11 results. Subsequently, after a careful reading of the abstracts, 8 articles relating to the goal of this work were selected.
Results: most of the studies found a correlation between TMD and VD. Vitamin D may play a role in TMD etiology. Serious VD deficiency resulted to be more prevalent in the patients with disc displacement with reduction when compared to healthy controls. TMJ radiographic changes and teeth loss seems to be related to the VD level. VD affects masticatory muscle activity by improving its thickness and boosting its tonicity and VD supplementation provided faster relief in TMD patients with centric stabilization splint. Only one study showed that serum concentrations of VD are not associated with TMD.
Conclusions: in patients with TMD, VD deficiency should be evaluated and corrected. Vitamin D therapy might be indicated for deficient patients with TMD for improving masticatory muscle activity and efficiency or to reduce pain. Further studies are needed to confirm the relationship between vitamin D levels and different types of temporomandibular disorders and for making general recommendations for VD supplementation in TMD patients with VD deficiency.

EFFICACY OF THERMORHIZOTOMY IN THE TREATMENT OF TRIGEMINAL NEURALGIA. A COHORT STUDY

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Aim: the Headache Classification Committee describes a Trigeminal neuralgia (TN) like a disorder characterized by recurrent unilateral brief electric shock-like pains, abrupt in onset and termination, limited to the distribution of one or more divisions of the trigeminal nerve and triggered by innocuous stimuli. It may develop without apparent cause or be a result of another diagnosed disorder. The antiepileptics carbamazepine and oxcarbazepine are the first choice drugs for long-term treatment of TN. By contrast, the Percutaneous Radiofrequency Thermorhizotomy (PRT) is a surgical procedure offered to patients who are refractory or intolerant to drugs.
Methods: this retrospective cohort study consisted of 29 Italian adults aged 18 years or older with refractory TN. All the patients underwent PRT from January 2010 to June 2021 at the Pain Therapy Unit of the Businco Hospital, Cagliari, Italy. In all cases using a 22-gage radiofrequency needle to kill nerve fibers responsible for sending pain signals to the higher centers. The χ^2 test was carried out to quantify the effect of PRT. The ANOVA test was carried out to establish prognosis to the effect's duration of PRT.
Results: the average duration of the PRT was approximately 2 years. Carbamazepine is the pre-surgical drug correlated with the most favorable outcome of PRT. Only in 5% of cases there was no improvement while 65% of cases stopped taking drugs.
Conclusions: PRT mini-invasive surgical treatment represent a valid alternative to treat efficacy patient with refractory TN.

FULL-DIGITAL FORKFLOW FOR TDMS MANAGEMENT: A CASE REPORT

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Aim: the aim of this study is to show the San Raffaele Hospital's "Gnathology" full digital protocol applied to a case of a patient with Temporomandibular Disorders.
Methods: a 22-year-old patient affected by TMD came to visit at San Raffaele Hospital. The patient presented a chewing discomfort, joint clicking, and headache, because of a facial trauma happened 2 years earlier (to the right TMJ) during a dance session. As the protocol state, electromyography, MRI, cervical mobility test, and facial scan were done with digital devices. Mandibular repositioning was digitally planned after assessing its movements through the ModJaw® (Tech in Motion) device. In this case, the mandible was repositioned forward of 2 mm and downward of 1 mm. The position was planned to increase the intra-articular space and to maintain a straight open dynamic tracing of the jaw. The splints were digitally printed using the therapeutic position. The treatment with occlusal appliances consisted of repositioning appliances in the upper and lower arches, to be alternatively worn night and day for about 6 months. Mandibular stabilization exercises were also recommended.
Results: in the present case reports the patient achieved a significant improvement in their symptoms in about 6-8 months.
Conclusions: the digital workflow has many advantages: The possibility of making a more "aware" diagnosis, faster realization and execution of the intraoral appliance, the possibility of digitally memorizing the therapeutic position and virtually checking the device, the exchangeability of the planned mandibular position and its kinematics with other colleagues in the dental team.

MANAGEMENT OF TMDS WITH DIGITALLY PLANNED APPLIANCES

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Aim: Temporomandibular joint disorders (TMD) have always been the subject of studies due to the difficult management of symptoms and the complex stabilization of the so-called therapeutic position. In this effort, digital technologies open-up new opportunities for such planning, allowing the clinician to digitally assess the situation and verify the stability of the new position from a functional point of view. The aim of this work is to show a Full digital protocol for the treatment of patient affected by TMD.
Methods: three clinical cases were analyzed with full digital techniques and workflow. A personalized treatment for each case was digitally planned on the base of proper kinematic tracings recorded for each patient, and intraoral appliances were digitally customized through a full-digital or semi-digital workflow. There was a full-digital planning of treatment in TMDs patients made with the preliminary evaluation of the kinematic activity of the mandible through a digital device (Tech in motion™, ModJaw, Villeurbanne, France). A personalized treatment for each case was digitally planned on the base of proper kinematic tracings recorded for each patient, and intraoral appliances were digitally customized through a digital workflow.
Results: in this study all patients achieved a significant improvement in their symptoms in about 6-8 months.
Conclusions: the digitalization of mandibular kinematic gave us the possibility of making a more "aware" diagnosis, especially in a dynamic key, and then it allowed a faster realization and execution of the intraoral appliance through a digital workflow.

EVALUATION OF OCCLUSAL TACTILE ACUITY IN INDIVIDUALS WITH BURNING MOUTH SYNDROME

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Aim: Occlusal Tactile Acuity (OTA) is the ability to detect small thicknesses between occluding teeth. Here, the aim was to compare the OTA of Burning Mouth Syndrome (BMS) patients with that of control (CTR) individuals.

Methods: twenty-five (25) BMS patients (19 women, mean age 55.9±12.7 years) and 25 age- and gender-matched CTR were enrolled. The OTA was tested with 10 thicknesses: 9 aluminum foils (from 8 to 72 μm) and 1 sham test (without foil), each being tested 10 times in random order. Participants were instructed to close their mouth once and to report whether they felt the foil between their teeth. Mean percentage of correct answers was measured for each thickness and the ANOVA for repeated measurements, with Bonferroni multiple correction, was used for the between-group comparison. Statistically significant level was set at $p < 0.005$.

Results: significantly increased OTA was observed in the BMS group for the thicknesses between 8 and 48 μm. No differences were found for the larger thicknesses tested. Also, BMS patients showed impairment in the detection of the sham test, even if this result did not reach significance ($p > 0.005$).

Conclusions: BMS patients showed increased ability to detect small thicknesses between antagonist teeth.

THE TOP 100 MOST-CITED ARTICLES IN DENTISTRY BY AUTHORS WITH ITALIAN AFFILIATION

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Aim: the purpose of this research was to perform a bibliometric analysis on the top 100 most-cited articles in dentistry, authored by researchers with an Italian affiliation. This analysis can provide valuable insights into the evolution of research and aid in predicting future developments.

Methods: in September 2022, a search was conducted for all articles published in journals indexed under the Scopus category “Dentistry” that had at least one author affiliated with an Italian institution. From the results, the top 100 most-cited articles were selected, and relevant data was extracted and summarized. Additionally, a co-authorship analysis at the country level and a co-occurrence analysis of keywords were performed.

Results: the selected 100 most-cited articles in dentistry were published over a span of 44 years, from 1976 to 2020. The number of citations ranged from 235 to 1683, with an average of 361. Out of the 100 articles, 25 were considered citation classics, having more than 400 citations. The majority of the articles were categorized as expert opinion or narrative reviews. The three most common disciplines referred to in the articles were implantology, periodontology, and restorative dentistry, which accounted for nearly half of all the articles. Only two of the articles had a single author, while 30 had authors affiliated solely with Italian institutions. The United States was the most frequent country of non-Italian authors. All but one of the articles were published in journals held by non-Italian publishers.

Conclusions: the collection of highly-cited articles in this study serves to validate the significant contribution of Italy to the field of dental research. The results showed that there was no correlation between the level of evidence presented in an article and the number of citations it received, and that highly-cited papers were not evenly distributed across different dental disciplines. Most of the articles analyzed in this study had international co-authorship and were published in highly influential journals.

EXPERIMENTAL EVALUATION OF CRANIAL EMG USAGE IN ATHLETES AND CLINICAL IMPLICATIONS

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Aim: the experimental analysis of the data, provided by the cranial electromyographic surface recording, is supposed to examine the correlation between the stomatognathic apparatus and the muscular tonic system, focusing attention on the implications that this relation has on the physical status of the professional athlete.

Methods: 25 athletes (average age 23 years, 20 men and 5 women) underwent electromyographic registration, of which 13 reported being in a condition of sports injury (symptomatic athletes) and 12 in perfect physical condition (asymptomatic athletes), while at the level gnato - orthodontic, 7 presented occlusal dysfunction (afunctional athletes), while 18 showed a well compensated occlusion (functional athletes).

Results: the statistical analysis of the data shows that the therapeutic choice implemented following the use of the electromyographic method in question had an overall efficacy in 72% of cases against 28% who did not respond to therapy ($p = 0.028$).

Conclusions: the use of cranial semg in competitive athletes is clinically indicated in the therapeutic choice aimed at balancing occlusal loads and at improving the overall tonic-postural attitude of the individual, with consequent positive feedback in the qualitative assessment of sports performance.

CORRELATION BETWEEN BRUXISM EPISODE INDEX AND HEART RATE VARIABILITY (HRV)

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Aim: a good management of sleep bruxism has not been achieved yet, although some etiological agents have been verified: stress, for instance, has been found to be closely related to autonomic nervous system (ANS) activity and sleep bruxism (SB). For this reason, the effects of a technique of abdominal breathing on Heart Rate Variability (HRV), activity of muscles of mastication and electrodermal activity (EDA), and a possible correlation between HRV and SB have been examined. Both HRV and EDA are indicators of sympathetic system activity.

Methods: using a Bruxoff device and Empatica E4, two recordings have been conducted in a sample of 8 adults, the second one 14 days after the first one. Between the two recordings, the individuals performed an autogenic training (AT) to acquire an autonomous deep and diaphragmatic breathing. It consists of the repetition of Schulz' protocol exercises which were performed for 14 days, twice a day for about 20 minutes each time, initially guided.

Results: a reduction in all 3 physiologic parameters has been observed, in accordance with the effects of AT on ANS: EDA has reduced 75%, and HRV by 20%. A 75% reduction in bruxism index in bruxist individuals (evaluated at T_0) was found.

Conclusions: the study is the first to have investigated the possible association between SB and HRV and shows a reduction of the measured parameters, in particular in bruxism index.

T-SCAN AND SEMG EVALUATION IN TEMPORO-MANDIBULAR JOINT INTRACAPSULAR DISEASE PATIENTS

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Aim: in this work authors show a diagnostic criterion of TMID: neuro occlusal clinical evaluation (NOE), T-Scan 2 system and surface electromyography (sEMG).

Methods: 18 patients (mean age 26.7) with TMID and 18 healthy group control have been selected and examined, T-Scan and sEMG test have been performed. NOE was calculated though functional masticatory angle (AFM) on the patient's lateral photos. T-Scan System was a digital occlusion analysis system providing a comprehensive occlusal balance measurement. Finally, sEMG recorded muscle force contraction. T-Scan and sEMG tests have been performed in resting position and in maximum clench.

Results: the findings of the study are the following:

- in healthy control there were no AFM difference; instead in TMID group there were differences between the two AFMs greater than 6 degrees.
- T scan detected that in the healthy control group there was never a COF difference greater than 5%, while in TMID patients the difference was greater than 5% ($p < 0.05$).
- T-scan detected the higher MIFT (time force of maximum intercuspidation) in healthy patients compared to TMID patients($p < 0.05$).
- The sEMG test showed large asymmetric masseter (MM) activation in the TMID group. MM activation was greater on the affected articulatory sound side than on the balance side ($p < 0.001$).
- The sEMG found lower maximal masseter activation in TMID patients than in healthy subjects ($p < 0.001$).

Conclusions: in patients with TMID, neuro occlusal clinical evaluation (NOE), T-Scan and sEMG test showed functional neuromuscular changes compared to healthy subjects.

MODIFIED SPLINT THERAPY FOR DISC DISPLACEMENT WITH REDUCTION OF TEMPOROMANDIBULAR JOINT

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Aim: Disc displacement with reduction (DDwR) is one of the most common TMJ arthropathy and is typified by clinical dysfunction and structural impairment involving the disc-condyle complex. The study aimed at assessing the effectiveness of modified occlusal splint in the management of temporomandibular joint disc displacement with reduction (DDwR) in comparison with conventional physical therapy.

Methods: the effects of modified occlusal splint were investigated in a one-blind, randomised controlled clinical trial involving 86 individuals diagnosed with DDwR. Patients were randomly assigned (1:1) by computer-generated allocation sequence to receive rehabilitation by using conventional physical therapy approaches or modified occlusal splint therapy. The first follow-up visit has taken place after one month of therapy and after 3 months. MRI examinations were performed using a 1.5 T MRI scanner. T1- and T2-weighted images with para-sagittal and para-coronal images were obtained. According to the MRI findings, temporomandibular joint (TMJ) discpositions were divided into 3 subgroups: normal, anterior disc displacement with reduction (DWR), and anterior disc displacement without reduction (DWOR). The cases of effusion were divided into 4 groups: normal, mild (E1), moderate (E2), and marked effusion (E3). Image analysis involved the evaluation of morphology and function of intra-articular structures.

The outcome was defined as leading to the disappearance of the joint sounds of temporomandibular joint (TMJ). Existence of disc displacement in joint (with reduction, without reduction), existence of effusion in joint gap, arthritis, degenerative changes in joints, limitation of movement of joint and anatomic evaluations were made using a set of morphological parameters.

Results: between March 2021 and November 2022, 176 patients were identified, and 86 participants were recruited: 43 were randomly assigned to receive the modified mandibular splint technique. We observed significant differences between groups in the success rate (74.4%) of patients with clicking of the TMJ at mouth opening of 1.5 cm.
Conclusions: the modified mandibular splint could be considered as the effective alternative for treatment of DDwR.

GNATHOLOGICAL AND PERFORMANCE ASSESSMENT OF BASKETBALL PLAYERS: MOUTHGUARD FUNCTION

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Aim: the purpose is to analyze oral, gnathological, and postural health status and performance levels before and after the use of a sports mouthguard in a homogeneous group of basketball players.
Methods: 34 basketball players from 3 sports clubs of Perugia aged 18-30 years were included (CER NO.: 4381/22). The multidisciplinary team (dentists, podiatrist and athletic trainer) conducted analysis on each athlete: dental and gnathological visit with surface electromyography and band accelerometer, podiatric and performance sports examinations with baropodometric platform and infrared sensors. A 3 mm splint was made for each athlete by thermoforming. The examination protocol was performed at time zero (T0), after three months of training without splint (T1) and after three months of wearing the mouthguard (T2), provided at the second visit (T1).
Results: at T0 it was found how 54% of subjects had gnathological alterations, the other data defined the baseline condition of the sample.
These values were confirmed at T1. At T2, 43% of the subjects experienced changes in gnathological parameters. Variations in cervical, baropodometric and performance parameters were also observed.
Conclusions: the use of a mouthguard generates gnathological, postural, and performance changes in athletes. The application of devices such as splints following careful multidisciplinary evaluation could be part of the strategies for monitoring the sports activity of various categories of athletes. Subsequent studies will analyze possible correlations between the selected parameters.

SURFACE ELECTROMYOGRAPHY: INSTRUMENTAL EXAMINATION TO SUPPORT GNATHOLOGICAL DIAGNOSIS

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Aim: the study aims to evaluate the benefit of adopting a surface electromyograph (EMG) as a diagnostic confirmation tool during gnathological examination.
Methods: 34 basketball players from 3 basketball teams of Perugia were enrolled. (CER NO.: 4381/22). Gnathological examination was performed according to the "Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) Clinical Examination Protocol, version: January 6, 2014" on each subject. Based on the data obtained 3 groups were identified: subjects without TMD, with muscle TMD, and with joint TMD, in accordance with the criteria of the American Academy of Orofacial Pain (AAOP). Surface EMG providing quantitative information on muscle behavior in relation to occlusion was then used. Clinical data collected were subjected to statistical analysis in order to evaluate the associations between the different parameters under investigation.
Results: there is a correlation between electromyographic parameters in each of the groups. There is a linear correlation with the variables TORS ($r = -0.917$) and SCORE ($r = -0.914$), referring to mandibular torsion and general electromyographic score, the two main discriminatory parameters between healthy subjects or those with muscle or joint TMD, and the best predictors of TMD. Additional variables related to the individual diagnostic groups were identified.
Conclusions: there are promising results for future investigations considering this preliminary study. EMG appears an effective tool in the diagnosis of TMD. Future researches will implement the sample size to confirm the results.

DENTAL IMPLANT REHABILITATION IN SUBJECTS AFFECTED BY CHRONIC KIDNEY DISEASE: A SYSTEMATIC REVIEW OF THE LITERATURE AND CASE REPORT

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Aim: the severe form of Chronic kidney disease-mineral could produce bone disorder and renal osteodystrophy accompanied by deficits of bone mineralization and electrolytes/hormonal disbalance. The aim of the present investigation was to evaluate the implant rehabilitation in subjects affected by chronic kidney disease through a systematic review and case report.

Methods: the literature screening was performed in accordance with the criteria of the PICO guidelines on PubMed/Medline, EMBASE, Google Scholars electronic databases. A male patient affected by chronic kidney disease undergoing treatment with hemodialysis was treated with upper and lower immediate implant-prosthetic rehabilitation.

Results: the screening showed a total of 54 manuscripts and one paper identified through the manual search. A total of 45 papers were excluded and 9 articles were considered for the descriptive synthesis.

No complications or events were reported during the surgery and the post-operative healing. The clinical course reported no significant inflammation or symptoms with a follow up of 1 year.

Conclusions: the study findings showed that the immediate implant rehabilitation reported a successful prognosis and could be considered also for severe chronic kidney disease and subjects under haemodialysis treatment.

A NEW WEDGE-SHAPE DENTAL IMPLANTS FOR NARROW BONE RIDGE: REX PIEZOIMPLANT, A CASE REPORT

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Aim: the progressive resorption of the alveolar ridge after tooth extraction may lead to maxillary or mandibular atrophy, resulting in reduced horizontal or vertical dimensions of the bone crest or in a combination of them. Insufficient bone volume could compromise the insertion of the traditional implant. The purpose of this study was to report the surgical protocol used in implant prosthetic rehabilitation with a new wedge-shape dental implant in a case of insufficient bone volume with a 40 months follow-up.

Methods: this case report documents the insertion of a REX PiezoImplant type TL1.8 (Rex TL, Rex Implants, Columbus, OH, USA) in a patient with a horizontal bone width between 2.66 mm and 3.29 mm. Piezoelectric instruments and a specific sequence of inserts were used for the preparation of the implant sites. The implants were inserted with the REX IPD magnetic hammer (Implant Placement Device, Mectron S.p.A).

Results: in this case report, the follow-up evaluation performed at the time of suture removal, on day 10, and after 1,24 and 40 months showed no complications, no residual radiolucency and revealed a good osteointegration of the inserted implants.

Conclusions: according to our results, the use of REX PiezoImplants can be considered a valid minimally invasive surgery technique in atrophic bone crests, which do not allow the insertion of traditional implants without bone regeneration procedures.

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MECHANICAL DEBRIDMENT WITH PDT IN PERI-IMPLANT DISEASE IN SMOKERS: A NARRATIVE REVIEW

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Aim: to evaluate the efficacy of mechanical debridment in combination with adjunctive photodynamic therapy in peri-implant disease treatment in smoking patients.

Methods: peri-implant diseases are pathologic inflammatory conditions that include peri-implant mucositis and peri-implantitis. Routine treatment modality in preventing and controlling these conditions is thorough mechanical removal of the deposits. Recently, the use of photodynamic therapy (PDT) centered on the premise that a photoactive substance offers benefits in the resolution of peri-implant diseases has gained attention.

Three perspective studies assessing the effect of PDT in smoking patients were included.

The follow up period generally ranged from 6 months to 1 year.

The clinical outcome parameters considered were: implant probing depth (PD), plaque index (PI), bleeding on probing (BoP).

Results: Alqahtani found no statistically significant difference in all parameters at all-time intervals in smokers, while Al Deeb reports a significant reduction in PI, PD and a reduction of BoP in smokers at six months follow-up. Javed found no statistically significant difference in BoP at 6-12 months of follow up compared with baseline, while significant reduction in PD was reported.

Conclusions: PDT seemingly offers short-term benefits as an adjunct to mechanical debridement in the treatment of peri-implant diseases.

To conclude emphatically about the role of PDT in peri-implant diseases may be difficult due to varying study designs and data sets. However, the data reported are encouraging and further study should be carried out to evaluate the benefits of this treatment.

CUSTOM-MADE ADDITIVELY MANUFACTURED SUBPERIOSTEAL IMPLANT: A CASE REPORT 2-YEARS FOLLOW-UP

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Aim: recently, several Authors suggested a revival of subperiosteal implants as an alternative to regenerative procedures. The purpose of this case report was to describe the clinical application of custom-made additively manufactured subperiosteal implant for fixed prosthetic rehabilitation of edentulous maxilla.

Methods: plaster models of the upper and the lower arch were scanned, as well as the mock-up. DICOM data obtained from CBCT were processed through the thresholding procedure. The design of the subperiosteal implant was drawn on the stereolithographic model and scanned. Once the digital project of the subperiosteal implant was completed, it was sent to additive manufacturing. After the surgery, the patient was strictly monitored for up to 2 years. The outcomes were assessed based on the incurrence of biological and mechanical complications, postoperative complications, and implant survival.

Results: the patient did not suffer from postoperative complications. Neither biological nor mechanical complications occurred during the follow-up period. At the end of the study, the implant was still in function.

Conclusions: custom-made subperiosteal implants could be considered as an alternative to regenerative procedures for the rehabilitation of severe bone atrophy. Further studies are needed in the future to confirm the positive outcome.

CLINICAL, RADIOGRAPHIC AND BIOCHEMICAL EVALUATION OF TWO-PIECE *VS* ONE-PIECE SINGLE IMPLANT

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Aim: the aim of this study was to compare the clinical and radiographic conditions and the expression of proinflammatory cytokines in peri-implant crevicular fluid (PICF) of two-piece/bone level (TP/BL) versus one-piece/tissue level (OP/TL) single implants with a laser-microgrooved collar after at least 5 years of functional loading.

Methods: for this study 20 systemically and periodontally healthy patients were selected. Each patient received 2 implants, both with a laser-microgrooved collar surface, with a split-mouth design: one TP/BL implant and one OP/TL implant. Levels of IL-1β, IL-1RA, IL-6, IL-8, IL-17, b-FGF, G-CSF, GM-CSF, IFN, MIP-1β, TNF-α, and VEGF were assessed in PICF using the Bio-Plex 200 Suspension Array System. Plaque index (PI), probing depth (PD), bleeding on probing (BOP), and gingival recession (REC) were recorded. Radiographic crestal bone levels (CBL) were assessed at the mesial and distal aspects of the implant sites.

Results: the mean PI, PD, BOP, and REC values had no significant differences in either group. TP/BL implants showed a significantly higher CBL value. The levels of IL-1β, IL-6, IL-8, GM-CSF, and MIP-1β and TNF-α were higher at TP/BL implants than at OP/TL implants. However, only IL-1β, IL-6, and TNF-α values presented significant differences between the groups.

Conclusions: after 5 years of loading single TP/BL and OP/TL implants with a laser-microgrooved collar surface presented similar good clinical conditions, a higher proinflammatory state and higher crestal bone loss were detected for TP/BL implants.

OUTCOMES OF TISSUE-LEVEL IMPLANTS IN FULL-ARCH REHABILITATIONS: AN OBSERVATIONAL STUDY

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Aim: tissue-level implants with a convergent collar have been recently introduced. While different studies have investigated their application in single and multi-unit implant rehabilitations, no observational studies are currently present on their usage in full-arch rehabilitations. This observational study aims to examine the use of tissue-level implants in immediate loading full-arch rehabilitations with different variables associated.

Methods: 20 Patients were recruited. Each patient underwent an immediate loading full-arch rehabilitation with four trans-mucosal tissue-level implants. The following variables were recorded: implants' diameter and length, and jaw distribution. The following outcomes were evaluated: implants survival rate, marginal bone loss (MBL), Plaque index (PI), Bleeding on Probing (BoP), Probing Depth (PD). Descriptive statistical analysis was reported, and univariate linear regression models were built to assess a significant correlation between MBL and the different implant related factors.

Results: at the one year follow up visit no implants failed resulting in an implant survival rate of 100%; the overall MBL was 1.19±0.30 mm, PI 0.48±0.50; BoP 0.43±0,50 and PD 2.07±0.65 mm. No statistically significant difference ($p < 0.05$) was highlighted among any of the subgroups analyzed.

Conclusions: despite different variables associated, tissue level implants seem to represent a valid option when applied in immediate loading full-arch rehabilitation. Further research and longer observational periods are encouraged to confirm the result.

INTRASULCULAR LEVEL AS PROGNOSTIC VALUE OF THE SUBSEQUENT ONSET OF PERI-IMPLANTITIS

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Aim: the aim of this retrospective study was to investigate the role of the amount of early bone remodeling, the marginal bone loss (MBL) progression and the peri-implant sulcular fluid concentration of MMP-8 in the incidence of peri-implantitis during 5 years of implant function.

Methods: a total of 80 patients receiving 80 implants [39 with a laser-microtextured collar surface (LMS) and 41 with a machined one (MS)] were included. Clinical and radiographic documentation at implant placement (T0), at restoration delivery (TR) at 6 months (T1), at 2- (T2) and at 5-years (T5) post-loading were collected. MBL levels/rates (MBLr) and peri-implant sulcular fluid levels/rates of MMP-8 were assessed at TR, T1, T2, and T5. Implants were divided into two groups: group 1 with peri-implantitis (P+) and group 2 without peri-implantitis (P-). A multi-level simple binary logistic regression, using generalized estimation equations (GEE), was used to assess the association between each independent variable and P+. Receiver Operating Characteristics (ROC) curve was used to evaluate a cut-off point of T1 MBL degree and MMP-8 level to discriminate between P+ and P- implants.

Results: 24 implants (6 with LMS, and 18 with MS) were classified with P+. No statistically significant association was found between the amount of early bone remodeling, MBL progression, MBLr and incidence of P+. Implants with MMP-8 levels >15.3 ng/mL at T1 presented significant influence on the onset of P+.

Conclusions: high MMP-8 levels, 6 months after loading, could have the discriminant ability to predict P+.

CUSTOM-MADE TITANIUM SUBPERIOSTEAL IMPLANTS OF MAXILLARY JAW: A CASE REPORT

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Aim: subperiosteal implants were introduced around 1940 and indicated in patients with huge jaws atrophies to avoid invasive reconstructive surgeries. Due to the lack of precision and stability they were progressively abandoned. The introduction of digital technologies in implantology allowed the development of new custom-made subperiosteal implants. The aim of this study is to show the surgical protocol and the 2 years follow-up results of these new devices.

Methods: two custom-made subperiosteal implants were placed in a complete maxillary edentulous patient with a Cawood-Howell class III. The implants were designed on the 3D bone reconstruction with CBCT and the STL files obtained from a digital scanning, then produced with Selective Laser Melting technique. A guided ostheoplasty was realized and then the implants were fixed with ostheosintesis screws in the midfacial pillars (nasal, zygomatic and pterygoideus pillars). An immediate loading with a provisional prosthesis was made. The final prosthesis realized with composite on a titanium bar was delivered after 6 months.

Results: after 2 years follow-up the implants were clinically and radiographically stable. Radiographs did not show significant marginal bone loss; no clinical or prosthetic problems were detected, and the patient is fully satisfied with the treatment.

Conclusions: with the introduction of digital technologies in implant dentistry the new custom-made subperiosteal implants can be considered a valid treatment in huge bone atrophies as alternative to invasive reconstructive surgery or in case of their failure.

FULL-ARCH REHABILITATION WITH STACKABLE GUIDE-PRELIMINARY DATA ON ACCURACY

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Aim: this study aims to compare the accuracy of implants positioned through utilization of stackable guides to that of traditional teeth-supported guides in patients with terminal dentition who are candidates for implant-supported provisional immediate loaded full-arch prosthesis.
Methods: five patients with terminal dentition have been rehabilitated with provisional full-arch prosthesis. Both implants and prosthesis have been placed with the aid of a stackable guide. This device is positioned in the oral cavity onto the remaining teeth and fixed in placed with pins. After removal of the teeth-supported component and extraction of teeth it allows the guided placement of implants according to the pre-operative project. At this point the guide is used to fix the prosthesis to the implants according to the pre-operative tridimensional position. The accuracy has been verified by comparing the position of the implants obtained by scanning the scan-abutments positioned after surgery and their position in the surgical plan.
Results: 26 implants have been analysed in terms of coronal horizontal deviation, apical horizontal deviation, apical vertical deviation and angular deviation. The data were then compared to the literature.
Conclusions: preliminary data on accuracy suggests stackable guides are as accurate as standard surgical guides and are really useful for the adaptation of prefabricated provisional prosthesis with minimal occlusal corrections needed, according to other cases reported in literature.

EVALUATION OF HGFS ADHESION ON INNOVATIVE TITANIUM SURFACES: AN *IN VITRO* STUDY

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Aim: evaluate the vitality, cytotoxic response and collagen secretion released by primary Human Gingival Fibroblasts cultured onto 2 innovative Fuchsia colored titanium Grade 5 surfaces treated with ytterbium laser compared to machined.
Methods: after surgical tooth extraction HGFs were isolated from gingival tissue biopsies obtained from healthy donors and seeded on the seven titanium disks that have been chosen. MTT Assay, Lactate Dehydrogenase Cytotoxicity Assay and ELISA Immunoassay for the release of human collagen type 1 were performed. Fibroblast growth was evaluated by stereoscopic and electron microscopy.
Results: Fuchsia and Dark Fuchsia samples were selected for the study and MTT, LDH and Elisa Immunoassay were compared with Machined control surface. The MTT Assay (spectrophotometric reading at 540 nm) show a better response from the cells attached to the dark fuchsia disk (0,52) than Machined control surface (0,42). The Fuchsia and Dark Fuchsia samples show a statistically significant reduction in the release of LDH (spectrophotometric reading at 490 nm and 690 nm and normalized with MTT assay values) in the culture medium (0,926 and 1,008) compared to the Control sample (1,293). The cells attached to the Fuchsia surface are those that have released more collagen, creating more adhesion with the surface.
Conclusions: the *in vitro* results confirmed the innovative physical titanium improvements due to laser treatment and represent interesting perspectives in order to obtain esthetic in dental implants innovation and more predictable esthetic use.

MAGNETODYNAMIC IMPLANT SITE PREPARATION: PRIMARY STABILITY ANALYSIS OF TWO IMPLANT SHAPES

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Aim: our study aims to evaluate the primary implant stability (PS) of different implant shapes (*Five* Ø4.1x10 mm and *TiSmart* Ø4.0x10 mm; Leader Medica, Padua) performing traditional and magnetodynamic osteotomy in low-density bone. We analyzed peak of insertion torque (PIT), implant stability quotient (ISQ) and peak of removal torque (PRT).

Methods: four groups of 34 implant each were identified in accordance with the surgery and implant shape: T5 (*Five*), osteotomy using dedicated drills; M5 (*Five*), osteotomy using Magnetic Mallet (Osseotouch, Gallarate, Italy); TT (*TiSmart*), osteotomy with dedicated drills; and MT (*TiSmart*), magnetodynamic osteotomy. Each fixture was placed in porcine ribs scanned on CBCT with low bone density (750<HU). PIT and PRT were digitally recorded in Ncm with a torque gauge device. ISQ was recorded using Osstell IDX (Osstell, Sweden).

Results: mean of PIT were 25,04±4,4 T5, 30,62±3,81 M5, 30±3,74 TT and 32,05±3,55 MT. Mean of ISQ were 68,11±3,86 T5, 71,41±3,69 M5, 70,88±3,08 TT and 73±3,5 MT. Mean of PRT were 16,47±4,56 T5, 26,02±4,03 M5, 23,91±3,28 TT and 26,93±3,96 MT. Our data (t-test $\alpha = 0,05$) showed a significant difference in PIT between TT-T5 ($p < 0.0001$), M5-T5 ($p < 0.0001$), MT-TT ($p = 0.02$).

ISQ showed a significant difference between TT-T5 ($p = 0.001$), M5-T5 ($p < 0.001$), MT-TT ($p = 0.01$). PRT evidenced a significant difference between TT-T5, M5-T5 and MT-TT ($p < 0.0001$).

Conclusions: our findings showed good PS values for both implant shapes. In particular, magnetodynamic technique seems to achieve a better performance in terms of PS values in low-density bone.

GUIDED IMPLANT SURGERY, APPLICATIONS AND LIMITS

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Aim: computer aided implant surgery is a widespread and consolidated technique also accessible to the general dentist. Conventional freehand implant placement could be challenging by difficult interpretation and secondary transfer of 2D radiographic diagnostics into the 3D clinical situation plus a limited visualization of the operative field of interest. Digital aids are gradually entering the routine of all dental professionals.

However, computer-assisted workflows with 3D imaging and virtual simulations offer powerful instruments for treatment planning, further surgical placement and prosthetic rehabilitation with respect to both anatomic as well as restorative parameters.

The purpose of this work is to review the main indications for guided surgery, while providing which are the clinical advantages and disadvantages of computer guided implant placement compared to conventional treatment protocols.

Methods: narrative review on guided implant surgery was performed using PubMed Library. A series of cases was treated using static guided surgery. The cases were selected with the aim of filtering the most relevant indications.

Results: data on indications, advantages and disadvantages are summarized in the tables and the clinical cases are presented.

Conclusions: although guided surgery can simplify complex cases, it should still be considered a tool to be used, in the opinion of the authors, in selected cases. Moreover, it should be reserved for already experienced surgeons able to deal with the complications of implant surgery and the limits of the technique itself.

EVALUATION OF IMPLANTS WITH INCLINED NECK IN IMMEDIATE LOADING FULL-ARCH REHABILITATIONS

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Aim: co-axial implants with an inclined neck might overcome the problems of angulation of the implant axis. The aim of this research is to compare traditional and co-axial implants in immediate loading full-arch rehabilitations of the upper jaw.

Methods: 4 external hex tapered implants (Southern Implants) were placed in each patient: 2 traditional axial implants on which angled abutments were screwed, and 2 co-axial implants at 12° and 24° on the other hemi-arch on which straight conical abutments were screwed. The surgeons filled up a questionnaire to evaluate how the morphology of the coronal implant platform influenced the surgical and prosthetic phases. Peri-implant bone level was recorded radiographically at T0, and at 3, 6 and 12 months of healing and then annually. Plaque index, probing depth, and bleeding on probing were also evaluated. Implant survival rate was calculated, and biological or technical complications recorded.

Results: the preliminary data collected did not show significant differences in peri-implant tissues health between the two implant types. No implants failed and both implants proved to be favorable for full-arch rehabilitation using tilted implants. Co-axial implants facilitated the prosthetic procedures. However, a learning curve is required in order to optimize their insertion.

Conclusions: both implants proved to be reliable and suitable for achieving clinical success in full-arch immediate loading rehabilitations but further research with longer follow-up and larger sample size is needed to confirm these preliminary outcomes.

CLINICAL OUTCOMES OF DENTAL IMPLANTS WITH TWO DIFFERENT INTERNAL CONNECTION CONFIGURATIONS

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Aim: the aim of the present study was to highlight clinical and radiographical differences among implants sharing the same macro-geometry but with two different prosthodontic connections.

Methods: patients requiring at least 2 implants in the posterior area of the jaw were randomly divided into two groups (Conical (CS) and Internal Hexagonal (IH) connection). At implant surgery (T0), insertion torque, implant stability quotient (ISQ values recorded by resonance frequency analysis, RFA), and soft tissue thickness (STH) were assessed. A 1-abutment/1-time protocol was applied, and the prosthesis was realized following a fully digital workflow. At the 36-month follow-up periapical x-rays were taken. In order to statistically analyze differences among the two groups and the different variables, paired T-test was used. Linear regression analysis was conducted to analyze how marginal bone loss (MBL) was affected by other independent variables. A neural network created to predict the success (good or not good) of the implant itself was implemented.

Results: 30 out of 33 patients (14 males, 16 females, mean age: 68.94±13.01 years) (32 CS and 32 IH) were analyzed. No implants failed. Marginal bone loss at the 3-year time-point was 0.33±0.34 mm and 0.43±0.37 mm respectively for CS and IH with a significant difference between the two groups ($p = 0.004$). The presence of keratinized gingiva ($p = 0.034$) significantly influenced MBL.

Conclusions: both the implant connections investigated presented optimal clinical outcomes with minimal marginal bone loss; however, CS implants and implants with the presence of a greater width of keratinized tissue presented significantly lower MBL.

COMPARISON OF HGFS ADHESION ONTO 2 LASER AND MACHINED TITANIUM SURFACES: AN *IN VITRO* STUDY

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Aim: evaluate the vitality, cytotoxic response and collagen secretion released by primary Human Gingival Fibroblasts cultured onto 2 different Gold titanium Grade 5 surfaces treated with ytterbium laser compared to Machined.

Methods: after surgical tooth extraction HGFs from gingival tissue biopsies were isolated from healthy donors and coltured onto Gold, Deep Gold and Machined titanium disks. MTT Assay, Lactate Dehydrogenase Cytotoxicity Assay and ELISA Immunoassay for the release of human collagen type 1 were performed. The fibroblast growth was evaluated by stereoscopic and electron microscopy.

Results: the MTT Assay show a better response from the cells attached to the yellow and dark yellow disks compared to Machined and showed a statistically significant reduction in LDH release in the culture medium compared to the Control. The Deep Gold samples showed a several cells adhesion and higher value of collagen release compared to Gold and Machined samples.

Conclusions: the *in vitro* results confirmed innovative physical titanium improvements due to laser treatment and represent interesting perspectives in order to obtain esthetic clinical enhancement in dental implant rehabilitations and predictable success in maxillary esthetic sites.

INNOVATIVE BONE QUALITY INDEX (BQI) IN THE BONE EVALUATION DURING OSSEOINTEGRATION

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Aim: bone quality and the dental implants osseointegration in animal sheep model evaluation after 15-30-90-days.

Methods: in twelve implants were evaluated three chambers: chamber 1 (head of the implant) chamber 3 (implant body) and chamber 5 (implant apex) in which 4 zones were identified: A (the implant-bone interface), B (centre of the chamber) C (surgical thread) D (native bone, used as control). Twenty microanalyses SEM-EDX were performed for each chamber to evaluate bone quality index (BQI). The BQI was calculated as the percentage of Ca and P ions in relation to the control zone at specific sites in the chamber.

Results: at 15 and 30 days SEM-EDX analysis showed a BQI about 25% in zone A, slightly above 50% in zone B (except for P) and around 70% in zone C.
At 90 days zone A had a BQI always around 25%, while zones B and C had a BQI approximately 70% and 90% respectively.

Conclusions: the bone quality maturation showed higher values "at distance" (growth of native bone to the implant surface, observed later in the osseointegration process). After 3 months BQI = 25% in zone A, confirming that the healing and maturation process of the bone is not complete.

TREATMENT OF SEVERE ATROPHIC EDENTULOUS SITE USING GUIDED BONE REGENERATION CUSTOM MADE

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Aim: GBR is one of the most used techniques for bone regeneration. The constant evolution of CAD-CAM system enables to adapt custom made membranes closely to alveolar ridge of single patient. The aim of this study is to show the process we use to manage severe bone defect by using GBR custom made.
Methods: the protocol has been used on 8 patients (6F, 2M) enrolled in Oral and Maxillofacial sciences Department of Policlinico "Umberto I", Rome. Custom made GBR planning includes the study of plaster models, diagnostic wax-up and provisional prosthesis functionalization. The pre-prosthetic project is necessary to define atrophic site missing bone and implants placement in CT evaluation. CAD software allows to decide mesh main features such as: mesh thickness, size and position of pores, membrane extension.
Results: first surgical phase involves the membrane placement with homologous and heterologous bone. Then resorbable membrane is placed to cover the mesh. Second surgical phase involves mesh removal and implants placement. Depending on primary stability, third surgical phase consists of implants uncovering. Each patient was rehabilitated with fixed prosthesis.
Conclusions: despite severe bone defects, it's possible to rehabilitate patients by following a defined protocol. According to literature, custom made GBR allows to achieve successful results, thanks to many advantages: easy manipulation of mesh without the need for modelling or trimming; the surgical time reduction; regeneration major predictability; low risk of dehiscence and mucosal irritation thanks to rounded mesh angles.

BIOMECHANICAL EFFECTS OF MANDIBULAR FLEXURE ON IMPLANT-SUPPORTED FULL-ARCH REHABILITATIONS

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Aim: mandibular flexure is the deformation of the inferior jaw under stress occurring during the contraction of masticatory muscles and it's a crucial component that might affect the prognosis and outcome of several dental and implant therapies. The aim of this review is to evaluate its effects in different fixed implant-supported full-arch restorations.
Materials: an electronic search was conducted through databases: PubMed, Europe PMC, ResearchGate, and Google Scholar. The research was carried out by using the following keywords: "mandibular deformation" and "mandibular flexure". Randomized and controlled clinical trials and prospective and retrospective case series were included.
Results: 12 articles were selected. The bone tension caused by the mandibular flexion has higher values in the cervical area of distal implants of full-arch rehabilitations, especially in the molar region. There are two schools of thought about the stress connected to frameworks: for certain authors, the division of the superstructure at the level of the symphysis is recommended to reduce the greatest stress that occurs in this area of the framework; other studies show that one-piece implant-supported superstructure lessens the stress on the peri-implant bone that happens when using separate frameworks.
Conclusions: the biomechanical effects of mandibular flexure on fixed implant-supported full-arch restorations are debated. Prospective clinical and radiological observational studies should be carried out to assess the potential short-, medium-, and long-term consequences of mandibular flexure.

PRIMARY IMPLANT STABILITY EVALUATION BETWEEN PLATFORM LEVEL AND DIFFERENT ABUTMENT HEIGHTS

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Aim: our study aims to compare the primary implant stability quotient (ISQ) variation among implant platform, 1.75 mm high prosthetic abutment and 2.5 mm high prosthetic abutment performing resonance frequency analysis by Osstell IDX (Integration Diagnostic AB, Göteborg, Sweden).

Methods: 45 implants (Nobel Parallel TiUltra, Nobel Biocare AB, Gothenburg, Sweden) Ø 4.3 x 10 mm long were placed into fresh bovine ribs. After implant placement, ISQ was recorded on/AT the implant platform (Group 1) and subsequently a prosthetic abutment with a height of 1.75 mm (Group 2) (On1 Base Xeal CC, Nobel Biocare AB, Gothenburg, Sweden) was screwed into the fixture. ISQ was recorded for Group 2 and the same procedure was performed for a 2.5 mm prosthetic abutment (Group 3). Each ISQ measurement was performed by the same operator, twice and in triplicate. The highest ISQ value was taken as the reference for the statistical analysis.

Results: the mean average ISQ values recorded in G1 were 75.9 (+/- 1,65). The mean values of ISQ of G2 were 67.7 (+/- 2,21); and for G3 were 66,9 (+/- 2,01), showing a significant difference (a = 0,05) between G1 and G2 and between G1 and G3.

Conclusions: the measurements obtained from resonance frequency analysis were notably affected by the height of the abutment.

When the transmucosal abutment height was increased, the implant stability quotient value decreased. In clinical settings, it is recommended that the ISQ values obtained from the abutment should not be compared to those obtained from the implant platform.

COMPARISON OF FRAMEWORKS OBTAINED FROM DIGITAL AND CONVENTIONAL IMPRESSION: CLINICAL STUDY

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Aim: the aim of the present study was to investigate the accuracy of a new digital impression system, comparing it to the plaster impression technique in the realization of full-arch implant-supported metal frameworks.

Methods: we took 11 scans (8 of the upper maxilla and 3 of the lower jaw) on a sample of nine patients previously rehabilitated with fixed full-arch screw-retained prostheses following the Columbus Bridge Protocol (CBP) with four to six implants (total: 51) since at least 4 months. Two impressions were taken for each dental arch: one analogic plaster impression using pick-up copings and an open tray technique and a second one using an intra-oral scanner. Two milled metal substructures were realised. The precision and passivity of the substructures were clinically analysed through the Sheffield test and endo-oral radiographs.

Laboratory scans of the plaster casts obtained from an intra-oral scanner (IOS) and of the plaster casts obtained from traditional impression were compared with the intraoral scans following Hausdorff's method and an industrial digital method of optical detection to measure discrepancies. A Mann-Whitney test was performed in order to investigate average distances between surfaces after the superposition.

Results: the Sheffield test demonstrated an excellent passivity of the frameworks obtained through both the digital and the analogic method. In 81.81% of cases (n = 9) both substructures were found to have a perfect fit with excellent passivity, while in 18.18% (n = 2) of cases the substructures were found to have a very slight discrepancy. From the radiographic examination, no gaps between the frameworks and the implant heads or multiunit abutments were observed, with 100% accuracy. By superimposing digital files of scans according to Hausdorff's method, a statistically significant discrepancy (p = 0.006) was found between the digital scans and the digital models obtained from plaster impressions. Three-dimensional optical detection found a mean discrepancy of 0.11 mm between the analogic cast and the cast derived from the digital impression.

Conclusions: the present study clinically demonstrates that milled implant-supported full-arch frameworks obtained through a digital scan and the herein described technique have an accuracy comparable to those obtained with traditional plaster impression.

TRANSMUCOSAL HEIGHT *VS* IMPLANT CONNECTION: A COMPARATIVE CLINICAL STUDY

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Aim: the aim of this study is to compare representative parameters of peri-implant soft tissue remodeling in relation to four different implant connections, looking for a significant correlation between different components and the clinical results obtained regarding tissue height.

Methods: a database containing information on peri-implant tissues remodeling was created for a total of 297 implants, with four different implant connections of different manufacturers, each associated with a Connection Code. For the analysis of soft-tissue remodeling, arch models were scanned and matched to their analogue with 3D-imaging software GeoMagic at 3 sequential times (post-surgery, provisional and definitive crown delivery), and finally, measurements of the height of the soft tissues in the buccal side were obtained with 3D-imaging software GOM. The data obtained were tabulated and the statistical investigation was conducted.

Results: the vestibular height value resulted significantly correlated with the type of connection used ($p < 0.001$ in Kruskal Wallis test). In particular, different values were observed among the connections studied, with averages data ranging 2.2-3.8 mm. Some connections solutions appeared to be more performing in terms of the potentially achievable height in soft tissue healing.

Conclusions: the results obtained demonstrated various performances of potential development and maturation of peri-implant soft tissue in a vertical direction during the healing phase. The importance of these results lies in the primary role that soft tissue plays in the aesthetic relevance of the treatment.

PERI-IMPLANT SOFT TISSUE RESPONSE TO DIFFERENT ABUTMENT MATERIALS. A MOLECULAR HUMAN STUDY

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Aim: to evaluate the response of human peri-implant soft tissue on different healing abutment materials 24 hours after positioning, by assessment the expression of genes related to the connective tissue wound healing response.

Methods: experimental abutments of 4 different materials (A: grade 4 titanium, B: grade 5 titanium, C: zirconia and D: PEEK) were mounted on installed implants in 5 patients, four different abutments each (n = 20). Before implant placement, a gingival biopsy (control-CT) was obtained using a 2 mm diameter punch. After 24 hours, peri-implant gingival biopsies were collected using a specifically designed circular custom-made cutting device. Real time polymerase chain reaction was performed to analyze the expression of the following genes: COL-I, COL-III, MMP-1, TIMP-1 (collagen turnover); TGF-b1, FN, ITGA4, ITGA5, ITGB1 (ECM remodeling); RAC-1, COL-IV, aSMA (fibrosis-related mechanisms) and IL-6, CXCL-1 (inflammatory response).

Results: gene expression analysis showed some differences between CT and abutment of different materials. COL-I was significant down-regulated in groups A and C compared to CT. MMP-1 and TIMP-1 increased in all the experimental groups, although at a lower extent in group A. FN, RAC-1, COL-IV, aSMA were down-regulated, especially in group A, in which IL-6 and CXC-1 showed the lower expression.

Conclusions: the results of grade 4 titanium and also zirconia abutments seem to be promising, since a lower expression of genes related with inflammation, myofibroblasts activation and ECM remodeling was observed when compared with grade 5 titanium and PEEK, without triggering a pro-fibrotic response in the early phases of gingival repair.

COMPUTER-GUIDED *VS* FREEHAND PLACEMENT OF IMMEDIATELY LOADED DENTAL IMPLANTS: 10-YEAR RCT

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Aim: to evaluate the 10-year clinical and radiographic outcomes of partially or fully edentulous patients that received implants placed with or without surgical template, after virtual implant planning.

Methods: patients requiring at least two implants to be restored with a single prosthesis, having at least 7 mm of bone height and 4 mm in bone width were consecutively enrolled. Patients were randomised according to a parallel group study design into two groups, basing on the use of not of a dedicate surgical template. Implants were immediately loaded. Outcome measures were: implant and prosthesis failures, any complications, marginal bone levels, number of treatment sessions, duration of treatment, post-surgical pain and swelling, consumption of pain killers, surgical and prosthetic time, time required to solve complications, and patient satisfaction.

Results: fourteen patients with 50 implants were analyzed (7 patients with 27 implants in the template-guided group and 7 patients with 23 implants in the conventional group). At the 10-year follow-up examination, no prostheses failed in both groups. Three implants failed in the free-hand group (13.04%) vs none in the computer-guided group (P = 0.1576). Although there was not statistically significance, a RR of 8.16 was found for the free-hand group. Eleven patients (5 in the free-hand group and 6 in the template-guided group) experienced 12 minor complications (5 in the freehand group and 7 in the computer-guided group), that were successfully solved chairside. Difference between groups for was not statistically significant (P = 0.6504). Ten years after loading, the mean marginal bone loss was 1.01 mm±0.51 (95% CI: 0.64 to 1.39 mm) in the computer-guided group and 1.54 mm±0.36 (95% CI: 1.28 to 1.81 mm) in the freehand group. The difference was statistically significant (difference 0.53 mm±0.49; 95% CI: 0.16 to 0.89; P = 0.0451).

Conclusions: both approaches achieved successful results over the 10-year follow-up period. Statistically higher postoperative pain and swelling were experienced at sites treated freehand. Less marginal bone loss (0.5 mm) was observed in the computer-guided group.

TRANSCRESTAL *VS* LATERAL SINUS LIFT AT SITES WITH 3-6 MM OF BONE: 6-YEAR RESULTS OF A RCT

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Aim: to comparatively evaluate the 6-year outcomes of transcrestal and lateral sinus floor elevation (tSFE and lSFE, respectively).

Methods: the *per-protocol* population of a randomized trial comparing implant placement with simultaneous tSFE *vs* lSFE was invited to participate in the 6-year follow-up visit. Study assessments included: peri-implant marginal bone level at the mesial (mMBL) and distal (dMBL) aspects of the implant; proportion of the entire implant surface in direct contact with the radiopaque area (totCON%); probing depth; bleeding on probing. Peri-implant tissue conditions were classified according to the 2017 case definitions from the 2017 World Workshop.

Results: twenty-one patients treated with tSFE and 22 treated with lSFE participated in the 6-year visit. Implant survival was 100%. At 6 years, median totCON% was 96% in tSFE group and 100% in lSFE group (p = 0.036). No significant inter-group difference in patient distribution according to diagnosis was observed. Median dMBL was 0.3 mm and 0 mm in tSFE and lSFE group, respectively (p = 0.024).

Conclusions: at 6 years, implants placed concomitantly with tSFE and lSFE showed similar conditions of peri-implant health/disease. On average, peri-implant bone support was high in both groups but was significantly lower in tSFE group due to a higher peri-implant marginal bone loss at the distal aspect.

RESIN-BASED CAD-CAM IMPLANT-SUPPORTED CROWNS: STRESS AND STRAIN ANALYSIS. A 3D-FEA STUDY

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Aim: this study intended to calculate the influence of block resin-based CAD-CAM implant-supported materials on posterior crown restoration stress and strain concentrations.
Methods: a 3D implant model already use in past investigations was edited to receive a cement-retained posterior crown manufactured with different CAD/CAM resin-based materials (Estelite P Block and Estelite Block II). Each solid model was transferred to the computer-aided engineering software and submitted to the finite element analysis of stress and strain. Material properties were assigned to each solid with isotropic and homogeneous behavior according to the manufacturer information. A vertical load of 600 N was applied in the occlusal region of the crown, via a simulated food bolus, and stress was calculated in Von Misses (σVM) for the implant, abutment and screw, Maximum (σMAX) Principal Stresses for the crown and microstrain for the bone.
Results: all simulated materials showed acceptable stresses levels with a similar stress pattern among the models. At the crown intaglio region and cement layer, however, differences were observed: Estelite P Block showed a lower tensile and shear stresses magnitude when compared to the other resin-based materials with lower elastic modulus.
Conclusions: the stress effect of different resin-based CAD-CAM implant-supported crowns is predominant in the crown and cement layer, with Estelite P Block showing 7.4% versus 9.3% for Estelite Block II of crown failure risk.

CASE REPORT: POST EXTRACTIVE IMPLANTS IN THE AESTHETIC AREA

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Aim: the aim of this study is to describe the aesthetic and functional value of post extractive implants, with flapless technique, non-immediate loading and two- step immediate provisionalization in the maxillary central incisors.
Methods: a 46 years old, no smoker, healthy (ASA I) man presents a grade 3 mobility of the maxillary central incisors, 1.1 and 2.1. The decision is to remove both teeth atraumatically and to position two implants immediately after, with the use of piezosurgery and flapless technique, to reduce the prosthetics time and to improve patient's compliance. The gap between the fixtures and the bone is filled with bovine bone biomaterial. The provisionalization is obtained from the use of a dental mask to not interfere with the osteointegration process by charging fixtures with load. After 4 months, two screw-retained temporary resin crowns are connected to the fixtures for the soft tissue conditioning for 3 months. Later, definitive ceramic crowns are screwed.
Results: images at the baseline and after time shows an aesthetically satisfying result. Clinical and radiographic follow up after 3 years shows no bone loss and good parodontal and implant maintenance.
Conclusions: the use of postextractive implants in aesthetic area represent an optimal alternative to the classic differite method, with excellent results and a high aesthetic value, if the bone is maintained, to reduce the prosthetic and loading process time.

CLINICAL OUTCOMES AFTER IMPLANT SURGERY WITH DYNAMIC NAVIGATION SYSTEM: CASE SERIES

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Aim: X-guide (Nobel Biocare®) is a dynamically assisted guided surgery system, which allows surgeon to guide the insertion of the fixture, having real-time references about the position and depth of drills and fixture, in the three planes of space, during surgery. Compared to traditional free-hand technique, dynamic surgery allows greater accuracy in positioning the fixture in respect of the anatomy, for prosthetic and therefore aesthetic purposes. The great advantage of dynamic surgery, in addition to offer a flapless approach, is the possibility of making real time intraoperative changes; it still requires a learning curve for the clinician but can offer advantages to not experienced operators.

Methods: 6 single implants were placed in 4 patients with intercalated edentulism; the implants were all placed through X-guide system. The patients underwent a CT scan with an occlusal jig, then implant planning was obtained with DTX Studio™ software. The surgical phase was carried out with X-guide handpiece, by the same skilled surgeon; then patients followed-up clinically and radiographically, at 1 week and 3 months, when the prosthetic phase began.

Results: all cases showed complete healing without postoperative complications, only one patient reported slight oedema and mild postoperative pain. All the implants were prosthetically finalized, showing optimal occlusal and aesthetic adaptation.

Conclusions: dynamic guided surgery seems to be a real alternative to the traditional surgical guide, with possible use in difficult cases. A formed surgeon can take full advantages, minimizing postoperative complications and guaranteeing prosthetic success for the patient.

EVALUATION OF SURGICAL TECHNIQUES FOR CRESTAL SINUS LIFT

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Aim: the aim of this study is to review and evaluate the available techniques for sinus lift procedures in posterior edentulous maxillae, with a focus on the crestal approach.

Methods: the authors conducted a literature search of randomized controlled studies on sinus lift techniques and materials for implant rehabilitation with clinical follow-up. The review included 10 articles that represented the evolution of sinus lift techniques.

These include the crestal approach, the Sincrest technique and the more recent Iraise system.

Results: the literature showed that the crestal approach is less invasive, reduces postoperative edema, and preserves autologous bone and the Schneiderian membrane than the classic lateral approach, which is considered the gold standard. The Sincrest and the Iraise system have shown improvements in success rates and reduced morbidity.

Conclusions: overall, the crestal approach appears to be a valid option with a lower rate of perforation and morbidity compared to the lateral approach, although further studies are needed to confirm the efficacy of the newer techniques.

USE OF BIOMATERIALS IN POST-EXTRACTIVE IMPLANTS: A CASE REPORT

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Aim: the aim of this case report was to provide further scientific evidence on the efficacy and methods of application of post-extractive implants and biomaterials.

Methods: in this case report an implant, from Megagen implant house, with a diameter of 4.5 mm and a length of 8.5 was performed after the extraction of the fractured tooth (46). After the curettage of post-extraction socket, it was used a biomaterial called THE Graft™ produced by Purgo Biomaterials.

The site was closed with a 4/0 monofilament suture. At the end of procedure, according to the protocol, the patient was given some information such as avoiding chewing in the area of implant fixture and following home oral hygiene instructions in order to promote optimal tissue healing. Antibiotic therapy was prescribed for 6 days while stereoidal anti-inflammatory drugs were not prescribed.

Sutures were removed after 8 days, and the patient was visited every 10 days.

Results: one and a half months after surgery, it could be observed a correct position of the implant, the absence of infection and damaging micromotions, and an optimal healing of peri-implant tissues.

Conclusions: this case report analyzes the possibility of using post-extractive implants as an effective and reliable alternative to traditional implantology.

USE OF STACKABLE SURGICAL GUIDES IN FULL ARCH COMPUTER-GUIDED IMPLANT SURGERY

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Aim: this prospective cohort study aims to present titanium-reinforced stackable surgical guides for full-arch rehabilitations, that were designed with the aim of improving accuracy, simplifying and reducing errors both in guided surgical and prosthetic procedures.

Methods: in this study, 10 full-arch rehabilitations were performed. The ideal position of the implants was virtually planned into the 3D-guided surgery planning software by using a digital wax-up. The stackable templates used are composed of a fixed component, base template, and a removable component. The fixed component once secured with bone housing pins is no longer removed. The removable components include in this order, a tooth or mucosal supported template, an implant placement template, and the provisional prosthesis.

The interim prosthesis was fixed to the base template with screws and connected to the abutments with a self-polymerizing composite resin.

Results: in this study, no surgical complications occurred. 3 late prosthetic complications were recorded, consisting of 2 unscrewings of the provisional prosthesis and 1 fracture of PMMA overstructure. The implant survival and success rates were 100% in a minimum follow-up period of 6 months.

Conclusions: in the cases included in the protocol, when the provisional prosthesis was connected to the base template, no modifications of the abutments and of the titanium framework of the provisional prosthesis were required. A good level of accuracy of implant placement compared with the digital design is then demonstrated.

ADJUNCTIVE METHODS FOR THE NON-SURGICAL TREATMENT OF PERI-IMPLANTITIS: A META-ANALYSIS

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Aim: the aim of this systematic review (SR) was to evaluate the clinical efficacy of different adjunctive methods/therapies to the non-surgical treatment (NST) of peri-implantitis.

Materials and methods: the protocol of the review was registered in PROSPERO database (CRD42022339709) and was designed according to PRISMA statement. Electronic and hand searches were performed to identify RCTs comparing non-surgical treatment of peri-implantitis alone versus NST plus anyadjunctive method/treatment. The primary outcome was probing pocket depth (PPD) reduction.

Results: fifteen RCTs were included. Only 2 out of 1075 implants were lost and follow-up ranged from 3 to 12 months. PPD reduction across the studies varied from 0.17 to 3.1mm, while defect resolution from 5.3% to 57.1%. Systemic antimicrobials were associated to higher PPD reduction (1.56 mm; [95% CI 0.24 to 2.89]; p = 0.02) with high heterogeneity, and treatment success (OR = 3.23; [95% CI 1.17 to 8.94]; p = 0.02), compared to NST alone. No differences were found with adjunctive local antimicrobials and lasers for PPD and bleeding on probing (BoP) reduction.

Conclusions: non-surgical treatment with or without adjunctive methods may reduce PPD and BoP even if complete resolution of the pocket is unpredictable.

Among possible adjunctive methods, only systemic antibiotics seems to provide further benefits, but its usage should be considered with caution.

INTER AND INTRA-EXAMINER AGREEMENT OF BONE QUALITY ASSESSMENT AMONG EXPERIENCED CLINICIANS

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Aim: this study analyzed inter- and intra-examiner agreement in bone quality assessment performed on CBCT cross-sectional images by experts in oral implantology, including private practitioners (PP) and university teachers (UT) from different areas of Italy.

Methods: twenty-six experienced clinicians (13 PP; 13 UT) assessed bone quality of 45 CBCT cross-sectional images according to Lekholm & Zarb (L&Z) and Vercellotti & Vercellotti (V&V) classifications (T0). The same images, put in a different order, were re-evaluated by the same clinicians after 4 weeks (T1). Intra- and inter-examiner agreement analysis was performed using Cohen's kappa coefficient (CK) and Fleiss' kappa coefficient (FK), respectively.

Results: intra-examiner analysis showed weak agreement between T0 and T1 for both classifications [CK for L&Z: median 0.515, IQR 0.253 (total); 0.447 (PP); 0.516 (UT) - CK for V&V: median 0.530, IQR 0.213 (total); 0.556 (PP); 0.542 (UT)]. Inter-examiner analysis highlighted minimal agreement among examiners for both classifications at both time points [FK at T0 for L&Z: 0.273 (total); 0.274 (PP); 0.281 (UT) – FK at T0 for V&V: 0.319 (total); 0.342 (PP); 0.293 (UT); FK at T1 for L&Z: 0.243 (total); 0.217 (PP); 0.256 (UT) – FK at T1 for V&V: 0.370 (total); 0.364 (PP); 0.370 (UT)].

Conclusions: the need for an objective method to assess bone quality is emerging, as subjective evaluation based on the current classifications appears not reliable and repeatable.

TISSUE-LEVEL IMPLANTS WITH OR WITHOUT ABUTMENT IN FULL-ARCH: AN OBSERVATIONAL STUDY

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Aim: many studies highlight the possible bacterial contamination of the interfaces implant-abutment and abutment-prothesis. Hence, they are indicated as potential risk factor for peri-implant complication. Recently introduced are tissue-level implants with convergent collars. This study investigates the clinical outcomes of full-arch rehabilitations using tissue-level implants with or without abutments.

Methods: 20 patients with terminal dentition were enrolled. Their treatment was a full-arch rehabilitation following the Columbus Bridge Protocol. Each patient had four implants inserted: two anterior, straight and connected to the prosthesis; two distal, tilted and connected to angulated abutments. Parameters evaluated were implant survival rate, marginal bone loss (MBL), plaque index, bleeding on probing, probing depth. Correlations between MBL and the presence or absence of the abutment were assessed.

Results: 80 implants were inserted: 40 tilted distal with abutment; 40 straight anterior connected directly to the prosthesis. After one year, the implant survival rate was 100%. The mean MBL with and without abutment was 1.20±0.32 mm and 1.16±0.28 mm. No statistically significant difference ($p < 0,05$) was found.

Conclusions: within the limitations of this study, immediate loading full-arch rehabilitations using tissue-level implants with convergent collars proved to be a viable treatment option, with and without abutments. Further research with longer follow-up is needed to confirm results.

HYBRID ZYGOMA TECHNIQUE AND USE OF A HETEROLOGOUS CORTICAL MEMBRANE: A CLINICAL STUDY

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Aim: a clinical study of 5 patients with extreme upper jaw atrophy was conducted to investigate whether the use of a heterologous cortical membrane could stabilize the soft tissues around the zygomatic implants and whether there could be a reconstruction of the previously instrumented maxillary wall for zygomatic implant placement.

Methods: in the cases treated, one zygomatic implant was inserted on each side. in the anterior sector instead two or three traditional implants have been inserted as force breakers. In one of the two zygomatic implants, an equine cortial membrane was inserted to achieve regeneration of the lateral wall of the maxillary bone and limit the formation of bone dehiscence and decubitus of the soft tissues. The membrane was stabilized with titanium pins. In the other side, instead a collagen matrix was placed around the implant.

Results: after six months, another CBCT was performed to check for new bone tissue.

In one of those cases, the formation of a small band of bone was noted.

Clinical checks were also performed to verify the condition of the soft tissues. These controls showed good soft tissue health on both sides.

Conclusions: these results allow us to understand that in addition to the possible materials used, other important factors take over in soft tissue stability, such as the position of the zygomatic implant relative to the maxillary wall.

The clinical results of this study however show very encouraging results, that need more investigation with a larger number of cases and with different types of heterologous materials.

ZYGOMATIC IMPLANTS WITH THE NEW FLAT DESIGN: ONE YEAR FOLLOW-UP

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Aim: the purpose of this report is to show the one-year follow-up of three different clinical cases treated respectively with the quad zygoma technique, the hybrid zygoma technique, and a case of partial edentulism. In all cases was used a new implant design.

Methods: all three cases were treated with the new implant design that provides a flat vestibular surface at the smooth portion of the implant and a pre-angled head available with two different angles: 52,5° and 45°. Patients were checked periodically for soft tissue condition, OPTs were also performed to assess bone tissue condition.

Results: follow-up at one year showed good soft tissue health, which appeared pink, toned, and dehiscence-free around the zygomatic implants. The bone tissue also shows good health around the implants where there seems to be no resorption. The purpose of this new design is to stabilize the soft tissues and to avoid decubitus and recession of the alveolar mucosa in the genienal region. The absence of the abutment also limits the risk of unscrewing due to lateral loads, which allows the prosthesis to be screwed in with a higher torque. The absence of the microgap at the prosthetic connection promotes less peri-implant bone resorption.

Conclusions: zygomatic implantology has proven a dability over time, is an evolving technique, but unfortunately, clinical data are still scarce, so more RCT are needed to provide the best evidence-based clinical indications.

COMPARATION OF CHEMICAL COMPOSITION AND SURFACE ROUGHNESS BETWEEN DENTAL BONE DRILLS

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Aim: osseointegration is essential in dental implants success, but it can be affected by the heat created by bone drills that induces the formation of a necrotic layer which can compromise the dental implant therapy. The aim of this study was to analyze the chemical composition and the surface roughness of five different manufactured implant drills, in order to expect the potential heat released during surgical implant placement.

Methods: five implant drills of approximately 2.0 mm in diameter (Straumann, NobelBiocare, Xive implant System, Global D, Sweden & Martina) were used. Their microstructural and chemical features were analyzed with SEM and compared considering the external surface at the distance of 1 mm from the cutting edge after ultrasonic cleaning. Vickers microhardness was analyzed using a CV 2000 tester.

Results: the chemical composition of the drills was typical of martensitic stainless steel (MSS), while chromium, molybdenum, silicon and manganese represented minor ligands. The surfaces of the implant drills presented different roughness in relation to their producing process and coating.

Conclusions: different treatments were used to improve the hardness of drills external surface. Hot worked drills showed a higher hardness that could lead to a greater amount of heat. Machined drilles showed lower hardness, but their accurate shapes could also guarantee a lower heat release.

FIXED REHABILITATION OF AN EDENTULOUS ATROPHIC MANDIBLE: A MINIMALLY INVASIVE APPROACH

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Aim: to evaluate long-term reability of a complex case of a totally edentulous mandible treated with an implant-prosthetic rehabilitation through a minimally approach to avoiding the complications and morbidity associated with bone augmentation techniques.

Methods: an ASA1 71-year-old man was referred presenting a Class VI (Cawood & Howell, 1988) mandibular atrophy without adequate bone volume to place any implants in the posterior areas and with 4 mm of available vertical bone in the interforaminal zone and rehabilitated with a removable full denture. A minimally invasive rehabilitation consisting of 4 ultrashort 4 mm-long implants into the interforaminal region was planned and a 5-units provisional acrylic reinforced prosthesis was delivered after 24 hours.

Results: the patient was radiographically examined just after implant placement and 8 months later and clinically every week for the first month, every 2 weeks through the fourth month, and monthly until the eighth month. The final follow-up is at 1 years after immediate implant loading. Peri-implant marginal bone levels and the clinical prosthetic result stable at 1 years after loading.

Conclusions: within the limitations of this case report, 4 mm-long ultrashort implants placed in the interforaminal area used to immediately rehabilitate a fully edentulous class VI mandible could reduce operative times, costs, complications, and postsurgical morbidity compared to bone augmentation procedures and achieve a similar final esthetic result. However, RCTs with long follow-ups are needed to evaluate whether this could be a preferable option.

INTERNAL *VS* EXTERNAL CONNECTION IN IMMEDIATE LOADING FULL-ARCH REHABILITATION

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Aim: evaluate the hard and soft peri-implant tissues conditioning in relation to the different morphology of the implant-abutment connection.

Methods: the multi-center study included twenty patients requiring a fixed implant full-arch immediate load rehabilitation.
Four to six implants with identical macro- and micro-topography were inserted in each patient: external hexagon implants (EHC) in one side of the dental arch and internal hexagon implants (IHC) in the other side.
Primary outcome measures were the success rates of the implants and prostheses.
Secondary outcome measures were: peri-implant marginal bone loss (MBL), Plaque Index (PI), probing depth (PD) and bleeding on probing (BoP), evaluated at implant insertion and at 12, 36 and 48 months, post-loading.

Results: 43 EHC and 40 IHC implants were inserted in 20 patients. No patients dropped out. One IHC and one EHC failed in two different patients. The overall implant survival rate was of 97.7% for the EHC and of 97.5% for the IHC. The prostheses success rate was 100%; at the last follow-up (48 months), a mean MBL of 1.75±0.61 mm was recorded for the EHC, while a mean MBL of 1.93±0.60 mm was recorded for the IHC. The overall MBL was not significantly different between the two treatment groups (EHC *vs* IHC; $p > 0.05$). All the implants showed good periodontal health at the 4-year-in-function visit, with no statistically significant differences between groups.

Conclusions: according to the results, after 48 months in function, both implants provided good clinical outcomes, without statistically significant differences.

MULTI-CENTER EVALUATION OF ONE- AND TWO-STAGE TECHNIQUE USING EXTRA-SHORT IMPLANTS

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Aim: evaluate the differences in peri-implant tissues behavior using extra-short implants inserted with one-stage or two-stage technique. The secondary aim is to assess extra-short implants' survival rate 18 months.

Methods: 19 subjects were enrolled. They needed to receive two adjacent implants. Two adjacent distal implants (extrashort BTI) were inserted: one has been connected with a MUA and the other one has been submerged. After three months (T3) the second stage surgery was performed; then both of the implants were loaded with screw-retained splinted rehabilitation. Follow up and measurements were carried out up to T18. ISQ values were acquired using Ostell; peri-implant bone loss was evaluated on intraoral radiographs; peri-implant probing depth (PPD), plaque index (PD), bleeding on probing (BOP), mobility and pain were evaluated.

Results: 38 implants were inserted. The ISQ results showed a non-significant difference between one and two-stage group at T0 and also at T18. ISQ values increased in both the two groups after 18 months follow-up.
The bone loss at T18 had a mean of 0,45; the second-stage group had a mean of 0,47; the use of mixed generalized models showed a non-significant relationship with bone loss' increase. The study showed a non-significant difference for the plaque between the two techniques. There was no significant difference for the mean of probing depths. Implant survival rate after 18 months was 100%.

Conclusions: at 18 months, no statistically differences between the two groups have been shown. Extra-short implants' survival rate was 100%.

LITERATURE EVALUATION ABOUT CERAMIC IMPLANTS

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Aim: this work's aim is to analyze surface characteristics, advantages, disadvantages and clinical indications about ceramic fixture comparing with titanium ones.

Methods: zirconia implants are best choice for a metal-free rehabilitation, necessary in case of titanium allergy. The studies show a low bacterial adhesion on the surface of zirconia implants, which is a protective factor against the development of peri-implantitis. There are no significant differences in osteointegration and bone implant contact (BIC) between zirconia and titanium, except in the first few weeks, where the biomechanical capacity of zirconia is slightly inferior to titanium. The esthetic appeal of zirconia implants makes it easier to manage recessions and patients with thin phenotype. Currently, one-piece or two-piece zirconia implants are available, which can be used in various clinical situations. The introduction of the two-piece fixtures has allowed clinicians to choose submerged healing and consequently deferred loading, a necessary choice when it is not possible to use one-piece ones.

Results: the placement procedure for zirconia fixture is similar to titanium implants, which allows clinicians to integrate these new implants into treatment plans without learning new procedures.

Conclusions: zirconia implants are a valid alternative to the use of titanium. The literature now demonstrates how the survival and success rate of this fixture can allow them to be considered safe and to provide excellent results both aesthetically and functionally.

SINGLE IMPLANT PLACEMENT WITH COMPUTER-AIDED SURGERY: THE ADVANTAGES OF A MODERN PROTOCOL

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Aim: computer-aided implant surgery has become an important therapeutic tool in modern dentistry. The aim of the present case report is to emphasize the advantages of using a modern computer-aided implant surgery protocol for the rehabilitation of edentulous patients.

Methods: a 40 years old man with 1.4 edentulous was selected for an implant surgery. After the CBCT evaluation, a dedicated software was used to elaborate the surgical template and to plan the ideal implant position in depth, inclination and mesio-distal distance between natural teeth. The digital system also allowed the clinician to plan an individual permanent Zirconia/Aluminia abutment which immediately fits the soft tissues using the CAD/CAM technology. The surgery was performed choosing a flapless approach after a keratinized tissues and alveolar bone clinical evaluation. An immediate loading protocol was chosen for the case.

Results: the surgery was performed rapidly and free of obstacle. A good primary stability of the implant was achieved. The Zirconia/Alumina abutment well fitted to the soft tissues, and it guaranteed a good healing. The patient referred an acceptable postoperative pain and swelling.

Conclusions: the computer-guided "flapless" surgery for implant placement represents a very safe and predictable rehabilitation compared with conventional surgery. The present protocol ensures less invasiveness, accuracy of implant placement, less surgical discomfort and reduced time required for definitive rehabilitation, although an adequate learning curve is needed.

"TRABECULAR-METAL" ZIMMER IMPLANTS: A LITERATURE ANALYSIS

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Aim: this work aims to describe the main qualities and novelties introduced by "trabecular-metal" implants. The focus is on the mid-portion of the fixture, which is designed for external and internal bone growth.

Methods: trabecular-metal implants have some of the most typical characteristics of tapered screw-vent implant design, making them compatible with classic Zimmer instrument kits. The type of internal connection and coronal microgrooves are designed to preserve crestal bone. In a preliminary study on canine mandibular models published in 2017, internal bone growth was observed two weeks after implant placement.

Results: since studies on humans with these types of implants only began in 2010, long-term follow-up data are not yet available in the literature. However, the results suggest that trabecular-section healing may be able to achieve greater secondary stability in shorter times compared to conventional implant surfaces currently available on the market.

Conclusions: trabecular-metal implants offer several advantages in terms of bone incorporation and growth, which can lead to improved implant stability. However, additional clinical studies are necessary to confirm these benefits, particularly in patients with low bone density. Furthermore, the long-term success and survival rates and possible complications still require further analysis. Overall, trabecular-metal implants represent a promising innovation in dental implantology that requires further investigation and evaluation.

POST-EXTRACTIVE CORTICAL IMPLANTS: A CASE REPORT

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Aim: the purpose of this case report is to describe the surgical management of a post-extractive implant-prosthetic rehabilitation using post-extractive cortical implants.
Methods: a 47 years old patient presented at our clinic with a poor prognosis for a second upper molar. The dental element was extracted atraumatically. Subsequently, a post-extraction implant (SDI) was inserted, and the defect was filled with biomaterial. The implant was left in place and loaded after 3 months.
Results: post-extraction implants have allowed both treatment times and the number of interventions a patient must undergo to be reduced. The Cortical implants produced by Noris Medical consist of a conical internal helix that allows for self-perforation, self-tapping, and self-bone condensation. All of these properties allow the clinician to have greater control during insertion, thus achieving high primary stability.
These advantages allowed to reach a good primary stability and to avoid complications during the check-up performed one month after implant loading.
Conclusions: post-extraction implant therapy presents several advantages, such as a reduction in treatment times and the number of interventions. Additionally, this technique allows for greater conservatism towards hard and soft tissues. Both primary stability and bone density are of fundamental importance for implant survival, as they allow for immobilization of the implant, guaranteeing healing.

TWO PIECE ZIRCONIA IMPLANT NEW DESIGN WITH IMMEDIATE LOAD: A CASE REPORT

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Aim: this report's aim is to explain the clinical management of a rehabilitation with a particular two piece zirconia implant, built with a 3.3 mm deep 3C connection to cement a glass fiber customizable abutment.
Methods: male patient comes for an implant-prosthetic metal-free rehabilitation of the element 4.5. OPT, CBCT and oral 3D scan were done before the surgery. It was decided to place a 4.1x9 mm two piece zirconia implant (PATENT, ZIRCON MEDICAL MANAGEMENT AG, Altendorf, Switzerland). Surgery started with a crestal incision in the area and the detachment of a full-thickness flap. Specific drills used to prepare the implant sites and place the fixture with torque higher than 35 Ncm. An endobuccal x-ray and an oral 3D scan were done immediately after surgery. The abutment prepared by the odt laboratory cemented a week later permanently to the implant, while a temporary crown was cemented temporarly out of occlusion. After 7 weeks a new oral 3D scan was done and a week later the permanent crown is cemented.
Results: thanks to its design, the shape of margin of the implant helps oral hygiene, and it ensures long-term oral health. The endosseous part of the implant, threaded with rough surface, permits great primary stability and good osteointegration.
A 2.5 mm tall transgingival collar allows healing of the soft tissues.
Conclusions: zirconia implant permits excellent results in stability, aestetic and health of peri-implant tissues. The customizable abutment replicates traditional restorative procedures without the need for extensive components, simplifying the clinics day-to-day use.

BIOMARKERS FROM PICF AS PREDICTORS OF PERI-IMPLANT BONE LOSS: A SYSTEMATIC REVIEW

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Aim: the aim of the present systematic review is to summarize current knowledge regarding the analysis of biomarkers extracted from peri-implant crevicular fluid (PICF) as predictors of peri-implant bone loss (BL).

Methods: an electronic search was conducted on three databases, PubMed/Medline, Cochrane Library, and Google Scholar, to find clinical trials published until 1 December 2022 suitable to answer the following focused question: in patients with dental implants, are biomarkers harvested from PICF predictive of peri-implant BL? The initial search yielded a total of 158 entries. After a full-text review and application of the eligibility criteria, the final selection consisted of nine articles. The risk of bias in included studies was assessed using the Joanna Briggs Institute Critical Appraisal tools (JBI).

Results: according to the present systematic review, some inflammatory biomarkers harvested from PICF (collagenase-2, collagenase-3, ALP, EA, gelatinase b, NTx, procalcitonin, IL-1β, and several miRNAs) seem to be correlated with peri-implant BL and may assist in the early diagnosis of pathological BL, that characterizes peri-implantitis. MiRNA expression demonstrated a predictive potential of peri-implant BL that could be useful for host-targeted preventive and therapeutic purposes.

Conclusions: PICF sampling may represent a promising, noninvasive, and repeatable form of liquid biopsy in implant dentistry.

PERI-IMPLANT BONE LOSS IN FULL-ARCH REHABILITATION: A RETROSPECTIVE RADIOGRAPHIC ANALYSIS

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Aim: the aim of the study was to assess the existence of peri-implant bone loss of distal implants in implant-supported full-arch mandibular restorations through radiographic investigations (OPTs). A comparison between full-arch implant-supported rehabilitations performed in the intra-foraminal region and full-arch rehabilitations that include implant insertion distal to the mental foramen was done.

Methods: a retrospective observational analysis of 17950 OPTs from 2010 to 2020 was conducted. The presence of fixed implant-supported prostheses in a fully edentulous mandible was the inclusion criteria of the study. OPTs were divided into three groups according to the number (4, 6, 8 implants) and position of the implants (mesial or distal to the mental foramen).

Results: a total of 51 OPTs were included in the study, of which 19 showed peri-implant bone loss. In particular, 16 belonged to the 6-implant rehabilitation group and 3 to the 8-implant rehabilitation group; none of the 4-implant supported rehabilitations were affected by peri-implant bone loss. In all rehabilitations affected by peri-implant bone loss, the distal implant was the most involved, especially the implants in positions 36 and 46.

Conclusions: implants distal to the mental foramina are more susceptible than mesial implants to bone resorption in full-arch fixed implant-supported prostheses. This significant difference should be more investigated for the presence and synergy of biomechanical factors that could act predominantly in this area, such as mandibular flexure and occlusal loading.

CONVENTIONAL AND DIGITAL WORKFLOWS FOR FULL-ARCH IMMEDIATE LOADING REHABILITATIONS: A RANDOMIZED CLINICAL TRIAL

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Aim: digital impression provides several advantages in the clinical workflow in implant prosthodontics, however its use in full-arch rehabilitations, especially immediately after surgery, has still to be validated. The aim of this study is to compare the fit of immediate full-arch prostheses realized using conventional impressions or digital impression.

Methods: patients requiring a full-arch immediate loading rehabilitation were recruited and randomly divided in 3 groups: T1 (digital impression taken immediately after surgery), T2 (guided surgery and delivery of a prefabricated temporary bridge), C (conventional impression taken immediately after surgery). Immediate temporary prostheses were delivered within 24 hours. Rx were obtained at the time of prosthesis delivery and at the 2-year follow-up. The primary outcomes were cumulative survival rate and prosthesis fit, radiologically evaluated as the distance between the bar and the abutment. Secondary outcomes were marginal bone level (MBL) and patients' satisfaction evaluated with a questionnaire. Kaplan-Meier was used to evaluate implant survival. T-test and Mann–Whitney U test were used to compare medians of the 3 groups for patient satisfaction.

Results: 150 patients were treated from 2018 to 2020, 50 in each group. Seven implants failed during the observation period. The CSR was 99% for T1, 98% for T2 and 99.5% for C. A statistically significant difference in prosthesis fit was found among T1 and T2 vs. C, with worst outcomes in C.
A statistically significant difference was found in MBL between T1 and C.

Conclusions: the outcomes of the present randomized clinical trial suggest that digital impression is a viable alternative to traditional protocols for the realization of full-arch immediate loading prostheses.

SERS ANALYSIS OF SULCULAR FLUID IN THE SCREENING OF PERI-IMPLANT PATHOLOGIES

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Aim: this study aims to define a possible screening method for peri-implant pathologies through Surface-Enhanced Raman Scattering (SERS), based on the evaluation of specific molecules in the peri-implant sulcular fluid (PISF).

Methods: PISF was collected with sterile Periopaper® strips inserted in the peri-implant sulcus for 30 seconds. Strips were processed by the addition of colloidal solution of silver nanoparticles, centrifuged at 800 rpm for 10 minutes and then analyzed by SERS.

Results: 331 samples were collected and 54 were discarded due to plaque or blood contamination. 277 samples (111 patients; 45M/66F) were included in the final analysis (90 healthy, 95 mucositis and 92 peri-implantitis). Spectral analysis through the Principal Component Analysis (PCA) did not allow samples classification in the three classes, due to a large intra-class variability. Therefore, it was decided to combine, through a low-level data fusion, spectral variables with clinical data (PPD, IP and BOP), dividing the dataset using the Kennard-Stone algorithm. Excellent results were seen in classifying "healthy" samples, whilst the predictive value for "mucositis" and "peri-implantitis" was only discrete; furthermore, little specificity regarding the class "peri-implantitis" was shown.

Conclusions: SERS analysis of PISF seems not directly usable in the screening of peri-implant pathologies. Spectral variables associated with clinical data may be used to build a multiclass model with reliable results in revealing healthy condition, with a pretty high number of false positives for peri-implantitis.

ROUGH IMPLANTS: PHASE-CONTRAST MICROSCOPY AND HOME HYGIENE PROTOCOL IN PERI-IMPLANTITIS

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Aim: literature shows that the exposition to the oral cavity of rough surface implants leads to the propensity of peri-implantitis than roughness or minimally rough implants. The aim of this study was to examine two different kinds of rough implant surface and to estimate their tendency to peri- implantitis disease, with a follow-up of more than 10 years and a continuous microbiological control.

Methods: 500 implants with Ti-Unite surface and 1000 implants with Ossean surface, both inlaid in native bone or regenerated bone, were collected. All patients accepted the following maintenance protocol: sonic brush with vertical movement (Broxo), interdental brushes, and oral irrigators (Broxo) at least two times every day. We recorded incidence of peri-implantitis and other causes of implant failure. For all patients, we evaluated subgingival plaque samples by phase-contrast microscopy every 4 months for a period of more than 10-years.

Results: implants with Ti-Unite surface underwent peri-implantitis in eight implants (1.6% of the total amount of implants) and implants with Ossean surfaces underwent peri-implantitis in 15 implants (1.5% of the total amount of implants). The total percentage of implant lost was 4% for Ti- Unite surfaces and 3.6% for Ossean surfaces.

Conclusions: implants under strict control of plaque leads to low percentage of peri-implantitis even for rough surfaces dental implants. The use of phase-contrast microscopy could help in early detection of microbiological pathologic conditions with an increase of Gram-negative micro-organisms.

COMPARATIVE EVALUATION OF TWO CEMENTS ON SINGLE IMPLANT RESTORATION: A SPLIT MOUTH STUDY

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Aim: cement-retained implant restorations still represent a widely used prosthetic solution due to their simple execution, the possibility to correct implant axis according to dental axis, and an extremely satisfactory aesthetics. The use of original and custom abutments with varying inclinations and heights further expands the possibilities of using this solution.

Methods: the objective of this study is to determine whether resin-based cements are more aggressive towards peri-implant tissue than zinc-oxide cements. In the present split-mouth designed study, 18 patients (8 males and 10 females) were included and examined. The follow-up period after delivery of the cement-retained single crown is a maximum of 48 months, during which 36 implants were monitored. Clinical and radiographic tests were conducted with constant re-evaluation in case of prosthetic or biological problems that brought the patient back for a visit.

Results: the results for both cements were in line with the manufacturers' indications. No implant failed during the observational period, resulting in a 100% survival rate for all 36 implants.

Conclusions: the number of de-cementations for cement-retained crowns cemented with zinc-oxide non-eugenol cement was higher, but not statistically significant. In contrast, biological complications and marginal bone loss (MBL) were significantly higher in cement-retained crowns cemented with resinous cement.

SOCKET SHIELD TECHNIQUE IN POST-EXTRACTIVE IMPLANTS IN AESTHETIC REGION: A REVIEW

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Aim: the review's aim was to examine the current results of the socket shield technique (SST), focusing on its applications in the aesthetic area. The aim has been developed referring to the PICO question: P, Adult patients of any gender and ethnicity; I, Patients undergoing socket shield technique in post-extractive implants in the aesthetic region; C, post-extractive implants in the aesthetic region with or without any other regenerative technique; O, Gingival architecture, bone height and width, implant success or loss.

Methods: the Medline used for PubMed research was "Socket Shield technique" and "SST". The inclusion criteria for the articles' selection were: adult patients, post-extractive implants in aesthetic region, no restrictions regarding type of study, year of publication 2017-2023. Exclusion criteria were: no post-extractive implants, treatment of posterior region only. The team evaluated 123 abstracts of which 16 a corresponded to eligibility criteria. Therefore, they were fully read and then included.

Results: SST can offer numerous advantages for post-extractive implant placement. Unfortunately, the procedure is rather complex and requires greater surgical competence.

Conclusions: SST may represent a valid option for post-extractive implants in the aesthetic area, ensuring excellent results of implant survival rate and aesthetics. However, further long-term studies are required to evaluate the effectiveness and durability of the technique and to define its pro and cons.

TRANSCRESTAL MAXILLARY SINUS FLOOR ELEVATION WITH INJECTABLE XENOGENIC BONE IN GEL FORM

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Aim: the purpose of this retrospective study was to measure bone tissue augmentation by transcrestal sinus floor elevation with injectable xenogenic bone substitute in gel form with simultaneous implant placement. This procedure allows atraumatic elevation of the sinus floor and reduces the risk of Schneider's membrane perforation, one of the most common complications of the transcrestal approach procedure described by Summers.

Methods: patients need of unilateral sinus floor elevation, with a residual crestal height of 2 mm to 5 mm and requiring at least one implant-prosthetic rehabilitation in the posterior maxillary area were enrolled. Sinus elevation was measured postoperatively and 6 months later with a CBCT. Mean values were calculated for each measurement.

Results: a total of 52 patients participated in the study; 46 implants were placed simultaneously while 6 were placed after 4 months due to lack of primary stability.

All placed implants, with follow-up varying from 3 to 5 years after loading, successfully osseointegrated with a 100% survival rate.

The mean preoperative bone height was 4.2 mm, whereas after intervention, the mean value achieved was 10.1 mm with a mean value of new bone gain of 6.43 mm.

Conclusions: transcrestal sinus floor elevation with injectable xenogenic bone substitute in gel form showed complete osseointegration of all implants and significant gain in height of new bone through a minimally invasive procedure.

CLUSTERING OF RADIOMIC FEATURES FOR THE QUANTITATIVE CLASSIFICATION OF EDENTULOUS RIDGES

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Aim: the aims of the present study were: i) to extract radiomic features from cone beam computed tomography three-dimensional images of edentulous bone crests; ii) to group analyzed images with clustering methods in order to obtain a quantitative bone grading and compare it with Lekholm and Zarb classification.

Methods: CBCTs of 110 patients were analyzed. Three-dimensional regions of interest (ROI) were selected on 3D images at partially edentulous sites. ROIs were analyzed using LifeX software to extract radiomic features of the alveolar bone. Three different clustering methods were then applied to the extracted features: K-means, Hierarchical and Fuzzy C-means. Finally, the same areas were grouped by ten experienced clinicians according to Lekholm and Zarb classification.

Results: basing on radiomic features similarities, the clustering analysis revealed the presence of three distinct groups within the dataset. The three different clustering methods applied in the present analysis aggregated the three groups in the same manner. Hence, the relationship between radiomics clusters and Lekholm and Zarb bone classification was investigated. “Cluster 0” was mainly represented in upper jaw (87.5%), corresponding to bone types 3 and 4 according to LZ (75%); “Cluster 1” and “Cluster 2” had homogeneous distribution in the mandible and maxilla, corresponding to bone types 2 and 3 of LZ classification (70%).

Conclusions: based on the present findings, coupling radiomics with clustering methods seems to be a very promising approach for a quantitative classification of edentulous bone crests.

IMPLANT-PROSTHETIC REHABILITATION IN PATIENT WITH ECTODERMAL DYSPLASIA

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Aim: the Ectodermal Dysplasia (ED) is a group of an autosomal dominant or recessive nature which determines malformations of the structures deriving from the ectodermal layer. The most common type is hypohidrotic (1:100,000) while the anhidrotic form affects only a few hundred people worldwide.
In this paper we present a patient with rare case of severe maxillary atrophy with edentulism in both deciduous and permanent dentition, approached, during adolescence, with autologous bone graft unfortunately failed and currently retreaded with a zygomatic implant rehabilitation.

Methods: a 32 years-old male came to our observation with a condition of anodontia, bone atrophy and hyposcialia. Further pathological signs are alopecia, anhidrosis and nasal dryness. The patient was treated under general anesthesia due to invasiveness of the surgery and computer-guided surgery procedure was followed, using a stereolithographic model and surgical template.

Results: the surgery was performed in February 2023. Currently no complications have been reported despite the poor bone quality and the increased intraoperatory bleeding tendency.

Conclusions: various therapeutic alternatives are available for patients with ED. The current choice was based on the failure of the previous rehabilitation with autologous graft and the possibility of a new therapeutic approach with zygomatic implants.

FROM MULTIPLE TOOTH EXTRACTION TO PROSTHETIC-IMPLANT REHABILITATION: A CASE REPORT

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Aim: a multidisciplinary approach, from oral surgery procedures to an implant-supported prosthetic rehabilitation, is presented here.

Methods: a 61 years-old male patient was referred to the Oral Surgery Unit of the Umberto I Hospital of Rome. From the clinical and radiographic examination, impaction of 2.3 and 3.8, a 2.6 fixture beyond the sinus floor and an improper prosthetic restoration on 2.1, 2.4 and 2.5 were detected. The fixed bridge was removed with the extraction of teeth 2.1, 2.4 and 2.5 and, through a full thickness flap and ostectomy, the surgical extraction of both the impacted 2.3 and the fixture in the site 2.6 was carried out. Surgery was completed with the application of hemostatic material and sutures. The patient came back after 7 and 14 days to check the wound healing and remove the sutures. After 16 months, 3 fixtures were inserted in the place of the teeth 2.1, 2.4, 2.5. Second stage surgery was performed 4 months later, and a resin provisional prosthetic restoration was applied after the composite esthetic direct rehabilitation of the mesial side of the teeth 1.1, to give the symmetrical dimension to the central incisors and close the initial diastema. The definitive restoration was applied 2 years later due to the COVID-19 pandemic.

Results: clinical and radiographic post-operative examinations reveal a satisfying aesthetic result and a good integration of the fixtures.

Conclusions: the success of any multidisciplinary rehabilitation depends on the correct planning, timing and execution of the single operative phases.

SPLINTING DEVICE FOR DIGITAL IMPRESSIONS IN FULL-ARCH IMPLANT REHABILITATIONS

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Aim: the aim of the present *in vitro* study was to evaluate the influence of a novel auxiliary geometric device (AGD) on the accuracy of digital full-arch impressions made with 3 different IOSs.

Methods: an edentulous maxillary model with 4 internal connection implant replicas was used. Three different intraoral scanners (IOS) were used: iTero Element 5D (iT) (Align Technology, Tempe, AZ, USA), Trios 4 (Tr) (3Shape A/S Holmens Kanal 7 1060 Copenhagen Denmark) and Carestream 3700 (Cs) (Carestream Dental, Atlanta, USA). Twenty scans were made with each IOS, 10 with an AGD with a dedicated design in place and 10 without the AGD. A digital master model (MM) was created using an industrial structured light optical scanner (ATOS compact Scan 5M, GOM GmbH, Braunschweig, Germany), A surface comparison was performed, and deviation labels exported for each scan body in order to evaluate the 3D deviation. Statistical analysis was performed using linear regression methods.

Results: when evaluating tridimensional deviation without AGD, the use of different IOSs resulted to have an impact over measurements. The use of AGD using Cs scanner did not impact measurement. On the other hand, the use of AGD induced significant differences for Tr scanner on the y and z axes, and for It scanner on the z axis.

Conclusions: the use of AGD showed not to be effective *in vitro*, not influencing scanners performance. Further clinical *in vivo* investigations are needed when digital impression is more challenging (saliva, tissues, etc.).

CAD/CAM ABUTMENTS IN THE ESTHETIC ZONE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aim: computer aided design and computer aided manufacturing customized abutments are increasingly being used in every day clinical practice, especially in the aesthetic zone. The main aim of this systematic review and meta-analysis was to compare the soft tissue outcomes of prefabricated (stock) versus customized (CAD/CAM) abutments.

Methods: the present review was registered with PROSPERO and the protocol was developed according to PRISMA statement. Electronic search was performed on four databases (PubMed, Web of Science, Cochrane Central and Embase). Hand searching was performed on related journals up to February 2021.

Results: three Randomized Controlled clinical trials (RCTs) and three Controlled clinical trials (CCTs) (number of patients = 230; number of dental implants = 230) with a follow-up comprised between 12 and 36 months were included. RCTs were judged at unclear risk of bias whereas CCTs were judged at high risk of bias. The meta-analysis was performed on 12-month data. No statistically significant differences were observed among abutment groups: Overall Pink Esthetic Score (PES) (SMD -0.43; 95% CI -1.21, 0.35; P-value = 0.28); Interproximal Papilla (SMD 0.12; 95% CI -0.10, 0.34; P = 0,28) facial peri-implant mucosal recession (ML) (SMD -0.14; 95% CI -0.36, 0.08; P = 0.21).

Conclusions: no significant differences were observed between prefabricated (stock) versus customized (CAD/ CAM) abutments regarding midfacial mucosal recession, interproximal papillae and pink aesthetic score (PES) after 12 months.

FIXED-ON-2 CROSS-ARCH IMMEDIATELY LOADED PROSTHESES IN FRAIL PATIENTS: A COHORT STUDY

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Aim: evaluate the clinical outcome of two implants supporting a cross-arch prostheses in frail patients.

Methods: eighty patients with fully edentulous mandibles were enrolled in a private dental clinic (Pavia) to receive fixed mandibular prostheses supported by only 2 implants. Seventeen patients showed signs of frail and comorbidity as: oral bisphosphonates, heart attack, cardiac bypass, hypertension, Hepatitis C, Diabetes Type-II, prostate carcinoma, uterus carcinoma, breast carcinoma, chronic bronchitis, and Parkinson's disease. Forty-six received laser-welded titanium frameworks and 34 received cast silver-palladium frameworks. Outcome measures at 1(T1) - 3(T2) - 5 (T3) years evaluated surgical and prosthetic complications, marginal bone loss (MBL), ISQ values and implant failure.

Results: in T1 were showed 5 surgical and prosthetic complications, 4 in T2 and 22 in T3. All complications were successfully treated. At T1 only one implant failure occurred in 2 different patients. At T1 were recorded 2 prostheses failures, 1 in T2 and 7 in T3. At baseline, the mean marginal bone level was 0.04 mm, the mean MBL was -0.30 mm at T1, -0.39 mm at T2 and -0.69 mm at T3. At baseline the mean ISQ value was 75.4, 72.5 at T1, 75.3 at T2 and 73.8 at T3.

Conclusions: after a 5-years follow-up the results obtained confirmed the immediately loaded cross-arch prostheses supported by only two implants as a predictable treatment. However, a higher cluster of patients and a longer follow-up will be needed to confirm this therapeutic approach in frail and healthy patients.

INNOVATIVE INHIBITION TREATMENT IN MAXILLARY DENTAL IMPLANT PLACEMENT: A CASE REPORT

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The alveolar ridge undergoes changes in both horizontal and vertical ridge dimensions following extraction, Alveolar Ridge Preservation (ARP) techniques are used to counteract bone resorption after tooth extraction, including periosteal inhibition and modified periosteal inhibition techniques.

Aim: the aim of the present study was to describe the first rehabilitation of a post-extraction dental implant in the maxilla using the innovative Alveolar Ridge Preservation (ARP) procedure via a modified periosteal inhibition (MPI) technique. The goal of the technique is to protect the vestibular cortical bone from pre-osteoclastic aggression, which can cause bone resorption.

Methods: after the extraction, the clot was left in place and after achieving stability, a single customized screw-type abutment T3, 3i implant with a diameter 4.1 mm was inserted and screwed in place. The implant was oriented in palatal position and temporary cemented, following a delayed loading. The technique involves the use of a 0.5 mm cortical lamina to mechanically protect the vestibular cortical bone from pre-osteoclastic aggression, thus preventing vestibular cortical bone resorption and increasing its thickness without the need for biomaterial insertion.

Results: the technique was positively evaluated through a CBCT scan performed 12 months after implant placement, showing an increase of 0.5 mm.

Conclusions: although only one case was used, the one-year follow-up results are promising, and further studies will be necessary to confirm the technique's effectiveness.

GUIDED IMPLANT SURGERY WITH STACKABLE GUIDES: A CASE REPORT

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Aim: the development of digitally guided surgery has allowed for better optimization of resources and greater patient comfort. The stackable guides are its direct evolution and contain all the information needed to achieve the ultimate goal, a planned prosthetic placement. The report's purpose is to describe the clinical steps of this procedure.

Methods: the patient comes to our attention with an upper prosthesis anchored to 11, 21, and 22 and implants in positions 24 and 25. The treatment plan involves the fabrication of an implant-supported full-arch upper denture. Digital diagnostic wax-up combined with CBCT defines the ideal position of implant fixtures. A base guide with dental-mucosal support is created. After the guide's placement, the upper portion is removed, and the part remaining in place is the reference point for all the next prosthetic-surgical steps. A periosteal-mucosal flap is performed after the extraction of teeth 11, 21 and 22 and implants at the second quadrant. An implant guide is attached to the base guide for implant placement at positions 15, 12, 22, and 25; the prosthetic components are placed with the provisional prosthesis attached to the base guide. Finally, alveolar Ridge Preservation and first intention suturing were performed.

Results: the screw-retained prosthesis reproduces the initial design, and radiographic inspection shows the procedures succeeded.

Conclusions: the use of digital tools for the study of surgical and prosthetic solutions provides a real advantage in terms of accuracy, less invasiveness and reduced operative time.

ASSESSMENT OF BONE REMODELING OF THE ALVEOLAR RIDGE: A LITERATURE REVIEW

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Aim: the aim of this review is to evaluate dental literature to assess the average dimension changes of hard tissues in the alveolar ridge, both vertically and horizontally, after tooth extraction.

Methods: a search was conducted on major databases such as PubMed, Cochrane Library, and Medline. The bibliographies of review articles were checked. The search was performed to identify randomized controlled clinical trials and prospective cohort studies that only evaluate human bone healing.

Results: in human hard tissue, horizontal dimensional reduction was higher than vertical reduction at 3 months, measured from the buccal wall, and after 6 months of healing. The percentage of vertical dimensional variation is considered to be 11-22% at 3 months and between 29 and 63% at 6-7 months.

Conclusions: studies show a rapid reduction in the first 3-6 months, followed by a gradual reduction in dimensions. The horizontal reduction in the coronal area of the alveolar ridge is much more prominent than in the apical part, which maintains the same size, and horizontal variations are also more accentuated than vertical ones, which are still more concentrated on the buccal wall. Although the lingual wall undergoes inevitable changes, this area of the crest seems to be much better preserved than the buccal area.

ONE PIECE ZIRCONIA FIXTURES MANAGEMENT: APPLICATIONS OF TISSUE LINE *VS* ALVEO LINE

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Aim: the aim this report is to evaluate zirconia one piece implants, comparing tissue line and alveo line fixtures, to analyze strengths and weaknesses, to understand the indications involving the use of two types.

Methods: one piece zirconia implant is defined as monocomponent because of a single structure consisting of an abutment and implant body. Both implants have an important thread, a quadrangular anti-rotational head, a 4.5 mm high abutment with 2 faces for fixing the temporary prosthesis. To better understand we evaluate two clinical cases with both fixtures, from the implant placement, to the site healing, finally to observe how the choice of the different fixtures can guide the result.

Results: fixture's choice is essential to obtain the expected results. One piece zirconia implants guarantee good osseointegration, similar to titanium ones. Tissue Line implant is used when a small diameter is required and it allows for good healing, even in cases of thin gingival phenotype, where the use of titanium could lead to transparency issues and cause bad esthetic results. Alveo line implant has an important shoulder with which you can fill the cavity, that's why it's used in case of a post-extraction site.

Conclusions: one piece zirconia implants are an excellent rehabilitation option, as they can give excellent results over time both in terms of stability and health of the peri-implant tissues. The introduction of alveo line implants fills all those limits imposed by the tissue line ones and extending the use of one piece zirconia fixture to a greater number of clinical situations.

BONE TO IMPLANT CONTACT ANALYSIS IN ZYGOMATIC IMPLANTOLOGY

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Aim: the aim of this study is to evaluate the BIC (Bone to Implant Contact) of zygoma implants in several maxillary atrophy treated with unilateral zygoma, Hybrid approach and Quad technique.

Methods: we have been studied 50 subjects treated from 2016, 95 zygomatic implants have been performed, 32 patients have been categorized as Hybrid rehabilitations, 15 as unilateral zygoma rehabilitations and 3 as Quad zygoma rehabilitations.

Thanks to the use of 3D rendering software (Real Guide Software, 3DIEMME srl, Como, Italy), we analyzed the post-operative CBCT scan, and the clinicians had the possibility to measure the BIC of the zygomatic implants.

Data have been organized in a Microsoft Excel (Microsoft, Redmond, Washington DC) table for statistical analysis.

Results: the clinicians have evaluated the BIC on the internal and external cortical bone thanks to the use of 3D software reconstruction of dicom file.

Different evaluations on post-operative CT have been taken for each zygoma fixture. Two CT planes have been chosen for this preliminary study: sagittal and coronal plane.

The average BIC of the external cortical (16,3629 coronal plane, 16,1760 sagittal plane) was higher than the internal cortical (9,7582 coronal plane, 10,1344 sagittal plane) for most of the data measured.

Conclusions: preliminary evaluation of the Data showed a wide difference between the BIC of the internal and external cortical for unilateral zygoma, Hybrid and the Quad technique. Indeed, the Quad uses longer implants and with a greater average angle of insertion and this could lead to an increase of BIC.

ZIRCONIA IMPLANT, AVAILABLE ALTERNATIVE IN CASE OF HYPERSENSITIVITY TO TITANIUM

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Aim: the purpose of the following report is to describe a clinical case related to a patient who experienced an allergic and hypersensitivity reaction to titanium and what are the possible therapeutic alternatives.

Methods: the patient presented to our observation for significant pain at the third quadrant where two titanium implants had been placed just 10 days earlier. Following anamnestic investigations and objective examination where an endoral radiograph was taken in which peri-implant bone resorption was seen, a possible allergic reaction to titanium was considered, in fact, the Melisa test was positive. the implants were then removed, and following an adequate healing period, two single-component zirconia implants were placed in area 3.5 and 3.6. The inserted implants were immediately protected with a resin splint that remained outside the occlusion. Provisional resin crowns were then placed at a distance of 4 months, a final zirconia crowns were placed after another 4 months.

Results: after the placement of zirconia implants, the patient did not refer to any symptoms or problems, and after 8 months from surgery, the clinical-radiographic exams showed the success of the metal-free implant prosthetic rehabilitation.

Conclusions: titanium Hypersensitivity is uncommon in the population, but recent data suggest an increased incidence of hypersensitivity to titanium for patients with dental implant and orthopedic arthroplasties. This can be an important motivation for further research into zirconia implants, which has shown excellent results even in the long term.

OSSEOINTEGRATION AND IMPLANT SURFACES

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Aim: this study aims to review the available literature on the topography and osteointegrative capacity of different dental implant surfaces, with a particular focus on zirconia and laser-treated surfaces.

Methods: the study searched for some relevant terms in literature databases. The study reviewed the outcomes of follow-up studies on dental implants made of different materials and with different surface treatments.

Results: dental implants made of both titanium and zirconia showed good osteointegration with good bone-to-implant contact, particularly in titanium implants with SLA surfaces. Short-term survival rates and marginal bone loss in zirconia implants stabilized with yttrium oxide support single crowns and fixed dental prostheses after 1 year are increasing and comparable to those of biphasic titanium implants, as reported by a systematic review. While there is limited clinical evidence on laser-treated surfaces, laboratory studies suggest that they produce a surface roughness superior to that achieved through subtraction, without thermal and structural alterations.

Conclusions: zirconia implants with SLA surfaces are the gold standard in implant rehabilitation, while a different approach should be adopted in the treatment of zirconia implants. These show excellent biocompatibility, aesthetics, and low bacterial colonization. Laser-treated surfaces have limited clinical evidence, but the surface treatment is very controlled and precise, creating a specific topography that is well-suited for implant rehabilitation.

THE ROLE OF IMPLANT POSITION IN THE PREDICTABILITY OF SOFT TISSUE DEVELOPMENT

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Aim: the aim of the study is to find a significant correlation between peri-implant soft tissue remodeling, through compliance with the Nozawa ratio in the post-surgical healing phases, and different areas of implant positioning.

Methods: for this study, the oral cavity was divided into sextants. A sample of 341 implants from six different manufacturers was examined. For the analysis of soft tissue remodeling, arch models were scanned and matched to their analogue with 3D-imaging software GeoMagic at three sequential points in time (post-surgery, provisional and definitive crown delivery), and measurements of soft tissue thickness and height in the buccal portion were obtained with GOM software. The Nozawa ratio was calculated as the ratio between thickness and height of the soft tissues on the buccal side. The data obtained were tabulated and the statistical investigation was conducted.

Results: the results obtained generally showed a greater tendency to comply with Nozawa ratio (tissue thickness/height ratio = 1.5) in posterior sectors, i.e. in sextants 1, 3, 4, 6. In the aesthetic sectors, on the opposite, the ratio was unfavorable, with a mean value of 1.0. This correlation resulted statistically significant ($p = 0.039$) in the Kruskal-Wallis test.

Conclusions: it has been shown that there is a significant correlation between the tendency to comply with the Nozawa ratio and the different areas of implant insertion in the oral cavity. In fact, while the posterior areas ensure greater compliance, there are still criticalities in aesthetic sextants.

CORRELATION BETWEEN VERTICAL/HORIZONTAL TISSUE DEVELOPMENT AND IMPLANT PLACEMENT POSITION

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Aim: the aim of the study is to look for a significant correlation between peri-implant soft tissue remodeling, in particular vertical and horizontal development, and different areas of implant placement.

Methods: for this study, the oral cavity was divided into sextants. A sample of 341 implants from different manufacturers was examined. For the analysis of soft-tissue healing and remodeling, arch models were scanned and matched to their analogue with 3D-imaging software GeoMagic at 3 sequential times (post-surgery, provisional and definitive crown delivery), and finally, measurements of soft-tissue thickness and height in the buccal portion were obtained with GOM software for the evaluation of peri-implant vertical and horizontal maturation. The data obtained were tabulated and a statistical investigation was conducted.

Results: both vertical and horizontal tissue remodeling resulted influenced by the position. In posterior sextants the vertical development resulted on average higher ($p = 0.025$ in Kruskal-Wallis test); the buccal thickness of the tissue showed major development, on average, in the maxilla than in the mandible ($p = 0.312$).

Conclusions: the analysis conducted showed that, in the large sample examined, horizontal and vertical tissue maturation and remodeling do not necessarily have the same predictability in the different sextants of placement, due to several factors.

CLINICAL ASSESSMENT OF ORAL LICHEN PLANUS REFRACTORY TO ANY MEDICAL THERAPY: A CASE REPORT

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Aim: Oral lichen planus (OLP) is an inflammatory disease that can be painful, mainly in the erosive-atrophic forms. Corticosteroids remain the gold standard therapy but, sometimes, they can produce adverse effects or not be efficiency. Photo biomodulation therapy (PBMT) has been proposed as a new therapeutic approach as a potential treatment of OLP. The aim of this case report was to investigate the effectiveness of PBMT in a patient presenting with long-standing symptomatic erosive-atrophic OLP, not responsive anymore to the medical therapy.

Methods: since 2013, a 77-year-old woman with diagnosis of erosive-atrophic OLP has been followed in our section of Oral Medicine. The painful erosions, 8 in the Visual Analogue Scale (VAS), were located on the dorsum of the tongue and on both buccal mucosae. After several years of corticosteroids medication without long-lasting alleviation of symptoms, we opted for one vial every two weeks of intralesional triamcinolone acetonide (Kenacort 40 mg/ml) for six weeks. After two injections, the patient reported a clinic and symptomatic worsening, and expressed the desire to suspend all pharmacological therapies.
Given the continuous clinical and symptomatic declines we proposed, as an alternative to the usual gold standard treatment, some PBMT sessions. We achieved the PBMT using a diode laser with double wavelengths (645 nm and 980 nm) with the following parameters: Fluency = 8J/cm^2; Power Density = 0,5W/cm^2; Spot Area = 0,5 cm^2 with gaussian profile; point-by-point technique; distance from the lesion = 2 mm. The sessions were performed two times weekly from November 2022 to March 2023. Clinical pictures of the case were taken at baseline, during treatment and at the end.

Results: since the first PBMT session, the patient reported symptom improvements according to the VAS scale (from 8 to 5). After the fourth PBMT session, the outcome of our case showed remarkable improvements in the reduction of erythema, ulceration and burning sensation as recorded by VAS (from 8 to 1.5). Since the symptomatic and the clinical healing was satisfactory after two months of PBMT, we reduced from two sessions to one session in February 2023. However, the patient inconsistent attendance to the scheduled dental appointments led to the increasing appearance of erosions affecting the dorsum of the tongue and the right buccal mucosa. Those lesions had been solved with three other PBMT sessions.

Conclusions: the present case report indicates that PBMT can be efficient and can be used as a valid alternative therapy alongside standard methods or as a new modality for refractory erosive-atrophic OLP forms. However, further investigations are needed to perform a standardization of the treatment procedure.

OHLLT IN PERI-IMPLANTITIS: SURGICAL *VERSUS* NON-SURGICAL APPROACH. A RETROSPECTIVE STUDY

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Aim: peri-implantitis could be treated with a surgical or non-surgical protocol. Several treatment options have been presented in the literature, such as chemical agents, antiseptic and antibiotic therapies, rotary titanium brushes, curettes, ultrasonic, air abrasive, and laser treatments. Specially, photodynamic therapy combined with hydrogen peroxide (OHLLT) resulted to be valid in the elimination of bacterial biofilm from implant surfaces. The aim of our study is to compare OHLLT performed with a surgical approach to a non-surgical approach.

Methods: a cluster of 227 implants with peri-implantitis were collected: 139 implants underwent to a non-surgical approach and 88 implants to a surgical approach. We registered the bone loss pre-operative and post-operative (with a follow-up of five years).

Results: the results demonstrate a statistically significant difference between the two groups. In the first group, bone loss after treatment was 2.3 mm for OHLLT with a surgical approach. In the second group, bone loss was 3.8 mm for OHLLT with a non-surgical approach; according to the Kolmogorov–Smirnov test,

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the overall data followed a normal distribution (value of the Kolmogorov–Smirnov test statistic = 0.0891; p = 0.35794).
Conclusions: the explanation to these results could be found in a greater difficulty to efficiently decontaminate implant surfaces in the case of the non-surgical approach because of air abrasives and ultrasonics could not completely reach implant surface, while with a surgical approach, these devices are clearly able to perform it.

OHLLT IN PERI-IMPLANTITIS: OHLLT *VS* OHLLT WITH ER: YAG LASER. A RETROSPECTIVE STUDY

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Aim: the aim of our retrospective controlled study is to compare an oxygen high-level laser therapy (OHLLT) protocol alone to a OHLLT protocol with Er:YAG laser in order to maximize bacterial removal and to evaluate if an Er:YAG laser could enhance hard tissue regeneration.
Methods: two hundred and ten implants affected by peri-implantitis were organized into two groups: the OHLLT alone was used on 88 implants (control group) while 122 underwent OHLLT and Er:YAG treatment (test group). Data collected were about the mean bone loss before (T0) and after treatment (T1) for all implants with a follow-up of 5 years.
Results: no statistically significant differences were found. In the OHLLT group, the mean bone loss after treatment was of 2.1 mm in the upper arch and 2.4 mm in the mandible. In the OHLLT + Er:YAG group, the results shows a mean bone loss of 2.0 mm in the upper arch and 2.5 mm in the mandible. Both groups revealed a mean bone loss after treatment of 2.3 mm. According to the Kolmogorov–Smirnov test, overall, data followed a normal distribution (value of the K-S test statistic = 0.0912; p = 0.36112).
Conclusions: this retrospected study confirms the central role of the OHLLT in improving clinical results in peri-implantitis treatment, leading to an effective bacterial decontamination. Our results showed no statistically significant differences between OHLLT and OHLLT + Er:YAG laser; therefore, the ineffectiveness of the Er:YAG laser in order to obtain advantageous enhancements in the treatment of peri-implantitis with OHLLT was demonstrated.

EVALUATION OF PHOTOBIOMODULATION SUPPORTED TOOTH EXTRACTION IN PATIENTS WITH RISK OF MRONJ

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Aim: is to share our experience of Photo-Biomodulation (PBM) as a supportive modality for tooth extraction in patients with risk of Medication-Related Osteonecrosis of the Jaw (MRONJ).
Methods: a single-center retrospective study was performed by searching the department database between 2018 and 2023 for patients with risk of MRONJ development, with history of anti-resorptive and/or anti-angiogenic therapy, and underwent tooth extraction combined with the preventive PBM protocol. The PBM protocol was 4 sessions. In each, the extraction sites were irradiated by a multidiodic laser emitting simultaneously 650nm, 810nm, and 910nm wavelengths. The parameters were: total power = 0.6W, total energy = 577.4J, frequency = 30kHz, and time = 15 min. The collected data were age, gender, primary pathology, concomitant pathologies, type and duration of medication, route of administration, number and site of extracted teeth, and MRONJ development.
Results: the database search revealed a total of 60 patients (57 females and 3 males) fulfilling the inclusion criteria with average age of 67.4 underwent total of 142 extractions. MRONJ was observed in 12 (20%) female patients, 4 in maxilla, 7 in mandible, and 1 in both. A significant risk of MRONJ was observed with Zoledronic acid administration (p = 0.01). Marginal risks were observed with the increase of extracted teeth number (p = 0.066), oral administration (p = 0.067), and oncologic patients (p = 0.067).
Conclusions: the data shows that PBM seems to be a reliable supportive modality for dental extractions in patients with risk of MRONJ.

PHOTOBIOMODULATION AS TREATMENT FOR ORAL ULCERS IN ONCOLOGIC PATIENT: CASE REPORT

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Aim: Photobiomodulation (PBM) is a medical treatment by the means of a laser that makes use of the interaction between a light beam and specific molecular targets in the oral cavity's tissues in order to obtain analgesic, anti-inflammatory and biostimulant effects. PBM is currently being employed in odontostomatology to treat several osteo-mucosal diseases. The aim of this study is to report a case in which PBM was the first therapeutic choice for multiple oral ulcers in an oncological patient, who underwent chemotherapy and has been taking Rituximab.

Methods: a 81-year-old woman was referred to the Pediatric Dentistry and Odontostomatology Unit after an ENT consultation. The patient presented several ulcers and mucositis in the mouth and oropharynx. The remote pathological history consisted in a Follicular NH Lymphoma, that was treated with 6 cycles of Rituximab-Bendamustine. The lesions appeared between the 5th and 6th cycle of therapy. The patient received a PBM treatment (8 sessions in 4 weeks) with a diode laser (43J, 10 KHz) and perilesional injections of half the vial of Triamcinolone (40 mg/ml).

Results: the patient, thanks to the laser therapy sessions adjuvated by one-off perilesional cortisone treatments with Triamcinolone, referred right after the first session a decrease in perceived pain. At the end of the therapeutic treatment there has been an improvement in painful symptomatology from an initial value of 10 to one of 7/8.

Conclusions: PBM has been proven effective although further studies are needed to set up standardized protocols.

COMPARISON OF DIODE LASER AND TRADITIONAL SURGERY FOR THE TREATMENT OF PYOGENIC GRANULOMA

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Aim: the aim of this study was to compare the following surgical techniques: the use of diode laser and the use of a cold blade as conventional surgical technique in the surgical removal of a pyogenic granuloma (PG).

Methods: 21 patients with clinical diagnosis of PG in the gingival tissue were enrolled for this study. They underwent preliminary biopsy punch of 2x2 mm of gingival soft tissue to confirm the clinical diagnosis of PG by histomorphometric analysis. After a week all patients were recalled for the surgical excision of the PG, executed by the same operator. According to the used surgical technique they were divided into two groups: the cold blade group and the diode laser group. All samples had the same dimensions (less than 3cm in the larger size) and a second biopsy was executed.

Results: a significant reduction of the mean speed of incision was observed in the diode laser group (0.61±.29 mm/s) while in the cold blade group was (1.47±1.23 mm/s) ($p < 0.05$). The mean lengths of time for the whole surgery were (221.15±220.89 s) in the diode laser and (316.10±248.69s) in the cold blade group ($p < 0.05$). The intraoperative bleeding was 42.1% for diode laser group and 86.5% for cold blade group ($p < 0.05$). The 26.3% of diode laser group and the 39.2% of cold blade group needed the suture ($p = 0.139$). The mean number of stitches was 0.74±0.23 in diode laser group and 1.26±1.22 in cold blade group ($p = 0.121$).

Conclusions: diode laser was advantageous, in fact it was able to prevent bleeding, to reduce post-operative pain and to favor healing of gingival tissue.

MANAGEMENT OF PERIMPLANTITIS THROUGHT ERBIUM:YAG LASER: A CRITICAL REVIEW OF THE LITERATURE

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Aim: peri-implants inflammation (periimplantitis) represents a frequent serious disease after dental implant treatment, and its management is still unclear and difficult. The aim of this critical review was to summarize the advantages and disadvantages of using Erbium laser (Er:YAG) in surgical treatment of peri-implantitis.

Methods: literature research was conducted on Medline database using the entry terms "Erbium laser" and "Er:YAG" combined through the Boolean indicator "and" with the following words "Implant decontamination", "Implant decontamination", "Implant disinfection", "Implant disinfection", "Perimplantitis", "Perimplantitis". Inclusion and exclusion criteria for paper selection were applied. Duplicates were deleted through End Note X9®, Clarivate Analytics software.

Results: eventually, 34 papers were included in the review. Twenty-six of 34 analysed the advantages of Er:YAG laser in surgical treatment of periimplantitis: a better antimicrobial action, a non-alteration of the implant surface when used at low power, a low overheating, an higher attachment gain and a better healing. Instead, 8 paper reported the disadvantages of using Er.YAG laser, such as: the impossibility to irradiate each area equally, due to the rough surfaces of the thread; chipping of the coating (from an energy of 160 mj); the negative effects on the osteoblast proliferation at high energy level. The statistical analysis of the included papers show that the use of the Er:YAG laser as a good alternative to the traditional techniques.

Conclusions: the result of the present review highlighted that Er:YAG laser can be safely used as a treatment for periimplantitis.

OSTEOTOMY WITH ER:YAG LASER: A STEREOMICROSCOPIC EVALUATION ON *EX-VIVO* MODEL

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Aim: the aim of the present work is to report results of an *ex vivo* experiment to assess the best osteotomy technique, comparing surgical bur and two erbium laser application techniques (Medium Short Pulse (MSP) and Quantum Square Pulse (QSP)). Thermal injuries, amount of bone debris, healing times were evaluated.

Methods: fifteen blocks of porcine bone were created, which were divided into 3 groups and sectioned into two equal parts using the following techniques:

- surgical bur mounted on a straight handpiece at 40,000 rpm.
- Erbium laser in MSP mode, energy 250 mJ, frequency 20 Hz, water 4 and air 6, obtaining a total of 5 Watts of power.
- Erbium laser in QSP mode, energy 330 mJ, frequency 15 Hz, water 4 and air 6, obtaining a total of 4.95 Watts of power.

Section times have been recorded. Cut surfaces were analyzed using a stereomicroscope (SMZ25, NIKON, Tokyo, Japan), and areas with bone tissue debris were highlighted with a colorimetric software (ImageJ®).

Results: the bur is fastest tool to perform osteotomies. However, the analysis of the cut surfaces highlighted the presence of a large amount of bone debris with the surgical bur, both in cortical and trabecular areas. In MSP mode laser cuts, no debris is visible and trabecular lacunae appear clean, while QSP mode performed even better.

Conclusions: the experiment demonstrates how the erbium laser has superior features in terms of cutting precision and cleanliness, with consequent positive effects on healing. However, cutting time records show that laser requires a longer application time to perform osteotomies. Further research is required to determine whether the benefits of laser technology are truly advantageous in clinical settings.

ND:YAG LASER AND HYALURONIC ACID FOR IMPLANT REHABILITATION IN AESTHETIC AREA

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Aim: this paper describes a combined technique of implant rehabilitation in the aesthetic area performed using Hyaluronic Acid (HA) and laser photobiomodulation (LPBM) application. HA has the advantage of promoting clot stabilization, osteogenesis, angiogenesis and it also has a bacteriostatic, anti-inflammatory, anti-oedematous nature. LPBM instead stimulates osteoblastic activity and osteogenesis improving implant stability and reduces tissue inflammation supporting tissue healing.

Methods: after loco-regional anesthesia, the extraction of the fractured lateral incisor was performed, followed by implant insertion with immediate loading. Hyaluronic acid mixed with autologous bone, taken from the drills used for implant insertion, is then applied inside the socket. Two stitches to stabilize bone graft was applied and an Nd:YAG laser (1064 nm) application was performed (320 microns fiber, 1W power, 10Hz frequency for 5 minutes).

Results: the follow-up shows optimal soft tissue healing and, consequently, the achievement of an aesthetically pleasing result: the gingival margin and interdental papillae are well represented. In addition, the radiograph at 4 months shows successful osseointegration and the absence of non-physiological hard tissue loss.

Conclusions: the combined use of HA and LPBM leads to a complementary and additive effect that, for implants in aesthetic areas, seems to have a positive influence on both osseointegration and soft tissue healing, which is fundamental for aesthetic results.

APDT IN ADJUNCT TO NON-SURGICAL PERIODONTAL THERAPY: A RANDOMIZED CONTROLLED TRIAL

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Aim: the present randomized clinical trial (RCT) aimed to evaluate the efficacy of antimicrobial photodynamic therapy (aPDT) by indocyanine green (ICG) in adjunct to the non-surgical periodontal therapy in the treatment of periodontitis, in terms of clinical and microbiological outcomes.

Methods: twenty-four periodontitis patients received a full-mouth ultrasonic subgingival debridement (FMUD) and, after 1 week, were randomly assigned to receive the test (ICG-aPDT with an 810 nm diode laser) or the control treatment (off-mode aPDT) at sites with probing depth (PD) ≥5 mm. After 3 weeks test and control treatments were repeated. Clinical parameters were registered and microbiological analyses of subgingival samples by real-time PCR were performed, at 3 and 6 months. Ethical Committee approval (Ref. 525). ClinicalTrials.gov (NCT04671394).

Results: significant clinical improvements for both treatments at 3 and 6 months were found, with no inter-group differences, except for a higher PD reduction in initial deep pockets (PD ≥6 mm) and a higher percentage of closed pockets (PD ≤4 mm/no bleeding on probing) for the test group at 6 months. Limited intra-group and inter-group microbiological changes were observed, except for a significant reduction in Aggregatibacter actinomycetemcomitans and Parvimonas micra in the test group at 3 months.

Conclusions: limited clinical and microbiological adjunctive effects were found for the combination of repeated ICG-aPDT and FMUD. Further, well-designed RCTs with larger sample sizes are needed to confirm the clinical relevance of these findings.

PHOTOBIOMODULATION ON SALIVARY GLANDS: USE OF DIODE LASERS WITH ALTERNATING WAVELENGTH

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Aim: evaluation of the clinical utility of photobiomodulation treatment (PBMT) in patients with diagnosed hyposalivation to stimulate salivary flow.

Methods: 8 patients with diagnosed hyposalivation being treated at the Clinic of Oral Medicine and Pathology of Milan were recruited. 4 patients were randomly assigned to the PBMT group (4 Laser applications, once a week, 10 application points, 3 extraoral and 2 intraoral. The parameters used were 450 nm, 660 nm and 970 nm one minute for each wavelength, and 3 minutes per spot with scanning movement. 4 patients were randomly applied to the control group. 1 week before the (T0) first Laser application, 3 weeks later after the second laser application (T2) and 2 weeks after the last Laser application (T5), sialometry was performed. Before the T0 phase, an ad hoc questionnaire was administered to all patients to evaluate the extent of the hyposalivation problem. VAS and NRS scales were registered before and after each laser application. Patients, operators, and statisticians were blinded. ANOVA test for variance was followed by linear regressions. Significance was predetermined as $p < 0.05$ for all the tests performed.

Results: variance analysis showed a significant increase ($p < 0.05$) between the T1 control and the T1 PBMT groups. The VAS and NRS scales demonstrated decreased discomfort related to hyposalivation, concerning the increase in salivary flow.

Conclusions: it is possible to appreciate how patients with hyposalivation, treated with multiple applications of PBMT exhibit an increase in basal and stimulated salivary flow. It is necessary to investigate whether the effect of photobiomodulation can be amplified by pharmacological treatment.

SOFT-CURVED LAMINA FUNCTIONALIZED WITH PHOTODYNAMIC THERAPY IMPROVES OSTEOBLASTS ACTIVITY

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Aim: in our previous studies we have verified that a novel antibacterial protocol of photodynamic therapy, if applied on osteoblasts and fibroblasts *in vitro*, showed a proliferative enhancement. This protocol ALAD-PDT (AlphaStrumenti) was based on a gel with 5% 5-aminolevulinic acid incubated for 45 min and irradiated for 7 min by a LED light at 630 nm. The present study hypothesized that ALAD-PDT application on a porcine cortical membrane (soft-curved lamina, OsteoBiol) with cultured osteoblasts might increase its osteoconductive properties. Thus, this study aimed to characterize the Lamina and to investigate the effects of ALAD-PDT on the adhesion, the growth, and the mineralization activity of HOBs seeded on the lamina.

Methods: the topographical characteristics of the membrane surface, the adhesion, and the morphology of hOBs were investigated at SEM at 3 days. The viability was assessed at 3 days, the Alkaline Phosphatase (ALP) activity at 7 days, and calcium deposition at 14 days.

The control was represented by the membrane with cultured cells (Lamina).

Results: the Lamina showed a porous surface. An increase in cell attachment of hOBs was observed compared to Lamina. A significative enhancement ($p < 0.0001$) was observed in the proliferative rate, in ALP and calcium deposition after ALAD-PDT with respect to Lamina.

Conclusions: the application of ALAD-PDT protocol to oral osteoblasts cultured on the cortical Lamina stimulated a higher cellular proliferation, adhesion and increased matrix bone deposition, improving its osteoconductive properties.

Q-SWITCHED ND:YAG IN TRANSEPITHELIAL GINGIVAL DEPIGMENTATION: *IN VIVO* OBSERVATIONAL STUDY

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Aim: smile esthetics can be adversely affected by para-physiological conditions such as gingival hyperpigmentation. This condition may also affect the subjects' quality of life. Therefore, the aim of the present study was to use Q-Switched Nd:YAG laser, according to a defined protocol, to treat Gingival Melanin Hyperpigmentation with a transepithelial approach.

Methods: ten patients with different grades of gingival hyperpigmentation were treated using Q-Switched Nd:YAG in one to four laser sessions without local anesthesia. The degree of depigmentation was assessed by comparing Oral Pigmentation Index (OPI) and Melanin Pigmentation Index (MPI) at baseline and three weeks after last laser session. Oral discomfort, rated by the Numeric Rating Scale (NRS), one, three, and five days after the procedure was also recorded. Finally, patients' perception of the procedure was appreciated 12 months after treatment.

Results: a complete depigmentation was achieved in all cases. No/little discomfort (NRS 0 to 3) was reported by patients during the laser session, and if present, lasted a maximum of five days.

No major complications were reported as well as recurrences during at least 12 months follow-up. According to patients' perception, all of them were available to be re-treated, if necessary.

Conclusions: within the limitation of the present study, it could be concluded that Q-Switched Nd:YAG may be considered as an effective and well-tolerated approach in the treatment of gingival melanin hyperpigmentation.

PEDIATRIC ORAL VASCULAR MALFORMATIONS: ULTRASOUND-AND MR-ANGIOGRAPHY-GUIDED LASER THERAPY

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Aim: this observational prospective study describes the relevance of intraoral ultrasonography and magnetic resonance angiography as guidance for the photocoagulation of oral vascular malformations in pediatric patients.

Methods: the authors included patients ≤17 years old and showing at least one intraoral vascular malformation referred to the Unit of Odontostomatology of Aldo Moro University of Bari from 2020 to 2022. All patients underwent ultrasonographical examination of the lesions by using an 18 MHz linear probe with color doppler and those with malformations showing superficial diameter ≥3 cm and/or thickness ≥5 mm also underwent magnetic resonance angiography. The children underwent laser therapy under conscious sedation or general anesthesia depending on their compliance. All patients received at least a cycle of diode laser transmucosal photocoagulation (14 W/cm^2; pulsed mode; t-on 190 ms; t-off 250 ms). In addition, the authors performed intralesional photocoagulation in the lesions with thickness ≥5 mm. After a healing period of 40 days, a further cycle of photocoagulation was performed for persisting lesions.

Results: the authors included 11 children (7 females and 4 males) during the study period. Since 5 children showed multiple oral vascular malformations, the authors treated 19 lesions, and 6 of them required at least two cycles of intralesional laser application.

Conclusions: the current results support intraoral ultrasonography and magnetic resonance angiography as guidance for photocoagulation of oral vascular malformations in pediatric patients.

USE OF LOW ENERGY ND:YAG LASER FOR THE AESTHETIC TREATMENT OF VENOUS LAKES

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Aim: Venous Lakes (VL) are common vascular lesions of the superficial dermal layers, predominantly involving face skin, oral mucosa and lips, thereby impacting on the self-confidence of the patients. In the current research, the use of Nd:YAG laser, according to a defined protocol with a low level of absolute energy, is proposed for the treatment of VL of the lips.

Methods: 47 patients with 50 labial VL were treated with the Nd:YAG in one laser session, without local anaesthesia. The area reduction, according to the Vlachakis criteria, was evaluated 7 and 30 days after the laser application. Additionally, the oral discomfort, rated according to the Numeric Rating Scale (NRS) during and 24-hours after the procedure, was recorded.

Results: all the patients achieved a complete clinical healing within 30 days after the laser application. In particular, those patients with VL with a diameter ≤6 mm (62.1%) achieved a complete resolution after 7 days ($p < 0.001$). Such patients reported no or little discomfort (NRS 0 to 3) during the laser session and no discomfort after 24-hours ($p < 0.001$). No major complications were reported, and no recurrence was observed at a 2-year follow-up.

Conclusions: the use of Nd:YAG laser in the treatment of phlebectasias could represent an excellent effective alternative to the conventional invasive procedures due to its safer and more tolerable profile.

THIRD MOLAR SURGERY FOLLOWED BY LOW LEVEL LASER THERAPY TO IMPROVE POSTOPERATIVE PERIOD

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Aim: third molar surgery is often followed by pain, edema and trismus due to the complexity of the surgery. In the last decade the use of Low Level Laser Therapy (LLLT) has spread in dentistry and oral surgery. The aim of this study is to evaluate if LLLT may be a potential tool in the management of postoperative discomfort after complex third molars extraction.

Methods: Helsinki Declaration and local ethics committee approval. Healthy volunteer with complex III molars were enrolled. Complex means teeth totally/partially impacted or whose root anatomy requires odontotomy.

T0: collection of the maximum opening with digital caliber as trismus indicator, the presence of edema according to the method of Amin MM (1983) by measuring the distance between the cutaneous pogonion-tragus, and commissure-tragus, the disto-buccal and disto-lingual/palatal probing value of II molar.

T1 after 48h: the previous parameters + VAS scale.

T2 after 7 days: same T1 parameters.

After the surgical extraction, test sites were treated with laser (Medency Triplo) with an average power of 0.10W, red light with wavelenght 635 nm, for 60 seconds with moving technique

The data was subjected to Two-Way mixed ANOVA.

Results: eleven healthy patients were enrolled, seven female and four male. Twelve third molars were considered, six test and six controls.

PARAMETERS	CTR	TEST
Tg-Pg' T1	0.23	0.44
Tg-Comm T1	0.24	-0.27
Tg-Pg' T2	-0.42	0.48
Tg-Comm T2	-0.41	-0.1
PPD T1	0.47	0.38
PPD T2	0.28	0.19
Trismus T1	-3.21	-8.43
Trismus T2	2.48	0.89
VAS T2	-2.35	-3.17

Conclusions: the differences between the averages in different observation times is more reliable than the observation of the difference within the single test and controls since it evaluates the parameter variation in the same population, reducing the differences due to sampling. LLLT is a non-invasive and rapid method. Its use seems to improve pain and edema reduction, but not trismus. LLLT can act on reducing postoperative pain and edema following third molar surgery, whereas trismus remains not significantly changed. Further investigation and sample size increase are required.

INFLUENCE OF POLYMERIZATION TIME ON COLOUR OF 3D PRINTED CROWNS: PILOT STUDY

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Aim: to evaluate the influence of post-printing polymerization time on colour of resin crowns 3D printed with different angles.
Methods: two crowns for teeth number 1.5 and 4.6 were designed. Nine crowns for each model were printed using Zortrax Raydent resin (A2). The two groups were divided into three subgroups of three samples each and different printing angle: 90°, 45° and custom angle; they were polymerized using a 360° blue LED 24W oven, one crown for 30 minutes, one for one hour, and one for 24 hours. A Spectrophotometer was used to analyze the colour and compare it to the control (A2 VITA scale sample).
Results: the colour variation between samples was summarized in a CIE 1976 graphic. The Delta value between the reference sample (A2 VITA scale) and each sample was considered, defined as the distance between two points in the graphic and expressing the difference in color between samples. This determined which combination of printing angulation and polymerization time was optimal: for crown 1.5 it was printing at a 90° angle and polymerized for 30 minutes, while for crown 4.6 it was printing at custom angle and polymerized for 1 hour.
Conclusions: the post-printing polymerization process is a fundamental phase, which may influence esthetic results of a provisional resin restoration. Crown morphology may influence the effects of polymerization on colour since two different crown designs yielded different results at the same print angulation and polymerization time; a study with greater number of samples to provide adequate statistical analysis is necessary.

A DIGITAL WORKFLOW PROCEDURE TO MAKE A CUSTOM MINISCREW-ASSISTED RAPID PALATAL EXPANSION

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Aim: the aim of this study is to illustrate a digital protocol that can be used for the evaluation and construction of a custom miniscrew-assisted rapid palatal expansion (MSE).
Methods: this type of device can be used in patient with certain requirements. For this reason, it is designed a template of the device to do a non-invasive preliminary clinical evaluation. For the evaluation of the quality and quantity of the bone and the soft tissue a CBCT and a dental scansion of the patient is required. Thanks to the Dolphin 3D software the information from CBTC and dental scan are overlapped and studied. During these studies the maxillary sinus and the dental roots collocation are examined. A particular option of the TINKERCAD program allows to design a 3d model of the appliance with four miniscrews. After that, the stl. file of the project is generated and imported on Dolphin 3D for planning the virtual placement of the device in the palate. At the end, the negative template of the device on the maxillary 3D model is 3D printed. The 3D printed maxillary model permits the technician to make the appliance based on our digital project.
Results: this digital workflow allows to improve the communication between the orthodontist and the technician. Thanks to these procedures it is possible to create a reliable and accurate custom device based on the patient's characteristics.
Conclusions: the digital method proposed can help the clinicians to plan a predictable placement of the appliance and to create a negative template of the device for its construction.

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NICKEL-TITANIUM AND LOW-LEVEL LASER THERAPY FOR TOOTH MOVEMENT RANDOMIZED CLINICAL TRIAL

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Aim: present study evaluated the effects of NiTi coil spring during low-level laser therapy (LLLT) by means of a diode laser in accelerating orthodontic tooth movement (OTM).

Methods: after extraction of first upper premolars for orthodontic purpose, 64 maxillary canines which needed distalization were analyzed in 32 enrolled patients (15 males, 17 females, mean age 12.9±1.8). On all experimental sites, an orthodontic force of 50N was applied by a NiTi closed coil spring obtain space closure. Using a split mouth randomized design, test side was treated using a diode laser operating at 810 nm wavelength in continuous wave mode at both the buccal and palatal side on three points/side (distal, medial and mesial) at baseline and at 3-7 and 14 days and every 15 days until the space closed. On control side, opposite canine was treated only using orthodontic traction.

Results: primary outcome chosen was the overall time needed to complete the levelling and closing space, measured on a study cast. Secondary outcome chosen was the evaluation of pain levels related to tooth traction, using a Visual Analogue Scale (VAS), recorded at 3-7 and 14 days after treatments. Mean space closures of the maxillary canines were comparable between groups.

Laser group yielded less mean time to accomplish space closure compared to the control group. Test side showed a significant reduction in the average range of dental pain at 3, 7 and at 14 days.

Conclusions: this study demonstrates that the use of LLLT therapy was effective in accelerating tooth movement and reducing pain levels related to OTM.

BONDING PERFORMANCE OF A HEMA-FREE UNIVERSAL ADHESIVE TO DENTIN

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Aim: *in vitro* evaluation of the bonding potential, ultrastructural organization and endogenous enzymatic activity of dentin samples conditioned with the novel HEMA-free universal adhesive BeautiBond Xtreme (Shofu).

Methods: forty-eight non-carious sound human molars were cut to expose middle/deep coronal dentin. Groups were formed (n = 8) as follows: 1) Beautibond Xtreme universal in self-etch mode (BXSE); 2) Beautibond Xtreme in etch-and-rinse mode (BXER); 3) iBond Universal (Kulzer) in self-etch mode (IBSE); 4) iBond Universal in etch-and-rinse mode (IBER); 5) Scotchbond Universal (3M) in self-etch mode (SBSE); 6) Scotchbond Universal in etch-and-rinse mode (SBER). After 24h, the specimens were sectioned into 1-mm thick sticks and subjected to microtensile bond strength (μTBS) test and scanning electron microscope (SEM). To investigate the effect on MMPs activity, 3 additional molars per group were processed for the *in situ* zymography analysis at T_0. Data were statistically analysed ($p < 0.05$).

Results: adhesive (SBU >IB >BX) and application mode (SE>ER) significantly influenced the μTBS values ($p < 0.05$). The endogenous enzymatic activity was also influenced by the adhesive and in the ER mode (BX >IB=SBU, $p < 0.05$), while there were no differences between the adhesives in the SE mode ($p > 0.05$).

Conclusions: within the limitations of this *in vitro* study, it may be concluded that ethanol-based SBU showed better bonding performance than acetone-based IB and BX. All the adhesives performed better in the SE mode, possibly due to the lower enzymatic activity compared to the ER mode.

CLINICAL APPLICATION OF THE PACE ALGORITHM IN DENTAL RADIOLOGY

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Aim: PACE (Pipeline for Advanced Contrast Enhancement) is a post-processing algorithm for radiology images that enhances contrast, improving the quality and accuracy of detail, despite a reduction in dosimetry. The efficacy of PACE was already evaluated in chest radiographs of patients with lung parenchyma lesions, where PACE made anatomical details and lesions more evident, sometimes not found in unprocessed images. The aim of this study is to evaluate if the application of PACE in dental radiology can be helpful to the clinician in the detection of anatomical and pathological structures.

Methods: in a first step, unenhanced OPT images were collected and analyzed. Next, PACE was applied to them, obtaining enhanced OPT images that were analyzed. Next, PACE was applied to them, obtaining enhanced OPT images that were analyzed. Finally, the data collected were compared. The analysis was based on the identification of anatomical and pathological structures present.

Results: the enhanced OPT images showed an improvement in quality, making details more evident. The number of lesions found in both types of images was coincident, but most anatomical structures and pathological lesions appeared with greater definition in the enhanced OPT images.

Conclusions: the application of PACE in OPT images could represent an advantage for the clinician, as it allows to simplify the identification of anatomical structures and pathological lesions, and to reduce OPT imager evaluation times.

STANNOUS FLUORIDE EFFECTS ON ENAMEL SCOPING REVIEW AND AN *IN VITRO* STUDY

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Aim: in recent years there has been a lot of talk about toothpastes with a particular chemical compound: stannous fluoride (SnF2). Its presence is currently still highly controversial. The different companies that produce toothpastes express its dosage in ppm. The purpose of this systematic literature review is to analyze all randomized clinical trials in the literature over the last 10 years and to draw clear results on the function of stannous fluoride.

Methods: the first analysis of the literature produced a high number of results, subsequently and following a manual analysis of the results, 26 manuscripts have been obtained. A SEM *in vitro* study has been performed to evaluate the efficacy of CLIADENT toothpaste.

Results: it could be shown that stannous fluoride does not present important contraindications, if not those commonly reported for fluorine. A meta-analysis on enamel loss has been conducted, it shows that SnF2 products provide better results with a $p < 0.05$ value., the *in vitro* study showed the efficacy of toothpaste on dentin.

Conclusions: this compound could have significant effects in favor of erosion and recalcification of the enamel, on the biofilm formation, gingival inflammation.

SYSTEMATIC REVIEW ON THE EFFICACY OF OZONE THERAPY COMPARED TO OTHER MATERIALS

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Aim: ozone, a triatomic compound, is significantly reactive. There are a lot of advantages about ozone therapy: pain-relieving, anti-inflammatory, antibacterial and tissue revitalizing action.
Methods: known as one of the most powerful oxidizing agents, ozone can react with other organic substances. This property gives ozone a powerful fungicidal and bactericidal activity; The antimicrobial action is given by its ability to damage the cytoplasmic membrane of the bacterial cells. Through its oxidizing properties, ozone acts by stimulating the activation of endogenous antioxidants, which have an anti-inflammatory effect, modulating the immune response of the surrounding tissues. The ozone can be applied to oral tissues in three forms: as a gas, water and olive oil. It is possible to associate ozone therapy with caries, OLP, gingivitis, osteonecrosis, post- surgical pain, plaque, hypersensitivity, joint disorders and whitening.
Results: scientific evidence demonstrates a better antibacterial effect: it has been reported that the
results of ozone therapy can be similar, if not even better than chlorhexidine, in terms of plaque and inflammation. The placement of implant, it can be positively influenced by the use of ozone therapy.
Conclusions: from the heterogeneity of all the studies performed, it can be concluded that ozone therapy covers many dental fields, with satisfactory results.

MECHANICAL AND BIOLOGICAL CHARACTERISATION OF 13 NEW 3D-PRINTED RESINS FOR PROSTHETIC USE

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Aim: to analyse the mechanical and biological properties of 13 additive manufacturing (AM) moulded dental resin materials to understand their prosthetic application in dentistry.
Methods: for each material, 6 specimens were moulded for mechanical analysis and 6 for biological characterisation (to perform repeatability of the tests).From the mechanical point of view, the specimens were studied by means of Dynamic Mechanical Analysis (DMA), to obtain the mean, uncertainty and p value of the Young's Modulus (E*). Each specimen was subjected to bending tests (Three-Point Bending test) with increasing frequencies (1-100Hz) and stress amplitude of 1N. Biologically, cytotoxicity was analysed using a yellow-purple colorimetric assay (MTT) for mitochondrial succinodehydrogenase (SDH) activity, performed at 3h and 24h.
Results: statistical analysis of E* shows a rather homogeneous trend for all materials, with the exception of FullCure 720. The materials tested above 21Hz seem to maintain similar E* and could therefore be used in the mouth, whereas they are more brittle from 1 to 11Hz. Considering uncertainty p value, the most accurate prints turn out to be: FDM, SLA and finally Polyjet.
Although the materials showed a highly significant reduction in viability ($p < 0.01$) at both 3h and 24h, the cells initiated a recovery of mitochondrial activity at 24h.
Conclusions: according to this study, most of the materials examined appear to be effective in clinical application. Future studies will focus on the clinical application of the materials to confirm the results obtained.

RELIABILITY OF MANDIBULAR TRAJECTORIES RECORDED WITH DIGITAL TECHNOLOGY: ITAKA

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Aim: the aim of the study is to evaluate the accuracy of the measurements of a digital movement detection system in gnathologically healthy subjects.

Methods: the preliminary assessment of the reliability of the instrument was performed on students of the Dentistry School of the University of Perugia.

Each subject was submitted to gnathological evaluation using the "Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) Clinical Examination Protocol, version: January 6, 2014". Subsequently, the non-invasive examination was performed to determine the mandibular movements. The data was processed using a Python code with which the calculation of the average values and standard deviations of the traces was performed.

Results: with this preliminary feasibility study was possible to create tracings and solid graphs of healthy patients to determine diagnostic criteria which establish, after instrumental examination with Itaka, the regular physiological function of the patient's gnathological situation.

Conclusions: based on the results obtained in the present study, the Itaka digital movement detection system appears to be reliable in the detection of mandibular tracts and in its diagnostic function. Studies on further variables that can influence the instrumental examination will follow.

FEM AND TSA ANALYSIS APPLIED TO FOUR DIFFERENT MATERIALS SECTIONS OF A CAD/CAM BARS

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Aim: the aim of this study is a FEM (finite element method) comparison, prior TSA (thermoelastic stress analysis) trial, between four posterior section of a CAD/CAM bars with a distal extension element with the same geometry, subject to the same load and constraint conditions, made with different materials: titanium, Co-Cr alloy, Polymethyl methacrylate (PMMA) and zirconium, milled by New Ancorvis srl; Bargellino, Italy and provided by Rhein 83 S.R.L, Bologna, Italy.

Methods: through engineering tools such as TSA, with which the titanium bar was tested, and FEM we could see the distribution of stress on the surface of the bar. Once the model was calibrated, it was used to analyze how the behavior of the same geometry varies depending on the material used for the realization. Experimental tests were made by an electrodynamical shaker and a thermal imaging camera to subject the part to a load at a known frequency and then to measure its deforming using TSA.

Results and conclusions: we could see that the stress distribution in that section of the bar is very similar between the two machines. The more ductile materials such as Co-Cr alloy and Titanium will have a more elastic response to a deformation caused on their surface, while the zirconium will have brittle behavior, that is reaching brittle failure as soon as it deforms. PMMA has a higher probability of entering a plastic field.

EFFECTS OF SALIVA ON ADDITIVE MANUFACTURING MATERIALS FOR DENTISTRY APPLICATIONS

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Aim: the aim of this study is to evaluate whether the effect of saliva influences the mechanical performance of 4 resin materials printed in additive manufacturing.

Methods: PEEK, Nylon 6 and Nylon 12 were printed by Fused Deposition Modeling (FDM) technique while PP by Selective Laser Sintering (SLS). For each material, six samples were tested, three immersed in a saliva solution for 24h prior to testing and three used as controls. The flexural strength test was carried out using the LLOYO LR 30K instrument with a force capacity of 30kN. The test ended automatically when the specimen began to plasticize. Finally, the average Young's modulus was calculated for each specimen.

Results: all samples confirm that saliva has a negative impact on Young's modulus except for Nylon-6. In this the uncertainty bands overlap although the mean value shows a decrease.

PEEK performs best in terms of elastic behavior with 1794.083 MPa while the worst result is given by Nylon-12.

Conclusions: the corrosive characteristics of saliva have a negative impact on the mechanical performance of these materials. PP shows the highest decrease among the samples as the SLS technology increases the porosity of the surface. PEEK presents a decrease in performance of only 3%, due to its hydrophobicity.

CASE REPORT OF A COMPLICATED CORONAL FRACTURE AND LATERAL DISLOCATION OF CENTRAL INCISORS

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Aim: dental traumas consist of accidental, minor or major events that frequently occur in children and young adults. The most common dental injuries of permanent teeth are crown fractures and dislocations.
The aim of this work is to describe the management of two central incisors that presented a complicated coronal fracture and lateral dislocation with apical dislocation after a road accident.
Methods: a young patient comes to our observation presenting: element 1.1 with complicated coronal fracture and element 2.1 with lateral dislocation with bucco-palatal inclination with subsequent buccal dislocation of the root apex and fracture of the alveolar process.
The choice of treatment complied with the guidelines of the International Association of Dental Traumatology (IADT): element 1.1 was positive to the vitality test (cryo-test), and a partial pulpotomy treatment was performed with bioactive cement (Biodentine) and permanent composite filling; element 2.1 underwent forced repositioning and splinting with passive wire for 4 weeks, followed by root canal treatment and permanent composite filling.
Results: after 12 months element 1.1 maintained its vitality and both elements are stable. After radiographic examination, there was no signs of pulp compromission.
Conclusions: the prevention of trauma complications is implemented with a therapy aimed at the recovery of the dental elements through correct diagnosis, prompt intervention and appropriate treatment and through proper follow-up.
The elements will be kept under control according to clinical and radiographic follow-ups to evaluate the success of long-term therapies.

CLINICAL APPROACH TO AVULSIVE DENTAL TRAUMA: A CASE REPORT

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Aim: aim of this case report is to record how to approach clinically an avulsive dental trauma of a superior central incisor of a 11 y.o. patient. The purpose of this analysis is to understand what kinds of risks can happen during the management of dental trauma, which requires specific operating sequence and the respect of clinical timing. This clinical case was reported and treated in the UOC of Paediatric Dentistry, Sapienza, University of Rome.
Methods: an 11 y.o. came in the UOC after an avulsive dental trauma on 1.1. The patient was just treated in the dental emergency room 2 hours after trauma. The tooth was replanted and splinted with an orthodontic flexible splint. After the execution of clinical and radiographic examinations, the endodontic treatment was done. The endodontic treatment was completed thanks to apical plug with MTA rrp (ProRoot MTA, Dentsply). A periapical state of inflammation required the execution of a $Ca(OH)^2$ medication in order to create a proper environment to complete the treatment with MTA rrp. The patient was placed on a follow-up program.
Results: the root canal filling and the restoration respected parameters of a good performance, such as shape, function and biointegration.
Conclusions: this event could be reputed as one of the most important emergencies. Knowing how to intervene drastically increases the predictability of the treatment. For that reason, it's important to better prepare the structures and the members of the staff as this type of trauma occurs quite often.

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CASE REPORT OF AN AVULSED AND REIMPLANTED CENTRAL INCISOR

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Aim: trauma involving the dento-alveolar region represent a frequent emergency in children and young adults in dentistry. Among others, one of the most serious issues is avulsion of permanent teeth, which stands for 0.5-16% of all dental injures. Nowadays the treatment of choice is represented by reimplantation of avulsed teeth but it also constitutes a major challenge in terms of long-term prognosis. The aim of this study is the clinical management of external root resorption of an avulsed and reimplanted maxillary central incisor.

Methods: a 9-year-old boy reported uncomplicated crown fracture and avulsion of tooth 11 and complicated crown fracture of tooth 21 due to trauma. Element 11 was reimplanted within 30 minutes after trauma. Three days later, both elements were diagnosed with pulpal necrosis and tooth 11 showed early external root resorption. Both teeth were endodontically treated and root canal filling was performed with apical plugs using calcium-silicate-cement that promotes deposition of mineralized tissue that inhibits the progression of resorption.

Results: at 6 months follow-up, root resorption appeared to have ceased. Clinical results 24 months after trauma were stable although signs and symptoms of ankylosis were observed.

Conclusions: in case of avulsed and reimplanted central incisor, immediate endodontic treatment and the use of calcium-silicate-cement after 24 months of follow-up appeared to inhibit the progression of root resorption.

DIAGNOSIS AND TREATMENT OF PYOGENIC GRANULOMA OF GENGIVA WITH RAPID GROWTH: A CASE REPORT

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Aim: an 8 years old male with HIV+ was visited at our Hospital because of a pedunculated gingival neoformation in correspondence with element 8.5, previously extracted, which caused discomfort while eating and bleeding. This lesion was characterized by rapid exophytic growth. Radiographically, there were no visible abnormalities and the alveolar bone in the region of the growth appeared normal.

Methods: patient was subjected to antibiotic prophylaxis. A laser-assisted excision of the lesion up to mucoperiosteum and including the edges was performed under local anesthesia. Compression hemostasis using tranexamic acid-impregnated gauze was executed. The excised tissue was sent to the Department of Oral Pathology for histological examination.

Results: the histopathological examination provided the diagnosis of pyogenic granuloma.
Differential diagnosis included Kaposi's sarcoma because of patient's HIV+.

Conclusions: pyogenic granuloma is distinguished from Kaposi's sarcoma due to the proliferation of dysplastic spindle cells, vascular clefts, extravasated erythrocytes and intracellular hyaline bodies, none of which are seen in pyogenic granuloma.
Though the term pyogenic granuloma is frequently used, it is not associated with pus and histologically it resembles angiomatous lesion rather than granulomatous lesion indicating that the term "pyogenic granuloma" is a misnomer.

MIXTURE OF TOPICAL PROBIOTICS IN THE NON-SURGICAL THERAPY OF GUM HYPERTROPHY IN A GIRL

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Aim: to report a case of gum hypertrophy in orthodontic patient treated with probiotics. Gingival hypertrophy is an inflammatory condition that often affects orthodontic pediatric patients. This condition can be favored above all by the presence of orthodontic wires and brackets on the teeth which represent local risk factors for the accumulation of plaque. Probiotics are defined as live microorganisms which, when administered in adequate doses, confer benefits on the patient's health by defending the oral cavity from a state of dysbiosis. The bacteria most commonly used as probiotics are lactobacilli and bifidobacteria.

Methods: a healthy 15-year-old patient undergoing fixed orthodontic therapy presented with an exophytic gingival lesion that has exceeded the equator of the tooth for about 2 months. Before submitting it to surgical removal it was decided to prescribe atopical probiotic therapy with *L. reuteri* and *S. salivarius*, 2 tablets a day, to be dissolved in contact with the gum, for a month.

Results: at the 15-day follow-up the lesion had reduced by more than half in volume and at 30 days it had almost completely disappeared.

Conclusions: *L. Reuteri* and *S. Salivarius* is able to induce changes in the subgingival and salivary microbiota by acting on the microorganisms involved in periodontal disease, especially on *P. intermedia* and *P. gingivalis*. The use of topical probiotics could be considered a valid alternative to surgery in cases of large gingival hypertrophy in orthodontic pediatric patients.

GOLDENHAR SYNDROME MANAEGEMENT - 2 CASE REPORTS

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Aim: to report 2 cases of multidisciplinary management of Goldenhar syndrome.

Introduction: oculo-auricolo-vertebral spectrum (OAVS) also known as Goldenhar syndrome is a rare congenital defect, that involves structures arising from the first and second branchial arches.

Anomalies include facial asymmetry, epibulbar dermoid or lipodermoid, zygomatic and/or maxillary hypoplasias, microfacial hemisomia, microtia and ear abnormalities, vertebral defects and cranio- facial deformities. Dental defects include delayed tooth development, agenesis of premolars and molars, enemal and dentin malformations.

Methods: a 10 year old boy, presenting OAVS, exhibites facial asymmetry, microfacial hemisomia, Angle class II malocclusion, multiple agenesis in upper and lower maxilla. An orthodontic therapy and an oral mucosa evaluation has planned to achieve a correct fonatory and chewing function. A 7 year old boy presented facial asymmetry, ear malformations, zygomatic process agenesis, jaw hypoplasia and jaw ramus agenesis. After maxillofacial surgery with bone graft from the VI e VII toracic rib, the scapula and the clavicle to recreate the conformation of the jaw ramus and zygomatic bone, a palatal plate (orthodontic removable system) had been used to guide mandibular growth, correct occlusion, reduce facial asymmetry and change tongue interposition.

Results: chewing and phonatory function was restored in these patients.

Conclusions: the interaction between the Pediatric Dentist and the other medical figures has proved to be a winning strategy in the management of these cases.

NATAL TOOTH IN A 7-DAY-OLD BABY: MANAGEMENT AND FEASIBLE LINK TO SYNDROMIC PICTURES

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Aim: to recognize syndromic pictures at early times.
Methods: a 7-day-old twin patient came to us from the Neonatology Department of Cagliari University Hospital for a white hard mass on the anterior inferior alveolar ridge. His brother showed no oral alterations. At objective exam we detected a small tooth, which had not created traumas on the soft tissues yet, and a thick white lesion on the lingual dorsum. To allow the baby to feed properly, a tooth extraction was scheduled.
Results: 1st week and 1st month follow up showed excellent tissue healing.
The white patina revealed removable; it was utterly removed with a gauze during the extraction and a diagnosis of localized mycotic infection was given, so the baby underwent topical antifungal therapy. Natal teeth are dental elements present at the time of birth, especially in the antero-inferior region (85%). They may lead to problems such as insufficient feeding, injury to the mother and development of traumatic ulcers. Management often involves early extraction. Syndromic pictures are associated with natal teeth: Riga-Fede Disease, Van der Woude Syndrome and Congenital Pachyonichia (CP) are some examples. CP embraces a group of autosomal dominantly inherited conditions showing signs of thickening like palmoplantar and follicular keratosis and oral leukokeratoses in the lingual dorsum.
Conclusions: due to the former considerations, we considered as differential diagnosis an initial CP picture in our patient. Currently there are no elements making us suspect a syndromic picture. The baby is still under control.

TELEDENTISTRY DIAGNOSIS IN PEDIATRIC ORAL PATHOLOGY: A CASE REPORT

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Aim: during the COVID-19 pandemic, the majority of dental visits or treatments were postponed. Many patients with non-urgent oral problems had to resort to teleconsultations with their dentists by sending images, thus providing an opportunity to evaluate problems and giving patients the ability to self-manage minor oral issues. This approach is called "teledentistry" a method already validated in literature. The aim of this study is to demonstrate how it was possible to diagnose and monitor an unconventional oral candidiasis case in a 9-year-old child using this method.
Methods: the patient's mother contacted the pediatric dentist via WhatsApp, sending photos and videos of the child's mouth and tongue and reporting the child's condition. Based on these elements, some possible diagnostic hypotheses were formulated but none completely fitted. An "observation" and "wait-and-see" approach was adopted for a few days, using online video telemedicine technology and messaging with a smart device.
Results: observing the evolution of the lesion allowed the diagnosis of oral candidiasis, a common superficial mycosis in the oral cavity. In children, the most common type is pseudomembranous candidiasis, characterized by white or yellow-white patches that can be removed. Topical therapy with miconazole nitrate, which was prescribed, was very effective for oropharyngeal candidiasis.
Conclusions: during the COVID-19 pandemic, teledentistry was essential for access to dental care and will be an important resource in the medical field also in the future.

ORAL MANIFESTATIONS IN KOOLEN DE VRIES SYNDROME: A CASE REPORT

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Aim: Koolen de Vries syndrome (KdVS) is a rare multisystem disease caused by genetic changes that eliminate the function of one copy of the KANSL1 gene in each cell. Affected individuals exhibit developmental delay, mild to moderate intellectual disability, congenital malformations and behavioural features. In the present case report, the case of a child with KdVS is presented.

Methods: X.V., a 4-year-old boy affected by KdVS, came to the Dental Clinic of San Paolo Hospital in Milan for a first dental examination. The patient has also epilepsy, severe cognitive delay and speech disorder.

Results: on extraoral examination, X.V. presents facial features typical of patients with the syndrome, such as eyelid ptosis, prominent ears, high and elongated forehead, descending labial cleft, epicantal folds and pear-shaped nose with bulbous nasal tip. The presence of mouth-breathing is also noted. On intraoral examination, the patient shows microdontia, increased overjet due to prolonged pacifier sucking, continuous until 3 years of age and then occasional until the time of the visit. Oral hygiene is inadequate with tartar accumulation, especially on the lower incisors. The treatment plan included oral hygiene instruction, calculus removal and a pacifier replacement device to break the sucking habit.

Conclusions: patients with rare syndromes should be included in a program of regular dental check-ups and preventive strategies to maintain oral health and intercept oral problems early.

MODERN DENTISTRY BETWEEN ADVANCED TECHNOLOGIES AND HUMANIZATION: CARIES MANAGEMENT

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Aim: modern dentistry is nowadays gaining ground even in the pediatric field, as it is associated with a more comfortable patient experience. The aim of the present study is to present a case managed with digital technologies.

Methods: L.M., dental phobic patient (12aa) complaining pain of left lower arch reported previous failed treatment attempts: Frankl's Behavioral Scale (FBS) score 2 at visit. After gaining his confidence through behavioural approach techniques, oral examination revealed a carious lesion in the left lower first molar.

To overcome the patient's dental fear, the following treatment plan was proposed: conscious sedation with nitrous oxide (digital machine), electronic anaesthesia, caries removal with Erbium laser, and composite restoration.

Results: computerized infiltration of anaesthesia, allowing the analgesic fluid to be adjusted and ensuring a constant low pressure over time, controlled the pain related to ignition. The Erbium laser, safe and effective for caries removal, allowed the cavity preparation in line with minimally invasive dentistry requirements due to its low depth of tissue penetration and ability to decontaminate infected dentin.

Conclusions: L.M.'s cooperation during the procedure achieved score 4 (FBS). The boy, relaxed and incredulous, requested intraoperative images that could demonstrate the infiltration of anaesthesia. The lack of vibration and the different noise produced by the Erbium laser made it more acceptable than rotary instruments. This case demonstrates that modern dentistry can offer paediatric patients with dental fear new treatment options.

MEDIAN RHOMBOID GLOSSITIS: A CASE REPORT

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Aim: median rhomboid glossitis is a condition caused by the overgrowth of Candida spp. that can occur due to a weakened immune system, the use of antibiotics or other factors that alter the balance of the ecosystem of the mouth. In children, it can cause discomfort or burning sensation in the affected area, resulting in difficulty eating or speaking. The purpose of this study is to facilitate early diagnosis of this condition by presenting a clinical case.

Methods: the 4-year-old girl arrived for an oral examination at the Conscious Sedation Department of the Milan Polyclinic. During the examination, a medial lesion was observed on the dorsal surface of the tongue. The patient was referred to an oral pathology specialist.

Results: the median lesion on the tongue, approximately 12 mm in size, was not painful to the touch and was compatible with median rhomboid glossitis. Treatment with topical miconazole (Daktarin 2%, Gmm Farma srl, Segrate, MI, two applications per day) was prescribed and a follow-up appointment was scheduled at 10 days.

At the follow-up appointment, the lesion was found to be healed and the patient reported no more symptoms, being able to eat and talk without discomfort. The drug treatment was well tolerated.

Conclusions: early detection of the lesion allows effective and timely treatment, sparing the young patient a prolonged period of discomfort and difficulty in normal activities.

AN INNOVATIVE APPROACH TO RESTORE PRIMARY TEETH: A CASE REPORT

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Aim: the purpose of this clinical case is to present an innovative technique to restore deciduous teeth with customized prosthetic crowns and minimal invasiveness.

Methods: a female patient of 9.6 years old in good general health presented to our clinic with carious processes affecting elements 6.4 and 6.5. Photographic and X-ray records and an intra-oral digital impression with the iTero Element™ Flex scanner were acquired during the first session. The scan was sent to the laboratory with the prescription and indications to make the customized prosthetic crowns in 600 MPa zirconia of the affected elements. In the second appointment was performed a minimal tooth preparation and the crowns were fixed with a dual composite-based and self-curing cement (Bifix® SE VOCO). Subsequently a follow-up X-ray was performed.

Results: the procedure allowed the restoration of deciduous elements through customized prosthetic crowns to be applied immediately after a minimal preparation of the same. The crowns presented correct dimensions, a good marginal adaptation and an adequate colour.

Conclusions: the technique proved to be a valid procedure to rehabilitate deciduous caries-affected teeth with customized prosthetic crowns through a digital workflow. It made possible to overcome the disadvantages of the conventional technique both in terms of operational time savings and comfort for young patients improving their compliance and maintaining at the same time the clinical advantages of other procedures.

EVALUATION OF OSA RISKS AND MALOCCLUSIONS IN A PATIENT WITH CANTU SYNDROME

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Aim: Cantu syndrome is a rare syndrome, with less than 30 cases described in the world, characterized by congenital hypertrichosis, osteochondrodysplasia, cardiomegaly and dysmorphism. The purpose of the present study is to assess the risk of OSA and malocclusions in a pediatric patient with Cantu syndrome.

Methods: a 12-year-old boy with Cantu syndrome, aged 12 years, was referred to the Pediatric dentistry department at the A. Gemelli Hospital for a complete dental evaluation. Caregivers were asked to complete the Italian version of the Pediatric Sleep Questionnaire (PSQ) in order to assess the risk of suffering from OSA.

Results: based on PSQ result, the patient did not present a significant risk of suffering from OSA.
From the orthodontic evaluation the patient presented dento-skeletal biprotrusion, dental molar and canine class III relationship on the right, dental molar and canine class I relationship on the left, mismatched midface and dental lines, anterior openbite and negative overjet. Atypical swallowing was also noted.

Conclusions: the case patient with Cantu syndrome is affected by dento-skeletal malocclusions, but has a low risk of OSA.

INFLUENCE OF FRENOTOMY ON BREASTFEEDING IN NEWBORNS WITH ANKYLOGLOSSIA AND ON MOTHERS' QOL

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Aim: ankyloglossia, resulting in restricted tongue movement, is a cause of breastfeeding difficulties and nipple pain in mothers. The literature is controversial regarding frenotomy. This study aims to evaluate the efficacy of frenotomy in facilitating breastfeeding, reducing maternal discomfort and maternal quality of life (QoL).

Methods: the study was conducted on 30 infants (19 M, 11 F) at the Maggiore Hospital in Bologna, Italy. 3 phases were planned for each patient: diagnosis, intervention and re-evaluation. In the diagnostic phase the 30 infants with class III, IV or V ankyloglossia were examined, a questionnaire assessing symptoms and sucking, swallowing and breathing coordination during breastfeeding and QoL was completed by the mothers. Pediatricians monitored infant weight and midwives assessed breastfeeding.
Frenotomy was performed in the intervention. At reassessment, 1 month after the intervention, mothers completed a second questionnaire to assess the benefits of frenotomy in terms of QoL compared with the pre-treatment period.

Results: at reevaluation there was significant improvement in all symptoms in both child and mother and in QoL, with increased growth in the infant.

Conclusions: frenotomy improves breastfeeding in infants with ankyloglossia, gives benefits on common lactation-related infections, dermatologic conditions and engorgement for mothers, reducing short-term pain.

ORAL HEALTH STATUS OF CHILDHOOD CANCER SURVIVORS AFTER ANTINEOPLASTIC THERAPY

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Aim: the aim of this cross-sectional study was to assess the prevalence and severity of dental alterations according to age at cancer treatment using the Modified Dental Defect Index (MDDI) and to explore the association between MDDI scores and caries experience in Italian childhood cancer survivors (CCS).

Methods: 93 CCSs patients sent to the Pediatric Dentistry Section of Dental School for routine checks were recruited from March 2019 to December 2022. All patients were treated with chemotherapy and/or radiotherapy and were in remission from at least 2 years. All participants were examined by a single operator for dental caries and enamel defects in the permanent dentition according to the decayed-missing-filled teeth (DMFT) index and the Aine rating scale. Dental abnormalities were diagnosed using panoramic radiographs and graded for severity according to MDDI. The MDDI values were categorized as normal (MDDI = 0), moderately abnormal (1 ≤ MDDI <16), and severely abnormal (MDDI ≥16).

Results: none of the enrolled children had normal MDDI score. MDDI and DMFT values were higher in CCSs submitted to cancer treatment before 5 years of age (54/93). A significant positive correlation emerged between DMFT and MDDI values (p <0.001). CCSs with moderately abnormal disturbances had statistically significant lower DMFT scores (p <0.001) than those with severe dental abnormalities.

Conclusions: these findings suggest that children in remission from malignant diseases with MDDI values ≥16 are at higher risk for poor dental health and should be strictly monitored by dental specialists.

CLEFT LIP-PALATE CHILDREN AND PARENTS PERCEPTIONS OF ORAL HEALTH-RELATED QUALITY OF LIFE

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Aim: the aim of this cross-sectional study was to investigate and compare the perception of Oral Health-Related Quality of Life (OHRQoL) of patients affected by cleft lip, with or without palate (CL±P), and their parents using the Child Oral Health Impact Profile (COHIP).

Methods: non-syndromic CL±P patients aged 8-14 years and their parents referred to Section of Pediatric Dentistry at University of Turin from December 2019 to March 2022 were recruited for this study. All patients and parents were asked to answer the COHIP questionnaire which includes oral symptoms, functional well-being, emotional well-being, school environment, and peer interaction referring to positive or negative children's experiences in the last 3 months. Age, gender, ethnicity, type and side of the cleft and parents' country of origin were noted and a statistical analysis were carried out.

Results: fifty-three CL±P children and their parents filled in the COHIP questionnaire: concordance between their reports was low to moderate.

Parents reported worst scores in the peer interaction (p = 0.033) and functional well-being domains (p = 0.005) and they overestimated the impact of unilateral (p = 0.047) and bilateral CL±P (p = 0.021) on OHRQoL than they children did.

Foreign parents were more bothered about peer interaction (p = 0.010) and school environment (p = 0.012) dimensions while Italian parents about the functional well-being of their children (p = 0.014).

Conclusions: according to our study results, parents cannot replace children in assessing their OHRQoL but can provide relevant complementary information.

DENTAL TRAUMATOLOGY IN CHILDREN: THE EXPERIENCE OF UNIVERSITY/HOSPITAL POLICLINICO OF BARI

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Aim: traumatic dental injuries are very frequent during childhood and adolescence (2 out of 3 children have suffered a dental trauma before adulthood). The aim of this study was to evaluate the traumatic dental trauma data in patients referred over a 2-year (2021-2022) period to the University of Bari (School of Dentistry, Clinics of Pedodontics) and compare with records emerging from international literature.

Methods: the study was based on the clinical data of 70 patients enrolled in our hospital in the period 2021-2022. Examining children by the same investigator the following information was recorded: age, gender, etiology, localization, place, number of injured teeth, type of trauma and treatment received.

Results: a total of 70 patients presented a total of 129 traumatized teeth (71 permanent and 58 primary). 45 boys (64%) and 25 girls (36%) with an age between 1 and 20 years participated in the study. The most common type of dental trauma recorded was luxation in primary teeth (40%), uncomplicated crown fractures in permanent (55%). The main causes were falls at home. The most frequent treatment was examination and relocation in primary (60%) and conservative treatment in permanent (37%) accordingly to the general guidelines reported in literature.

Conclusions: our results are similar to the data in literature. Sensitize dentists to develop greater attention to interceptive dental trauma in children appears fundamental. This is possible thanks to the correct information of parents and teachers, correcting the predisposing factors and preventing post-trauma complications.

THE TREATMENT OF THE NECROTIC IMMATURE TOOTH: PAST *VS* FUTURE. A LITERATURE REVIEW

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Aim: immature necrotic permanent tooth represents a challenge for clinicians. The etiopathogenesis of pulp necrosis can include: caries, trauma and dental anomalies. For their resolution, several therapeutic approaches have been employed: apexification with calcium hydroxide, apical plug with MTA and regenarative endodontic procedures. This literature review aimed to assess whether endodontic regeneration approach is an avalaible method in resolving this lesion.

Methods: a comprehensive search was carried out on electronic databases, including Pubmed, Google Scholar, Scopus, Web of Science and Cochrane. The following terms were searched individually and combined together: “Regenerative endodontic protocols”, “Immature teeth”, “Pulp necrosis”. Only studies published between 2014 and 2022. A total of 9 articles were included in the review.

Results: the studies analyzed have shown that true regeneration is not achieved with current protocols. The apexification and endodontic revascularization procedures have a comparable percentage of clinical success. The REG approach favors the root elongation and thickening of the dentin walls.

Conclusions: among all the techniques analyzed, pulp revascularitation is a promised technique thanks to its relative easiness of execution and the possibility of re-intervention in case of failure. The evidence for clinical recommendation of the regenerative approach is not strong, thus, further RCT studies with long-term follow-up should be conducted.

OSAS AND BRUXISM IN PEDIATRIC PATIENTS: FOCUS ON DIAGNOSIS AND QUALITY OF LIFE

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Aim: this narrative review aimed to evaluate the correlation between obstructive sleep apnea syndrome (OSAS) and sleep bruxism (SB) in pediatric patients, focusing on diagnosis and quality of life (qol).

Methods: a research was carried out on electronic databases, such as: Pubmed, Scopus, Web of Science, Google Scholar and Cochrane. The following "mesh terms" were searched individually and combined together: "Pediatric Bruxism", "Pediatric OSAS", "Sleep bruxism and OSAS in Children". This scientific search engines produced 47 results. Only 19, published from 2000 to April 2022, were included.

Results: 19 full-text articles were included in this narrative review. The presence of both OSAS and SB ranged in the sample analysed from 11.03% to 26.1%. The articles evaluated showed how an accurate clinical examination was the first step to perform a correct diagnosis, but it was insufficient. The patients' evaluations should include: tonsillar grading, evaluation of dento-skeletal discrepancies, cephalometric analysis etc. The polysomnography was the gold standard for diagnosis and severity assessment. OSAS and SB could cause short-term and long-term pathological consequences, impairing considerably the qol of the patients.

Conclusions: obstructive sleep apnea associated to bruxism in pediatric patient is a topic still debated, that needs further studies. The management of the two pathological disorders is multidisciplinary, and depends on etiology assessment. A correct approach to these associated diseases leads to prevent the complications involving the physical and intellectual children development.

MESIODENS: MINIMALLY INVASIVE MANAGEMENT OF A PEDIATRIC PATIENT

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Aim: mesiodens is a supernumerary tooth which occurs more often in the midline between the maxillary central incisors, as single, multiple, unilateral or bilateral and its morphology varies from conical or peg-shaped, to tuberculate or supplemental. The prevalence of mesiodens varies between 0.3% and 0.8% in deciduous dentition and 0.1% and 3.8% in permanent dentition, in a 2:1 gender ratio. Since mesiodens is more frequent in pediatric age, it is necessary to perform a minimally invasive approach, in order to limit dental fear anxiety and dental behaviour management problems, that most commonly occur in this age range. Aim of the present study is to provide a minimally invasive approach for the management of mesiodens in pediatric dentistry.

Methods: in a 9 year-old female, after the clinical examination, an instrumental examination was carried out, availing of Cone Beam Computed Tomography (CBCT). A minimally invasive surgical approach for both mesiodens was performed under local anesthesia and a full-thickness marginal vestibular flap has been set up. The surgical intervention has been conducted by the use of magnifying sistems, operating microscope and piezo-surgery.

Results: the clinical examination revealed a cone-shaped mesiodens on the palatal side of the upper central incisors. By CBCT a second supernumerary conic-shape tooth was revealed in the upper jaw. The minimally-invasive surgical approach allowed the use of a less amount of anesthetic, good bleeding control and hemostasis, less swelling, less tension of the wound margins and no evidence of wound infections. After a 3 months follow-up the surgical site showed good healing and the adjacent teeth responded positively to the vitality tests.

Conclusions: the minimally invasive approach in mesiodens represents a promising scenario in pediatric dentistry, trough which it is possible to achieve good healing and less intra and post operative complications. In addition, modern technologies such as piezo-sugery may improve the effectiveness of pediatric subjects' compliance, reducing dental fear anxiety or dental behaviour management problems. Further and wider studies may highlight the potential of a minimally invasive management for mesiodens in pediatric dentistry.

ECC AND BREASTFEEDING: A WORLDWIDE OVERVIEW

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Aim: to synthesise the current evidence for the association between prolonged breastfeeding and earlychildhood caries (ECC), taking a worldwide overview on different studies.
Methods: systematic review, meta-analyses and narrative synthesis on main scientific databases.
Results: the available scientific evidence showed that there is a correlation between breastfeeding and ECC, particularly when oral hygiene is not a common preventive measure. Moreover, frequency of feeding influenced the prevalence of ECC, also considering the number of nighttime feeding sessions.
Conclusions: extended breastfeeding is a protective factor for childhood caries under 1 year of age. By contrast, breastfeeding from 12 months onwards, in association with nighttime feeding and cosleeping, is considered a risk factor for ECC.

ORTHODONTIC BANDS IN MOLARS AFFECTED BY MIH FOR THE PREVENTION OF POST-ERUPTIVE BREAKDOWN

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Aim: this retrospective cohort study assessed the efficacy of orthodontic bands luted with glass-ionomer cement (GIC) in the prevention of dental caries and post-eruptive enamel breakdown (PEB) in first permanent molars (FPMs) affected by Molar-Incisor Hypomineralization (MIH) with extensive yellow-brown defects.
Methods: we retrospectively analyzed, as study group, dental records of children who received this preventive restauration on 22 FPMs free from caries and dentin breakdown (DB). Control group consisted of 22 FPMs with similar defects treated only with mineralization protocols. Primary outcome was “no need for restoration” due to dental caries or DB. Secondary outcomes were enamel breakdown (EB) prevention and plaque index (PI) reduction. Kaplan-Meier method was used to calculate 6-month, 1-year and 18-month survival probabilities.
Results: cumulative survival rates for study and control group were 100% *vs* 94% (S.E: 0.032) at 6-month follow-up and 98% (S.E: 0.022) *vs* 73% (S.E: 0.075) between 6- and 18-month follow-up. The difference between groups was significant (Log Rank test; $p < 0.001$). EB frequency was significantly higher in control group during each observation period. Study group showed a significant reduction in PI from baseline (p: 0.010; Friedman test).

Conclusions: luting orthodontic bands with GIC can be an effective approach in preventing dental caries and PEB in FPMs affected by extensive MIH defects. This preventive measure should be implemented during the early stages of eruption to maintain teeth in oral cavity and avoid complex restorative.

DENTAL TRAUMA IN CHILDREN WITH AUTISTIC DISORDER: A RETROSPECTIVE STUDY

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Aim: autism is a severe development disability characterized by impaired reciprocal social interactions, communication skills, and repetitive behavior patterns. The research article aims to estimate the oral status of autistic children, comparing it with non-autism patients.

Methods: a retrospective study was done that reviewed the oral health status of 70 patients, 35 autistic children and 35 patients without the autistic spectrum (≤15 years of age). Dental trauma type, periodontal tissue injuries, soft tissue lip injuries, different treatments carried out, associated soft tissue findings and disorders, and the long-term management were regarded as terms. All patients were selected consecutively.

Results: the enamel fracture was the most highly represented in both groups, followed by enamel/dentin/pulp fracture, root fracture, and avulsions in the autistic group, and by avulsions, root fracture, and enamel/dentin/pulp fracture in the non-autism patients. The comparison showed a statically significant difference ($P < 0.012$).

Conclusions: a more focused screening and precautionary interventions (e.g., reducing the increased overjet) should be done to prevent dental trauma. The most common treatment carried out was the composite restorative technique, and the long-term approach was managed through root canal therapy in the control group and through root canal therapy and extraction in the sample group.

CONSCIOUS INHALATION SEDATION WITH N_2O/O_2 IN CHILDREN: A RETROSPECTIVE STUDY

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Aim: demonstrate the efficacy of N_2O/O_2 in reducing anxiety and increasing children's cooperation during pedodontic treatment.

Methods: 371 children aged 4 to 10 years were enrolled. Two appointments were established for each one: the first cognitive of the environment and procedure, the second for conservative treatment on deciduous with the aid of the dam and administration of N_2O/O_2 for a maximum of 30 minutes.

At first, it was administered 100% O_2 and N_2O gradually increasing the concentration by 10% every two minutes up to 35%.

At the end of the treatment, 100% O_2 was administered for 5minutes. The child's comfort and cooperation were assessed with reference to the Venham Scale before treatment(t_0) at the end of induction (t_1) mand during the procedure (t_2).

Results: in older children, cooperation increased significantly from t_0 to t_1 and t_2, while in younger children, lower levels of cooperation were obtained at t_0. None of the children lost consciousness, over 97% reported no side effects, while the remaining 2.7% reported transient effects. No difference was also found between females and males, while there is significant difference between the two age groups in relation to Venham score.

Conclusions: N_2O/O_2 administration has been shown to reduce anxiety and pain in children by promoting excellent compliance. However, subjects with severe anxiety, who resisted administration due to uncooperative behavior, were identified, defining the need for further studies on randomized control groups.

EVALUATION OF RELATIONSHIP BETWEEN ODONTOPHOBIA AND PAIN EXPERIENCE IN PEDIATRIC PATIENTS

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Aim: dental fear or anxiety (DFA) is a normal emotional reaction to some specific stimulations in dentistry, experienced as threatening. When it becomes excessive to the real threat hindering the performance of regular activities, it could lead to dental phobia (DP). Pediatric patients are more inclined to DP, as dentists it is important to establish a relationship of mutual trust that can calm the state of anxiety and fear in the child, preventing the latter from becoming a phobic adult.
The aim of this study is to investigate the correlation between odontophobia and odontalgia, to realize how much pain affects the development of DFA and therefore how much, a careful dental prevention program, can avoid the risk of onset fear of the dentist.

Methods: 84 patients of the Pediatric Dentistry Service of UOC the Dentistry and Odontostomatology AOU "G. Martino" Messina in October-March 2022/23 were examined. Each patient was given the following self-assessment psychometric tests: CFSS-DS, MCDAS and VAS.

Results: the average scores achieved are all lower than the limit values considered: 30.28, 17.25, 17.5. The relationship between odontalgia and odontophobia varies significantly between tests, with a higher correlation for the VAS scale (2:1) followed by the MCDAS test (3:1) and the CFSS-DS (5:1).

Conclusions: despite the high number of patients with odontalgia tested, the three psychometric scales used revealed a low percentage of odontophobic patients.

CONSERVATIVE TREATMENT OF CONDYLAR FRACTURE IN PAEDIATRIC PATIENTS: A CASE REPORT

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Aim: maxillofacial trauma seldom affects children under the age of 5, and because of the potential for adverse effects on mandibular growth and dentition development, these patients require different treatment modalities than adults. In this case report, a condylar fracture in a 3-year-old kid was treated conservatively using functional device.

Methods: a 3-year-old boy, following an accidental fall, presented mandibular fractures on CT scan: on the right there was a compound paramedian symphyseal fracture, and on the left, there was a decomposed condylar fracture with condylar neck raised and the head displaced inferomedially. The dysfunction resulting included an initial buccal opening of 2.4 mm and laterodeviation to the left. Given the patient's age, a conservative approach was preferred. Bite raisers were applied to repeat the median and resolve the dysfunction. Following their removal, an AMCOP preformed appliance was provided to stabilize the outcome and enhance masticatory function. It was worn every night and for an hour during the day. Follow-up was performed monthly.

Results: the dysfunction was corrected, and the final buccal opening was 4.8 mm after 1 year of functional treatment. The choice of the preformed appliance was motivated by impossibility of taking an impression due to his small buccal opening.

Conclusions: condylar fractures in children may have major consequences such as ankylosis, mandibular development restriction, and temporomandibular dysfunction. To restore optimal function and encourage condylar remodeling, treatment must be timely and appropriate.

CRANIO-FACIAL FEATURES IN A PATIENT WITH PIERRE ROBIN SEQUENCE. A CASE REPORT

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Aim: Pierre Robin sequence is characterized by micrognathia, glossoptosis with consequent airway obstruction, and cleft palate. The purpose of this work is to describe the cranio-facial features of a child with Pierre Robin sequence.

Methods: an 11-year-old patient afferred to Dentistry Department of the Policlinico of Bari. The patient had been diagnosed at birth with Pierre Robin sequence since he presented a micro-retrognathia, cleft palate and respiratory failure. Genetic analysis detected a partial duplication of chromosome 13 long arm. He underwent palatoplasty surgery in 2013. An anamnestic questionnaire and intra- and extra-oral assessment were performed and OPG X-ray and latero-lateral cephalogram were requested.

Results: clinical examination showed motor, cognitive and speech delay and breathing disorders. Extraoral *inspection* revealed oral respiration, atypical swallowing, labial incompetence, reduced height of the lower third of face and convex profile. Intraoral analysis revealed atypical swallowing, transversal contraction of both arches, V-shaped upper arch, increased overjet. Agenesis of 45 and 55 was observed at OPG. Cephalometric analysis showed skeletal class II, small mandibular size and hyperdivergent growth pattern.

Conclusions: patients with Pierre Robin sequence have cranio-facial abnormalities with aesthetic and functional implications and require careful treatment planning.

ORTHODONTICS CHARACTERISTICS IN A PATIENT WITH NOONAN SYNDROME: A CASE REPORT

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Aim: Noonan Syndrome is a rare autosomal dominant disorder of the disease group generally known as RASopathies as associated to the RAS gene mutation. Patients affected may present a highly variable phenotypic expression, that additionally changes with age. The most common diseases associated to NS are pulmonic stenosis, cryptorchidism, cognitive and language delay, bleeding tendency, although the main clinical signs are orthopedic and orthodontic dysmorphisms. People with NS are characterized by hypertelorism, jutting eyes, descendent eyelid, depressed root of the nose, cavities, periodontal lesions and odontogenic keratocysts.

Methods: we described a case referred to our observation in 2022; the patient was a 12 y.o. and presented multiple diseases in different organs, systems and specific orthodontic characteristics.

Results: patient showed sensorineural hearing loss, III grade chronic kidney disease and bicuspid aortic valve; as for the orthodontic characteristics, the patient presented a flattened cranium, classified as brachycephal cranium, and cephalometric analyses highlight an ANB >5°, a SNA >83° and a SNB <78°; also, maxillary protrusion and mandibular retrusion, that classify the maxillary-mandibular relationship as Angle II class, and the upper-lower incisor relationship as open-bite with overbite reduction.

Conclusions: NS patients generally need of a multidisciplinary approach and treatment for systemic diseases, while for the orthodontics problems a first phase of functional treatment, also using the patient's residual growth, and a second phase with braces is generally recommended.

GUM HYPERTROPHY IN AN ORTHODONTIC PATIENT TREATED WITH TOPICAL PROBIOTICS *L. REUTERI*

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Aim: the aim of this work is to document a case of gum hypertrophy in an adolescent patient in fixed orthodontic therapy successfully treated with the use of topical *L. reuteri.*

Methods: a 13-year-old female patient in good systemic health, wearing a fixed appliance with brackets, presented with gingival inflammation, edema and bleeding. Conventional etiological therapy associated with antibacterial mouthwashes had not improved the clinical picture. Treatment with topical *L. reuteri* probiotics was therefore evaluated. At t_0, after recording the clinical periodontal parameters, instructions were given for accurate oral hygiene (OH) standards and after deplaquing, the probiotics *L. reuteri* DSM 17938 ATCC PTA 5289 was applied in suspension on the gum hypertrophy and left to act for 5 minutes. *L. reuteri* in cpr 2 vv/day was prescribed for 4 weeks. The tablets had to be dissolved in the oral cavity after OH, avoiding drinking, eating or rinsing the mouth for the next 60 minutes. In the second, third and fourth sessions, scheduled for one (T1), two (T2) and four (T3) weeks, the periodontal clinical parameters were re-evaluated.

Results: Gum hypertrophy at the four-week follow-up was 90% regressed. Baseline, Full Mouth Plaque Score (FMPS) was 89%, four weeks later it was 3%, and bleeding on probing (BOP) from 32% decreased to 2% at one month.

Conclusions: The treatment of gum hypertrophy in orthodontic patient, with topical probiotics, was found to be effective safe and without side effects. Studies with a larger sample size and more follow-up are needed to confirm this finding.

A SIMPLE SOLUTION TO SOLVE A COMPLEX PROBLEM

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Aim: the rapid palate expander (RPE) is a widely used orthodontic device, extremely versatile and easy to use. This case report shows a retained upper right canine, resolved thanks to the extraction of the corresponding primary tooth and the use of a RPE.

Methods: the patient is a 9.7 years old female in mixed dentition, second class II division, cervical stage 1 according to Franchi e Baccetti with a retained 1.3. Initial extra and intra-oral photographs, orthopantomography of the dental arches, teleradiography of the skull in latero-lateral projection and cone beam CT with reduced field of view (FOV) were performed.

The angle formed by the long axis of the retained canine with the medial line was measured on the panoramic: this value was found to be 64°. A RPE cemented on the sixths was used. The deciduous teeth 53 and 63 were extracted. The design of the device consisted of palatal arms forward up to the deciduous fifths and a vestibular arm equipped with an eyelet ready to act as a point of support for the disinclusion of 13, in case of eruptive failure.

Results: fortunately, the vestibular arm was useless since 1.3 showed improvements in position and eruption pattern 1 year after the cementation of the RPE, as documented by the final intraoral x-ray.

Conclusions: this interceptive intervention made it possible to simplify the orthodontic case which, otherwise, would have found a favorable substrate for evolution into inclusion, ectopia or transposition, including the risks associated with much more complex therapies, such as ankylosis and root resorption.

USE OF MINISCREWS AS ORTHODONTIC ANCORAGE: A CASE REPORT

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Aim: miniscrews represent an intraoral but extradental skeletal anchorage and required less patient compliance. The purpose of this study is to present a case of correction of a Class III malocclusion using miniscrews as a skeletal anchorage.

Methods: we present a 10-year-old girl in dynamic growth phase, skeletal class III, high angle malocclusion with retracted premaxilla, transversely contracted upper jaw, molar and premolar mesialization, negative overjet, at the end of permanent teeth eruption except for second molars but with retained upper canines for lack of space for eruption, crossbite of incisors.
Examinations performed: facial and intraoral photographs, orthopantomography, teleradiography in postero-anterior and latero-lateral projection, cephalometric tracings and maxillary cone beam.
The treatment plan included the application of an orthodontic device for hybrid palatal expansion, anchored on 2 paramedian palatal miniscrews and dental support for custom bands, nickel titanium springs for detachment of first molars, class III orthopedic elastic bands with anterior hooks, and Delaire mask.

Results: after 1 year and 10 months from the start of treatment, palatal augmentation in transverse diameters and modification of the negative overjet to positive values was obtained. Space for correct positioning of the upper canines was obtained. Vertical plane correction still needs to be improved.

Conclusions: the improvement of malocclusion by the use of miniscrews can be considered a viable alternative to traditional orthodontic appliances.

MARSUPIALIZATION OF A DENTIGEROUS CYST AND SUBSEQUENT DENTAL ERUPTION: A CASE REPORT

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Aim: dentigerous cyst is the second most common cyst in the jaws. Almost all dentigerous cysts enclose the crown of a tooth, and the radiolucent area is attached to the tooth at the cementoenamel junction. It occurs due to the accumulation of fluid between the crown and the follicular epithelium. Management of dentigerous cysts is by enucleation of the cyst and removal of the associated unerupted tooth. If the path to eruption is favorable, the tooth may be left in place. Large cysts with extensive destruction of the mandible are managed by marsupialization.

Methods: an 8-year-old boy shows on oral inspection agenesis of 3.5, motility of 3.4, caries of 7.5, 3.3 and unerupted 3.4. Radiographic examination identified a large mandibular cyst involving unerupted 3.3 and 3.4. Swelling but no pain was present. Surgical treatment was performed with tooth extraction of 7.4 and 7.5, decompression with opening of the cyst cavity and removal of the cyst roof for histological analysis, and marsupialization with placement of a drainage in the region of 7.5 that protruded into the cyst cavity and was anchored externally to the gingival mucosa.

Results: two months after surgery, drainage removal was performed. The rearrangement of the bone was visible on radiograph with partial eruption of 3.4. Six months after surgery, coronal eruption of 3.4 and partial eruption of 3.3 was visible on oral inspection.

Conclusions: marsupialization of a large mandibular cyst allowed recovery of two permanent teeth in a pediatric patient.

COMPOUND ODONTOMA ASSOCIATED WITH IMPACTED CANINE IN A PEDIATRIC PATIENT: A CASE REPORT

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Aim: odontomas are considered hamartomas or tumor-like malformations composed of dental hard and soft tissues. They are generally asymptomatic, often associated with delayed exfoliation of primary teeth, delayed eruption, or impaction of permanent teeth. The aim of this study was to describe the surgical treatment of a compound odontoma, associated with retention of 4.3 and persistence on the dental arch of 8.3 in a pediatric patient.

Methods: a 13-year-old girl presented at the Pediatric Dentistry Department of the University Hospital, "Federico II", Naples, Italy, for routine dental care. An orthopanoramic examination revealed the presence of a compound odontoma, impeding the eruption of 4.3. The cone beam CT provided more information about the localization in the parasymphyseal region of mandible, between the roots of 4.2 and 4.4. The treatment consisted of surgical removal of the odontoma under local anesthesia. A full-thickness flap was raised, bone was removed on vestibular side and the compound odontoma was exposed and enucleated. The extraction of 8.3 was also performed. The crown of 4.3 was exposed and anchored. The flap was repositioned and sutured.

Results: the postoperative period was uneventful. The patient was referred to the orthodontist to continue the treatment. The follow-up was done at 1 week, two weeks, 3 and 6 months, showing no complications or recurrence.

Conclusions: early detection of odontoma allows a less complex treatment and ensures better prognosis, increasing the possibility of preservation of the impacted tooth.

PULP POLYP IN TRAUMATIZED PRIMARY UPPER INCISOR IN A TODDLER: A CASE REPORT

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Aim: pulp polyp, also called hyperplastic pulpitis, is a pulp, characterized by the overgrowth of granulation tissue within the pulp chamber. It typically occurs in teeth with extensive caries or as a result of dental trauma and is more commonly observed in young patients. The condition can lead to various clinical manifestations such as pain, sensitivity, and discomfort. The aim of this study was to describe the diagnosis and management of a pulp polyp subsequent to a traumatic intrusion associated with a corono-radicular fracture of 5.1 in a toddler.

Methods: a 15-month-old toddler presented with his parents at the Pediatric Dentistry Department of the University Hospital, Federico II, Naples, Italy, after a trauma that had occurred 2 months before. The chief complaint was difficulty eating and discomfort. Clinical examination revealed a corono-radicular fracture of 5.1, accompanied by a pulp polyp, which required prompt management. It was decided to extract the upper right primary incisor. The extraction was performed under local anesthesia, and the patient was discharged with post-operative instructions.

Results: the patient's symptoms resolved without complications. The healing process was uneventful and regular follow-up appointments were recommended.

Conclusions: dental trauma can also be associated with the development of pulp polyp, resulting in significant functional impairments and discomfort.

Extraction of the affected inflammatory response of the dental tooth can be a successful treatment option in very young patients.

SUPERNUMERARY TEETH IN A PEDIATRIC PATIENT: CLINICAL MANAGEMENT

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Aim: Supernumerary teeth (ST) refer to an excess number of teeth compared to the normal dental series. They are frequently associated with syndromes, but multiple ST in individuals with no other disease or syndrome are very rare. The aim of this case report was to describe the clinical management of two included ST in a pediatric patient.
Methods: a 12-year-old boy presented at the Pediatric Dentistry Department of the University Hospital "Federico II", Naples, Italy, with the chief complaint of dental *crowding*. The panoramic radiograph revealed the presence of two included ST, localized in the maxillary anterior region and in close proximity to the floor of the right maxillary sinus, respectively. To study their relationship to the adjacent teeth and other anatomical structures, a cone-beam CT examination was performed. According to the orthodontist, it was decided to extract only the supernumerary tooth located in the anterior region. A palatal semilunar and paramarginal flap was raised from right upper canine to left upper canine. Then, an osteotomy was performed and the supernumerary tooth was removed. The flap was repositioned and sutured.
Results: the post-operative follow-up visits showed no complications and the surgical site healed well within two weeks.
Conclusions: management involves surgical extraction, which can be challenging in certain complicated cases, owing to the risk of injury to the surrounding anatomical structures. Any treatment decision for unerupted ST removal should be assessed and considered individually for each case.

NATAL AND NEONATAL TEETH: SIX CASES WITH A MULTIDISCIPLINARY APPROACH

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Aim: neonatal teething is a phenomenon that can be a cause of feeding problems, traumatic ulceration of the ventral surface of the tongue and risk of tooth inhalation, so early diagnosis is important. This case series aims to illustrate six cases of neonatal teeth treated under sedation for tooth extraction.
Methods: six clinical cases referred to the Neonatology Department of the Maggiore Hospital in Bologna are presented. Four patients are term infants and two are preterm infants. The first dental examination was performed in the infants' first days of life during postpartum hospitalization. The site, clinical appearance and degree of mobility of the teeth were evaluated. Family history and health condition of the mothers were also investigated. The treatment plan consisted of tooth/teeth extraction under sedation followed by histological examination of the extracted tooth(s).
Results: six infants with a total of 12 natal or neonatal teeth were identified (F,4; M,2). All teeth were in mandibular incisor position (100%). No significant differences were observed between males and females in tooth morphology, family history or physical condition of the mother before delivery.
Conclusions: a pediatric dentist should be able to diagnose neonatal and early teeth, provide effective management and treatment in cases requiring extraction in close collaboration with neonatologists and pediatricians.

PASSIVE SMOKING AND PEDIATRIC DENTAL CARIES

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Aim: smoking indoors is harmful to both the smoker and those around them through passive smoking. Children are particularly at risk of health issues due to their developing bodies being constantly exposed to secondhand smoke. One of the potential consequences of passive smoking is dental caries, as the chemicals released from secondhand smoke can affect the mineralization of developing teeth. The aim of this study is to investigate the effect of passive smoking derived from traditional cigarettes and "heated-tobacco" cigarettes (IQOS) on children dental caries.

Methods: this study involved 300 patients, aged 3-6 years old. One single trained Dentist performed the initial visit and collected data on patients' medical history, including dietary habits. The collected data included questions about exposure to smoke and the number of cigarettes smoked daily by family members and the children DMFT. The study analyzed data from three groups of 100 patients each, categorized by family members' smoking habits (non-smokers, traditional cigarette smokers, and IQOS smokers). The data were collected at a pediatric dental clinic in Borgo Cavalli, Treviso, belonging to the University of Padua.

Results: the statistical analysis did not show any significant differences in dmft among patients with non-smoking family members compared to those with family members who smoke IQOS or traditional cigarettes. The literature on passive exposure to IQOS smoke is still limited, and no studies have yet investigated the correlation between passive smoking and caries in deciduous teeth.

Conclusions: although our study did not find any correlation, it is crucial to increase parental awareness regarding their children's oral health. This can be achieved by providing education on pediatric oral hygiene and encouraging regular visits to dentists and dental hygienists from an early age.

USE OF SILVER DIAMINE FLUORIDE: A SURVEY OF ITALIAN DENTISTS' KNOWLEDGE AND BEHAVIOUR

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Aim: to evaluate educational experiences, knowledge, and professional behaviour of Italian dentists in relation to SDF.

Methods: a cross-sectional survey was performed, using a pre-tested and validated questionnaire that was distributed online.

Results: 2733 dentists responded, more than half had over 20 years of work experience. The survey revealed that 6.99% of the respondents received adequate education on the use of SDF during undergraduate studies, 8.47% during post-graduate studies but the majority through online resources, publications, and continuing education courses. A minority of them had good knowledge of SDF use to treat hypersensitivity (18.81%), caries in children (21.45%), and caries in adults (15.30%). Interviewees consider SDF use a proper treatment for non-cavitated caries lesions (62.81%), cavitated enamel lesions (61.92%), cavitated dentine lesions (40.96%), and root caries lesions (37.19%). SDF was also considered as an alternative for treating caries in uncooperative patients (59.50%) and special-needs patients (44.49%). However, only 6.36% of the respondents reported using SDF often/very often to arrest lesions in primary teeth, although 73.51% planned to use it in future. The multivariate analysis showed that dentists who are aware of SDF use in the treatment of caries in children and adults are 2.57 and 1.57 times more likely to use SDF in their clinical practice ($p < 0.01$).

Conclusions: results indicates that Italian dentists require further education on SDF usage to increase its use.

LONG TERM EFFECT OF CANCER THERAPY ON ORAL HEALTH IN CHILDHOOD: A PROTOCOL STUDY

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Aim: the present protocol study aims to investigate the long-term adverse effects on dental and orofacial structures development of anticancer therapy in childhood. In addition, the impact of a prevention program on the oral health status and the quality of life of patients during their hospital stay will be studied.

Methods: an observational case-control and a prospective study will be conducted. Patients enrolled will be categorized in 3 groups: cancer survived children, unaffected children and a prospective group with cancer. Patients will be enrolled at the dental clinic of IRCCS G. Gaslini children's hospital. After consent is obtained, parents/caregivers will be asked to fill the Early Childhood Oral Health Impact Scale and Parental-Caregivers Perception Questionnaire to assess their children's quality of life. Oral examination will be conducted in order to assess caries experience, enamel developmental defects, periodontal health and orthodontic status. If not already available, an orthopantomography will be performed on all children aged six years or more, and a salivary sample will be taken for laboratory analysis of salivary biomarkers.

Results: the data collected will be analyzed to understand the long-term effects of different protocols of anti-neoplastic therapy on oral health, compared to healthy controls. The potential prevention of some adverse effects through an oral health program will be assessed.

Conclusions: the findings may be of clinical relevance in developing suitable strategies for prevention and clinical management of oral diseases in childhood cancer survivors.

ORAL HEALTH STATUS IN CHILDREN WITH RARE DISEASES: A RETROSPECTIVE STUDY

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Aim: children with rare diseases may experience oral health problems due to genetic, metabolic, and immune system abnormalities. The aim of this study was to investigate the oral health status in a pool of pediatric patients affected by rare diseases.

Methods: data from pediatric patients, affected by rare diseases, who underwent a dental visit at the Pediatric Dentistry Department of the University Hospital "Federico II", Naples, Italy, between 2019 and 2022 were recorded.

Results: 190 pediatric patients (109 males and 81 females) (mean age 9.00±4.76), suffering from rare diseases, were visited. 68 patients were affected by congenital malformations or genetic syndromes; 18 patients presented with peripheral and central nervous system alterations; 13 patients suffered from immune system diseases; 12 patients had blood pathologies; 11 patients were affected by rare metabolic conditions; 11 patients presented with skin, eye, respiratory, gastrointestinal diseases; 57 patients suffered from rare diseases still awaiting diagnosis.

Among these, 149 patients were affected by caries; 89 patients showed gingivitis; 30 patients showed dental anomalies. Patients in primary dentition showed higher prevalence of caries, while patients in mixed dentition showed higher prevalence of gingivitis.

Conclusions: pediatric patients affected by rare diseases are at a significantly higher risk of experiencing oral health problems. It is crucial to integrate routine dental visit and preventive interventions into their overall management to improve oral health outcomes.

MAXILLARY CHANGES AFTER TREATMENT OF FUNCTIONAL POSTERIOR CROSS-BITE USING ELASTODONTICS

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Aim: the present study aimed to evaluate changes in maxillary arch and palate morphology in subjects with functional posterior cross-bite (FPXB), using elastomeric appliances, in a retrospective cohort of subjects in early mixed dentition.

Methods: the sample of this retrospective study included 39 subjects: 25 subjects, representing the treatment group (TG), received the activator AMCOP Integral/Basic; 14 subjects, representing the control group (CG), were subjects who postponed orthodontic treatment for 12 months due to the Sars-COV-2 pandemic.

Two intraoral scans were performed before treatment (T_0) and after 12 months (T_1) and the transverse dimension of the palate was calculated measuring the intermolar width (EMW) and the intercanine width (ICW), including emi-lateral measurments. Model superimposition and digital surface analysis was used for morphological evaluation. All data were statistically analyzed.

Results: all subjects showed clinical correction of the FPXB. At T_1, subjects in the TG showed a significant increase in ICW and IMW and a reduction in the differences in eICW and eIMW between both sides. They also show an increase in the percentage match, indicating a recovery of the palatal asymmetry. No significant changes were found between T_0 and T_1 in the CG.

Conclusions: EAs allowed correction of FPXB. An asymmetric pattern of palatal growth was found and located in the dento-alveolar process; such asymmetry significantly improved by the use of EAs, which ensure a restoration of the harmonious development of the palate.

TREATMENT APPROACH TO PRIMARY INTRUSIVE TRAUMA AND ITS COMPLICATIONS: A SCOPING REVIEW

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Aim: dental trauma often represents first approach of the pedodontic patients with dentists. Intrusive luxation is defined as the dislocation of the element deeper into the alveolar socket; its prevalence is about 20% of TDIs on primary teeth with a mean age of 2-3 years old; Aim of this review is to evaluete protocols treatment of Intrusive post-traumatic's issues such as local complications or delayed sequelae on permanent dentition.

Methods: the research was conducted from November 2022 to March 2023, based on PRISMA protocol, using various databases as PubMed, Medline, Scopus, Web of Science, applying idoneous inclusion criteria and using proper keywords: traumatic; intrusion; deciduous theeth; children.

Results: initial screening of databases, including the keywords, provided 167 articles, whom only 15 fully respected the inclusion criteria. The results showed that spontaneous re-eruption occurs between 4 months to 1 year range; Permanent theeth are exposed to high risk of anomalies as a consequence of primary trauma.

Conclusions: "Watch and wait" approach for spontaneous re-eruption or immediate extraction due to high risk of impacting the tooth bud are the election treatments. Nearly one-third of re-erupted deciduous shows complications such as pulp necrosis or ankylosis within the first year, an amount of injured teeth do not re-appear at all; It is therefore important to underline the lack of guidelines or scientific studies concerning management of follow-ups after first approach choice and the necessity of standardized protocol not based on empiric experience.

CARIES RISK ASSESSMENT IN PATIENTS WITH CLEFT LIP-PALATE: CASE-CONTROL STUDY

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Aim: Orofacial clefts (OFC) are the most common craniofacial anomalies. Clefts can be unilateral, bilateral, complete, or incomplete, and may involve the lip only (CL), the palate only (CPO), or both (CL/P). The aim of this study is to determine the caries risk in patients with cleft lip-palate.

Methods: 40 patients (20 patients with orofacial clefts, 20 without pathologies), followed by the Section of Pediatric Dentistry at Dental School-University of Turin, aged 5-10 years. A dental examination was conducted for each patient, with evaluation of the Decay, Missing and Filled Deciduous Teeth (dmft); Decay, Missing and Filled Permanent Teeth (DMFT) and the modified Quigely Hein Index (QHIm). Salivary tests were performed, aimed at measuring the amount of stimulated salivary flow, buffer capacity, salivary pH, *S. Mutans* and *Lactobacilli* counts. The data collected were processed using the Cariogram software.

Results: *S. Mutans* values higher than 10^5 CFU were detected in 60% of the OFC group and 10% in the control group. The buffering capacity of the cleft group (6.9±3.0) is reduced compared to the control group (9.6±2.8). Based on the Cariogram analysis, 25% of patients in the cleft group have a high probability of avoiding caries in the future, compared with 50% in the control group.

Conclusions: our study shows that OFC patients have higher risk of developing caries in the future; they must be followed up by practitioners with greater attention, through close follow-up sessions, correct oral hygiene instruction and applications of topical fluoride products.

ORAL HEALTH IN ADOLESCENTS DEALING WITH EATING DISORDERS: EPIDEMIOLOGY AND SELF-PERCEPTION

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Aim: to evaluate the oral manifestations in eating disorders (ED) affected adolescents, the association between oral lesions and different ED and patients' self perception about oral health.

Methods: patients aged 10-18 years, referred to the Dental Clinic by the neuropsychiatrist after ED diagnosis, were visited to collect data about their oral health. ED affected adolescents also completed a questionnaire regarding previous dental experiences and their perception of their smiles through the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ).

Results: 29 adolescents (96% F, 4% M, mean age 16 years) were included in the study. 79% of them were diagnosed with anorexia nervosa (AN), 7% with bulimia nervosa (BN), 14% with other ED. 17% reported self-induced vomiting (SIV) as purging behaviour. SIV patients presented worse oral health conditions: higher DMFT (3.6), higher prevalence of dental erosion (40%), xerostomia (60%), parotid hypertrophy (25%) and morsicato buccarum (40%) compared to non-SIV. All patients used to go to the dentist regularly and the majority (72%) considered oral health important for general health.

However, only half of them had a dental visit after ED diagnosis and judged their dentist's knowledge about their disease limited. Regarding their self-perception, AN-affected patients were more comfortable with their smile than BN and other ED-affected ones: PIDAQ scores were 27, 39 and 35, respectively.

Conclusions: adequate knowledge of the possible oral manifestations of ED is fundamental to approach and treat the affected adolescents properly.

ORO-DENTAL TRAUMA IN A NORTHEASTERN ITALIAN PEDIATRIC HOSPITAL: AN EPIDEMIOLOGICAL STUDY

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Aim: this study aims to describe the prevalence and features of oro-dental traumatic lesions in paediatric patients referred to the Dental Clinic of the IRCCS "Burlo Garofolo", Trieste.

Methods: this retrospective epidemiological study was performed over 12 months' dental emergency activity. Traumatic lesions of dental, support and soft tissues and temporomandibular joint (TMJ) lesions that occurred within 72 hours in 0-18 aged subjects were registered. For each patient data about place and dynamic of the occurred trauma were also collected from the clinical records.

Results: in a population of 1056 subjects referred to the Emergency Dental Unit (EDU), 116 (11%; 75 M, 41 F; mean age 7.3 years) had a diagnosis of oro-dental trauma: most of them (76%) accessed the EDU at least 6 hours after trauma. The majority of injuries occurred in open-air locations (39%) or at home (37%) for accidental falls (56%), and involved one or more teeth (86%; 55% deciduous, 45% permanent). Dental tissues lesions were more frequent in permanent dentition than in primary teeth (64% *VS* 36%), while the opposite occurred for the support tissue lesions (primary 65% *VS* permanent 35%). Upper teeth were more often involved (86%) than lower ones. Intra- or extra-oral soft tissues were injured in 40% of cases. TMJ lesions were observed only in 8% of patients.

Conclusions: oro-dental trauma were frequent in the paediatric population evaluated and occurred especially in daily life. The dental visit was frequently delayed, while a correct and timely diagnosis is essential for a proper management.

USE OF POSITIVE REINFORCEMENT IN ASD PATIENTS: INTERDISCIPLINARY APPROACH

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Aim: the aim of the study is to investigate the possible potential of using food-type positive reinforcements in patients affected by ASD, in a multidisciplinary study involving dental hygiene professionals and speech therapists.

Methods: the study sample was selected among professionals enrolled in the FLI Scientific Technical Association (Italian Speech Therapy Federation).

To evaluate the patient's knowledge in the field of oral health styles, an anonymous questionnaire was submitted via the Google Form platform.

Results: 50 speech therapists answered the questionnaire and gave the following answers.

They use food reinforcements 23.5%, and specifically: candies 12.5%, fruit juice 6.3%, savory snack 50%, sweet snack 6.3%, 25% other; 86.1% responded positively to the request for specialist dental visits. The questionnaire consists of 11 questions, one part of which refers to the personal operating habits and the other concerns the prevention of the patient assisted in full thickness, also including the management of the oral cavity.

Conclusions: the prevention of pathologies of the oral cavity is a primary importance goal in patients with autism. It is therefore necessary, from the moment the underlying pathology is diagnosed, to include the patient in a program for the prevention of oral pathologies, guaranteeing him a biological and psychological advantage.

The involvement of parents and therapists, in the first place, through motivation, information and education about the pillars of dental prevention is the prerequisite for obtaining valid and lasting results over time.

SINERGY BETWEEN SPACE AND THERAPY: THE DEDICATED APPROACH TO ASD PATIENTS

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Aim: the Department of Pediatric Dentistry and Special Needs Patients has been involved for years in the care of children with ASD, promoting through the project "Sorrisi Speciali" a personalized pedagogical approach that makes chairside treatment possible. In order to create a tailored environment to support our sensory education-based approach, it was decided to restructure the operating environments, with the support of the Department of Architecture, integrating the contribution of design, colorimetry and customization of spaces.

Methods: in order to involve our patients and their families and make part of the renovation process, an anonymous questionnaire was submitted via Google Form, for the choice and selection of colours related to the floors of the operational areas of the Department. The questionnaire provided two choice options: A (Lemonade-Aquamarine colour pairing) and B (Ochre-Blue colour pairing). We explicitly requested that children themselves, as much as possible, expressed their preference.

Results: among the 100 questionnaires sent out, 39 responses were received. 53.8% preferred option B (Ochre-Blue), while 46.2% preferred option A (Lemonade-Aquamarine).

Conclusions: personalization, as well as sensory approach, is the basis of our dental care project, therefore, our goal is to create a new department that can improve the experience of our patients, making them part of the process in order to increase compliance.

EFFECTIVENESS OF TWO DIFFERENT TREATMENTS IN PEDIATRIC CLASS III SUBJECTS: A 3D STUDY

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Aim: the aim of the present study is to compare the effects of acrylic bimaxillary removable plates (Shwarz Appliance) and elastodontic devices (ED) in treating early class III malocclusion.

Methods: the study group included 10 subjects, 5 patients were treated with Schwarz appliances (Group A) and 5 patients treated with elastodontic devices (group B). Digital impressions were taken along with the bite registration before treatment (T_0) and after 1 year (T_1). Occlusal parameters such as overbite, overjet, incisor inclination were recorded using an orthodontic software (Maestro Studio). Morphological changes of the palate were calculated by superimposing 3D models of T_0 and T_1, firstly by using two points located along the mid-palate plane in the anterior region and secondly trough a "best fit" algorithm using the region defined by palatal rugae. All data were statistically analyzed.

Results: a significant improvement in occlusal parameters was found in both groups ($p < 0.05$), restoring a physiological inter-incisal relationship and this confirms the short-term efficiency of both systems in intercepting class III malocclusions. Moreover, in group B there was an important modification of the palatal morphology both in terms of expansion and correction of asymmetry, when recorded at T_0.

Conclusions: elastodontic devices could represent a valid clinical alternative for the interceptive treatment of class III growing subjects.

OSTEOGENESIS IMPERFECTA AND PAEDIATRIC DENTISTRY: A SYSTEMATIC REVIEW

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The aim of this systematic review is to find and highlight the craniofacial features of Osteogenesis Imperfecta, which are of interest in dental practice and occur during the facial development.

Searches in PubMed, Google Scholar, Scopus and Cochrane Library were performed. Parameters included were: English as language of publication, year of publication between 2012 and 2022, age of participants lower than 26. PRISMA guidelines (2020) were used to analyze the studies and report the results. 40 studies met the criteria.

Individuals affected by OI are more likely to develop III class patterns, with hypoplasia of maxilla and anterior cross-bite, as well as posterior cross-bite and both anterior or posterior open-bite. Hypodontia/oligodontia can often occur mainly depending on the type of the OI. Facial profile, transversal dimension and mandibular rotation pattern are not closely linked to the type of OI, while the overall severity of craniofacial features is directly related to its severity. Bisphosphonate treatment slows down the development and the eruption of teeth. Early onset bisphosphonate treatment highly increases the risk of tooth agenesis. Dentinogenesis Imperfecta associated with OI seems to affect primary teeth more severely than permanent ones. DI also increases the risk of hypodontia and oligodontia, which become more severe as the DI features worsen. OI increases the risk of Angle III Class patterns, hypoplasia of maxilla and hypodontia/oligodontia. DI associated with OI also increases the risk for tooth agenesis and affects the primary teeth more severely than permanent ones. Bisphosphonate treatment slows down the development of teeth and delays their eruption. Limitations of the current review are: absence of a protocol, previously registered and tested; heterogeneity of study designs; lack of sample numerosity in the included studies; lack of collected data in most studies. Therefore, a standardized protocol and further discussions are still required.

ORAL HPV BENIGN AND MALIGNANT LESIONS IN HEALTHY CHILDREN: A SYSTEMATIC REVIEW

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Aim: the present systematic review aimed to assess the epidemiology, clinical presentation, and histopathology of oral HPV-related benign and malignant lesions in pediatric subjects (≤18 y.o.) and to evaluate their frequency and types in relation to HPV genotypes and vaccine type (if any).

Methods: the study protocol, compliant with the PRISMA statement, was registered at PROSPERO (CRD42022352268). Data describing oral HPV-related lesions diagnosed through clinical examination and confirmed by histopathological analysis in pediatric subjects were independently extracted and narratively synthesized. The study quality was assessed using the ROBINS-I tool.

Results: of the 60 studies included, 36 were case reports, 19 case series, 3 retrospective, and 2 prospective studies, involving 153 (M:F = 1:1.4) pediatric cases diagnosed (mean age of lesion onset = 8.46 y.o.) with the following oral HPV-related lesions: 47.26% Verruca Vulgaris, Squamous cell Papilloma, and Condyloma Acuminata, 51.37% Focal Epithelial Hyperplasia, and 1.37% Oral Squamous Cell Carcinoma. The viral genotypes detected were HPV-13 (30.61%), -6 (20.41%), -11 (16.33%), -2 (12.24%), -32 (10.20%), -57 (6.12%), and -16 (4.08%). HPV vaccination was reported in any case.

Conclusions: the prevalence of oral HPV-related benign and malignant lesions in the pediatric population needs further investigation. The HPV association with OSCC was described in 2 cases based on lesions' p16 status, although no viral genotype was reported. Nonetheless, the possible independent role of HPV in oral carcinogenesis remains unknown in these cases and underscores the importance of HPV vaccination. Oral healthcare providers should also take a leading role in this scenario in the early diagnosis and treatment of oral HPV-related lesions and in raising awareness of HPV vaccination among pediatric patients and their parents and caregivers.

ALTERNATIVE METHOD OF COMMUNICATION WITH AN UKRAINE MOTHER TONGUE CHILD: A CASE REPORT

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Aim: to explore an alternative non-pharmacological behaviour management technique to facilitate a positive dental experience for ukraine refugees (child/young patients).

Methods: a Ukraine twelve-year-old refugee child presented at our Dental Clinic. The child, with acute pain due to deep decay on the first permanent lower right molar, and her mother were unable to communicate their needs clearly. A first attempt to approach with non-verbal communication and with standard non-pharmacological behaviour management techniques showed to be ineffective: the child refused to receive a complete treatment of the tooth decay. During the second session, we resorted to a new protocol consisting in a combined use of three alternative methods of communication: Picture Exchange Communication System; an accurate written translation of phrases commonly used in dental practice with children; the presence of a Russian mother tongue interpreter who skillfully acted as intermediary between the caregiver, the child and the mother.

Results: the implementation of the common management technique has been a succesfull way to treat a non italian mother-tongue child. Speech, used in a versatile way (in drawn, written or spoken formulations), has created a powerful transfert between the personal and familiar background of the child (and the mother) and the dental equipe.

Conclusions: dental practice with ukraine refugee children should take advantage of further tools, focusing on the importance of the written and spoken mother tongue language as an instrument of reassurance and connection with their well-known pre-war world.

MIDAZOLAM PLUS INHALATION SEDATION IN SPECIAL DENTISTRY: A CASE REPORT

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Aim: to present the case of a child with cognitive impairment, congenital disease, and Attention Deficit/Hyperactivity Disorder (ADHD) and dental fear undergoing conscious sedation for dental therapy.

Methods: a 13-year-old male with severe hemophilia type A was referred to the Dental Clinic for severe jaw pain. The mother attributed the marked lack of cooperation during the visit to ADHD and dental fear induced by the experience of previous bleeding after treatment. Extraction of the mandibular first molar was planned because of severe caries (ICDAS 6). Bleeding control was ensured by preoperative factor replacement. Sedation was achieved by co-administration of Mizadolam oral solution in single-dose container (OZASED 2mg/ml, TheSI Farma s.r.l.) and a 35% nitrous oxide/oxygen mixture. Tooth extraction was performed after inferior alveolar block, and root separation. The procedure lasted about 20 minutes. Blood pressure and oxygen saturation were constantly monitored, and the patient was comforted several times during the procedure with iatro-sedation methods.

Results: mixed sedation overcame the initial anxiety and non-cooperation, allowing the surgical procedure to be completed safely.

Conclusions: behavior management through basic and advanced techniques in special dentistry is essential for the proper treatment of patients with cognitive deficits and medical problems. Both sedation and behavioral techniques, such as show-tell-do, can help overcome fear of the dentist and achieve successful dental treatment.

DENS EVAGINATUS: A CASE REPORT

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Aim: dens evaginatus is an uncommon dental anomaly observed mainly in Asian populations. Developmental aberration of these teeth leads to the establishment of a tubercle on the occlusal surface of posterior teeth and/or from the lingual surface of anterior teeth. The resultant traumatic occlusal force due to chewing results in communions between the pulp and the oral cavity with consequent pulpal complications. Aim of this study is to present a case of dens evaginatus in a 10yo boy.

Materials: A.Y. (Chinese, 10 years old) presented to the Emergency Room of the San Paolo Hospital, University of Milan, complaining of pain in chewing.

On examination, a fistula was noticed on tooth 35 in the absence of caries and an abnormal morphology with the presence of an accessory tubercle in the occlusal position. The viability test was negative and the percussion test positive. Radiographic examinations confirmed the endodontic origin of the lesion and the extension of the pulp to the accessory tubercle. These findings allowed us to make the diagnosis of dens evaginatus. The treatment of choice was apicogenesis.

Results and conclusions: treatment options for dens evaginatus depend on when it is diagnosed. Elective treatment consists of prevention of occlusal trauma by removal of premature contacts as soon as the tooth erupts, application of a flowable composite to protect the area, and application of topical fluoride. If pulpal damage has already occurred, endodontic therapy aims at completion of the root process. Careful and prolonged follow-up is mandatory in any case.

MULTIPLE ABSCESSES IN PRIMARY DENTITION, A CHALLENGING DIAGNOSIS

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Aim: in dentistry, diagnoses are not always simple and certain. The purpose of the present study is to discuss a case of multiple dental abscesses in apparently healthy teeth in a child.

Methods: Y.H.T. (4 years old) with no known systemic disease, came to the emergency department for a previous swelling in the right periorbital area treated unsuccessfully with antibiotics, anti-inflammatories and corticosteroids. Diagnostic exams (CT, MRI, OPT) were performed, which showed several teeth with extensive pulp chambers and almost complete lack of dentin. Fistulous lesions on teeth 5.1, 7.1, 7.4 and grade 1 mobility of 5.2, 5.1, 6.1, 7.1, 7.2 and 8.1 were observed; no caries was detected. Intraoral radiograph of 5.1 showed apical resorption and root radiolucency; percussion test was positive, while vitality negative. 5.1 was extracted. A few weeks later the patient presented new fistulas on 5.3 and 7.2. Root canal treatment of teeth 5.3-6.3-7.4-7.5 was performed under conscious sedation with nitrous oxide. The patient was referred for further diagnosis to the Paediatric Department

Results: diagnostic hypotheses included dentinogenesis imperfecta, regional odontodysplasia, and generalized odontodysplasia. Since all three syndromes did not correspond exactly to the observed clinical picture, a definite diagnosis could not be made.

Conclusions: although it is not possible to make a definite diagnosis, it is important to treat the symptomatic teeth and to preserve the others.

ORAL FEATURES AND OBSTRUCTIVE SLEEP APNEA IN POPLITEAL PTERYGIUM SYNDROME: A CASE REPORT

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Aim: this report describes the oral features of a 5-years old boy who presented to us for dental anomalies and surgical outcomes of cleft lip and palate. He was diagnosed as Popliteal Pterygium Syndrome (PPS), a rare autosomal dominant congenital disorder described by Trelat in 1869, that includes orofacial, cutaneous, musculoskeletal and genital anomalies. This syndrome has some features in common with Van der Woude syndrome, also inherited as an autosomal dominant condition. The minimum diagnostic criteria for PPS are any three of the following: cleft lip/palate, popliteal pterygium, paramedian lower-lip pits/sinuses and genital and toenail abnormalities.

Methods: we present the case of a boy with enamel demineralization, dental fusion, maxillary hypoplasia, anterior cross bite and skeletal third class. He was treated surgically for cleft lip and palate at four months and one year of age. He suffers from obstuctive sleep apnea syndrome. Lower-lip pits represent the opening of a tract leading from a mucous gland embedded in the lip.

Results: from the beginning we used all the primary dental prevention devices in order to maintain the deciduous until their exfoliation. We decided to undergo him a first phase of orthopaedic-orthodontic treatment with Delaire mask to correct skeletal defects on the sagittal plane.

Conclusions: in syndromic anomalies, collaboration between maxillofacial surgeons, pediatric dentists and orthodontists is the key factor for obtaining satisfying results. Meticulous physical examination of the family members and genetic counselling is also required.

GENERALIZED MICRODONTIA IN A YOUNG PATIENT: REHABILITATION AND LONG-TERM MANAGEMENT

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Aim: the target of this report is to present a dento-alveolar discrepancy case caused by generalized microdontia in a child, treated with an orthodontic rehabilitation aimed to the insertion of implant-based prothesis.

Methods: a 13.4-years-old male subject with good general health conditions presented I class malocclusion, over jet and overbite, with a slight lack in mesio-distal width of permanent dentition, also confirmed by orthopantomography and noticeable from diastemas in both dental arches; nonetheless, anterior and overall Bolton's ratios did not show any considerable alteration (77.3% and 91.2% respectively). Therapy lasted for 27 months, and it consisted in two sets of aligners to sequentially mesialize all the teeth and to create four bilateral spaces distally to maxillary and mandibular second bicuspids, stabilization was obtained thanks to thermos-printed containing aligners (Vivera, Invisalign®).

Results: treatment guaranteed I dental class, corrected over jet and overbite and countered microdontia creating four spaces in posterior position to second bicuspids. The patient will have to wear containing aligners until the end of growth to complete rehabilitation with four implant-based prothesis.

Conclusions: a multidisciplinary approach is useful to reach good aesthetic and functional outcomes managing microdontia. In this case orthodontic and containing therapy will allow an implant prosthetic finalization without reconstruction solutions to enlarge dental size.

CONSERVATIVE SURGICAL APPROACH OF A MANDIBULAR INFECTED BUCCAL CYST IN A PEDIATRIC PATIENT

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Aim: the aim of this case report is to describe the surgical excision of a mandibular infected buccal cyst in a 10-year-old patient and to report its histopathological analysis.

Methods: the clinical examination of a 10-year-old male revealed a delayed eruption of the right mandibular first molar that was investigated with an orthopantomography. The radiograph showed a radiolucency involving the area between the right first and second molars. The following CBCT revealed that the lesion was on the buccal aspect of the roots of the first molar. Based on the clinical and radiological appearance of this lesion, it was assumed that it was a mandibular infected buccal cyst. Therapy consisted of a cystectomy, with particular attention not to damage the adjacent anatomical structures. The biopsy of the excised lesion was performed.

Results: the histological evaluation revealed a chronically inflamed cyst lined by a non-keratinized stratified squamous epithelium, that was consistent with the diagnostic hypothesis. The postoperative course was uneventful and the three-months follow-up ortopantomography proved a correct dental and bone evolution on mandibular right molars side.

Conclusions: the mandibular infected buccal cyst is an inflammatory odontogenic cyst that occurs on the buccal and lateral aspects of the roots of mandibular molars at the eruption time.

The inflammation may have an important role in the pathogenesis of this lesion and a conservative surgery aimed at the enucleation of the lesion without extraction of the involved dental elements appears to be the therapy of choice.

OPTICAL COHERENCE TOMOGRAPHY USE FOR ENAMEL DEFECTS IN MOLAR INCISOR HYPOMINERALIZATION

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Aim: Molar Incisor Hypomineralization (MIH) is defined as a hypomineralization of systemic origin of one to four first permanent molars (FPMs) frequently associated with affected incisors, but it could also affect any primary or permanent teeth. MIH can cause several clinical problems such as hypersensitivity, high risk of pulp involvement, tooth loss and aesthetic issues. Optical coherence tomography (OCT) is an emerging hard and soft tissue imaging system investigated as a new potential diagnostic method in dentistry. The aim of this study is to evaluate the *in vivo* enamel structure of MIH patients and related specific OCT scans.

Methods: a total of 20 moderate MIH permanent teeth of pediatric patients (n = 10 incisors, n = 10 FPMs) were tested and 20 healthy teeth (n = 10 incisors, n = 10 FPMs) were controls. The most representative OCT scans were recorded, analyzed and compared.

Results: on OCT scans, healthy enamel and dentin appear as two superimposed distinct layers divided by the dentin-enamel junction while the hypomineralized areas of MIH teeth are characterized by subsurface bright hyper-reflective areas followed by deep hypo-reflective shadowing.

Conclusions: OCT is considered a promising assessment study method for identifying structural models of enamel defects *in vivo*; but, to date, there is a lack of standardization in identifying patterns of different MIH severity. This study provides a basis for this orientation, supporting the use of OCT as a risk-free technique for the validation of remineralization treatment in pediatric patients.

EVALUATION OF PREVALENCE OF OSA RISK AND MALOCCLUSIONS IN PATIENTS WITH RARE SYNDROMES

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Aim: the purpose of the present study is to assess the prevalence of OSA risk and malocclusions in a population of pediatric patients with Okur-Chung, Pitt-Hopkins and Feingold syndromes.
Methods: one pediatric patient for each kind of syndrome was referred to the Pediatric dentistry department at the A. Gemelli Hospital for a complete dental evaluation. Caregivers were asked to complete the Italian version of the Pediatric Sleep Questionnaire (PSQ) in order to assess the risk of suffering from OSA.
Results: based on PSQ results, only the patient affected by Okur-Chung syndrome presented a high risk of suffering from OSA.
The orthodontic evaluation showed maxillary constriction and occlusal wear facets as common signs.
Conclusions: dento-skeletal evaluation revealed the presence of malocclusions in all the studied syndromes. Only the patient with Okur-Chung syndrome suffers from OSA.

PREVALENCE OF DEVELOPMENTAL DEFECTS OF ENAMEL IN A SAMPLE OF CHILDREN WITH AUTISM

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Aim: to investigate the prevalence of enamel development defects (DDE), their characteristics and potential etiological factors, in a sample of pediatric patients with autism spectrum disorder (ASD).
Methods: a cross-sectional study was conducted on 74 subjects affected by ASD and aged between 3 and 15 years. For each patient all erupted teeth were examined, considering the presence of DDE through the Modified-DDE Index. The anamnestic history of the patient (sex, premature birth, vitamin D deficiency, history of infections or hospitalization and intake of antibiotics in the first 3 years of life) and that of the mother during pregnancy were investigated and statistical analysis were done to verify associations between these variables and the prevalence of DDE.
Results: the prevalence of defects in the examined sample was of 45.9%: 34 subjects had at least one DDE. A total of 158 defects were recorded: 130 on permanent teeth and 28 on deciduous one. Among the permanent teeth, those most frequently affected were upper central incisors and first molars while in deciduous teeth the upper second molars were more involved. The most common defects were white or cream-colored demarcated opacity and diffuse patchy opacity. Finally, no statistically significant correlation was found between the variables considered in the anamnesis and the presence of DDE.
Conclusions: this investigation showed a high prevalence of DDE in children with ASD, making early identification necessary to prevent hypersensitivity and risk of carious lesions in special need patients.

PARTIAL PULPOTOMY IN YOUNG PERMANENT TEETH: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aim: nowadays, partial pulpotomy (PP) is one of the vital treatments for pulp therapy that promotes physiological root development in young teeth with an open apex, avoiding root treatment or extraction; it involves the removal of the inflamed pulp while preserving most of the pulp rich in coronal cells with a good chance of healing due to physiological dentine deposition in the amputated area. The aim of this study was to evaluate the clinical and radiographic success and pathologic outcomes of techniques and materials used for PP in deep caries lesions or post-eruptive breakdown defects in young vital permanent teeth.

Methods: a literature search was performed using three databases: Pubmed, Embase and Scopus. The selected studies should be RCTs or retrospective studies including a population <21 years and with a follow up period of ≥12 months. From 3017 articles retrieved, 9 were eligible and included in the systematic review of which 5 in the meta-analysis.

Results: the overall success rate of PP at 12-month follow-up was greater than 85% in all studies considered, regardless of the technique or material used. Clinical and radiographic success was considered comparable in all studies. Additionally, the studies included in the meta-analysis did not indicate any statistically significant differences in success rates when Mineral Trioxide Aggregate was compared to calcium hydroxide (p = 0.059).

Conclusions: PP could be a valid option in cases requiring vital pulpal therapy in young, highly damaged permanent teeth, allowing more invasive endodontic treatments to be postponed.

PREVALENCE OF SYNDROMES MANAGED IN A PEDIATRIC DENTISTRY DEPARTMENT (UNICA)

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Aim: to Report the percentage of syndromic cases with oral cavity involvement in children in the Pediatric Dentistry Department of the University of Cagliari.

Methods: 1040 medical records with their radiographic images, clinical diary, age, sex of the patients and any therapies carried out were viewed using anamnestic information. Some patients arrived in the Department addressed by their family doctor and others from pediatric hospitals.

Results: in our research we found 59 syndromic patients with an age between 3 and 19 years old and a percentage of the total number of records of 5.6%. The most frequent syndrome was Down syndrome with 13% of cases followed by Goldenhair syndrome (6.7%), DiGeorge syndrome and Noonan syndrome both with 5% of cases; 13 had malocclusion (22%), 4 jaw bone abnormalities (6,7%), 32 had treated for several caries (54%), 3 presented oral soft tissue lesions (5%).

Conclusions: no studies have evaluated the prevalence and the characteristics of the syndromes within a Pediatric Dentistry Department. Currently in the international scientific literature there are no protocols for the management of syndromic pediatric patients on related oral problems. Further epidemiological and retrospective studies should be conducted in order to better characterize the problem and to draw up effective treatment and prevention protocols.

ORAL TRAUMATIC LESIONS IN PEDIATRIC PATIENTS: EPIDEMIOLOGICAL STUDY *VS* LITERATURE DATA

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Aim: to state the frequency of oral traumatic tissue lesions in the Department of Pediatric Dentistry in Cagliari University Hospital "San Giovanni di Dio" compared to literature.
Methods: we performed a deepen review of the literature to establish which kind of traumatic lesions of the soft tissues is the most common in pediatric people. Then we compared those results to the ones obtained by an epidemiological study we carried out in our Pediatric Dentistry Department.
Results: over 80 scientific papers for our review and 1070 medical records for the epidemiological study were analyzed. The epidemiological study considered 31 patients, 14 girls and 17 boys (2.88% of the total amount of the medical records). Dental traumas associated with mucosal traumas are the most frequent lesion we detected (11/31 cases, 35,46%). 2nd place is taken by fibrous – exophytic lesions (4/31 cases, 12.90%) and at 3rd place morsicatio buccarum and ulcers, each with 3 cases out of 31 (9.68%). Data in literature see fibrous lesions, mechanical traumas and ulcers on top 3 of the most common traumatic mucosal lesions. Piogenic granulomas and mucocele are strongly represented in literature, but we did not find the same evidence in our study. We found no correspondence even for morsicatio lesions.
Conclusions: even if our results differ a little from the data in literature, we could assure that lesions of the oral mucosae we detected in our department follow the global trend we found in literature. The bigger discrepancy may be due to the fact that our department is not specialized in Oral Pathology.

EVALUATION OF STRESS AMONG POST-GRADUATE DENTAL STUDENTS: A NARRATIVE REVIEW

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Aim: stress is becoming a significant part of the everyday life of medical students, trainees and qualified physicians. Medical faculties are stressful and demanding. Aim of this review is to summarise articles reporting on stress among dental residents.
Methods: PubMed was searched for articles published in the last two decades reporting on stress among dental residents. The literature search yielded 407 papers: 48 were obtained in full-text format, out of these 8 were selected and 3 more were added after hand searching. A total of 11 studies were included.
Results: studies suggest a high prevalence of stress among dental residents. The most used scales were the Perceived Stress Scale (PSS) and the Modified Dental Environmental Stress (DES/GDES). The hazard ratio of moderate stress evaluated in the selected studies, was nearly 50% (range 22%-78.4%). Long working hours and lack of free time were found to be the most reported sources of stress among dental residents, followed by financial issues.
Conclusions: stress among dental residents has been observed in many countries and it has been incredibly reported in literature. Some stress is beneficial for stimulating better performance, but it may have a negative impact in both emotional and somatic field, stimulating feelings of fright and lack of ability. It may also lead to poorer performance, increased errors, decreased productivity, worse quality of care for patients and burnout. Studies on how to prevent stress among dental residents are needed.

IMPACTED PRIMARY AND PERMANENT TEETH IN CHILDREN

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Aim: impaction is an eruption failure of a tooth due to obstacles in the eruption path or abnormalities in its position. Teeth can be unerupted, retained or partially erupted based on clinical and radiographic evaluation. This phenomenon is more frequent in permanent dentition. Even if the maxillary canine is the tooth most often impacted in the anterior segment, overall, the most impacted tooth is the third molar. This study aims to present a review on impacted teeth in children.

Methods: PubMed and Embase were searched using the following key words: impacted teeth, retained teeth, primary dentition, permanent dentition, children.

Results: tooth impaction in the permanent dentition ranges from 0.8 to 3.6%. It is very rare in the primary dentition, occurring in 1:10000 cases and mainly involving secondary molars. Impacted primary and permanent teeth present a variable and multifactorial etiology. Systemic and local factors can contribute to impaction: fibrous hyperplasia of the gingiva, space deficiencies, insufficient maxillofacial skeletal development, trauma, premature loss or prolonged retention of primary teeth, abnormal eruptive path, odontogenic tumors such as odontomas, cysts. 3D imaging techniques should be used to obtain a precise diagnosis of the location of the impacted tooth. Management technique includes the removal of any obstruction and exposure of the unerupted tooth. Orthodontic attachment can be used to bring the tooth in the dental arch.

Conclusions: the early detection and treatment of impacted teeth are crucial for the proper development of children.

ORAL SIGNS OF HYPOPHOSPHATASIA: A NARRATIVE REVIEW

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Aim: this narrative review aims to provide knowledge about hypophosphatasia (HPP), particularly regarding oral signs, so that the condition can be recognized early and treated with a multidisciplinary approach.

Methods: this literature review was conducted by screening the literature using keywords related to hypophosphatasia, oral signs, and potential treatments in PubMed. Some articles were also examined at the University Library of Pisa. First, we selected 150 scientific works based on relevance and contribution to the topic. Subsequently, after a deeper analysis, we restricted our pool to the most pertinent 10 articles.

Results: the common dental signs are primary tooth loss before the age of three years with intact roots without signs of inflammation or trauma. The level of marginal alveolar bone may be reduced with relative vertical bone loss. Teeth can have larger pulp chamber extending to root canals. Histological analysis showed that both acellular and cellular cement are affected. Sharpey's fibers do not connect the collagen fibrils of the gingival ligament to the cementum. Action must be taken with both specific preventive programs and interceptive orthodontic or prosthetic interventions to avoid aesthetic and language problems.

Conclusions: it is very important for patients and their treating physicians to connect with specialized referral centers. Follow-up of patients with HPP can deepen the knowledge of the disease and make the diagnosis of hypophosphatasia more immediate.

INFLUENCE OF BLACK STAIN ON DENTAL CARIES: SYSTEMATIC REVIEW OF THE LITERATURE

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Aim: Black Stain (BS) has been considered a form of dental plaque differentiated from other types by insoluble iron salt and high calcium and phosphate content. The aim of our research is to evaluate whether the administration of toothpastes or mousses based on lactoferrin, which determine resolution of BS, can also influences the DMFT index of the same patients.

Methods: our research has been done by collecting articles form Cochrane Central Register of Controlled Trials, PubMed, Scopus e Web of Science. We used as mesh terms "black stain", "black stain and caries", "black stain pigmentation".

Results: considering nineteen selected articles with a sample of 290 BS patients, it can be describe a reduction of the main DMFT values to 60% compared to the same sample of non-patients suffering from BS.

The mean DMFT and mean DMFS were both statistically lower in children with black stain. Actinomyces colonization enhances the level of Actinomyces antibodies, which also have an inhibitory effect on caries.

Conclusions: in conclusion, the bacterial composition of BS with lower number of *Lactobacillus sp*. and *F. Nucleatum* might be associated with less caries experience in children with BS. There is no sufficient evidence to affirm the variability of influence on DMFT following the administration of toothpastes and mousses containing lactoferrin.

THE TREATMENT OF THE PATHOLOGICAL LINGUAL FRENULUM: A SYSTEMATIC REVIEW

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Aim: ankyloglossia is a congenital anomaly characterized by a short or ipertrofic lingual frenulum. This condition is treated with surgery and myofunctional therapy due to its consequences on breastfeeding, pronunciation, abnormal maxillary bone's development, nocturnal respiratory disorders. This study aims to analyze and compare the current evidence of diagnosis and the surgical methods and treatments of patological frenulum in young patients.

Methods: a systematic review of the international literature was conducted on PubMed and Pubmed Central databases. The chosen keywords were: "frenulum" "frenulectomy" "lingual" "ankyloglossia" "laser". Then the research has been restricted considering the articles published in English between 2000 and 2022.

Results: 14 articles were included in the review. 10 studies found more advantages using diode or CO_2 laser than traditional surgery.

Many studies showed an improvement both in mobility of tongue and in quality of pronunciation of words, although some studies reported a non-significant difference between surgery and myofunctional therapy.

The limitations of this review are: a few published articles, a small number of the sample size and the lack of universal standardization for hypertrophic frenulum.

Conclusions: there is not a management protocol for this pathological anomaly yet. So far diode laser therapy is the first choice by clinicians due to successful outcomes compared to the use of scalpel.

MECHANICAL VENTILATION PNEUMONIA AND ITS RELATION WITH HOSPITALIZED CHILDREN ORAL HYGIENE

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Aim: Hospital-acquired pneumonia (HAP) is a serious condition that can lead to severe complications and increased mortality rates, particularly in pediatric patients on mechanical ventilation. Although the rise in HAP cases has been well documented in recent years, little attention has been paid to the potential role of poor oral hygiene in the development of this condition. The oral cavity is a rich source of pathogenic bacteria that can be easily aspirated into the lungs of patients on mechanical ventilation. Therefore, improving oral hygiene practices may be a critical step in preventing the development of HAP in this vulnerable patient population. This literature review aims to investigate the potential correlation between poor oral hygiene and HAP, and to explore the efficacy of preventative measures such as oral care bundles in reducing the incidence of this serious condition.

Methods: the utilization of "AND" or "OR" Boolean operators was applied during an exhaustive search on Medline and Scopus databases to retrieve articles that include the keywords "oral hygiene", "children", and "Hospital-acquaired pneumonia".

Results: after conducting a comprehensive search, a total of 177 articles were identified as potentially relevant. Following the elimination of duplicates and a thorough assessment of titles, abstracts, and full texts, we ultimately selected 9 articles for inclusion in this review.

Conclusions: the literature has shown promising results regarding the efficacy of pharmacological and mechanical treatments in reducing or delaying the onset of ventilator-associated pneumonia. However, the impact of chlorhexidine as a preventative agent is not yet fully understood, as several investigations conducted in recent years have uncovered evidence that appears to be against its use. Nevertheless, the healthcare of pediatric patients requires significant recognition and consideration, particularly when it comes to dental issues that are frequently underestimated.

DENTAL ANOMALIES AFTER CHEMOTHERAPY WITH ALKYLATING AGENTS IN CHILDREN: SYSTEMATIC REVIEW

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Aim: patients treated with chemotherapy during childhood have a great possibility of suffering from dental abnormalities on permanent teeth. This study aimed to estimate the late effects of alkylating agents on permanent dentition.

Methods: 71 articles were found from four database using key words "Chemotherapy", "Dental anomalies", "Pediatric population" from the past 10 years. We included 26 studies written in English where was possible to discriminate chemotherapy and radiotherapy effects in children treated with alkylating agents.

Results: cancer survivors under five years treated with chemotherapy, including with alkylating agents, have a high risk of presenting the following dental anomalies: microdontia, agenesis, enamel defects, taurodontism, delayed eruption and root development abnormalities.

Conclusions: current literature evidence that chemotherapy is associated with adverse effects on permanent dentition, but none of the studies specifically evaluated the effects of alkylating agents, so further studies are required to assess the correlation between these drugs and dental anomalies.

EARLY FLUORIDE EXPOSURE AND MIH-RELATED DEFECTS: A DOSE-RESPONSE META-ANALYSIS

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Aim: the relation between early fluoride exposure and the occurrence of Molar Incisor Hypomineralisation (MIH) defects is still controversial. This systematic review and meta-analysis aimed at assessing whether fluoride is a protective or a risk factor for MIH defects, also investigating such relation through a dose-response approach.

Methods: we conducted a systematic literature search up to 22 November 2022, using combinations of terms related to "fluoride" as exposure and to "molar incisor hypomineralisation" (e.g. "demarcated opacities", "developmental opacities") as outcomes. We performed a meta-analysis through forest plots comparing the highest versus lowest fluoride exposure using a random-effects model, and we quantitively assessed this relation using linear meta-regression.

Results: out of 315 potentially relevant records, 13 eligible papers were identified, 12 of which were also suitable for the dose-response meta-analysis. Comparing the highest versus lowest exposure categories for water fluoride, a slight protective role of fluoride was identified, with an odds ratio of 0.93 [95% confidence interval 0.60; 1.45]. The dose-response analysis for exposure to fluoride from drinking water showed a decreasing MIH risk for exposure up to 1 mg/L, whereas an increase in MIH risk emerged at higher exposure levels.

Conclusions: early systemic exposure to fluoride may affect the occurrence of MIH defects differently depending on fluoride concentration. However, these results need to be evaluated with caution due to potential methodological limitations of the included studies.

ANTI-BIOFILM ACTIVITY OF A MOUTHRINSE CONTAINING CALCIUM HYDROXIDE AND UMBELLIFERON

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Aim: calcium hydroxide-umbelliferon association is claimed to exert anti-inflammatory effects on the oral mucosa, but the anti-plaque activity, especially in pediatric patients, has been poorly investigated. This study aimed to assess the *in vitro* antimicrobial activities of a mouthrinse containing 10% calcium hydroxide and umbelliferon (Litopsor).

Methods: *lactobacillus salivarius* ATCC 11741, *Streptococcus mutans* ATCC 25175, *Actinomyces naeslundii* ATCC 12104 and *Candida albicans* ATCC 90028 were chosen as test microorganisms. Crystal violet (CV) assay, MTS assay and Live/Dead Baclight Bacterial Viability (LD) assay were performed in triplicate and in presence/absence of sucrose.

Results: sucrose improves biofilm formation in all microorganisms (CV assay). MTS assay showed that the exposure of biofilm to the mouthrinse produced different effects: for *A. naeslundii* a statistically significant decrease on 48h-biofilm with and without sucrose; for *S. mutans* a decrease on 24h-biofilm without sucrose; for *L. salivarius* a decrease on 24h-biofilm with sucrose; for *C. albicans* a slight decrease only on 24h-biofilm. LD assays were performed only on 48h-biofilm grown with sucrose. After 5 min exposure, dead cells were detected only in *A. naeslundii*.

Conclusions: the mouthrinse containing 10% calcium hydroxide and umbelliferon (Litopsor) showed different anti-biofilm activity depending on the microorganism under test. This product, being alcohol-free, could be recommended in pediatric patients as an adjunct to mechanical oral hygiene. Further studies are needed to assess the antimicrobial activities in the early stages of biofilm formation.

DENTAL TREATMENTS UNDER GENERAL ANESTHESIA IN UNCOOPERATIVE CHILDREN: RETROSPECTIVE STUDY

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Aim: General anesthesia (GA) to provide dental treatments is not only reserved to children who are medically compromised, but it is a strategy for treating healthy children who are uncooperative, because of young age or anxiety. This study analyzed the characteristics of dental treatments conducted under GA in pediatric patients.

Methods: data from pediatric patients, who underwent dental treatments under GA at the AORN Santobono-Pausilipon Hospital, Naples, Italy, from January 2011 to December 2022, were recorded. The following data were collected: gender; age; health status; anesthetic procedure; adverse events; dental procedure performed.

Results: 2331 pediatric patients (1359 males and 972 females) were treated. Mean age was 6.3±2.6 years. 1748 patients were healthy and uncooperative and 583 were medically compromised. In relation to the anesthetic procedure, 36.4% of patients underwent oral endotracheal intubation, 3.6% of patients underwent nasal endotracheal intubation and 60% of patients were treated with facial mask. Two adverse events occurred (1 massive intra-operative bleeding and 1 delayed awakening). Relatively to the dental procedure, 2086 patients were submitted to dental extractions; 53 patients to supernumerary teeth removals; 6 patients to odontomas removals; 23 patients to soft tissues neoformations excisions; 158 patients to frenulectomies; 5 patients to cysts excisions.

Conclusions: different types of dental treatments under GA can be safely provided in a hospital setting both for healthy uncooperative and for medically compromised children.

ASSOCIATION BETWEEN DMFT/DMFT INDEX AND DIET IN FOREIGN CHILDREN

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Aim: this cross-sectional study was conducted to evaluate an association of diet and oral hygiene practices with DMFT/dmft (decayed, missing and filled teeth) of children between 0 and 8 years of age, immigrants or born in Italy to foreign parents, and the impact of a multicultural diet on caries etiopathogenesis.

Methods: the study included 200 children visited in our Dental Clinic. A questionnaire consisted of sociodemographic information and some questions about current diet and oral hygiene practices was provided to the participants. After acquiring the dataset, all children's DMFT/dmft scores were assessed and recorded. The children were divided into four different ethnic groups (Africa, Asia, Eastern Europe and South America).

Results: the highest mean DMFT/dmft value was in Eastern Europe group, equal to 5.68 per child, followed by Africa (4.56), Asia (4.22) and South America (3.40) groups. However, cavities are more frequent in Africa group with a higher number of affected patients compared with healthy subjects belonging to the same group. Caries has a homogeneous distribution in both genders in the Africa and Eastern Europe groups, while females were more affected in the Asia and South America groups.

Conclusions: the sample studied shown different DMFT/dmft values and stratification of reports in the four groups. This study further augmented the contributory role of diet in the development of caries. A strong relationship of decayed and missing teeth with dietary variables (like meals per day, use of snacks in between meals and frequency of sweets) was displayed.

CORRELATION BETWEEN ORAL HEALTH AND THE POOR CONDITION IN THE MIKUMI POPOLATION (TANZANIA)

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Aim: the study was conducted at the San Kizito Hospital, Mikumi, (central east Tanzania). The aim of this article is to present the results of the investigation carried out in the village of Mikumi. Through the index DMFT (Decay/missing/filled teeth), the relationship between oral health and socioeconomic inequality was assested, using data collected from a sample of the population.

Methods: a sample of 1010 people between the ages of 15 and 59 was considered. The sample was subdivided into four groups based on the age of people (15-25 yr, 26-35 yr, 36-45 yr, 46-59 yr). The data on each person was collected through a dental visit.

Results: the cumulative DMFT of those between 15 and 25 years old (361 people) is 1.5. In the 26-35 years old (265 people) the result is 3. In the third group, the 36-45 years old (174 people) the DMFT is 4.

In the 46-59 years old (210 people) the DMFT is 4.5. These results were compared with the average income and occupation level.

Conclusions: considering the correlation between oral health and the economic possibility of having access to medical care, the research carried out shows that only 30% of the people are employed with good wages (clinical doctors, healthcare workers and nurses) and can afford a good service of oral health. It is necessary to improve knowledge and promote oral health prevention programs.

AN INNOVATIVE COLLAGEN-BASED APPROACH TO PRESERVE AND MAINTAIN THE ORAL SOFT TISSUE HEALTH

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Aim: collagen plays a key role in the biochemical and structural support of oral tissues and in the maintenance of soft tissue health and long-term implant stability, while collagen fibers alterations seem to be involved in the etiopathogenesis of periodontitis and peri-implantitis. In this regard, photobiomodulation (PBM, LED 630 nm) has been recently proved to be useful in promoting new collagen deposition by fibroblasts. Thus, this study aimed at assessing the *in vitro* and *in vivo* effect of a collagen-based medical device (COL) in presence or absence of PBM on oral tissues.

Methods: COL-PBM effects were assessed on primary human gingival fibroblasts (hGF), oral osteoblasts (hOB), and endothelial cells (HUVEC), and on periodontal and peri-implant soft tissues in different clinical case reports. In particular, cell viability, wound healing, mineralization, cell adhesion to COL-coated implant surfaces, and the expression of mechanotrasduction markers were evaluated for the *in vitro* protocol.

Results: the *in vitro* results showed that COL, also combined with PBM, allowed a significant increase of the overmentioned parameters, acting as a mechanical bio-scaffold. Then, the use of COL-PBM *in vivo* lead to neocollagenesis, hydration and maintenance of periodontal and peri-implant soft tissues up to 6 months.

Conclusions: these data proved the efficacy of using COL-PBM in counteracting the oral physiopathological aging, and in promoting structural, functional, and aesthetic tissue support, besides shedding light on the great therapeutic potential of using this approach for periodontal and peri-implant tissue rejuvenation and maintenance and in preventing some oral diseases.

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RCT OF NONINFERIORITY OF THE ANTI-PLAQUE POTENTIAL OF A MOUTHWASH CONTAINING FATTY ACIDS

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Aim: the aim of the present study is to evaluate by means of a randomized clinical trial the degree of effectiveness of a mouthwash containing fatty acids compared to a mouthwash containing ammino stannous fluoride toward chemical control of bacterial plaque.

Methods: the above study involved 16 healthy subjects with at least 20 natural teeth aged 18 to 25 years, who for the 14 days prior to the start of the study had abstained from oral hygiene maneuvers resulting in plaque-dependent gingivitis. They were administered according to block randomization either a mouthwash containing FAG or amine stannous fluoride for 14 days in the doses 2/die/10 ml/60"; statistical software was used to generate randomization tables and graphs.

Results: the plaque and bleeding indices at baseline of the study patients before the clinical trial and after the use of the two different mouthwashes were evaluated. The results showed that abstaining from oral hygiene maneuvers for 14 days resulted in plaque-dependent gingivitis in the entire cohort of patients with a reduction in the bleeding index in the 14 days following treatment with FAG and amino stannous fluoride by 0.14% and 0.1% respectively.

Conclusions: comparisons between the two treatments showed no statistically significant differences between the two types of solution products, therefore, the FAG mouthwash proved to be noninferior in terms of reducing plaque indices compared to the amine stannous fluoride mouthwash.

ANXIETY IN A ROUTINARY DAY OF A DENTIST: PATIENT RELATIONSHIP… DOES IT MATTER?

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Aim: this study evaluates correlations between physiological indexes and psychological variables during a working day in dentists, bridging the gap between anxiety, patient approach anxiety and physiological activity in dentists.

Methods: psychophysiological measures were collected from 20 young dentists. Electrodermal Activity (EDA), Heart rate (HR) and Heart rate variability (HRV) were measured with Empatica-E4 wristband, a device that participant wore for 24 hours while working, sleeping and during the rest of the day. General anxiety disorder-7 Questionnaire and a self-reported anxiety scales were also administered.

Results: 5 participants (3F, 2M) had a GAD-7 compatible with a moderate general anxiety disorder. Females reported higher anxiety in confronting the patient ($p = 0.002$) and lower HRV ($p = 0.022$). Higher values of EDA were found during sleep time ($p = 0.037$).

Conclusions: a global shift in the nocturnal sympathetic activity was found as a possible biomarker of excessive stress in dentists. Anxiety in confronting the patient was associated with the Female gender. No difference between Males and Females was observed through the validated anxiety questionnaire. A lower parasympathetic activity was found in Females while a comparable sympathetic activity with Males was found, thus fostering a possible vulnerability to excessive stress for the Female group. 25% of dentists fell within generalized anxiety disorder diagnosis. These data underline the need to pose attention to the health of dentists and open a way to monitor it.

IMPACT OF DIODE LASER IN PERIODONTITIS TREATMENT: RANDOMIZED CLINICAL AND MICROBIAL TRIAL

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Aim: the aim of the study is to detect the different effects of the following approaches: scaling and root planning (SRP) alone and SRP in association with diode laser for the treatment of generalized aggressive periodontitis (GAgP).

Methods: 31 patients affected by GAgP were selected in the research using a split-mouth design. Randomly right and left maxillary quadrants were treated with SRP plus diode laser or with SRP alone. During a year, patients underwent routine checks for detecting changes in their clinical, microbial, and inflammatory mediator profiles. At each follow-up appointment, sub-gingival biofilm samples and gingival crevicular fluid (GCF) inflammatory markers were also examined.

Results: one year later, both therapies showed improvement in periodontal parameters compared to the baseline. Nevertheless, when compared to SRP alone, SRP + diode laser significantly improved the results for probing depth (PD; 2.56 - 0.44 *vs* 3.36 - 0.51 mm, $p < 0.05$) and CAL (3.47 - 0.25 *vs* 4.11 - 0.26 mm, $p < 0.05$).

Similar to the SRP alone group, the bacteria of the orange complex group greatly decreased in the SRP + diode laser group at 30 and 60 days.

Additionally, IL-1b/IL-10 ratio and mean GCF levels of IL-1b were lower with SRP + diode laser than with SRP alone at 15 and 30 days ($p < 0.05$).

Conclusions: at the end of the study, it was seen that SRP + diode laser substantially reduced some clinical parameters, but SRP alone had no significant effect on changes in microbial or inflammatory mediator levels.

EVALUATION OF ORAL HEALTH IN BREAST CANCER PATIENTS TREATED WITH ADJUVANT HORMONE THERAPY

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Aim: the study aims to investigate the oral health status in a cohort of female patients affected by breast carcinoma and treated with adjuvant hormone therapy (AHT).

Methods: a total of 128 patients with breast cancer treated with AHT and 60 controls, were prospectively enrolled in the study, from 2019 to 2021, at the "Maggiore della Carità" Hospital, University of Eastern Piedmont (Novara). The Decayed, Missing and Filled Teeth (DMFT) index and the oral microbial profile were evaluated. Salivary samples were collected between 11-12 a.m., through the standardized "spitting" collection method to analyze the Unstimulated Whole Saliva Flow Rate (UWS-FR) and the salivary pH. Finally, each subject undergoing to oropharyngeal swab to assess the oral microbial status.

Results: the DMFT value of cancer patients was significantly higher compared to control group (16.07±7.05 *vs* 11.93±7.14; $p = 0.0077$). A reduction of UWS-FR was detected in the cancer patients respect to the control group (0.23±0.17 mL/min *vs* 0.29±0.17 mL/min; $p = 0.014$). No significant differences emerged in the evaluation of pH values (6.78±0.37 *vs* 6.76±0.34; $p > 0.05$). Finally, a negative association between oral candidiasis and UWS-FR was demonstrated in cancer patients ($p = 0.0254$).

Conclusions: these results suggested the AHT could affect oral health status, impairing the oral cavity homeostasis and increasing the risk of developing hard and/or soft tissue diseases.

EVALUATION OF TWO DIFFERENT MOUTHWASHES ON BLEEDING REDUCTION: A RANDOMIZED CLINICAL TRIAL

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Aim: the objective of this study was to compare the efficacy and safety of three different mouthwashes on gingival bleeding after 2 weeks of use.

Methods: in this randomized, double-blind parallel-design clinical study, the eligible subjects, who fulfilled the inclusion criteria, were divided into the following three groups: Group C (control, mouthwash with Chlorhexidine 0.12%); Group CX (test, mouthwash with Chlorhexidine 0.09% and Citrox®); Group P (test, mouthwash containing natural extracts). Subjects were instructed to brush their teeth twice a day without changing their habits associating the use of the assigned mouthwash. The analyses compared bleeding on probing (BOP) in the buccal and palatal/lingual tooth sides of maxillary and mandibular teeth (6 sites per tooth). A questionnaire was submitted to patients to assess any side effects. Pairwise comparisons between groups were performed at T_0 (baseline) and T_1 (after 2 weeks) ($p < 0.05$).

Results: The BOP scores decreased in all groups between T_0 and T_1 (relative variations from -12% to -6%). Within the groups, the reduction of the BOP scores occurred differently depending on the side and the area of the tooth evaluated. In particular, Group C and Group CX showed a decrease of BOP scores in palatal sites in T_1 compared to T_0.
Instead, Group P highlighted the highest BOP score reduction in the buccal sites both in maxillary and mandibular teeth. No side effects were noticed for any patient throughout the study period.

Conclusions: to reduce gingival inflammation, all the mouthwashes tested showed comparable results in terms of BOP scores decrease when used as an adjunct to mechanical oral care.
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EFFECT OF PLAQUE DETECTORS ON THE COLOR STABILITY OF A GLASS-IONOMER CEMENT

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Aim: to investigate the color stability of a glass-ionomer cement (GIC) after staining with 2 plaque detectors (PDs) with different composition and delivery forms.

Methods: twenty rectangular-shaped specimens (7 x 3 x 2 mm) were produced with a glass-ionomer cement (GIC; Fuji IX GP, GC Corp.). Color evaluation at baseline (T_0) was performed with a novel digital colorimeter (Smart_Color, Smartvision). The following PDs were used (n = 10): 1) Tablets (T; Plaq-Search™, TePe) and 2) Mouthwash (M; Plaque Agent, Miradent). The PDs were washed out according to manufacturers' instructions with a disposable toothbrush per each specimen. Color parameters were retaken after washing (T_1) as well as after polishing (T_2). The same protocol (T_{01}, T_{11} and T_{21}) was repeated after 1 week. Color changes (ΔE_{ab}) measurements at the different testing times were automatically recorded by the digital colorimeter. Data were statistically analyzed ($p < 0.05$).

Results: the type of PD, the polishing procedure and their interactions influenced the color stability of the GIC tested ($p < 0.001$). M resulted in higher color changes than T ($p < 0.05$). Repolishing could not reestablish the initial color of GIC, irrespective of the PD used ($p < 0.05$).

Conclusions: the use of plaque detectors can influence the color stability of the GIC tested in a material-dependent way, with the color changes increasing with the number of applications. Discoloration was maintained even after repolishing. From an esthetic point of view, this is clinically relevant, thus requiring further studies in this direction.

LEVEL OF DEPRESSION AND ANXIETY IN PATIENTS WITH ORAL POTENTIALLY MALIGNANT DISORDERS AWAI

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Aim: waiting for a biopsy is an unpleasant psychological experience; the patient, while in the waiting room, often fills the wait with intrusive and anxious negative thoughts. The purpose of the present open trial was to assess patients' anxiety and depression while waiting for an incisional biopsy in the oral oncology setting.

Methods: this open trial included 25 consecutively recruited patients with clinical suspicion of oral potentially malignant disorders (OPMD). The patients were administered the Beck Depression Inventory (BDI) and the Depression Anxiety Stress Scales-21 (DASS-21), and immediately thereafter underwent oral biopsy.

Results: most of the recruited patients were women (17/25, 68%), and most patients were aged between 40 and 60 years (14/25, 56%). There were 10 ex-smoker (40%), while 8 patients had never smoked (32%). The BDI and DASS-21 mean scores were 13,5 (±10,3) and 16,4 (±7,55), respectively. The BDI scores underlined a mild level of depressive anxiety, while the DASS-21 scores highlighted a moderate level of anxiety and a mild level of stress. Worthy of note, the higher BDI scores were registered on the questions regarding the "loss of interest in sex" and the "changes in sleeping".

Conclusions: the suspicion of a cancer diagnosis is probably one of the most stressful events an individual can face in his or her life. Clinicians should be aware that even a simple oral surgical procedure, such as an incisional biopsy, can evoke moderate or mild levels of anxiety and stress in patients.

STUDENT IN THE MEDICAL FIELD AND COVID-19 VACCINATION COMPLIANCE

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Aim: regardless of how vaccines are distributed among various age groups, vaccination skepticism remains a significant obstacle to the success of vaccination campaigns around the world.

Several studies conducted in various countries have reported a significant reluctance to administer the anti-Covid-19 vaccine. Aim study is to evaluate the attitude of students in the medical field towards the administration of the anti-SARS-CoV-2/COVID-19 vaccine.

Methods: the survey starts with an online questionnaire on the Google Forms platform. A link was created and disclosed via academic communication channels. The questionnaire consists of 59 questions divided into 4 sections.

Results: as of October 26th, responses from 334 students, 91 male and 243 female, had been received. Only 4 students report that they have not received the Covid-19 vaccine. Indeed, most of the students believe that the vaccine is effective and consider it their duty, as future healthcare professionals, to be informed about the Covid-19 vaccine for the health of their patients.

Conclusions: the results show a positive attitude. Most of the students were willing to get vaccinated as soon as the vaccine became available, since they believe in its effectiveness and its importance for their own and their patients' health. As an integral part of the healthcare team, students in the medical field play an important role in providing information about coronavirus and vaccination and in shaping preventive behavior in the population.

MEDICAL STUDENTS AND THE INFLUENCE OF THE PANDEMIC ON THEIR MENTAL HEALTH

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Aim: it is known that healthcare students have higher rates of depression, anxiety and stress than the general population. The objective of this study is to evaluate the effects of the pandemic on healthcare students' psychological condition, since COVID-19 is considered an additional source of stress.
Methods: the survey starts with an online questionnaire on the Google Forms platform. A link was created and subsequently disclosed via academic communication channels. The questionnaire consists of 59 questions divided into 4 sections.
Results: as of October 26th, responses from 334 students (91 male and 243 female) had been received. The most frequent moods during the lockdown and after Covid-19 were loneliness, resignation, anxiety, boredom, nervousness, sadness, stress, insecurity and intolerance associated with an increase in states of muscle tension and bruxism and daily consumption of cigarettes and alcoholic beverages.
Conclusions: these findings highlight the need for better surveillance of students' psychological health through both professional counseling educational platforms and the collaboration with psychologists and mental health therapists, in order to address issues related to post-pandemic negative consequences and moods.

KNOWLEDGE, GYNECOLOGY AND OBSTETRICS' ATTITUDES TOWARDS THE ORAL HEALTH OF PREGNANT WOMEN

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Aim: aim of the study is to investigate gynecology and midwifery students' knowledge and their attitudes towards pregnant women's oral health, as well as to find an inter collaboration between the professional figures who accompany the pregnant woman throughout the entire gestation, childbirth and postpartum process, in order to promote oral health.
Methods: the survey was conducted with the administration of an anonymous questionnaire divided into 5 sections concerning oral health and its implications during pregnancy on the Google Forms platform.
Results: the response rate obtained is 38.8%. 78.2% of participants reported that they had never conducted an oral health assessment on pregnant women during prenatal visits, as they stated that they did not have adequate preparation and the skills to carry out relevant assessments. The results of this study revealed that the participants have little knowledge of oral health during pregnancy and fear that dental procedures may have negative side effects on the fetus and/or newborn.
Conclusions: the study shows the willingness among students to deepen their knowledge of oral health, since they believe it could be useful in their training and in their daily clinical practice. To this end, it would be appropriate to include lessons and seminars related to oral health in the training course of students of the Obstetrics degree course.

ORAL HYGIENE EDUCATION FOR SPECIAL NEEDS PATIENTS' PROPOSAL FOR HEALTH MINISTRY

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Aim: to evaluate the oral health status of children with special healthcare needs having either systemic illness or any disabilities.

Methods: a retrospective analysis of oral health status was done from Sept 2020 to Dec 2022 on 128 (both genders) up to 12 years of age. The oral health status of patients was assessed with the decayed, missing filled teeth (DMFT) indices and simplified oral hygiene index (OHI-S) by using the World Health Organization 2013 oral health survey criteria.

Results: fair oral hygiene was present (65%) among all the subjects. Association between oral hygiene status and systemic illness/disability was done using the Chi-squared test was found statistically nonsignificant. The overall mean DMFT found was 4.16. The highest mean DMFT score was recorded in nephrotic syndrome patients (16.0%), while the least score was seen among cleft anomalies (1,56%). Comparison between mean DMFT scores among various systemic illnesses/disabilities were done using Kruskal-Wallis one-way analysis of variance (Kruskal-Wallis ANOVA) test and found statistically significant (*p*-value 0.048).

Conclusions: the majority of the CSHCN fall under fair oral hygiene status. A high caries prevalence and statistically significant value were demonstrated between mean DMFT scores of various systemic illnesses/disabilities. Present study aids in understanding the needs of the community, identifying high-risk groups, planning the required treatment and prevention strategies, and thus monitoring and improving the oral health status of children with special healthcare needs.

DIABETES AND PERIODONTITIS: WHAT IS THE DENTIST'S ROLE? A NARRATIVE REVIEW

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Aim: diabetes and periodontitis are two chronic diseases with high prevalence and consistently increasing incidence; moreover, the two-way association between them is of particular interest. This narrative review aims at summarizing the evidence found in literature pertaining to such a relationship and the implication it has on dentists' role in managing their patients' overall health in synergy with other healthcare professionals.

Methods: a literature search has been conducted on PubMed, selecting articles published in the last 20 years pertaining to the association between periodontal disease and diabetes and the dentist's role. Furthermore, the websites of some national and international scientific societies of periodontology and diabetology have been consulted.

Results: 10 scientific works have been selected. They indicate that diabetes is a risk factor for periodontal disease, while the inverse association is still a subject of debate. The potential that dentists and their team have in preventing diabetes, for example by educating the patient, and in interacting with other professionals, such as the diabetologist or the general practitioner, is certain.

Conclusions: dentists should have a prominent role in primary and secondary prevention of diabetes, in addition to that of periodontal disease. However, more studies are needed in order to clarify the interactions between the two diseases and the importance of dentists in this multidisciplinary field of great importance to public health.

OZONIZED HYDROGELS *VS* 1% CHLORHEXIDINE GEL FOR THE MANAGEMENT OF PERI-IMPLANT MUCOSITIS

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Aim: the new classification of periodontal and implant disease of 2017 defined peri-implant mucositis as a reversible inflammatory process of the peri-implant tissues characterized by bleeding on delicate probing without bone loss. Ozone therapy is extensively studied for its effectiveness in treating various dental conditions. To date, few studies have evaluated ozone as an adjunct to oral hygiene measures in patients with peri-implant mucositis. The aim of the present study is to evaluate the efficacy of an ozonated gel (test group) compared to chlorhexidine (control group) after a home oral hygiene protocol in a 6-month study.

Methods: According to a split-mouth study design, patients were divided into Group 1 for the application of chlorhexidine gel in the peri-implant mucositis sites of quadrants Q1 and Q3, while in quadrants Q2 and Q4 the ozonated gel was administered in the studio. For group 2, the dials were reversed.

Results: at baseline (T_0) and after 1 (T_1), 2 (T_2) and 3 (T_3) months, Probing Depth (PD), Plaque Index (PI), SI Suppuration Index (SI), Bleeding Score (BS) and condition of the marginal mucosa (MMC). A statistically significant distinction was found for all variables evaluated in each group ($p < 0.05$), while significant differences between groups were found only for PI, BoP and BS.

Conclusions: consequently, both agents tested in this study showed efficacy in the treatment of peri-implant mucositis. Particular attention deserves the ozonized gel, which is considered the best result compared to chlorhexidine on specific periodontal clinical parameters, as well as its minor defects.

PRELIMINARY STUDY ON EFFECTIVENESS OF POSTBIOTICS IN PATIENTS WITH DOWN SYNDROME

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Aim: evaluation of the domiciliary effectiveness of a postbiotics based soothing gel, compared with placebo gel devoid of active substance, in patients affected by Down Syndrome. A randomized controlled Pilot Study.

Methods: after signing the informed consent, patients satisfying the inclusion criteria will undergo supragingival and subgingival professional oral hygiene of both arches (T0). After that, the following treatment will be randomly assigned:
Biorepair Plus Parodontgel Intensive (Coswell S.p.A.) intensive soothing gel based on microRepair®, Hyaluronic Acid, Lactobacillus Ferment and *Aloe Barbadensis* Leaf Juice Powder, applied on the gingival tissues once a day until the next recall.
Placebo Gel without any active substance, applied on the gingival tissues once a day until the next recall.
Patients will be visited at: T_0, after 1 month from T_0 (T_1), after 3 months (T_2) and after 6 months (T_3). At each recall session, the following periodontal clinical indices will be collected using a probe on each periodontal site: BOP (Bleeding on Probing), PCR% (Plaque Control Record), MGI (Modified Gingival Index), level of compliance and satisfaction questionnaire of the product. At T_3, professional hygiene will be performed again.

Results: the patients investigated so far have been 10:4 at T_0, 2 at T_1 and 4 at T_2.

Conclusions: the preliminary data shows a moderate reduction in all the indices taken into consideration especially the bleeding index in patients treated with postbiotics compared to the control group. However, a larger sample size is needed to finalize a pilot study.

ACCESS TO ORAL CARE FOR PEOPLE WITH DISABILITIES DURING THE COVID-19 PANDEMIC

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Aim: the impact of the COVID-19 pandemic on dental care for subjects with different types of disabilities is still unclear. This single-center retrospective study aims at analyzing possible changes in the number and type of dental therapies provided in subjects with mental, physical and systemic disability before (year 2019) and during the COVID-19 pandemic (year 2020).

Methods: the study included patients with disabilities referred at the Gorizia-Monfalcone Dental Unit during the years 2019 and 2020. Demographic and clinical characteristics, as well as the type of treatments provided were recorded. Statistical analysis was performed employing Mann-Whitney U test and Chi-squared test.

Results: the total number of patients with disabilities referred before and during pandemic was similar (157 patients in 2019, 144 in 2020). There was a significant increase in the access of patients with cognitive disability and with low compliance ($p = 0.0146$), and a decrease in the number of patients with systemic frailty ($p = 0.0012$). Mean age of patients was significantly lower in 2020 ($p < 0.0001$). The total number of dental interventions was lower in 2020 and were mainly non-deferrable treatments.

Conclusions: the COVID-19 pandemic had a significant impact on oral treatments in patients with disabilities. While we didn't observe a decrease in the access to dental care, we observed significant changes in the type of disability, age of patients and the number and type of dental treatments that were performed.

SIMULTANEOUS DETECTION OF HUMAN CORONAVIRUSES (HCOVS) IN 1195 PATIENTS BY MULTIPLEX PCR

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Aim: in this study, we evaluated the performance of a multiplex rRT-PCR able to detect seven HCoVs simultaneously. We tested 1195 clinical samples with suspected to COVID-19.

Methods: SARS-CoV-2 RT-PCR kit available in our laboratory.

Results: the assay identified 69% of SARS-CoV-2 positive samples.

Conclusions: firmed that the multiplex rRT-PCR is a sensitive assay, time and cost-saving. These aspects make the assay a good approach be used for large-scale screening studies, for rapidly detected SARS-CoV-2 and other HCoVs relevant to human health.

HUMAN MONKEYPOX: ORAL IMPLICATIONS, SCREENING AND INFECTION CONTROL IN THE DENTAL SETTING

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Aim: on June 23, 2022, the World Health Organization classified Human Monkeypox Virus (MPXV) as an "emerging threat of moderate health concern". While approximately 25,800 and 30,200 cases of Monkeypox (MPX) were reported in Europe and the United States, respectively, till February 2023, the number of cases is still relatively small compared with the number of patients treated annually by dentists. Consequently, the likelihood of oral health care workers in non-endemic regions encountering an MPX case is low. However, MPX risk factors, clinical presentation, transmission routes and clearance, and the associated risk in the dental setting, remain uncertain, the present narrative review synthesized epidemiological and clinical data

available to provide specific recommendations for infection control and oral and dental management of MPX cases.
Methods: relevant evidence was narratively reviewed.
Results: MPX cases with manifestations limited to the head and neck region may require oral and dental care because they complain of cervical lymphadenopathy.
Moreover, MPX lesions may initially appear in the oral cavity or perioral area.
Appropriate preventive measures should be taken to minimize cross-infection risks in the dental setting.
Conclusions: given the recent spread of MPXV to non-endemic regions where dentists may not usually include the disease in their differential diagnosis or take appropriate preventive measures, oral healthcare providers need to be aware of the oral presentation of MPX for appropriate oral screening and infection control measures in the dental setting.

THE EFFECT OF NON-FLUORIDE AND FLUORIDE TOOTHPASTES ON TOOTH SURFACE ROUGHNESS

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Inside the oral cavity, variations in salivary pH are the main cause of tooth enamel erosion and demineralization. For this reason, the application of materials such as non-fluoride toothpastes and fluoride toothpastes is recommended. The aim of this *in vitro* study is to evaluate the effect of a non-fluoride toothpaste and a fluoride toothpaste on tooth surface roughness and their ability to protect against erosion. The acid attack simulation was performed on six caries-free human teeth, extracted for periodontal reasons, using a carbonated drink. The samples were immersed in 5 ml of carbonated drink for 2 minutes at room temperature and rinsed with distilled water. The immersion process was repeated 4 times for a total of 8 minutes. Subsequently, the toothpastes were applied for 3 minutes at 0, 8, 24 and 36 hours without brushing to cover the entire enamel surface and then rinsed with distilled water to test their effect on surface roughness. A second cycle of acidification was then carried out with the consequent reapplication of both products to evaluate their ability to protect against erosion. The samples were then analyzed with a scanning electron microscope (SEM) and a profilometer. Both toothpastes have shown to be able to restore surface roughness to values comparable to the initial ones. Surface roughness remained unchanged after the second acid attack only in the teeth treated with fluoride toothpaste. Fluoride toothpastes have been shown to be better at protecting against acid attack demineralization than non-fluoride ones.

CARIES PREVENTION IN HEAD-NECK CANCER PATIENTS WHO RECEIVED RADIOTHERAPY

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Aim: among the most frequent side-effects of head and neck radiotherapy (RT), there are radiation-induced caries, correlated to the direct effects of RT on dental hard tissues and to hyposalivation. Their frequency depends on the dose and localization of RT received. Nowadays, fluoride, together with correct oral hygiene and dietary habits, is considered a key-point for the prevention of carious lesions. Calcium phosphate-based products could be of help in supporting remineralization in case of severe hyposalivation. The aim of this study is to evaluate the effectiveness of a topical product, based on the calcium phosphate mousse, added to topical fluoride, in reducing the incidence of radiation-induced caries.
Methods: this study is a randomized clinical trial with two parallel arms on 20 head and neck cancer patients who received RT (15 women, 5 men). Ten patients were treated with topical fluoride only (control group) and 10 patients with fluoride plus the calcium phosphate mousse (test group). Patients were recalled every 3 months for dental examination; full mouth plaque score (FMPS) and DMFT index were collected.
Results: at 6 months recall, DMFT index remained stable in the test group (only 1 new carious lesion was found), while increased in the control group (3 new carious lesions were found). In both groups a reduction of full mouth plaque score was observed.

Conclusions: these preliminary results suggest that calcium phosphate-based products, added to topical fluoride, could be promising to prevent the onset of radiation induced-caries.

ORAL-HEALTH RELATED QUALITY OF LIFE (OHQOL) IN PATIENTS WITH COGNITIVE IMPAIRMENT

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Aim: compromission of oral health is one of the main factors that may affect geriatric patients presenting cognitive impairment (CI). However, there is a lack within scientific literature of studies assessing the oral-health related quality of life (OHRQoL) within this population. Therefore, the aim of the present study was to evaluate the relationship between OHRQoL and oral health status, in terms of periodontal condition, in subjects affected by mild-to-moderate CI.

Methods: a total of 80 patients with mild-to-moderate CI and 80 controls matched by age and gender were enrolled in the present study. 36-Item Short Form Health Survey (SF-36), Oral Health Impact Profile (OHIP 14) and General Oral Health Assessment Index (GOHAI) were carried out. In addition, the periodontal status was assessed by staging and grading.

Results: a poorer OHRQoL was appreciated in the CI group compared to the controls (OHIP-14 total score: $p < 0.005$, GOHAI total score: $p < 0.005$). In addition, the general quality of life (QoL) of CI patients was significantly impacted as resulted in SF-36 sub-items. Higher scores of periodontal disease were recorded in the CI group, demonstrating a poorer oral health status than controls (p-value: 0.023).

Conclusions: within the limitation of the present study, it could be concluded that CI patients presented a poor OHRQoL and oral health status that might enhance the psychological impairment.

Oral health care needs to be improved within geriatric patients, promoting prevention and early diagnosis of oral diseases and increase of the prognosis and patients' QoL.

STUDENTS' ATTITUDE TOWARDS HIV. PRELIMINARY REPORT FROM ITALIAN SCHOOLS OF ORAL MEDICINE

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Aim: fear of infection and poor knowledge of the actual risks of transmission lead some healthcare professionals to discriminate infected patients by not providing the necessary care and sending them back to public facilities or other professionals.

Methods: anonymous questionnaires were given to 470 students. The survey is divided in 4 sections. The first one collects demographic data of students. The second section deals with the relationship between students and HIV patients and it is divided in three subsections based on the student's response to the request to treat an HIV positive patient (agreed, refused or not asked). The third section evaluates the student's knowledge about HIV infections and the fourth one regards the application of hygiene protocols to avoid operator exposure and cross infections and the need to implement information on the relationship between dentists and HIV-positive patients by professional bodies or universities.

Results: the data has proved that from half of the participants, who were required to treat patients with HIV, nearly everyone agreed to treat them, except from 3 participants who, for fear of being infected or infecting their colleagues, refused to. Even among students who have not been asked to treat HIV-positive patients, the will to treat seropositive patients prevails.

Conclusions: after discussing the data from the questionnaires, it emerges that the preparation of students, both practical and theoretical, regarding HIV infection is valid and sufficient to allow the treatment of these patients without discrimination.

PREVALENCE OF ODONTOMA IN PATIENTS WITH IMPACTED TEETH: A RETROSPECTIVE STUDY

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Aim: the aim of this study is to determine if exists a correlation between the prevalence and position of odontoma and the occurrence of delayed or impacted teeth.

Methods: a retrospective study was conducted to collect demographic and clinical data of patients who presented odontomas from 1995 to 2022. Forty-five patients (mean age 14.2 years) with 29 complex and 16 compound odontomas were included in the study. The initial symptoms observed were delayed eruption of permanent teeth (n = 25), pain (n = 6), swelling (n = 4), and no symptoms (n = 10). The presence of odontoma was discovered through panoramic radiographs in all patients. The mandible to maxilla ratio was approximately 2:1 (31/15).

Results: out of 45 patients, 31 were diagnosed incidentally, with all patients being discovered via panoramic radiographs. Thirty-two out of 45 odontomas were in close proximity to at least one tooth (n = 21 at incisive).

A total of 12 teeth were extracted (complex: n = 8; compound: n = 4). Of the non-extracted teeth, 33 were displaced and retained.

Of those, 29 were successfully aligned through an orthodontic-surgical approach, and 4 teeth erupted spontaneously after surgery during the follow-up period.

Conclusions: an early detection of odontoma is more likely an accidental radiological finding, hence the need for routine radiographic analysis should be emphasized.

Early diagnosis of odontomas in primary dentition is crucial in order to prevent later complications, such as impaction or failure of eruption of teeth.

CIRCULAR ECONOMY TO ORAL HEALTH: EFFECTS OF BWPF FROM BREWING PROCESS ON *LACTOBACILLUS*

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Aim: the aim of this study is to evaluate the effect of bioactive wastewater phenolic fractions (BWPF) natural compounds, on *Lactobacillus casei*.

Methods: the total phenolic content obtained from the brewery wastewater process was determined by the Folin-Ciocalteu assay, as reported from our previous experience in the field. The effect of BWPF on the growth of *Lactobacillus casei* was assessed by the growth curve assay. Moreover, the effects of the phenolic fraction on acid production and biofilm were measured according to standard methodology.

Results: the experimental results indicated that BWPF can inhibit *Lactobacillus casei* biofilm formation as well as acid production activity and may contribute to a rise in the cytoplasmic acidity, followed by decreasing acid adaptation.

Conclusions: natural products represent an essential source in the discovery of such new drugs. The brewery industry generates wastewater that could yield a natural extract containing BWPF compounds.

Few Lactobacillus species represent a major contributor to caries progression due to their ability to produce lactic acid as a by-product of glucose metabolism. In the circular economy era, waste compounds offer great potential for developing and producing customized oral dosage forms using available sources.

COMPARISON BETWEEN HORIZONTAL COUNTERPARTS IN THE SKELETAL CLASSES I, II, III SUBJECTS

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Aim: the aim of the present study was to assess whether the length of the upper cranial structures takes part in the etiology of different sagittal skeletal discrepances of growing subjects.

Methods: from a sample of 1309 teleradiographs obtained from a radiological center, those of patients aged between 12 and 18 years, without previous orthodontic/prosthodontic/implant treatments, were selected for cephalometric measurements in Deltadent software. Subjects were grouped in three skeletal sagittal classes according to ANPg^: Class I (-1° ≤ ANPg^ ≤5°); Class II (ANPg^ >5°); and Class III (ANPg^ <-1°). The measurement of S-N, ANS-PNS, and Go-Me were used to characterize the length of the upper cranial structures, the maxilla, and the mandibole, respectively. Differences in S-N, ANS-PNS, Go-Me measurements between groups were assessed through the ANOVA test. The p-value was set to <0.05.

Results: subjects who met inclusion criteria were 370, including 265 in class I group; 68 in class II group; and 37 in class III group. Age difference between groups was not significantly. When comparing measurement of cephalometric plans between the groups, differences were found in ANS-PNS (p = 0.006) and Go-Me (p <.001) measurements. Instead, no statistically significant difference was found in S-N measurement.

Conclusions: the results of the present study pointed out that the development of sagittal skeletal discrepances is influenced exclusively by the length of the jaws (ANS-PNS, Go-Me), while the length of the upper cranial structures (S-N) does not appear to be involved in this process.

COMBINED ORTHODONTIC SURGICAL THERAPY TO DISINCLUDE TWO INCISORS

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Aim: this study highlights the importance of combined surgical-orthodontic treatment to restore a smile to a patient in a very delicate period of growth, such as preadolescence.

Methods: an "included tooth" is a tooth that is unable to erupt through the gum by remaining partially or completely trapped in the bone, within the physiological time frame. The "timing" of eruption of the upper central incisors should be at about 6-7 years of the upper lateral incisors at 8-9 years.

The 12-year-old patient presented significant esthetic, and therefore psychological, damage due to the absence in the arch of incisors 11 and 12. From in-depth instrumental, opt and CBCT diagnostic investigations, the two incisors were found to be in bony inclusion and in unfavorable position for spontaneous eruption and with fully formed roots. The first step was to place brackets in the upper arch and surgically expose 11 and 12 with vestibular access, by diode laser with continuous light and power 2-3 W. Brackets were finally applied to the two exposed elements.

After about 10 months, the two incisors were aligned with the other dental elements and in proper closure with the lower arch elements.

Results: combined surgical-orthodontic treatment resulted in the resolution of a case with two included incisors in a nearly horizontal position in a 12-year-old patient.

Conclusions: the major success, however, was not the repositioning of two hidden anterior dental elements and dental alignment, but having restored a smile to a growing girl with a markedly improved psychological outcome.

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USE OF THE PROVISIONAL MAD AS A TOOL TO EVALUATE THE EFFICACY OF OD IN MILD-MODERATE OSAS

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Aim: the aim of the work is to evaluate the efficacy of provisional MAD in patients with mild-moderate OSAS. OSAS is the partial or complete obstruction of the upper airways during sleep, resulting in episodes of apnea/hypopnea followed by arousals. The therapeutic gold standard is C-PAP, which is not always tolerated. In mild and moderate cases, the AASM leaves the decision to use an OD to the doctor and the patient.
Methods: in order to evaluate the therapeutic efficacy of OD, a provisional MAD is used which has a lower cost than a definitive MAD. The provisional MAD is a standardized silicone device that can be customized: it is immersed in boiling water to make it soft, it cools down and it is possible to proceed with the registration of the arches. It is rinsed and finished. The last steps are the assembly and the titration of 50-60% of the protrusive of the patient.
Results: a retentive device is obtained, which guarantees resistance to the opening mouth during sleep. The temporary MAD is used for about 6 months: in presence of satisfactory results, the definitive MAD is created. The 56-year-old male patient came to our Unit for excessive daytime sleepiness. He had class II malocclusion, BMI 25.8, AHI 24.7 at PSG. The creation of a temporary MAD was arranged, to evaluate whether the patient was a candidate for a definitive MAD.
Conclusions: at the next PSG there was a marked improvement in symptoms with reduction of the AHI. It is now possible to proceed to the creation of a definitive MAD.

USE OF "3D SLICER" IN SURGICAL-ORTHODONTIC TREATMENT OF IMPACTED DENTAL ELEMENTS

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Aim: 3D Slicer is a freeware, open-source software for the visualization, processing and 3D segmentation of radiographic images.The aim of this case report is analyzing the potential of this software in planning complex surgical-orthodontic treatment of impacted elements that require a multidisciplinary approach.
Methods: in January 2022, an 8-year-old male patient came to our observation for a surgical-orthodontic evaluation of elements 11 and 12. In the CBCT these elements appeared included, retained, rotated, with 11 palatalized and 12 with major axis almost parallel to the occlusal plane. Once CBCT files were imported into the software, segmentation was performed with the "segmentation editor" module, using the "threshold" function for maxillary upper jaw and "grow from seeds" for the teeth. In order to have a reference of both hard and soft tissues, sections from the CBCT and those from intra oral scan were superimposed to visualize elements 11, 12, 13 (apical to the crown of 12) and the upper jaw individually on the sections and the reconstruction.
Results: thanks to the previsualization and precise localization of the included elements, it was possible to set up a flap exposing elements 11 and 12. Buttons with eyelets were applied on the mesio-vestibular and vestibular surface of 11 and 12 respectively, proceeding with traction of these elements.
Conclusions: 3D reconstruction obtained by segmentation can be influential in decision making and interdisciplinary communication between the oral surgeon and orthodontist, making radiographic investigations easier to be interpretated.

EVALUATION OF MOLARS' CLASS: DIFFERENCE BETWEEN DIGITAL IMPRESSION AND PHOTOGRAPHY

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Aim: in orthodontics is very important to determine the molars and canine class to be able to establish the appropriate treatment plan. The aim of this study is to evaluate the difference perceived between digital impression and intra-oral lateral photos, considering the Angles' malocclusion classification, in particular the relationship between upper and lower first molars.

Methods: this study included two patients with permanent teeth having second molar class according to Angle's classification. The intra-oral lateral photos were taken with a professional photo camera, Nikon D7000, using a ring-flash; while the digital impression was taken with an intraoral scanner, specifically iTero™. Theoretically, lateral photos should be taken perpendicularly to the occlusal plane (directly or with the help of the lateral mirrors). In the real clinical life this is not always possible because of the difficulties pulling the cheek laterally and uncompliant patients.

Results: observing the lateral photos and the digital impression, a difference could be seen. This could be caused by the capability of the clinician to take the photo with the right angle between the occlusal plane and the camera, that should be 90 degrees.

The difference noted consisted of a reduction of the second class in the photos taken by the photo camera in comparison with the real class visible during the clinical examination and with the digital impression.

Conclusions: in conclusion, the photos are not, in some cases, the best way to analyze the molar class relationships.

ORTHODONTIC SURGICAL TREATMENT OF TWO CENTRAL IMPACTED INCISORS. A CASE REPORT

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Aim: impacted tooth is a common occurrence in dental practice, affecting approximately 20-22% of orthodontic patients. Correct diagnosis of impacted tooth is important and requires understanding the normal development of the dentition as well as the most common etiologic factors (local, general and structural). The most common etiological local factors are: cysts, odontomas, supernumerary and traumatic dislocations.

The purpose of this study is to present a clinical case of orthodontic-surgical treatment of two impacted central incisors due to the presence of two large supernumerary teeth that hindered their physiological eruption.

Methods: our healthy patient was observed at the age of 11. The intraoral clinical examination revealed a good level of oral hygiene, no caries and the absence of teeth 11 and 21, with a Class II malocclusion and a deep bite. Radiographically, it was evident how the supernumerary teeth hindered the normal eruption of the corresponding impacted teeth. The supernumerary tooth was extracted and then an orthodontic-surgical treatment started.

Results: the impacted teeth were effectively recovered using a multibrackets therapy and elastic traction.

Conclusions: the treatment of impacted tooth can be a complex issue to resolve and require a multidisciplinary approach. It is important for pediatric dentists and orthodontists to be prepared to diagnose and intercept permanent teeth with ectopic eruption and to collaborate with surgeons in developing a proper orthodontic-surgical treatment plan.

USE OF PUSHING SPLINTS 3 IN A GROWING PATIENT: A CASE REPORT

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Aim: the aim of this case report is to describe the treatment of a dentoskeletal Class III malocclusion in a growing patient.

Methods: a 9-year-old boy came at the Orthodontic Clinic of the University of Naples Federico II for a first consultation. The main complaint were familiar history of Class III and anterior cross bite. From the extraoral view, he showed a concave profile with a retruded position of the anterior dental limit during smile. Intraoral examination pointed out a bilateral Angle Class I with anterior crossbite and absence of transveral discrepancy during early mixed dentition stage. The cephalometric assessment showed a tendency to skeletal Class III. The patient was treated with a Pushing-Splints 3 (PS-3) device for 18 months (16 hours/day). The patient will be followed up during growth.

Results: following interceptive treatment, at the extraoral view the profile was improved. Dento-alveolar Class II (edge to edge) with positive OVJ was achieved.

Superimposition of lateral x-rays showed a good control of the vertical growth pattern and an improvement of the tendency to skeletal Class III.

Conclusions: the PS-3 is a valuable option for the early correction of Class III. Its design provides favorable correction of anterior cross bite, maxillary advancement and adequate control of mandibular divergency.

CLASS III HYPERDIVERGENT: ORTHODONTIC COMPENSATION (EXTRACTIVE/NON EXTRACTIVE TREATMENT)

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The aim of the study is to present two cases of III class in which optimal occlusion was achieved, in compliance with good periodontal health and very satisfactory facial aesthetics. Surgical treatment is usually required to achieve optimal correction of class III disharmony. If the patient refuses surgical treatment, after a careful diagnostic evaluation, a compensatory orthodontic treatment can be used if the conditions allow the achievement of the pre-established objectives.

In this regard, 2 patients presenting III hyperdivergent skeletal class were compared. It was decided to proceed with extraction treatment for one patient and not to perform any extraction on the other.

Orthodontic compensation generally aims to slightly increase the upper perimeter line and reduce the lower perimeter line by acting above all on the torque of the incisors of both arches.

Both patients underwent orthodontic check-ups 10 years after.

CLASS II DIVISION 2 TREATMENT WITH HERBST APPLIANCE AND TWO MINISCREWS: A CASE REPORT

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Aim: class II division 2 is the malocclusion characterized by deep bite, retroclination of maxillary incisors, small and\or retropositioned mandible, showing a strong genetic link and correlation with dental anomalies. Herbst's fixed functional appliance is considered effective to treat class II mandibular retrusion.
This case report's purpose is to demonstrate how it is possible to manage the Herbst's side effects of lower incisors flaring with two miniscrews in a critical situation of anchorage.
Methods: the patient is a 14-year-old Caucasian female presenting a Class II\2 malocclusion with maxillary protrusion, mandibular retrusion, reduced overjet, deep bite, brachyfacial pattern, redundant lips. Significant proclination of the lower incisors is observed (T1 -1/Go-Gn = 107.7°). According to the Cervical Vertebral Maturation (CVM) method, the patient is in CVs 3 stage.
Results: the treatment goals were resolution of the deep bite, correction of the upper incisal retroclination, achievement of class I relationship, prevent further proclination of the lower incisors and improve the facial profile. Therapy involved the use of fixed multibracket appliance (Ovation; Dentsply-Sirona GAC, USA) with Roth prescription extratorque, Herbst appliance and two buccal miniscrews (PSM Medical Solution, Germany) in positions 36-37 and 46-47 ligated with metallic ligatures to the distal loop of a sectional arch 33-43.
Conclusions: the active treatment time was 28 months and, in the end, all goals stated were achieved with an adequate control of the lower incisal positions (T2 -1/Go-Gn = 108°).

TEMPOROMANDIBULAR DISORDERS AND JUVENILE IDIOPATIC ARTHRITIS: SCOPING REVIEW

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Aim: the purpose of current study is to highlight the potential correlation between Temporomandibular Disorders (TMDS) and Juvenile Idiopathic Arthritis. Juvenile Idiopathic Arthritis (JIA) encompasses a wide range of mostly idiopathic autoimmune arthritis which affect growing individuals. Temporomandibular disorders are a diffuse spectrum of diseases which involve temporomandibular joint (TMJ) and associated structures. However, much more need to be defined in order to detect and manage these conditions.
Methods: the current study has been developed in order to overview what it is known about these disorders and their mutual interactions. Have been reported three case report of patients affected by an Undifferentiated form of JIA developed arthritis to TMJs, complaining pain and functional impairments.
Results: after 2 years, the follow-up with combined pharmacological therapies and a modified oral stabilisation appliance shows no objective worsening of the joints' structures. However, the more complex symptomatic management of inflammation highlights the need for further knowledge.
Conclusions: the present study shows that both literature and clinical activity highlights a strong relationship between JIA and TMDs, that can affect the quality of life of children and adolescents.
Diagnosis and management of these conditions are extremely complex, thus additional studies and evidence are needed. However, the need of an interdisciplinary approach between rheumatologists, pediatricians and dentists has been demonstrated.

PHOTOBIOMODULATION TO REDUCE ORTHODONTIC TREATMENT TIME AND PAIN PERCEPTION: A CASE REPORT

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Aim: to demonstrate the effectiveness of PBM in shortening the duration of orthodontic treatment and reducing discomfort to restore aesthetics and function in an adult patient while ensuring optimal compliance.

Methods: a 61-year-old male subject, smoker, in good general and oral health, skeletal class III, left dental class undetectable due to agenesis of 2.2, class I dental on the right, noncontiguous midlines, OVJ 0.7, OVB 2.1, with severe crowding of the upper and lower arch was selected. The G8 tooth expansion protocol was applied with Invisalign® aligners replaced every 5 days. Oblique attachments were used in the anterior sector of the upper arch for incisor tip control during the opening of the space at site 2.2 for subsequent implant-prosthetic rehabilitation. Treatment was accelerated with the Orthopulse™ PBM device (λ: 850 nm) for 5 minutes per day per arch.

Results: at the end of the 9-month treatment, the patient had a class I dental occlusion, good tooth alignment, good aesthetic outcome, normal OVJ and OVB, centered midlines and space recovery for element 2.2 on which implant rehabilitation and placement of a temporary crown were performed.

Conclusions: the Orthopulse™ device has proven effective in accelerating tooth movement, reducing pain and increasing patient compliance. Radiological investigations showed no bone loss. Orthopulse™ can make a major contribution to increasing access to orthodontic treatment by the adult population.

MINISCREW-ASSISTED RAPID PALATAL EXPANDER, TRANSVERSE MAXILLARY HYPOPLASIA, IMPACTED TOOTH

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Aim: the aim is to show a valid treatment of the transverse maxillary hypoplasia using a rapid palate expander anchored to the palatal bone by means of miniscrews, followed by fixed orthodontic therapy for the recovery of an impacted tooth element and resolution of the malocclusion.

Methods: a 15-year-old male patient presented with bilateral crossbite without mandibular shifting, deficit of the transverse diameter of the upper jaw, 17 and 23 absent in the arch, with no space for 23.

The orthodontic case study allowed us to analyse the position of 23, which was impacted, to verify that 17 and 18 were fused, and to plan the therapy with mixed-anchored rapid palate expander with bands and palatal miniscrews, in combination with a unilateral distal slider to distalise the second quadrant. Multibrackets fixed orthodontic therapy then concluded the entire treatment.

Results: the application of the MARPE combined with a distaliser and fixed orthodontic therapy made it possible to correct transverse maxillary hypoplasia in a 15-year-old patient, with resolution of the bilateral crossbite and recovery of the space required in the arch for element 23, thus avoiding any negative effects on the dento-alveolar area.

Conclusions: where a good anchorage is needed, the MARPE appears to be a valid solution for the expansion of the transverse diameter of the maxilla, guaranteeing an optimisation of the skeletal expansion potential of the palate thanks to its mixed anchorage, and allows the patient to be prepared for a more rapid and simplified fixed orthodontic phase.

INTERCEPTIVE APPROACH TO AN ANTERIOR CROSS-BITE THROUGH DELAIRE'S MASK: CASE REPORT

Pezzolla C.

Aim: class III malocclusion is an orthodontic anomaly in which the mandibular arch is in a mesial position relative to the maxillary arch. In most cases of mandibular prognathism, treatment should be postponed until the growth ceases. However early treatment of class III malocclusion can be initiated to improve occlusal relationships and provide a more favorable environment for future growth. The purpose of this study was to present the treatment of a patient with class III malocclusion in mixed dentition, using a Delaire mask.
Methods: the patient was a 10-year-old male, with an anterior crossbite and undeveloped premaxilla. Familiar mandibular prognathism was present. He presents a concave profile and a shorter lower face third. The cephalometric evaluation showed a value of SNA 78.7° (maxillar retrognathism), SNB 83.4° (mandibular prognathism), and ANB -4.7° (Class III malocclusion). It was decided to start the treatment with a Delaire mask fixed on the deciduous molars with an RPE to improve the maxillary's transverse relationships.
The patient worm it 12-14 hours a day.
Results and Conclusions: five months after the beginning of therapy positive overjet and Class I occlusion of deciduous canines and permanent first molars was achieved. The patient used the Delaire mask for additional six months, therefore at the end of the treatment canines and first permanent molars were in half Class I relationship. The patient's facial aesthetics, however, is already significantly improved.

ANTERIOR CROSS BITE OF A SINGLE TOOTH AND INTERCEPTIVE DEVICE: A CASE REPORT

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Aim: the aim of this study is to highlight the importance of an early-stage treatment in a young patient with dental crossbite and deep bite treated with OG.
Methods: the patient at the beginning of the treatment was a 9-year-old female without menarche. Intraoral examination shows that the young girl is in mixed dentition, has I molar class, crossed 2.1, 6 mm OVB, midline deviation, lower dental crowding and upper malpositioned teeth. Extraoral examination highlights the typical "deep-bite" face, with imposing masseters, an elusive chin and the face squared. According to the treatment plan, the patient has to wear OG size 5G for 4 hours during the day while she does exercise for the activation and every night passively. OG helps to prevent the worsening of a malocclusion, to recover space in the arches by guiding the eruption of canine and premolars and to align frontal teeth. Once achieved the correction, OG was worn by the patient only overnight to stabilize the result and guide the eruption of the remaining teeth.
Results: after 1 year of treatment the dental crossbite and deep bite were resolved and the midlines were coincident.
Conclusions: preventive orthodontics through OG represents an important step forward in the field of interceptive orthodontics since is capable of solving most orthodontic problems and facilitating the next phase of treatment.

VERTICAL DIMENSION RESTORATION IN VIEW OF AN ORTHODONTIC TREATMENT WITH HAWLEY RETAINER

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Aim: this case-report assesses the usefulness of a vertical posterior dimension restoration in a grinding patient, in prevision of an orthodontic treatment in order to correct pro-inclination of maxillary incisors.

Management of severe worn dentition in bruxing patients is challenging, since it can lead to occlusal vertical dimension (OVD) loss and lack of space to correct teeth exo-inclination.

Methods: a 26-year-old grinding man sought orthodontic consultation to treat increased OVJ. Clinical evaluation revealed signs of molar surfaces wearing.

After orthodontic check-up, it was decided to increase posterior OVD before alignment treatment by cementing a resin provisional mock-up, made according to a wax model, on 34-37 and 44-47. Then followed cementation of definitive composite onlays.

During every treatment step, electromyographical Teethan® analyses assessed patient's tolerance to the increased OVD: these evaluations allow to control occlusal balance by checking Neuromuscular Equilibrium Index.

Results: a better maxillary incisors proclination is achieved maintaining a Hawley retainer with an elastic chain for 2 months. The final result is stabilized and after 1 year no signs of relapse/muscle discomfort were recorded.

Conclusions: hawley retainer, together with a vestibular elastic chain, is a valid tool to correct excessive dental proclination, while restorative techniques and EMG allow to rehabilitate OVD and avoid overload.

A multidisciplinary approach in orthodontics is needed in order to restore dento-facial harmony, aesthetic stability and neuromuscular balance.

INTERCEPTIVE ORTHODONTIC THERAPY TO IMPROVE AESTHETICS AND RESTORE FUNCTION: A CASE REPORT

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Aim: interceptive orthodontics must employ simple and predictable therapies that can enhance arch shape, face, and function, with aesthetically pleasing and stable long-term results, in order to be effective and efficient. A correct diagnosis is necessary to choose the best timing and course of treatment.

Methods: our young 8-year-old patient's convex profile, reduced lower third of the face, narrow smile, and wide buccal corridors are all visible on extraoral examination. An intraoral examination reveals a class II malocclusion, second division in mixed dentition, with crowding of the arches, deep bite, and palatal tilt of the upper incisors. A second skeletal class with a normodivergent growth pattern and a slight tendency toward hyperdivergence is visible upon examination of teleradiography in latero-lateral projection.

Results: two years were spent on the treatment. Following treatment, the patient shows a harmonious face in both frontal and profile views, with a pleasing smile that is quite broad. She achieved a class I occlusion, showing leveled and aligned teeth, a proper bite, and a correct position of the upper incisors. Although an aligner finishing phase was suggested, it was rejected because the patient and parents were already satisfied with the outcome.

Conclusions: this clinical case serves as an illustration of how interferences can be removed through a minimally invasive, reasoned approach as the result of a thorough diagnosis, allowing nature to express its full potential for growth and development.

LASER-ASSISTED LINGUAL FRENULOTOMY IN 3-WEEK-OLD NEWBORN: CASE REPORT

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Aim: any reduction in lingual movement can result in a functional alteration, such as difficulty in breastfeeding. A short lingual frenulum, also known as ankyloglossia, is a congenital anomaly in which a small portion of tissue, which should have undergone apoptosis during embryonic development, remains on the sublingual surface and anchors the tongue to the floor of the mouth, greatly reducing its mobility. The aim of this study is to report a case of ankyloglossia causing inability to feed. In particular, it concerns a 3-week-old newborn unable to feed properly due to the short lingual frenulum.

Methods: today, surgical treatment is only recommended if ankyloglossia caused breastfeeding problems such as nipple pain and tears, poor latch, and low infant weight gain. In our study, the patient was unable to feed either by artificial or natural breastfeeding. It was therefore decided, after local anesthesia with lidocaine spray, to perform a laser-assisted lingual frenulotomy.

Results: the result obtained in this case was an immediate increased lingual mobility in absence of bleeding. This therefore made possible to restore the correct tongue's function in the act of feeding.

Conclusions: this case report confirms the importance of early diagnosis of ankyloglossia, as the presence of a short lingual frenulum in. newborn is considered a warning sign for potential breastfeeding difficulties.

The surgical correction via frenulotomy must be carried out to allow better lingual mobility in case of difficulties in natural and artificial feeding.

AVOIDING ORTHOGNATHIC SURGERY THANKS TO ALT-RAMEC TECHNIQUE IN A PATIENT WITH UNILATERAL CLEFT LIP AND PALATE: CASE REPORT

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Aim: this case report aims to describe the effectiveness of alt-RAMEC therapy with temporary skeletal anchorage devices (TADs) appliance in solving midfacial retrusion in a unilateral cleft lip and palate patient, and to evaluate its long-term results.

Methods: the patient is a 14-year-old girl with unilateral cleft lip and palate, she was treated with the protocol proposed by Liou, which consists of 7 cycles with 7 days of expansion and 7 days of constriction using a 2-hinged expander, 1 mm per day, alternately.

In this case a double lingual arch with anterior hooks was soldered on molar and premolar bands and 2 maxillary and 2 mandibular temporary skeletal anchorage devices were used indirectly to avoid dental movement.

After the final expansion cycles, the patient underwent 8 months of active maxillary protraction with intraoral elastics (300 g), used 24 hours a day.

Results: skeletal and dental changes were evaluated by cephalometric analysis based on pre- and post- treatment records of the patient. The study demonstrated successful achievement of the case's therapeutic objectives, including the correction of maxillary retrusion, and the maintenance of stable long-term results, which were confirmed through analysis of the patient's 18-year record.

Conclusions: the results indicate that the Alt-RAMEC technique effectively allowed significant and stable maxillary protraction in the patient, ultimately preventing the need for subsequent orthognathic surgery.

RELIABILITY OF GUIDED MINISCREW INSERTION BASED ON LATERAL CEPH AND MAXILLARY STL FILE

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Aim: the anterior area of the palate is widely used as an insertion site for orthodontic miniscrews. These temporary anchorage devices can be placed either directly or using an insertion guide, and various kinds of digital planning and guides are currently available. This study aimed to verify if the guided procedure can guarantee the correct position of the miniscrews on the patient compared with the digital project.

Methods: twenty-five consecutively treated patients were included in the study. Angular and linear displacements of the miniscrews were evaluated among three groups: the planned position, the printed model position, and the achieved position.

Results: the median achieved angle between two digitally planned parallel screws was 6.22 (interquartile range: [4.35, 9.08]) and the difference between the angles in the planning and the achievement groups was significant (P <0.001). Lateral and vertical differences were also found among the three groups.

Conclusions: results show that the examined workflow is clinically efficient. Differences between the digitally planned position of the orthodontic miniscrews, the control position, and the achieved position were detected both for angular and linear measurements but were not clinically significant.

FIRST MOLAR ROTATION WITH ALIGNERS: A REVIEW

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Aim: the aim of this research is to find out if is possible to achieve first molar rotation and its accuracy and predictability.

Methods: the research has been conducted on the following databases: PubMed and Google Scholar. The keywords used were: “first molar rotation”, “molar rotation” and “clear aligners”. The research produced 13 results, of which only 4 articles met the inclusion criteria. Studies published from 2007 to present day were included, while book or book chapters, abstract, editorials were excluded. Age and gender were not considered as exclusion criteria.

Results: although molar derotation is a difficult orthodontic movement, aligners are found to be effective in performing this movement, the predictability was 82% in adult patients and 66% in growing patients. regarding rotational movement, our results reveal that rotation of the first molars is the only movement with excellent predictability, as reported in previous article.

Conclusions: the rotation movement is well performed with clear aligners and has high value of predictability. the inhomogeneity of the results in the studies analyzed can be due to different malocclusion treated and different aligners systematic used.

A LITERATURE REVIEW OF IMPLICATIONS OF SURGERY-FIRST APPROACH FOR OBSTRUCTIVE SLEEP APNEA

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Aim: the recent trend has been the "surgery first approach" (SFA) in which orthognathic surgery is performed without presurgical orthodontic preparation and it is followed by conventional orthodontics. The SFA, compared with the traditional approach, can reduce treatment time and avoid worsening facial esthetics and dental function during orthodontic preparation. Obstructive sleep apnea (OSA) is associated with significant morbidity so it has been gaining more attention from orthodontists. The aim of our research is to evaluate if SFA with maxillomandibular advancement (MMA) can achieve an early improvement of OSA condition.

Methods: a research on PubMed was conducted by using keywords: "Airway", "Surgery-first", "OSA". The eligibility criteria were: the period of publication-since January 2013; articles concerning OSA treated with SFA using bi-jaw advancement orthognathic surgery. Five articles were included in the review.

Results: the SFA with MMA is effective in treating patients with OSA without negatively affecting facial appearance and dental occlusion. It allows early improvement of OSA and reduces the risk of OSA worsening from presurgical orthodontic preparation.

Conclusions: the immediate correction of OSA condition is sometimes required to be the first consideration for the patients, and minor orthodontic treatment can be performed afterwards. However, pre-surgical evaluation is still mandatory with orthodontists to avoid unfavorable result and post-surgical complications. Further studies are needed to confirm these little results.

COMPARATIVE ANALYSIS OF ROOT RESORPTION BETWEEN TOOTH-BORNE AND BONE-BORNE EXPANDERS

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Aim: the aim of the study was to examine tooth-borne (TB) versus bone-borne (BB) rapid maxillary expansion (RME) in terms of external root resorption (ERR) in individuals.

Methods: pre-treatment (T_0) and post-treatment (T_1 = 6 months) CBCT scans of 40 participants who received tooth-borne RME (TB group; average age 13.3 years; 1.10 years) or bone-borne RME (BB group; average age 14.7 years; 1.15 years), were used to assess ERR. 3D reconstructions of the radicular architecture of the maxillary first molars (M1), first and second premolars (P1 and P2) were performed to calculate volumetric changes (mean and percentage values) and shape changes (deviation analysis of the radicular models) between T_0 and T_1.

Results: first molars were the teeth most affected by the resorption process in both groups, with a substantial reduction in radicular volume and length ($p < 0.05$) across the board (volume and palatal root length).

There were no differences between the examined teeth when volumetric radicular alterations were computed as a percentage of the pre-treatment volumes ($p > 0.05$).

According to the deviation analysis from radicular models' superimposition, the apex, and bucco-medial root surface were the areas most affected by shape change. Overall, the ERR in the TB group was considerably higher than in the BB group (mm3: M1 = 3.11, P1 = 1.04, P2 = 1.24) (mm3: M1 = 17.03, P1 = 6.42, P2 = 5.26).

Conclusions: despite the statistical significance, the different amount of ERR found in TB and BB groups remains clinically questionable.

EFFECTS OF MODIFIED SEC III TREATMENT FOLLOWED BY FIXED APPLIANCES IN CLASS III PATIENTS

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Aim: to evaluate the effects produced by the modified SEC III treatment in growing patients with Class III malocclusion followed by fixed appliances in the permanent dentition compared to untreated Class III subjects.

Methods: a retrospective observational longitudinal study was conducted on 40 patients, aged 7-14 years, diagnosed with Class III malocclusion. Cephalometric data were collected at initial (T_0), intermediate (T_1), and final (T_2) check-ups. Patients were treated from T_0 to T_1 with the modified SEC III protocol, and in the second phase of treatment in permanent dentition with fixed appliances. Final records (T_2) were taken at the end of comprehensive treatment. The treated group was compared to untreated Class III subjects. Statistical between-group comparisons were performed with independent sample t-tests in normally distributed data, Mann-Whitney test was used for data not normally distributed.

Results: comparisons at T_0 showed no significant differences. Statistically significant differences were found in the T_2-T_0 interval. In particular, the treated group showed significant increases in SNA (+1.3°), ANB (+1.9°), Wits (+2.0°), SN-Pal Pl (+2.0°) and decreases in Ar-Go-Me (-6.0°), SN-GoMe (-2.3°), Pal Pl-Md Pl (-3.8°) compared to untreated subjects. Moreover, the treated group showed significant decreases in total mandibular length (Co-Gn -5.9 mm).

Conclusions: subjects with Class III malocclusion showed significantly favorable sagittal and vertical skeletal changes after treatment with the modified SEC III followed by fixed appliances in comparison to controls.

RECYCLING ORTHODONTIC BRACKETS: A LITERATURE REVIEW

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Aim: a common problem during treatment is bracket dislodgement. The process of recycling is defined as removing adhesive from the bracket completely to provide the possibility of bracket reuse, without damaging the bracket backing or distorting the slot dimensions. The purpose is to evaluate the efficacy of different methods of recycling brackets and the effects on shear bond strength (SBS).

Methods: the search was conducted on PubMed database, screening results of the last 10 years. Keywords used are: "Orthodontic brackets" AND "recycling". Among the initial 18 articles, 3 articles were excluded because they do not mention SBS and of those remaining the entire text was read.

Results: 15 articles related to *in vitro* studies were selected. In each, comparisons were made between recycling methods: flaming, sandblasting, adhesive grinding method and Er: YAG laser by using an Electroforce test machine, scanning electron microscopy, confocal laser scanning microscopy and Raman spectroscopy. Er:YAG laser technique and sandblasting method have highest SBS.

The adhesive grinding method using tungsten carbide bur recorded the least SBS. SBS of ceramic brackets processed by flaming and sandblasting was significantly lower than that of new brackets. Instead, ceramic brackets recycled by Er:YAG have higher values of SBS.

Conclusions: as for the metal brackets Er:YAG laser and sandblasting are the most efficient methods for recycling at chairside. Concerning ceramic brackets, only with Er:YAG laser microcrystalline structures were not damaged.

INTERCEPTIVE ORTHODONTICS IN MIXED DENTITION WITH OCCLUS-O-GUIDE: A SCOPING REVIEW

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Aim: the aim of this study was to evaluate the efficacy of the Occlus-O-Guide (G type) appliance in patients in mixed dentition with dentoskeletal Class II malocclusion, deep bite and increased overjet.

Methods: a scoping review of the literature was conducted using the PubMed databases with the keywords "Occlus-o-Guide; Class II malocclusion; interceptive therapy" without time and language limitations.

The search focused on studies that evaluated the effectiveness of the Occlus-O-Guide in the treatment of Class II patients in mixed dentition. Studies that focused exclusively on patients with deciduous and permanent dentition were not included. A total of six articles were identified and included in the final analysis.

Results: the results of the review showed that the effects of the Occlus-o-Guide were primarily dentoalveolar, with a smaller but significant skeletal effect. The study found an increase in mandibular length, lower anterior and total anterior face height, mesial migration of the lower molars and mandibular posterior dentoalveolar height. The upper incisors were lingually tipped and retruded, while the lower incisors were linearly protruded. The maxillomandibular and molar relationships were improved and there was a significant decrease in overjet and overbite.

Conclusions: this review suggests that the Occlus-o-Guide appliance can be a valuable interceptive therapy for Class II malocclusion in mixed dentition, reducing the risk relapse with the potential to avoid the need for a second phase of orthodontic therapy in many cases.

3D PRINTED ALIGNERS AND ERRORS IN THEIR MANUFACTURING WORKFLOW: AN *IN VITRO* STUDY

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Aim: the purpose of this work is to highlight the CAD errors that may lead to differences among different software used to design a 3D printed aligner.

Methods: starting from the same STL file, obtained from a single patient's arch scan, we designed an aligner using seven different software (Geomagic, Meshmixer, D3 Splint, Maestro 4, Maestro 6, Bluesky, 3Shape) and setting the offset at 0 mm and the thickness at 0.5 mm.

After aligning the reference model and all aligners with each other, we used a customized analysis workflow of Rhino software to calculate each aligner's thickness and gap from the model.

Results: generic software (Geomagic and Meshmixer) overall showed the best performance, having high values of thickness accuracy and precision and a minimum gap from the model. Among the dental software, Maestro 4 and Bluesky had thickness values closer to 0.5 mm, while 3Shape was the best one in terms of fitting.

The interproximal spaces proved to be the areas with the most irregular thickness and fitting values.

Conclusions: our study demonstrates that also the CAD stage can lead to errors during the manufacturing of 3D printed aligners. Some differences among the software are statistically significant: it remains to be seen whether these differences are clinically significant.

Future studies are recommended to expand the sample and eventually confirm our results.

PROTOCOLS OF ORTHODONTIC RETENTION AMONG ITALIAN SPECIALISTS AND NON-SPECIALISTS

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Aim: to evaluate retention protocol and procedures, in Italy, among specialists in orthodontics (SP) and non-specialist dentists practicing orthodontics (NoSP).

Methods: a questionnaire on retention consisting of seven topics was developed. The seven parts comprised: background information of the doctor, retention protocol, retention duration, patient follow-up, information given to the patients, need of guidelines, opinion about bonded and removable retainers. The questionnaire was distributed online, via social media, to SP and NoSP practitioners. Statistical analyses included Chi-square test and P was set as <0.05.

Results: almost all participants use some retention after active treatment (99% of SP and NoSP groups). Pre-treatment situations influence the 76% of SP group, for the choice of the retainer, respect the 60% of NoSP group (P = 0.001). Both in upper and lower arch, in case of extraction, SP significantly use more the double retention (fixed and removable), respect NoSPs. For both group the thermoplastic retainer, in the maxilla, is the preferred mean of retention (SP group = 58%; NoSP group = 68%), instead a fixed retainer bonded to all anterior teeth is preferred in the mandible (SP group = 71%; NoSP group = 79%). 5% of NoSp and 12% of Sp had modified their retention procedures because of Covid 19: principally, the SP group increased the use of removable retainers.

Conclusions: SP and NoSP present some similarities in the retention strategies after treatment. Covid 19 had an impact on a limited percentage of practitioners (more SP than NoSp) about retention procedures.

RISK OF MAXILLARY CANINE IMPACTION IN PEDIATRIC PATIENTS WITH BILATERAL SKELETAL CROSSBITE

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Aim: the aim of the present investigation was to assess whether the bilateral skeletal cross-bite is a risk factor for maxillary canine impaction.

Methods: two groups of 13 patients, matched by gender and age, were composed: a study group of patients with bilateral skeletal cross-bite and a control group without bilateral skeletal cross-bite. The average age was 8.6±1.3 years. For both groups inclusion criteria were: age between 7 and 13 years; deciduous maxillary canines in the dental arch. Exclusion criteria were: previous orthodontic treatments; rare genetic abnormalities, syndromic and/or craniofcial conditions, lip and/or palatal clefts; maxillary lateral incisor agenesis. On the panoramic radiographs three risk factors for canine impaction were measured:

- the *α* angle, measured in degrees (<25° low/moderate risk; >25° high risk);
- the distance *d* from the occlusal plane, measured in mm;
- the overlapping sector *s* (from 1 to 4).

Fisher's test was used to compare the values of the two groups.

Results: the control group's average *d* was 20.1 mm; *s* was 1 for 24 canines and 2 for 2 canines. The study group's average *d* was 19.1 mm; *s* was 1 for 25 canines and 2 for 1 canine. The parameters s and d don't show a statistically significant difference between the two groups.

Setting the significance level at .05, it emerged that the Fisher value relative to α >25° was 0.0098. It was therefore statistically significant.

Conclusions: considering the difference in α angle between the two groups, there is a higher risk of canine impaction in bilateral skeletal cross-bite.

AREA AND VOLUME EQUIVALENCE OF 3D ANATOMICAL MODELS ACQUIRED FROM DIFFERENT OPTICAL SYSTEM

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Aim: stereophotogrammetry and laser scanning are two methods that allow to digitize and measure the palate of patients with cleft lip and palate (CLP). In order to understand if the data obtained is comparable and corresponding, this study aims to verify the repeatability (RTT) and reproducibility (RDB) of the data acquired with the two optical systems.

Methods: through the two systems, 96 casts of 32 unilateral CLP children were digitized (impressions were taken 3 different times for each patient). Volume (V) and area (A) of cleft area were measured with Vectra 3D Analysis Module (VAM). One validated protocol (automatic) was used for A measurements, while two validated protocols (automatic and semi-automatic) were used for V. For A and V and for all protocols, inter- and intra-operator RTT and inter-instrument RDB were verified through the following measurements: Technical Error of Measurements (TEM), relative TEM (rTEM) and Bland-Altman test.

Results: inter- and intra-operator RTT was higher for area than for volume. rTEM measurements (intra operator: 19.1%; inter-operator: 18.8%) showed that protocol 1 for V measurement was unreliable.

According to inter-instrument RDB results: A was highly reproducible (87%) with low bias; V protocol 1 was not reproducible with high biases; V protocol 2 was poorly reproducible (<46%) with acceptable biases.

Conclusions: the values of A are comparable and therefore equivalent. The values of V depend on the system used. More research needs to be done to identify a standard protocol.

EFFECTS OF MAXILLARY EXPANSION IN CLASS III PATIENTS WITH OR WITHOUT UNILATERAL CLEFT LIP

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Aim: to evaluate changes after treatment with a bonded maxillary expander in growing patients with Class III malocclusion with or without unilateral cleft lip and palate (UCLP).

Methods: the study sample included 51 patients (mean age 10±2.5 yrs), 21 with UCLP (11F-10M), and 30 without UCLP (19F-11M) both treated with a bonded maxillary expander. The digital dental models and lateral cephalometrics were collected before (T_0) and after maxillary expansion (T_1) then imported into the Viewbox4 software. Chi-square test was used for gender data in the two groups, descriptive analysis of data pre- and post-orthodontic treatment and evaluation of the differences between the two groups were performed with the t-test for independent samples. The p-value <0.05 was considered statistically significant.

Results: the comparison between T_0 and T_1 did not show statistically significant differences between the diameters of the upper arch, except for the value between the second premolars at the gingival level. The comparisons of the cephalometric values showed significant results for SNA and PNSA, demonstrating maxillary advancement in the group without UCLP. Moreover, I^SN was statistically significant both at T_0 and T_1 in the two groups.

Conclusions: growing subjects with UCLP showed improvement in maxillary arch morphology after treatment with the bonded expander. The comparison of post-treatment results with a control group without UCLP showed no significant differences. Cephalometric values showed greater jaw advancement and less buccal inclination of upper incisors in patients with UCLP.

SKELETAL EXPANSION USING MARPE IN A 50-YEAR-OLD PATIENT: A CASE REPORT

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Aim: this case report describes the treatment of an adult female patient (50-year-old) with transverse deficiency and bilateral cross-bite.

This study aimed to evaluate the dento-skeletal results obtained with a miniscrew-assisted rapid palatal expander (MARPE) on 4 miniscrews, followed by fixed orthodontic treatment without orthognathic surgery.

Methods: the MARPE appliance consisted of a conventional Hyrax expander anchored to 4 orthodontic miniscrews. The exact location of the miniscrews was determined with virtual planning software.

Cone-beam computed tomography (CBCT) scans were superimposed on the maxillary digital model, and 3-dimensional-printed surgical guides were used to accurately position the mini-implants.

A slow expansion protocol was used, and the appliance was held in place during the entire treatment (almost 20 months).

Results: the treatment was completed in 20 months. After removing the appliance, the post-treatment CBCT, panoramic radiograph, and cephalogram were taken with the MARPE appliance still in place. Pre-treatment, post-expansion, and post-treatment CBCT scans show the parallel expansion obtained without dental torque compensation or bite opening. The post-treatment scan showed that a long period is required to complete the midpalatal suture mineralization.

Conclusions: MARPE has proven effective in correcting transverse discrepancies, even in adults. However, post-treatment CBCT imaging showed incomplete ossification of the midpalatal suture, demonstrating that the retention period should be extended in some adult patients.

COMBINING INVISALIGN® SYSTEM AND LOWER INCISOR EXTRACTION: A CASE REPORT

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Aim: resolution of crowding with lower lateral incisor (4.2) extraction and use of Invisalign® aligners.

Methods: a 24.3-year-old male patient, in good general and oral health, non-smoker, skeletal and dental class I, normodivergent, with increased OVB, increased interincisal angle, severe anteroinferior crowding and mild contraction of the upper middle sectors, has been selected. The 18-month treatment plan included 4.2 extraction and resolution of the malocclusion with the Invisalign® aligners. Standard attachments have been used, allowing extraction space closure through distalization of 4.1 and mesialization of 3.1, 3.2 and 4.3. In the upper arch, dentalveolar expansion of the middle and anterior sectors was performed by the use of optimized attachments. Power ridges have been used to correct torque in the anterior sectors. Interproximal enamel reduction had to be performed to complete the alignment. The Treatment was concluded with a customised bonded Memotain® NiTi CAD/CAM Retainer.

Results: at the end of the treatment, the patient achieved good dental alignment with crowding resolution and extraction space closure, corrected OVB and OVJ, improved interincisal angle, Little's irregularity index less than 1, harmonic arch forms, a good aesthetic result despite the loss of inferior symmetry.

Conclusions: the clear aligners were adequate to solve severe crowding, with a lower incisor (4.2) extraction technique, restoring proper arch forms and tooth relation.

OROFACIAL PAIN, MULTIPLE SCLEROSIS AND OSAS: MANAGEMENT OF A COMPLEX CASE

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OSAS and multiple sclerosis share numerous signs and symptoms such as fatigue, cognitive dysfunction and reduced quality of life. Although studies are still scarce, the results agree that patients with multiple sclerosis are more susceptible to developing respiratory disorders. Dentists have an important role in both diagnosis and construction of a multidisciplinary path that takes into account risk factors common to OSAS and its comorbidities.

To maximize the chances of therapeutic success, dentists must be aware of the therapies that can be associated with mandibular advancement, whether they are of dental or multidisciplinary relevance.

PEDO-ORTHO MANAGEMENT OF A GROWING PATIENT WITH CARIES RECEPTIVITY AND POOR ORAL HYGIENE

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Aim: the purpose of the work is to describe the orthodontic treatment of a growing male patient with a poor oral hygiene, high caries receptivity, previous incongruous dental treatments in a mixed dentition with palatal contraction, crowding and skeletal class II.

Methods: a 12 year-old patient came to visit at dentistry department of San Raffaele Hospital. The visit highlighted a poor oral hygiene, high caries receptivity, previous incongruous dental treatments in a mixed dentition with palatal contraction, crowding and skeletal class II. After a valuation, some deciduous elements were extracted.

The treatment plan was formulated with rapid palatal expansion and maintenance of the Leeway space through a lingual arch.

In permanent dentition treatment with Invisalign® with an MA protocol was undertaken to simultaneously correct skeletal class II, align the smile, and maintain better oral hygiene.

The last aligners of the series had to be used at night to allow spontaneous eruption of the posterior sectors.

The ultimate part of the treatment was a refinement of dental alignment.

Results: there was a complete resolution of the malocclusion and, thanks to the cleaning motivation of aligners, there was an improvement of oral hygiene habits.

Conclusions: clear aligners helped to improve the course of the orthodontic treatment of a highly carioreceptive patient, also improving his habits.

FUNCTIONAL TREATMENT OF POSTERIOR CROSSBITE AND INCREASE IN INTER-ARCH DISTANCES

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Aim: posterior crossbite (PC) is a severe malocclusion associated with maxillary hypoplasia and masticatory dysfunction. We previously reported that the appliance Function Generating Bite (FGB) effectively corrected the altered mastication. This study aims to evaluate the dental effects of PC treatment in mixed dentition with FGB on the transverse dimension of the dental arches.

Methods: this study included 84 PC patients, F = 46; M = 38; mean age 8.2±1.8 [yr.mo], and 69 control patients (C), F = 31; M = 38; mean age 8.9±1.4 [yr.mo]. Measurements were taken with digital calipers on maxillary and mandibular study casts, before (T_0) and after the correction of the malocclusion (T_1): inter-molar distance (IMD), inter-molar gingival distance (IMGD), inter-canine distance (ICD) and inter-canine gingival distance (ICGD).

Results: at T_0, there was a highly significant difference in all maxillary measurements between PC and C ($p < 0.001$), reflecting maxillary hypoplasia in PC. At T_1, there was no difference between the groups. In PC, the mean increase between T_0 and T_1 for IMD was 4.34±2.42 mm, for IMGD was 3.51±2.19 mm, for ICS was 2.78±2.37 mm and for ICGD was 1.89±1.7 mm ($p < 0.001$). There was no significant difference in mandibular measurements at T_0 and T_1.

Conclusions: functional therapy with FGB effectively significantly increases the transverse dimension of the maxillary dental arch in PC.

Considering its efficacy in treating masticatory dysfunction, FGB is a good treatment option for correcting PC in growing children.

ORTHODONTIC MOVEMENT IN SELF-LIGATING SYSTEM THROUGH INTRAORAL SCANNER: A CLINICAL STUDY

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Aim: is to evaluate orthodontic movement obtained by Damon protocol arches in the upper jaw using an intraoral scanner.

Methods: the patients included in this study were bonded with WEPASS self-ligating system with MBT prescription in the U.O.C. of Orthodontics Policlinico Umberto I. 10 patients were selected and 8 completed the study.

Overlapping scans were chosen in addition to simple linear measurement of intercanines and intermolar distance in three different time with two consecutive types of archwires (AWs). Vestibular-oral (V-O), mesio-distal (M-D), and vertical (V) movements of teeth were evaluated. Data were analyzed with ANOVA test.

Results: no statistically significant difference was found between the difference of intercanine and intermolar distance for both AWs. ANOVA test confirmed the significance of three-dimensional movements with each arch-wire: for the 0.014-inch NiTi AW, V-O movement was prevalent, followed by M-D and V; for the 0.014x0.022-inch NiTi AW vestibular-oral and mesio-distal movement prevailed.

Conclusions: orthodontic movements corresponded to expectations: 0.014-inch NiTi AW is useful for alignment and levelling, while 0.014x0.022-inch NiTi AW, is useful to finalize alignment and to initial torque control. The use of intraoral scanner could be considered a valid monitoring tool to evaluate teeth movement during orthodontic treatment.

ECTOPIC ERUPTION OF THE PERMANENT MOLAR AND ROOT RESORPTION OF THE SECOND PRIMARY MOLAR

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Aim: ectopic eruption represents the eruption of a tooth in an abnormal position. The most frequently found ectopic teeth are the maxillary first permanent molars. Generally, the ectopic first molars are impacted under the distal roots of the deciduous second molars. The aim of this study is to determine the frequency of occurrence of the ectopic eruption of the first permanent molars and its correlation with the deciduous second molars root resorption.

Methods: the authors performed a literature review of the PubMed and Scopus databases with no language or time range limitations to identify publications related to the topic. Literature search was performed using combination of the following keywords: "primary second molar" AND "root resorption" AND "ectopic first molar". The first selection involved 19 citations. After further assessment of relevance, 7 articles were selected for the review process.

Results and conclusions: the mean prevalence rate of ectopic eruption of the maxillary first molars reported is 2-6%. The anomaly occurred unilaterally in 36% of cases and bilaterally in 64%.

No pain is associated with this condition and the diagnosis is generally made by premature exfoliation of the primary second molar or routine radiographic examination.

Two types of ectopic eruption of the first molar have been distinguished:

- reversible: the trajectory self-corrects spontaneously and the first molar erupts in a normal position.
- Irreversible: the ectopic molar remains impacted against the deciduous second molar.

Among the first ectopic molars analyzed, 70% were self-corrected and 30% remained impacted.

ALTERATIONS OF ORAL MICROBIOTA WITH CLEAR ALIGNER AND FIXED APPLIANCE: A LITERATURE REVIEW

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Aim: to investigate how orthodontic treatment with fixed appliances or clear aligner influence the oral microbiota and to report differences.

Methods: the research was led on PubMed. The following keywords were used: "oral microbiota", "Orthodontic treatment", "Clear aligner" and "fixed appliance".

PICO's method was applied:

1. population: patients on orthodontic treatment with CA.
2. Intervention: swab for microbiota research.
3. Control: patients on orthodontic treatment with FA.
4. Outcome: data of oral microbiota.

Inclusion criteria:

- Randomized, retrospective studies and reviews on permanent dentition patients.
- Studies proven by microbiological samples.

Exclusion criteria:

- Case report and other type of studies.

Results: of the 49 articles analyzed, 3 articles met the inclusion criteria. The articles affirm that patients receiving orthodontic treatment show qualitative and quantitative differences in the oral microbiota compared to untreated subjects, induced by increased retention of supra and subgingival bacterial plaque throughout the treatment period.

TBL (total bacterial load) increased in the FA group but not in the CA group, while the levels of the individual periodontal pathogenic bacteria species did not significantly increase during the observation period.

Conclusions: the type of orthodontic appliance could influence the subgingival microbiota. Removable clear appliance has less influence on the oral microbiota than the fixed ones.

ANALYSIS OF MANDIBULAR ARCH IN PATIENTS TREATED WITH LIP BUMPER USING 3D CASTS

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Aim: the aim of this retrospective observational study is to assess changes in the lower dental arch after Lip Bumper treatment using 3D digital casts and appropriate software verifying the appropriateness of this method.

Methods: a retrospective case-control study was conducted. Patients with mild or moderate crowding treated with Lip Bumper were enrolled. The data were collected before (T0) and after the Lip Bumper treatment (T1). Digital dental casts were obtained using the intraoral scanner iTero 5D Element (Align Technologies, San Jose, California, USA) and the STL files were transferred to the OrthoCAD software. For each digital cast, arch length and perimeter, intercanine, interpremolar, intermolar widths, crowding and molar rotation were measured. The cephalometric analyses were carried out for each radiograph to obtain the mandibular incisor inclination mensuration (IMPA). The data of the Control Group (CG) derived from a previous study and was paired for age, maturation of cervical vertebral, gender and period of observation with Treated Group (TG). The mean and standard deviation were calculated for the continuous variables considered. The comparison between the continuous variables at T0 and T1 were calculated with the t-test, and the level of statistical significance was set at $p < .05$. To analyze changes in the measurements between Treatment and Control Groups over the two-time points were used repeated measures from ANOVA.

Results: the Treated Group included 28 digital dental casts and lateral cephalometry of 12 female and 16 male patients (aged 9-13 years). The analysis of the data showed, in the TG, an increase in widths in the intercanine (2.42±5.93 mm), in the interpremolar (3.02±2.55 mm) and in the intermolar (2.57±3.61 mm) regions, while in the CG an important decrease of the same measurement was found. Results reported a crowding reduction of 3.37±0.09 mm and a change in molar rotation from 33,58° to 22,53°, both significantly different from the Control Group. In Treated Group, T1-T0 arch length and perimeter have an increase respectively of 0.37 mm and 1.83 mm, without being statistically significant ($p = .168$; $p = .667$). The value of the IMPA T1-T0 was not statistically significant ($p = .762$) between the two groups.

Conclusions: digital dental casts and 3D software, used to analyze arch changes, were confirmed as a valid and efficient system to evaluate the effects of treatments and compare results. The outcomes confirm the hypothesis that the Lip Bumper allows an increase in the transverse dimensions of the lower arch while respecting the inclination of the lower incisor. These changes allow a gain of space in the lower arch to resolve dental crowding.

CLASS II MALOCCLUSION THERAPY WITH REP II SYSTEM AND HERBST APPLIANCE IN GROWING PATIENTS

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Aim: to evaluate the efficacy of Rep II System compared to Herbst appliance and control group in class II skeletal malocclusion growing patients.

Methods: 13 Class II patients treated using the Rep II System (Group R) were compared with 13 patients treated with Herbst appliance (Group H) and with 13 Class II untreated children (Group C). The Rep II System included a Hyrax expander with two arms extending to the canine and a lower clear aligner with hooks on deciduous second molars. Cephalograms were compared at the start (T0) and after 24 months (T1). The following measurements were analysed: SN-PO, LFH (LOWER FACE HEIGHT), COGN, IMPA, OVERBITE, OVERJET, ANB. Wilcoxon test and variance analysis with Tukey post hoc correction were performed.

Results: post hoc Tukey's test showed statistically significant differences as follow:

1. SNPO: R >2.775°C, H >6.373° C, H >3.598° R;
2. LOWER FACE HEIGHT: R <5.467 mm C, H >4.13 mm R;
3. COGN: R <4.335 mm C, H >3.94 mm R;
4. IMPA: H >5.739° C, H >6.4° R;
5. OVERBITE: H <- 2.19 mm C;
6. OVERJET: R <3.59 mm C, H <4.83 mm C;
7. ANB: R <2.15° C, H >1.47° R.

Conclusions:

- the R group had a smaller lower incisors proclination, a lower occlusal plane inclination, a decreased ANB angle, a decreased mandibular length and a decreased lower facial height compared to H group;
- the R group had a decreased mandibular length and lower facial height, overjet and overbite reduction and a greater occlusal plane inclination compared to C group;
- the H group showed a greater occlusal plane inclination and lower incisors proclination, overjet and overbite reduction compared to C group.

The Rep II System seems to have better control of vertical effects and lower incisors inclination compared with Herbst appliance.
Both devices are effective to correct class II skeletal malocclusion in growing patients.

PROPOSAL OF A RELIABLE AND REPRODUCIBLE HORIZONTAL REFERENCE PLANE IN 3D CEPHALOMETRY

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Aim: this preliminary study aims to identify in the literature the most reliable horizontal plane in 3D cephalometry to evaluate alterations and asymmetries of the maxillofacial complex and to compare it with results from anthropometric analysis performed on stereophotogrammetry.
Methods: a PubMed literature review was conducted to find all horizontal planes proposed in 3D cephalometry from January 2000 to September 2022. The following keywords: “3D cephalometric landmarks”, “3D cephalometry”, “horizontal plane and/or 3D cephalometry”. The selected planes were then set up in a dedicated software (SimPlant O&O, Lueven, Belgium). A sample of patient (age 18-55y) with an angioCT taken between January 2019 and May 2022 was selected from the Neuroradiology Department database of the Maggiore Hospital in Parma, Italy; only subjects whose CT scans did not show bone pathology of any kind were chosen. Using SimPlant O&O, 3D skull reconstructions were obtained from angioCT and planes traced. Stereophotogrammetry was then performed on these subjects, using Polishape 3D scanner technology (Face Shape 3D MaxiLine, Bari, Italy); anthropometric analysis was conducted on these shots by an expert operator. The results of 3D cephalometry were compared with those from the anthropometric analysis to determine which 3D plane was most reliable in identifying facial symmetry.
Results: currently, 12 of 22 horizontal plans were found in literature analysis have been used in the 3D cephalometric software.
Conclusions: the statistical analysis of the data is in progress.

MANDIBULAR SYMPHYSIS’ SHAPE VARIATION DURING GROWTH: A GEOMETRIC MORPHOMETRIC ANALYSIS

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Aim: the aim of the present paper was to evaluate the morphology changes of the mandibular symphysis (MS) in a longitudinal retrospective cohort of class II untreated subjects.
Methods: the study sample included 120 subjects followed during normal growth and examined at the age of 12 (T0) and 15 (T1) years. MS was traced using two landmarks and ten sliding semi-landmarks. The acquired morphological data were processed via Procrustes superimposition that allowed to study variation and covariation in MS’form according to specific variables such as age, gender, and skeletal pattern.
Results: the first two principal components (PCs) described more than 90 % of the total morphological variation. Both types of form changes of the symphysis could be associated with the different skeletal vertical growth patterns. Age and sex did not interfere with the form of chin symphysis. Moreover, there was no significant covariation between initial MS morphology and form modifications.
Conclusions: clinicians should not expect to be faced with spontaneous changes of the form of the symphysis during the orthodontic treatment of adolescents.

LONG-TERM STABILITY: IMPORTANT GOAL OF ORTHODONTIC TREATMENT

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The purpose of the following work is to evaluate the stability and maintenance of orthodontic treatment over the years.
To achieve long-term occlusal stability it is important to achieve a mutually protected occlusion, in which the posterior teeth protect the anterior teeth in the position of maximum intercuspidation and the anterior teeth protect the posterior ones in eccentric movements. The canine guide allows the disclusion between the dental arches in laterality movements, while the incisive guide allows, in the protrusion movements of the jaw, the dislocation of the cusps of the posterior dental elements.
In addition, it is essential to formulate a correct diagnosis and identify the problems underlying the malocclusion itself. It is necessary to respect the 6 keys of Andrews, which concern the interarched relations, the angle of the crowns (tip), inclination (torque), rotation of dental elements, contact points and occlusal plane (Spee curve).
From a gnathological point of view, it is important that there is a health of the temporomandibular joints.
Finally, the orthodontic retention phase should last as long as possible.

CLEAR ALIGNERS AS ALTERNATIVE TREATMENT TO CORRECT DEEP BITE

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Aim: the purpose of this review is to analyse the effectiveness of clear aligners in the treatment of deep bite, as an alternative to fixed multi-bracket treatment.
Methods: an electronic research was performed using PubMed and Scopus databases, using keywords: “orthodontics” AND “clear aligners” AND “deep bite” AND “techniques”.
Results: from the initial search resulted 34 articles, from which, according to inclusion and exclusion criteria, only 4 have been selected.
The first investigated the predictability of deep bite correction using clear aligners concluding that aligner treatment showed 33% overbite correction and additional refinement treatments are needed in most patients with a deepbite.
The second investigated different intrusion patterns of clear overlay aligners and the corresponding orthodontic forces, concluding that Aligners with different intrusion patterns exert different forces, based on shape and position of the attachment and relative movement of the adjacent teeth.
Two studied the efficiency of aligners with bite ramps, one of them also comparing clear aligners with bite ramps and fixed appliances. Both concluding that the use of bite ramps represents a valid option for a successful treatment.
Conclusions: from this review results that clear aligners can represent an alternative for deep bite treatment. Although, since treatment’s outcome do not appear to be very predictable with clear aligners only, further studies are needed.

OBSTRUCTIVE SLEEP APNEA SYNDROME ANALYSIS USING STEREOPHOTOGRAMMETRY: A SISTEMATIC REVIEW

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Aim: obstructive sleep apnea syndrome (OSAS) is a disorder characterized by nocturnal breathing interruptions due to upper airway obstruction.
The aim of the review is to verify the existence of any current literature concerning the craniofacial stereophotogrammetric evaluation in order to predict the presence and severity of OSAS. This technology uses a three-dimensional model obtained from multiple frames of the face taken from different angles.
Methods: the research was performed on MEDLINE-PUBMED without applying temporal or linguistic restrictions. From 19 studies, 4 were selected.
Results: the study of Banabilh et al. 2009 shows how the severity of OSAS depends on the deposition of submandibular fat, neck circumference and body mass index. According to the study of Lin et al. 2018 numerous measurements concerning areas, volumes and anthropometric lines of the head and neck district indicate the presence and severity of the pathology. In the study of Ohmura et al. 2022 it has been demonstrated that mandibular width, length, depth and width-lenght angle are correlated with OSAS severity. In the study of Tyler et al. 2022 emerged that an increasing obtuse angle of facial convexity is found in severe OSAS subject.
Conclusions: in this review emerged a correlation between OSAS severity and submandibular fat deposition, neck circumference, body mass index, facial convexity as well as numerous anthropometric parameters from the literature. It should be note the limited amount of scientific material currently available in this regard.

A NARRATIVE REVIEW OF THE EFFECTS OF FR-3 IN THE TREATMENT OF CLASS III MALOCCLUSIONS

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Aim: the Fränkel function regulator III appliance (FR-3) is used to treat skeletal Class III malocclusions during early mixed dentition stage.
This study aims to assess the effectiveness of the FR-3 to correct Class III malocclusions.
Methods: a review was conducted on PubMed and Scopus databases using the keywords “Fränkel” AND “malocclusion” with no time range limitations.
Of the 210 articles resulting from the PubMed research, only 7 have been chosen since the others were not pertinent to the specific argument of this review. Of the Scopus 209 articles, only 1 has been chosen because the others were either not relevant or had already been included in the PubMed selection. A total of 8 articles have been selected for this review.
Results: although the FR-3 has been used for many years to correct Class III malocclusions, there are many conflicting opinions regarding this device and its long-term effects have not actually been proven.
The goal of the FR-3 was to act on both the mandible and the maxilla, stimulating the development of the maxilla and restricting mandibular growth by counteracting the forces of the surrounding muscles. Some studies have demonstrated that with the FR-3 there are significant effects on either the mandible or maxilla but not on both as was the primary objective.
Four of these studies stated that the greatest effects of the FR-3 occur in the upper jaw, stimulating the development of the maxilla, with an increase of SNA. In contrast of this, the other four articles considered that the FR-3 appliance produced effects mainly from backward and downward rotation of the mandible (with a decrease in the SNB angle) and linguoversion of the mandibular incisors. In all the studies at the end of the treatment, an increase of the ANB angle and of the overjet was found, with a correction of the Class III malocclusions.
Conclusions: there are currently few studies available in literature and, therefore, more studies would be needed to clarify the actual effectiveness of the FR-3 to correct Class III malocclusions.

A REVIEW OF THE CORRELATION BETWEEN HERBST-MULTIBRACKET APPLIANCE AND GINGIVAL RECESSION

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Aim: Herbst-Multibracket appliance (Herbst-MBA) is a possible treatment for Class II malocclusions.
The literature is controversial regarding if the Herbst-MBA can produce gingival recessions (GR) and the aim of this review is to assess the association between GR and Herbst-multibracket appliance (Herbst-MBA) treatment.
Methods: a scoping review was conducted on PubMed database searching the keywords "Herbst" AND "Gingival" with no time range limitation. Of the 12 results from this research, only 8 have been chosen since the others were not pertinent to the specific argument of this review.
Results: this review highlighted that GR after Herbst-MBA treatment occurs mainly on the first premolars and on the lower incisors (for the protrusion and proclination).
Although in most of these studies the presence of GR has been demonstrated after Herbst-MBA treatment, their etiology is multifactorial and their presence were too small to be significant.
Despite that, the study of Batista, Klaus Barretto Dos Santos Lopes et al. proposed Herbst appliance with skeletal anchorage to counteract the possible development of recessions after treatment with Herbst-MBA with dental anchorage.
Conclusions: unfortunately, the majority of available studies only evaluated rather selected patient cohorts fulfilling specific, fairly strict inclusion criteria.
Further studies are needed to clarify the correlation between GR and Herbst-MBA.

PERIODONTAL CHANGES AFTER TOOTH-BORNE OR BONE-BORNE RME: A PARALLEL COHORT STUDY

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Aim: this parallel cohort study evaluated the effects on periodontal (hard tissues) structures of tooth-borne (hyrax) and computer-guided miniscrew-supported rapid palatal expansion appliances.
Methods: 36 subjects were randomly allocated into 2 groups. Group A received treatment with hyrax appliance, while Group B was treated with a computer-guided miniscrew-supported skeletal RME appliance. The same type of expansion screw (10 mm; hyrax click) and the same protocol were used. In Group B, 4 miniscrew were inserted in the paramedian and parapalatal position, using a surgical guide. Periodontal changes (hard tissues) were compared on pre- and post-treatment CBCT images (6-months). The mean differences were analyzed using a Student's t test (significance set at $P \leq 0.05$).
Results: in group B the results showed a slight reduction of buccal and palatal thicknesses at the level of the maxillary first molars (0.15 mm), except for distobuccal thickness level of the first molar with a mean reduction of 0.5 mm. In contrast in group A, there was a greater loss of buccal bone thickness (0.3 mm) with a statistically significant difference on the right side (MBR, $P = 0.02$; DBR, $P = 0.02$). These results are in agreement with other studies, the loss of buccal bone thickness in patients treated with a tooth-supported expander could be caused by the force applied on the maxillary first molars through the orthodontic bands.
Conclusions: according to this study tooth-supported expanders cause a greater reduction of the buccal bone thickness of the maxillary first molar at 6-month follow-up.

LONG-TERM EFFECTS PRODUCED BY RME/FM: A MULTICENTER RETRO-PROSPECTIVE CONTROLLED STUDY

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Aim: to analyze the short- and long-term skeletal effects produced by rapid maxillary expansion and facemask (RME/FM) therapy in growing patients with Class III malocclusion.

Methods: a sample of 44 Class III patients (27 females and 17 males) treated with RME/FM was collected at the University of Florence, the University of Rome Tor Vergata, Italy and at the University of PUC Minas Gerais, Brazil. For all patients lateral cephalograms were available at pretreatment (T0 8.1±1.8 ys), posttreatment (T1 9.8±1.6 ys) and long-term observation (T2 19.5±1.6 ys). A matched control group of 17 untreated Class III subjects (12 females and 5 males) was selected. Between-group statistical comparisons were performed with ANCOVA using the values of the cephalometric variables at T0 as covariates.

Results: no statistically significant differences for any of the cephalometric variables were found at baseline (T0). In the short-term interval (T0-T1) the treated group exhibited significant improvements of ANB (+ 2.9°, P <0.001), Wits (+2.7 mm, P <0.001), SNA (1.8°, P <0.001) and SNB (-1.1°, P = 0.002). A significant closure of the CoGoMe angle (-1.3°, P = 0.031) associated with smaller increments along Co-Gn (-2.4 mm, P <0.001) was also found. In the long-term interval (T0-T2), significant improvements of ANB (+2.6°, P <0.001), Wits (+2.7 mm, P = 0.001) and SNB (-1.7°, P = 0.021) were recorded. A significant closure of the CoGoMe angle (-2.9°, P = 0.006) was also found. The prevalence rate of unsuccessful patients in the long term was 25%.

Conclusions: facemask therapy was effective in improving Class III sagittal skeletal relationships in the short-term and it remained stable in the long term due mainly to favorable mandibular changes.

ACCURACY OF ORTHODONTIC MODELS FOR CLEAR ALIGNERS. ANALYSIS OF 3D PRINTING TECHNOLOGIES

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Aim: the study aimed to evaluate the accuracy of orthodontic models obtained from crowded and spaced dentition and used to create clear aligners.

Methods: two digital master models were obtained from two patients, one with crowded teeth (CM group) and one with edentulous spaces (DEM group). The 3D printers assessed were: Asiga Pro 4K65 (DLP, high-professional), Anycubic Photon M3 (LCD, entry-level), Form 3B (SLA, medium-professional), and Vector 3SP (SLA, industrial). To evaluate the accuracy, each 3D printed model was scanned and registered into the master digital model. Afterward, models underwent digital deviation analysis and the discrepancy (accuracy error) between the master model and scanned model was calculated as root mean square (RMS), All data were statistically analyzed.

Results: SLA 3D printers showed lower trueness error than DLP/LCD ones in both the CM and DEM groups (p <0.001). Anycubic Photon M3 entry-level printer has the highest trueness error (p <0.001). Statistically significant differences were only discovered for the DLP/LCD printers when comparing CM and DEM models made with the same 3D printer (p >0.05). Asiga Pro 4K65 demonstrated lesser precision error compared to the other 3D printers tested. The accuracy error was within the clinically acceptable range to produce clear aligners (<0.25 mm), with the entry-level 3D printer almost reaching this value.

Conclusions: different 3D printing technology and anatomical characteristics of dental arches can affect the accuracy of orthodontic models made for clear aligners.

3D PATIENTS MERGING DIGITAL DENTAL CASTS IN FACIAL RECONSTRUCTIONS

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Aim: this study aims to verify the accuracy of matching digital dental casts on facial stereophotogrammetric images.

Methods: the study sample was composed of 9 adult Caucasians with full dentition and Angle class I. For each patient, a facial sterephotogrammetry (Vectra-3D, Canfield Scientific Inc., Fairfield NJ, USA) with open mouth and dental impressions were recorded. The maxillary dental casts were digitized by laser scanning; afterwards, the files were imported in the Vectra software and matched on the 3D facial scan. Using Vectra software, the digital 3D coordinates of facial (N: Nasion; Ftr: frontotemporale right, Ftl: frontotemporale left) and dental (I: inter-incisor; Pr, Pl: tip of the mesio-vestibular cuspids of right and left first permanent premolar) landmarks were obtained. Said landmarks were also identified directly on each subject using a 3D computerized digitizer (3Draw, Polhemus, Colchester, VT). Seven linear measurements were made between the occlusal plane (Pr-I-Pl) and the facial landmarks (Ftr-N-Ftl). The data obtained by the two imaging systems was compared using paired Student's t tests, mean absolute difference (MAD) and the technical errors of measurement (TEM).

Results: out of the seven analyzed distances, two (Ftl-I and N-I) showed systematic errors ($p < 0.05$). All MADs and TEMs resulted to be <1.5 mm.

Conclusions: it is feasible to superimpose 3D stereophotogrammetric images of facial tissues and digital dental casts using facial landmarks as a reference. To prevent imprecise measurements, however, more accurate dental landmarks should be selected.

NEED FOR ORTHODONTIC RETENTION PROCEDURES: EVALUATION OF PATIENTS AWARENESS AND COMPLIANCE

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Aim: the aim of this study was to evaluate awareness and literacy about the need for retention procedures among patients who underwent orthodontic treatment, and their compliance with the prescribed retention instructions.

Methods: an anonymous 27-items survey was developed with the help of Google Forms and spread through social media among patients older than 18 who finished the orthodontic treatment. The items were grouped in 3 sections: (1) sociodemographic characteristics of the cohort (Q1-Q2); (2) awareness about retention procedures (Q3-Q7); (3) retention protocol experienced and compliance (Q8-Q27). Descriptive statistics was performed for each item.

Results: survey participants were 302, and 74.2% received retention instructions and devices after the orthodontic treatment. Notably, 31.9% received fixed retainer and 68.1% mobile devices, with the instructions to wear them every night (61.6%) or also during the day (33.5%). Currently 50.4% of participants no longer use retention devices and 89.3% stopped its use in the first 10 years after the end of treatment, despite the indication of dentist. In fact, time of retention was not specified by dentists for 33.7% of participants, while 10 years/for life were suggested for 38.6%.

Moreover, 65.3% of participants reported teeth movement after the end of treatment.

Conclusions: the results of the current survey pointed out a satisfactory level of knowledges about the need for retention procedures among orthodontic patients, but a better compliance is needed to obtain a long-term stability of results.

EVALUATION OF TRANSVERSE DIAMETERS ON VIRTUAL MODELS OF CLASS I, II AND III SUBJECTS

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Aim: the practice of performing maxillary expansion in the treatment of class II is widely used in clinical practice, even in cases where there is no cross-bite. The aim of the study is to compare the upper and lower inter-canine (IC) and inter-molar (IM) diameters between Angle class II subjects and Angle class I and III subjects to determine whether there is a correlation between class II and reduced arch diameters.

Methods: a total of 376 virtual models of untreated subjects were selected. Measurements were taken through the software Meshmixer (Autodesk inc.), using the cusps of the canines and the central fossa of the first molars as reference points. According to the Angle class, the sample was divided into 3 groups. ANOVA was used to test the differences among groups' means of IC and IM diameters. The p value was set to <0.05.

Results: the means of the maxillary IC and IM diameters were 32.9±2.63 mm and 45.2±2.77 mm in class I group, 31.9±2.55 mm and 44.4±3.23 mm in class II group and 34.0±1.72 mm and 46.3±4.22 mm in class III group. The means of the mandibular IC and IM diameters were 24.9±2.54 mm and 40.8±3.21 mm in class I group, 24.7±2.64 mm and 41.0±3.33 mm in class II group and 25.5±3.25 mm and 42.5±4.65 mm in class III group.

Conclusions: there was a statistically significant difference in both maxillary diameters between class I and class II groups (IC p = 0.002, IM p = 0.033) and between class III and class II groups (IC p = 0.006, IM p = 0.042). No statistically significant differences between the group were found in the mandibular diameters.

PREDICTABILITY OF UPPER ARCH EXPANSION WITH SPARK ALIGNERS USING THREE PROTOCOLS

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Aim: on the last decades the use of aligners to level and align dental arches has increased exponentially. Aligners are clear and removable appliances that can be used together with attachments bonded to teeth, to help achieving the most complex movements. This study aims to evaluate the predictability of maxillary dental-alveolar expansion with Spark aligners using three different protocols: blocked, contracted or expanded second molars.

Methods: 40 patients have been included in this study, excluding patients with incomplete data, like missing teeth. To make linear measurements the software used was Viewbox 4. The measurement made were on 2nd molars, first molar, 2nd premolars, first premolars, canines. The patients were divided into three groups, based on the results obtained: contractions of the 2nd molar (group A), 2nd molar still (group B), expansion of the 2nd molar (group C).

Results: the result obtained by analysing the measurements is that the predictability of dental-alveolar expansions of first molar, premolars and canine with contraction of the second molar (group A) is higher than the one of groups B and C. Moreover, group B protocol, maintaining unmovable the 2nd molar, has a better predictability than group C.

Conclusions: nowadays aligners are used also for moderate to complex treatments. In treatments where maxillary expansion is needed, through this study, it has been observed that there is a higher predictability of expansions by contracting the 2nd molars than maintaining them still or expanding them.

DOES MANDIBULAR TYPOLOGY AFFECT COMPLEXITY IN THIRD MOLAR EXTRACTIONS?

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Aim: to evaluate any differences regarding the difficulty of impacted third molar extraction among mandibular typologies.
Methods: a total of 40 consecutive patients requiring third molar extraction were radiographically analyzed. The mandibular typology for each patient was established through cephalometric analysis based on the evaluation of SN^GoGn, CoGoMe^ and ANS-PNS^GoGn. The difficulty level was assessed on computer tomographies, applying a difficulty scale based on seven parameters: angulation, available space, depth, relationship with mandibular canal, buccolingual position, bone density and tooth morphology. The correlation was assessed through multinomial regression.
Results: a total of 65 third molars in 40 patients (17 females and 23 males, average age 26.15 years old) were evaluated. The sample was divided into three groups, based on facial typology: brachyfacial (25), mesofacial (30) and dolichofacial (10). Although linear regression did not show any association ($p = 0.728$) between mandibular typology and the total coefficient of difficulty, nominal regression showed a statistically significant association between bone density and mandibular typology ($p = 0.043$).
Conclusions: mandibular typology does not affect complexity in impacted third molars extractions. However, dolichofacial typology has shown less bone density than meso and brachyfacial typologies.

LEVEL OF ORTHODONTICS KNOWLEDGE AMONG GRADUATING DENTAL STUDENTS

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Aim: nowadays the attention about orthodontics and the masticatory function is growing in dental schools and basic knowledge of these topics are essential in order to correctly practice the other branches of dentistry. The objective of this questionnaire is to evaluate the average knowledge of orthodontics among students going to get graduated.
Methods: an anonymized survey, available in Italian, was sent electronically to 100 dental students of different Italian universities. The questionnaire was composed of ten questions made specifically for this study, using Google form (Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA, USA). All participants provided informed consent and accepted the privacy policy for the protection of personal data. It was achieved a number of answers equal to 74%.
Results: 97.3% affirmed to know what the Spee curve is. 50% of the sample declared being able to distinguish the physiological values of overjet. 23% had not understand the correct use of Delaire's mask. When it was asked the differences between the habitual occlusion and the centric relation, the 94.6% gave the correct answers. 95.9% was conscious of the correct use of Invisalign aligners. The knowledge of dental torque was not widespread, in fact 25.7% gave a wrong answer. Eventually 81.1% was aware of the Andrews occlusions keys.
Conclusions: according to these results the middle awareness of the Italian dental students about orthodontics and masticatory functions is not ideal, even if it is evident a general increasing of interesting towards this topic.

MORPHOLOGICAL AND DIMENSIONAL CHANGES OF THERMOPLASTIC RETAINERS AFTER INTRA-ORAL AGEING

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Aim: this study aimed to analyze dimensional changes of thermoplastic removable retainers after three months of intra-oral aging.

Methods: twenty adult patients (9 males and 11 females; age: 21-25 years) were recruited after fixed orthodontic treatment. After intraoral digital impression, upper and lower thermoplastic retainers were realized. With an industrial scanner, the removable retainers were digitized at the start of the retention phase (T0) and after 3 months (T1). The T0 and T1 digitized retainers were superimposed using a point-based and surface-based algorithm. After superimposition, cross-sections of digitized retainers were realized with a 2D slicing tool at the level of central fossa of second molars and inter-incisive papilla. Then, point-to-point linear deviation between the surfaces at T0 and T1 was measured.

Results: the analysis showed a linear deviation between 0.05 and 0.3 mm of an average 42.6% points of upper retainers and 46.4% of lower retainers. The lower right second molar and upper inter-incisive papilla showed the highest percentage of average point-to-point deviation (respectively 56.9% and 46.7%).

Conclusions: both upper and lower thermoplastic retainers showed dimensional and morphological changes after three months of intra-oral ageing.

A COMPLEX MANAGEMENT OF SEVERAL INCLUDED DENTAL ELEMENTS. A CASE REPORT

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Aim: eruption anomalies are frequently encountered in clinical practice and timely interception can be crucial for effective case management, especially in cases of tooth impaction.

The following clinical case presents a complex orthodontic management of a multidisciplinary case with several impacted teeth.

Methods: in 2020, a 10-year-old healthy patient came to our observation.

The intraoral examination showed multiple carious lesions and absence of teeth 11, 12 and 23 in the arch. The patient had a Class III skeletal growth.

Radiographically, it was observed: teeth 23 and 24 involved in a cystic lesion, the agenesis of tooth 12 and impacted teeth 11 and 13, with a supernumerary tooth.

Results: first of all, the treatment of marsupialization of the cystic lesion was performed, then the case was managed with an initial cycle of rapid palatal expander.

The recovery of tooth 11 was managed with an operculization of the vestibular mucosa and the multibracket therapy. Subsequently, orthodontic-surgery treatment of tooth 24 was performed, followed by extraction of ethe supernumerary tooth 13.

Conclusions: tooth impaction can be very complex to manage, requiring a multidisciplinary approach.

It is important that both pediatric dentists and general pediatricians are able to intercept eruption anomalies as soon as possible so that orthodontists can collaborate with surgeons to develop a correct orthodontic-surgical treatment plan.

ORTHODONTIC EXTRUSION, BIOMECHANICAL AND APPLICATIONS IN AESTHETIC ZONES

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Aim: orthodontic therapy is an essential part of dental treatment, especially in the prosthetic field. Orthodontic extrusion, known as forced eruption, was initially described as a treatment option to change the position of teeth in their socket through an occlusally active vertical eruption. The purpose of this study is to describe the treatment of a 57-year-old patient, who needed an improvement in aesthetics and a makeover of the prosthetic device.

Methods: the patient was seen in the Orthodontics department of the "San Giovanni di Dio" Hospital in Cagliari.

The clinical inspection revealed the presence of incongruous prosthetic products, a class II division II malocclusion and reverse gingival architecture. Orthodontic therapy was selected, in particular the orthodontic extrusion of 12 and 22 through the application of light forces in order to obtain an increase in the attached gum and with coronalization of the parabola's gums. Cylindrical section slots are created on the palatal surface of the upper teeth with light-curing composite, inside which a 0.16 mm lingual orthodontic NiTi arch is slid.

Results: the patient was brought to the attention of the clinicians every three weeks to check the orthodontic movement and to eliminate the pre-contacts.

After 9 weeks the planned extrusion was obtained and the prosthetic operations began.

Conclusions: mastery of orthodontic extrusion techniques represents an important option in interdisciplinary treatment plans because it offers predictable results through a minimally invasive or sometimes totally non-invasive procedure.

MULTIDISCIPLINARY APPROACH TO DISINCLUSION OF IMPACTED MAXILLARY CANINE

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Aim: the present study aims to demonstrate the efficacy of canine disinclusion and placement in the arch through the orthodontic-surgical approach.

Methods: the upper canine is the tooth most likely to be included after the third molar, ranging from 0.2-2.8%. The prevalence of palatal impaction of 85% is higher than vestibular impaction of 15%. The persistence of the deciduous canine and the delayed eruption of the permanent tooth are clinical signs. Clinical examination should be confirmed by OPT and CBCT radiographic examination. Localization is diriment by the choice of surgical approach (palatal or vestibular). Management is always multidisciplinary orthodontic-surgical.

A 20-year-old female patient presented to our observation, presenting first canine and molar class, with the permanence of dental elements 5.3 and 6.3. After CBCT analysis, it was possible to assess the actual position of included elements 1.3 and 2.3. It was decided to disinclude both canines first by surgical approach with avulsion of deciduous 5.3 and 6.3, surgical exposure of the two permanents 1.3 and 2.3, and application of orthodontic buttons with orthodontic traction anchored trans-palatal bar.

Multibrackets therapy (ROTH) uses self-ligating brackets and elastic springs in areas to preserve the post-extraction space of the deciduous.

Conclusions: it is correct to try to reposition the included canines in the arch; they are irreplaceable elements within the oral cavity both functionally and aesthetically in the projection of the smile line.

REVERSE CHEWING CYCLES AND SPINAL FLEXION IN PATIENTS WITH UNILATERAL POSTER CROSSBITE

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Aim: to investigate the association between reverse chewing cycles (RCC) and spinal flexion in the frontal plane in unilateral posterior crossbite (UPC) patients.
Methods: this study included 87 patients with UPC (median (IQR) age 8.0 (7.3-9.3)[yr.mo]; M = 44, F = 43) and a control group of 53 patients with normal occlusion (median (IQR) age 10.7 (9.3-12.8) [yr.mo]; M = 28, F = 25). Masticatory patterns were recorded during soft and hard bolus chewing with a kinesiograph (K7-I; Myotronics, Tukwila, WA, USA). Spine alignment was assessed with an electronic inclinometer Spinal Mouse® system (Idiag AG, Switzerland).
Results: the UPC patients showed a higher percentage of RCC on the crossbite side than the control group ($p < 0.001$). Moreover, a clear difference was observed between the spine's left and right flexion angles in the patients' group ($p < 0.001$ and $p = 0.001$), with the crossbite side being more flexible than the non-crossbite side. No such differences were seen in the control group.
Conclusions: this study suggests an association between UPC, asymmetrical chewing patterns, and asymmetrical spine flexion. These results may help improve understanding of any association between dental malocclusions and spine posture, aiding diagnosis and treatment strategies.

PREVALENCE OF REVERSE CHEWING PATTERNS IN ADOLESCENT IDIOPATHIC SCOLIOSIS

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Aim: to evaluate the masticatory function in a group of patients with Adolescent Idiopathic Scoliosis (AIS) with a control group using reverse chewing cycles (RCC) prevalence.
Methods: this study included a group of patients (N = 32; F = 24; M = 8; mean age±SD = 14±3 years) with a confirmed diagnosis of Adolescent Idiopathic Scoliosis and without posterior crossbite and a group of control subjects (N = 32; F = 24; M = 8; mean age±SD = 13±6 years) without spinal disorders and with normal occlusion.
Masticatory patterns were recorded with a kinesiograph (K7-I; Myotronics, Tukwila, WA, USA) during soft and hard bolus chewing, following a standardized protocol, and the prevalence of reverse chewing cycles were compared between the groups.
Results: patients with AIS showed a significantly higher percentage of reverse cycles when chewing on both sides, both with the soft and hard bolus, when compared to the control group (Right side soft bolus: 17.96% for patients AIS and 3.97% for control patients, $p < 0.001$; right side hard bolus: 19.12% for patients with AIS and 2.31% for control patients, $p < 0.001$; left side soft bolus: 20.9% for patients with AIS and 4% for control patients, $p < 0.001$; left side hard bolus: 14.87% for patients with AIS and 3.9% for control patients, $p < 0.001$).
Conclusions: this study's results indicate that Adolescent Idiopathic Scoliosis influences mastication, i.e., one of the main functions of the stomatognathic system. A multidisciplinary approach to these patients may be relevant in providing the best possible treatment outcomes.

BRACKET SURVIVAL AFTER ERYTHRITOL AND SODIUM BICARBONATE PRETREATMENT

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Aim: to test the efficacy of two different enamel pretreating agents on survival rates of orthodontic brackets.

Methods: 20 patients about to start fixed orthodontic treatment were enrolled and divided into 2 groups (A and B) according to a split-mouth design. Before the bonding of vestibular stainless-steel brackets, all the teeth were pretreated with erythritol and bicarbonate (with different particle size, respectively 14 and 65 mm) through Air-Flow handpiece for 5 seconds at maximum pressure, at a distance of 5 mm and an inclination of 90° between the enamel surface and the toecap. In group A, erythritol was used in the maxillary left and mandibular right quadrants, whereas sodium bicarbonate in the mandibular left and maxillary right quadrants. In group B, the quadrants were inverted. Bond failures were recorded every month for the first year of treatment whereas the periodontal evaluations including Probing Pocket Depth (PPD), Bleeding on Probing (BoP), Plaque Index (PI), and Papilla Bleeding Index (BPI) were collected before the beginning of treatment and 1, 3, 6 and 12 months after the bonding.

Results: a statistically significant difference in the failure rates between erythritol (3.00%) and sodium bicarbonate (7.50%) was found (P <0.05).

Kaplan-Meier survival plots showed statistically significant differences in terms of risk of failure between the 2 study groups. As regards the indexes, no significant difference was found between the two agents.

Conclusions: the use of erythritol as a pretreatment agent could reduce the failure rate of orthodontic brackets.

CEPHALOMETRIC CHANGES AFTER DISTALIZATION WITH PENDULUM IN SKELETAL CLASS I AND III

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Aim: maxillary molar distalization allows to increase space in the upper arch and to obtain a first class molar ratio. During distalization there is also a loss of anterior anchorage, with mesialization and buccal tip of the first premolar and upper incisors.

Distalization is indicated also in skeletal class III patients: in this case there is often a lack of space in the upper arch, and the loss of anterior anchorage can be used as a therapeutic effect. The aim of this study is to evaluate the distalization in skeletal class III patients.

Methods: laterolateral teleradiographs of 13 patients in skeletal class III, and 42 patients in skeletal class I, aged between 12 and 14 years, were analyzed before and after treatment with a K-Pendulum device.

Results: the results show that there are no statistically significant differences between the two samples. In skeletal class I patients the distalization of the molar was 3 mm, and the mesialization of the incisors 1 mm: 74% of the sagittal movement was therefore due to the movement of the molar, and only 26% due to the movements of the incisors. In the III class group the molar distalization was 2.4 mm, and the mesialization of the incisors was 1.7 mm: the molar movement was 59% of the total, and that of the incisors was 41%.

Conclusions: maxillary molar distalization in skeletal class III patients has no adverse effects, as seen from the comparison with class I. In class III patients there was a greater percentage loss of anchorage: this can therefore be used as a real therapeutic effect to improve the anterior relationships.

ALIGNERS *VS* DEVICES WITH OCCLUSAL BITERAMPS: EFFECTS ON EMG ACTIVITY IN YOUNG PATIENTS

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Aim: to compare the neuromuscular effects of clear aligners (CA) and fixed appliances with occlusal biteramps (FA) on the stomatognathic system after 3 months of treatment, through surface electromyographic (EMGs) analysis.

Methods: a total of 28 patients, between 13 and 22 yo, have been selected: 19 treated with CA and 9 with FA.

EMGs has been performed at the beginning (T0) and after 3 months (T1) of orthodontic treatment; measurements were collected with the Teethan software (Garbagnate Milanese, MI, Italy), evaluating indexes of the occlusal condition for both the time points: Percent Overlapping Coefficient (POC), Barycenter (BAR), Torsion (TORS), Impact (IMP).

Statistical analysis was performed using the R statistical package (version 3.0.1, RCoreTeam, Foundation for Statistical Computing, Vienna, Austria). The normality assumption of the data was evaluated with the Shapiro-Wilk test. Differences between T0 and T1 were compared with the t test. The level of significance was set at $P < .05$.

Results: in FA group, although a slight increase in POC, a decrease of BAR, TORS and IMP indexes were shown; none of these changes were statistically significant. In CA group, POC and TORS indexes increased to the normality range, but not statistically significant; BAR and IMP indexes, instead, had a significant increase ($p = 0,029$ and $p = 0,038$ respectively).

Conclusions: despite the FA group, significant improvements in neuromuscular balance (BAR) and muscle strength intensity (IMP) were found in young patients treated with CA. Given the limited sample size, these results should be taken with caution.

A NEW QUALITY LIFE (OSA WELNESS SCALE) IN DENTISTRY OSA PATIENTS

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Aim: the aim of this observational retrospective study is to present a new short self-test called the OSA Wellness scale (OWS), used to evaluate the health-related life quality (HRQoL) changing in OSA patients treated with MAD.

Methods: 36 OSA patients (5 women and 31 men, mean age 51.7) treated with a fully customizable MAD device (Protrusor) were retrospectively enrolled. Each patient received a home sleep apnea testing (HSAT) at baseline(T0) and after three month of MAD treatment(T1). Two self-test evaluations, the Epworth sleepiness scale (ESS) and OWS were also submitted at T0 and T1. The OWS was a short 8 questions self-test for evaluating the daytime HRQoL. Patients gave an assessment from 0 to 3 for each question. At the end, the questionnaire gave the patient's score from 0 to 24, resulting by the sum of all 8 scores. Hight score test detected the patient's discomfort state.

Results: this Retrospective study showed a significant decrease in the oxygen desaturation index (ODI) and apnea-hypopnea index (AHI) ($P < 0.0001$); no significant changes in body mass index (BMI); a significant reduction of both the ESS and OWS records, in daytime sleepness and HRQoL. ($P < 0.0001$).

Conclusions: the OWS could be a useful method to verify and numerically compare the perceived life quality in OSA patients, before and after MAD therapy.

HOW AGING AFFECTS LIP DIMENSIONS: A 3D ASSESSMENT ON HEALTHY SUBJECTS

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Aim: to evaluate the effect of aging on labial morphology.

Methods: a sample of 37 white Caucasian adults (young: 10 women, 11 men, age range 21 to 34 years, mean age 26; old: 9 women, 7 men, age range 48 to 61 years, mean age 53) was analyzed. Study participants were chosen according to the following inclusion criteria: complete maxillary and mandibular dental arches, Angle class I, OVJ <5 mm; exclusion criteria were: history of craniofacial surgery and/or trauma, congenital anomalies, periodontal disease and caries. Impressions of extra-oral (cutaneous) and intra-oral (mucosal) surfaces of the lips were taken and cast in dental stone. Each cast was then digitized and reconstructed using NURBS (Non Uniform Rational B-Spline) curves. Data concerning vermillion surface area, lip volume and lip thickness was gathered, and comparisons were made through ANOVA tests.

Results: all measurements resulted to be greater in men than in women. Labial dimensions resulted to be inversely related to age.

Differences between genders and age groups were statistically significant (vermillion area: sex, age $p < 0.001$; upper lip volume: age $p = 0.012$; lower lip volume: sex, age $p < 0.005$; lip thickness: sex, age $p < 0.05$).

Conclusions: modifications of facial soft tissues may be noticeable even in healthy individuals with full dentition as they age. In fact, after the 5th decade of life, labial dimensions decrease significantly in the three planes of the space, and said reduction is especially evident in the lower lip. Further research may allow a better understanding of facial modifications due to aging.

SURVEY OF KNOWLEDGE ABOUT PEDIATRIC SLEEP MEDICINE AMONG ITALIAN DENTISTS

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Aim: this study aimed to investigate knowledge and attitude about obstructive sleep apnoea (OSA) in children among Italian dentists.

Methods: an anonymous questionnaire was prepared using Google Forms and sent to dentists in Italy via private social platforms. The first part of the questionnaire contained basic demographic data questions, and the second part included items about paediatric OSA. A total of 125 responses were recorded over one month. For this study, we excluded questionnaires compiled by orthodontists using the answer "no" to the question "have you achieved your orthodontic residency?".

Results: the general dentists who compiled the questionnaire were in total 85, 35 female e 50 male, with an average age of 46,8 years, from regions of North, Centre and South Italy. About 50% of them reports having never received training about paediatric OSA and about 60% consider their knowledge in that field low. Most of the dentists who participated in this study acknowledge the importance of the multidisciplinary team in the management of OSA in children; despite that, they can't correctly identify the figures mandatorily involved and the referral to other specialists is infrequent. Moreover, some of the most common risk factors of the disorder remain underestimated and some severe consequence of OSA are not recognized by at least 30% of the interviewed.

Conclusions: this study shows lack of knowledge about paediatric OSA and its management among Italian dentists, revealing the need to update the dentistry curriculum and to organize educational interventions.

PREDICTABILITY OF TEETH ROTATION IN PATIENTS TREATED WITH CLEAR ALINGERS

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Aim: clear aligners are daily employed for the treatment of several malocclusions. Previous clinical studies indicated low accuracy for the correction of tooth rotations. The aim of this study was to evaluate the predictability of tooth rotations with clear aligners.

Methods: the sample comprised 390 teeth (190 mandibular; 200 maxillary), measured from the virtual models of 45 participants (21 men, 24 women; mean age: 29.2 years old). For each patient, digital dental models (STL files) of pre-treatment (T0), virtual plan (T1) and post-treatment (T2) of both, mandibular and maxillary arch were superimposed with Geomagic Control X. Two landmarks for each tooth were collected to define a vector in T0, T1 and T2, then, with an angular measurement tool, both the angle prescribed in the virtual treatment plane (angle formed by vectors in T0 and T1) and the corresponding angle obtained in the post-treatment (angle formed by vectors in T0 and T2) were calculated and compared to assess their accuracy.

Wilcoxon signed-rank test and paired t-Test were used to assess differences between prescribed and achieved movements ($P < 0.05$).

Results: the overall predictability of rotation movement was 78.58% for mandibular arch and 75.03% for maxillary arch. Second molar accuracy was the lowest in both cases while for the same group of teeth there were noticeable differences between the upper and lower arches.

Conclusions: clear aligners were not always able to achieve 100% of the planned movement.

IN VITRO STUDY TO EVALUATE SHEAR BOND STRENGTH BETWEEN ENAMEL PRETREATED AND BRACKETS

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Aim: to evaluate the bonding failure rates of orthodontic brackets after enamel pretreatment with decontaminating powders showing different particle sizes and RDA values, before the conventional acid etching procedure.

Methods: 80 bovine teeth were randomly and equally divided into 4 groups according to the pretreating agent used and its granulometry: erythritol (14 mm), glycine (18-22 mm) and sodium bicarbonate (65-70 mm). A control group with no pretreatment was considered. A sample of teeth underwent SEM morphologic evaluation of pretreated enamel. Teeth were etched and brackets bonded, then shear bond strength (SBS) was calculated with a universal testing machine.

Results: the SBS values were higher when using erythritol and no significant differences were reported with the untreated control group ($P > 0.05$), but with significant differences with glycine and sodium bicarbonate ($P < 0.05$). No difference was found between erythritol and glycine ($P > 0.05$). The lowest SBS values were found for sodium bicarbonate ($P < 0.05$). Pearson's correlation coefficient showed a moderate negative correlation between SBS values and the particle size of the pretreating agents ($r = -0.6217$). The findings of SEM microphotographs indicate that enamel is subjected to morphologic changes after pretreatment with erythritol, glycine, and sodium bicarbonate, with an increased roughness for higher particle size pretreating agents.

Conclusions: pretreated enamel with erythritol could represent a valid approach to reduce failure rates of orthodontic brackets.

ASSESSMENT OF SPONTANEOUS UPPER FIRST MOLAR DEROTATION AFTER LEAF EXPANDER AND RME

Abate A.

Aim: to assess the spontaneous upper first molar derotation after Leaf Expander (LE) and RME anchored to the deciduous molar.

Methods: inclusion criteria: no systemic disease; maxillary hypoplasia; CVMS 1-2; fully erupted upper first permanent molars. Exclusion criteria: CVMS 3-6; second deciduous molar not available; Class III malocclusion. 114 patients recruited at the Universities of Milan, and Genova were randomly located into LE and RME group. Allocation was performed by using a stratified blocked randomization. Patients were subdivided based on the presence or not of posterior crossbite. The paired T test was used for intra-group comparison. ANOVA test was computed for subgroups comparison. Linear regression analysis was also performed.

Results: a significant derotation was found after LE and RME in no-cross, monolateral and bilateral crossbite groups. LE showed a significant greater derotation in monolateral crossbite subgroup compared to RME.
LE appliance demonstrated a significant greater amount of molar derotation. The linear regression model showed a significant correlation between the amount of expansion and molar rotation.

Conclusions: maxillary expansion performed on deciduous molar produces spontaneous molar derotation. LE showed a significant greater molar derotation with also a greater effect on the crossbite side of the monolateral crossbite subgroup. Molar derotation is correlated to the amount of the expansion obtained on the second deciduous molar.

SKELETAL AND DENTAL EFFECTS OF FGB APPLIANCE COMPARED TO RPE AND UNTREATED CONTROLS

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Aim: the maxillary expansion is a fundamental interceptive orthodontic treatment because several morphological and functional aspects can be affected by a maxillary transversal deficiency. The maxillary expansion can be provided through either rapid expansion protocol or functional devices. The latter are preferred because of a lower risk of complications, but no data exist about their efficacy in providing a skeletal expansion. Therefore, the aim of this study was to compare the effects of the rapid palatal expander (RPE) and the function-generating bite (FGB) on the transversal dimension of the maxilla and dental arch width.

Methods: one hundred eighty-one young skeletal Class I patients with maxillary transversal deficiency were retrospectively enrolled in the study; among these 55 were treated with FGB, 73 were treated with RPE and 51 were untreated subjects retrieved by historical databases. The pre-treatment (T0) and post-treatment (T1) frontal cephalograms were retrieved, the width of maxillary and mandible was measured and the distance between upper first molars and lower first molars were collected. Then, a statistical analysis was performed.

Results: the statistical analysis showed that there are not statically significant differences regard the skeletal expansion and dental expansion between the RPE and FGB groups, while the untreated control group showed statistically significant differences compared to other two groups.

Conclusions: the effects of RPE and FGB appliances on skeletal and dental arch width were comparable between groups.

CRANIOFACIAL MORPHOLOGY RELATED TO TMD: A RETROSPECTIVE STUDY

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Aim: the aetiology of temporomandibular disorders is multifactorial and include trauma, parafunctional habits, psychological and social aspects. A recent review found an association between second skeletal classes, hyperdivergent jaw and the frequency of TMJ disc dislocations. The present retrospective study aims to evaluate the association between condylar height symmetry, vertical skeletal patterns and TMD in adults.

Methods: 200 patients between 18 and 30 years were recruited and divided into two groups: the experimental group included 100 patients with TMD (diagnosed by diagnostic criteria for temporomandibular disorders DC/TMD) and the control group consisted of 100 patients without TMD. For each subject, skeletal divergence was evaluated on cephalometry (SnaSnp^GoGn angle) and condyle height symmetry was assessed on orthopantomography according to Habet's method. Data were submitted to statistical analysis and significance was predetermined at $p < 0.05$.

Results: a strong association between TMD, hyperdivergence ($p = 0.0015$) and condylar asymmetry ($p < 0.0001$) was found. These disorders were observed more frequently in the female sex ($p < 0.04$) which can be related to the hormonal influence predisposing to cartilage breakdown.

Conclusions: hyperdivergent skeletal pattern and condylar asymmetry are important risk factors for TMD in adult patients whose prevalence is higher in women. Orthopantomography and cephalometry are useful preliminary screening methods to intercept patients with functional TMJ disorders.

PREVALENCE OF OXYGEN DESATURATION IN YOUNG ADULTS WITH TOOTH WEAR

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Aim: to investigate the prevalence of oxygen desaturation events during sleep in a population of young adults with tooth wear (TW).

Methods: this retrospective cohort study included subjects between 18 and 45 years with TW who had undergone a sleep study for suspected obstructive sleep apnea. TW was assessed using the Tooth Wear Evaluation System 2.0 and classified as mild, moderate or severe. Age, sex, body mass index (BMI), oxygen desaturation index (ODI, defined as the number of times oxygen saturation dropped to ≥3% per hour of recording) were also collected from medical records. ODI was graded into 4 groups: no desaturations (<5 events/hour), mild (5-15 events/hour), moderate (15-30 events/hour) and severe desaturations (≥30 events/hour).

Results: 26 patients were included. Overall, the prevalence of mild desaturations was 46%, followed by moderate (8%) and severe (4%) ones.

Respectively 43%, 73% and 25% of the patients with mild, moderate and severe TW exhibited mild to severe desaturations. No statistically significant difference existed across different desaturation subgroups for anthropometric data as well as for the severity of TW.

Conclusions: these preliminary data do not support the hypothesis of a correlation between severity of TW and desaturation events.

Further controlled studies on larger sample size are required in order to improve the generalization of the results.

IMPORTANCE OF POSITIONAL OSAS IN AN OSAS PATIENT POPULATION: A RETROSPECTIVE STUDY

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Obstructive sleep apnea syndrome (OSAS) is a sleep disorder characterized by repetitive airway obstructions during sleep, leading to oxygen deprivation and non-restorative sleep. OSAS has been linked to a range of health consequences including hypertension, neuropsychiatric abnormalities, and cardiovascular disorders. Mandibular advancement devices (MADs) have been recognized as a non-C-PAP therapy with proven efficacy in OSAS patients, increasing airway volume to prevent airway collapse. MADs have been shown to improve quality of life and work performance, and are indicated for patients with mild to moderate OSAS or who cannot tolerate C-PAP. However, individual responses to MAD therapy vary, and multidisciplinary approaches and clinical follow-up are crucial for successful treatment. PSG remains the best tool for monitoring OSAS progression.

Positional OSAS (where airway obstruction occurs primarily in the supine position) may also play an important role in predicting the success of MAD therapy. Patients with positional OSAS have been shown to have a better response to MAD therapy, as the device can help to maintain the airway patency in the supine position. Therefore, identifying the positional component of OSAS may be a crucial consideration in predicting the therapeutic outcome of MADs, and in optimizing treatment strategies for individual patients.

EFFECTS OF RAPID AND SLOW MAXILLARY EXPANSION IN PRE-PUBERTAL PERIOD: A SCOPING REVIEW

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Aim: the maxillary transverse skeletal deficiency is a common clinical finding, frequently managed with orthopedic expansion of the maxilla. The objective of this scoping review can be resumed in the following PICO question: (P) in pre-pubertal children in mixed or early permanent dentition (I) the orthopedic expansion of the maxilla (C) performed with rapid (RME) or slow (SME) expansion (O) exhibit statistically significant differences?

Methods: the PubMed, Scopus, The Cochrane Library and EMBASE online databases were searched according to the PRISMA-ScR guideline until October 30, 2022. Inclusion and exclusion criteria were established based on the PICO question: studies involving patients with cranio-facial anomalies and procedures involving mini screws and surgery were excluded. Two authors (S.T. and E.L.) conducted the study selection and data extraction; author's reliability was calculated with Cohen's Kappa statistic, meanwhile the Newcastle-Ottawa (NOS) scale was used to assess the studies' quality.

Results: after full text assessment, only 13 were included in the qualitative synthesis. NOS scores ranged 6 to 9 indicating high quality. The effects of RME (351 patients) and SME (169 patients) were compared and no statistically significant difference was registered, in terms of skeletal and dental changes.

Conclusions: overall, both RME and SME protocols were effective in treating maxillary transverse skeletal deficiency in pre-pubertal patients. Therefore, the choice between the two activation modalities is once again dependent on the clinician's experience and preference.

EVALUATION OF THE VARIABLES THAT INFLUENCE THE ACCURACY IN THE ATTACHMENTS REPRODUCTION

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Aim: the purpose of this study was to evaluate some clinical variables that influence the accuracy of thermoplastic template in reproducing the planned attachment shape. The following variables were considered: template material, type of composite, and pressure application on template during attachment curing.

Methods: the chosen materials used in this study are two types of composite resins: Enaflow (Micerium), Enamel plus dentina HRI (Micerium). Two different materials for the construction of the thermoplastic transfer template: Erkolen 0,8 Erkodent (PE) and Erkodur 0,8 Erkodent (PET-G). Two different light curing lamps: Valo cordless color no pressure and push light pressure (SCS). The 26 models included in the study were imported in the Ortho Analyzer software (3shape, Denmark), and attachments were virtually placed on dental elements of the first premolar and on both sides of the first upper molars. The accuracy of attachment reproduction was evaluated through linear and angular evaluations against the reference model (MCAD). Three physical models were obtained: model A (MA) printed with attachments, model B (MB) with attachments made with PE template and model C (MC) with attachments made with PET-G template.

Results: the results showed statistically significant differences ($P < 0.05$) between the PE and PET-G template with greater precision using PET-G template. Statistically, significant differences ($P < 0.05$) were found among Pasta composite and Flow composite with pressure curing.

Conclusions: in light of the data obtained, it is advisable to use a PET -G template and to not use pressure to cure when the attachment is built in flow.

FOOD CONSISTENCY AND MALOCCLUSION: SUGGESTION OF A QUESTIONNAIRE ON NUTRITION HABITS

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Aim: malocclusion is a condition existing since ancient times nevertheless it has been highlighted that the frequency has increased over the years. Dietary factors play a role in *malocclusion occurrence*. The aim of the study was to develop a questionnaire, which does not currently exist, to investigate the dietary habits regarding food consistency and frequency among pediatric patients.

Methods: following the consistency categories developed from the Nutritional Academy for dysphagia patients, foodstuffs were divided into 5 categories and scored from 0 to 4 as follows: liquid (0), semiliquid (1), creamy (2), soft (3) and solid/hard (4).

Results: a food questionnaire, divided according to the main meals, was developed: this questionnaire has a column on the left where the aliments belonging to a specific consistency category are listed, and a column on the right where it is requested to indicate the frequency of intake.

Conclusions: the questionnaire can be a useful tool to describe eating behaviors and preference of food in order to investigate the impact of diet consistency on orofacial development.

EFFECTS ON FACIAL SOFT TISSUES PRODUCED BY RAPID *VS* SLOW MAXILLARY EXPANSION: A RCT

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Aim: to compare the effects on facial soft tissues produced by rapid (RME) *vs* slow (SME) maxillary expansion in growing patients.

Methods: in the RME group (8.2±1.3 ys) a conventional expander was applied while in the SME group (7.9±0.8 ys) the Leaf Expander was used. The primary outcome was the difference of facial tissue changes in the nasal area measured on facial images captured through stereophotogrammetry before application of the expander and after one year of retention. Secondary outcomes were soft tissue changes of other facial regions (mouth, lips, and chin). Analysis of covariance was used for statistical analysis.

Results: 14 patients were allocated to both groups. There were no dropouts. Nasal width change showed a difference between the two groups (1.3 mm in favor of RME, 95%CI 0.4-2.2 mm, P = 0.005). Intercanthal width showed a significant difference (0.7 mm in favor of RME, 95%CI 0.0-1.3 mm, P = 0.044). Nasal columella width, mouth width, nasal tip angle, upper lip angle, and lower lip angle did not show any significant differences. The Y-axis (ant.-post.) components of the nasal landmark showed a significant difference (0.5 mm in favor of forward displacement of RME, 95%CI 0.0-1.2 mm, P = 0.040). Also, Z-axis (sup.-inf.) components of the lower lip landmark was significant (0.9 mm in favor of downward displacement of RME, 95%CI 0.1-1.7 mm, P = 0.027). All the other comparisons of the three-dimensional assessments were not significant.

Conclusions: RME produced significant facial soft tissue changes *vs* SME. RME induced greater increases in both nasal and intercanthal widths (1.3 mm and 0.7 mm). These findings, though statistically significant, are probably not clinically relevant.

INVESTIGATION OF SLEEP HABITS IN COMPETITIVE AND NON-COMPETITIVE ATHLETES

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Aim: sport leads to better mental and physical health, protecting the individual from cardiovascular disorders. The aim of this study is to establish if physical activity may also have a protective role towards obstructive sleep apnoea syndrome (OSAS). We analysed the routine of sportsmen related in particular to sleep and oral hygiene, in order to investigate the prevalence of OSAS and caries, respectively.

Methods: a questionnaire was administered to a mixed population, consisting of both sportsmen and ordinary people. It consists of three parts: the first one investigates the person's level of physical activity; the second part includes a screening for OSAS based on the Epworth Sleepiness Scale and the STOP-BANG questionnaire; the last part focuses on the consumption of sugary drinks during physical activity.

Results: 263 responses were collected: the sample includes 48 non-athletes and 214 athletes, of whom 149 are competitive. The study focuses on a sample of athletes practicing predominantly aerobic activities, since 66.3% of the competitive athletes practice triathlon, swimming or cycling. 29 persons, or 11% of the total sample, stated that they had experienced breathing apnoea during sleep. More than 80% report having had at least one caries on a permanent tooth.

Conclusions: the survey results are in line with the prevalence reported in the literature and indicate that OSAS is still a poorly understood condition, although it is estimated to be widespread. Carious pathology is also very common in the sports world due to the constant intake of sugary drinks during training.

SOFT TISSUES THREE DIMENSIONAL ANALYSIS FOR DIAGNOSIS OF SAGITTAL AND VERTICAL DISCREPANCY

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Aim: to establish variables based on 3D-imaging of the soft tissues which allow to perform a reliable analysis of the vertical and sagittal mandibular position.

Methods: data were collected at the University of Naples "Federico II", Italy. In this study, 300 participants who presented lateral cephalogram and three-dimensional facial scan were included. Facial scans were taken by means of 3dMD system. For vertical discrepancy, mandibular-plane angle (SN-MP) was considered and the partecipants were classified as hyperdivergent (SN-MP ≥42°), normodivergent (27°≤ SN-MP ≤37°), and hypodivergent (SN-MP ≤22°) facial types. For sagittal discrepancy, ANB angle was considered and the participants were classified as skeletal ClassI (0°≤ ANB ≤4°), ClassII (ANB ≥6°), ClassIII (ANB ≤-2). Nineteen ratio, angular and linear measurements were calculated. A stepwise multinomial logistic regression model was used to determine the best predictors of jaw vertical and sagittal position.

Results: in the vertical discrepancy analysis NTRGN and TRGOGN angles were the most predictive vertical variables to identify jaw divergence and they correctly identified almost the 94% of the hyperdivergent and hypodivergent patients. In the sagittal discrepancy analysis the ratio TRSN/TRPG was the most predictive variable to identify sagittal discrepancy and it correctly identified the 89% of the sagittal diagnosis.

Conclusions: three-dimensional cephalometric analysis of facials scans could represent a useful tool for classifying vertical and sagittal position of the mandible without unnecessary ionizing radiation.

FUNCTIONAL APPLIANCE IN CLASS II MALOCCLUSION: 3D CHANGES OF THE SOFT TISSUES

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Aim: the aim of the study was to evaluate the three-dimensional changes of soft tissues in growing patients with Class II malocclusion, after a treatment with a functional device.

Methods: 17 patients (14 males and 3 females, mean age: 11.7 years), recruited between April 2018 and June 2019 at the Section of Orthodontics at University of Naples Federico II, were included in the study. All the patients underwent a functional treatment with a Sander Bite Jumping Appliance (BJA). Facial scans were acquired using a 3dMD facial scanner before (T1) and after treatment (T2). T1-T2 mean interval was 1.2 years.

The data were analyzed by means of a Student T-Test for paired data and the level of significance was set as $P < 0.05$.

Results: the BJA produced an advancement of the lower jaw as indicated by the statistically significant changes in the Facial Convexity (T2 *vs* T1:2.1, SD:3.8, P = 0.033), LS-N-LI angle (T2 *vs* T1:-0.1, SD:2.3, P = 0.835), SS-N-SL angle (T2 *vs* T1:-1.3, SD:1.5, P = 0.003) and Upper Lip Position (-1.1, SD:1.7, P = 0.016). Moreover, there was a significant increase of the Submental angle (14.5, SD:13.8, P = 0.001).

Conclusions: the results of this study revealed that BJA was effective in determining soft tissue changes in young individuals. These changes were primarily located at mandible soft tissues with a mandibular and a lower lip advancement. There was also an improvement of whole profile subsequent to the increase of the facial convexity.

ORTHODONTIC EVALUATION IN CHILDREN WITH DOWN SYNDROME AND OBSTRUCTIVE SLEEP APNOEA

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Aim: the purpose of the study was to find an association between OSA and malocclusion features in children with Down syndrome.
Methods: a total of 48 children with DS were enrolled at the Department of Translational Medical Sciences, Federico II University, Naples, Italy. Inclusion criteria included children between 4-12 years old, with confirmed diagnosis of Down Syndrome (DS) by karyotype analysis. All subjects' mothers filled out the Child Sleep Habits Questionnaire in Italian language CSHQ-IT, and they were asked to score on a 3-point scale, children's sleep behaviors over a "typical" recent week. The score ranged from 33 to 99, and a cut-off of 41 identified sleep disorders. Children underwent orthodontic evaluation, performed by a specialist and the facial profile, molar relationship, Overbite and transversal molar discrepancy were analysed. Moreover, mothers were asked about sleep bruxism and oral parafunctional behaviors during the day. On the night of the study day, a sleep study with polygraphy (PG) was performed.
Results: the mean CSHQ-IT total score was 63±5.1. The orthodontic evaluation showed orthognathic profile in 68% of cases, class I relationship in 63%, and cross-bite in 51%. PG revealed OSA in 67% of cases (37% mild, 63% moderate-severe). No associations were found between the PG parameters and the orthodontic evaluation.
Conclusions: no significant associations were found between PG and the total CSHQ-IT score or orthodontic data.

GINGIVAL RECESSIONS FOLLOWING INVISIBLE ALIGNERS TREATMENT. RETROSPECTIVE EVALUATION

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A correlation between the use of fixed orthodontic appliances (FOA) and the onset of gingival recessions is now widely demonstrated. In 1999, a new type of treatment was introduced, designed, and created with invisible thermo-printed appliances.
It had great success, especially amongst adults, since it gives greater comfort, as the appliances are removed before meals and home oral hygiene practice; it also turns out to be less impactful from an aesthetic point of view, compared to FOA.
Aim: evaluate the number of gingival recession (REC) before the orthodontic treatment with aligners and compare it with the REC at the end of the treatment and after 5/10 years of a retention phase.
Methods: 49 patients were involved, for each of whom 3 intraoral photographs were taken at 3 different time points: before treatment (T0), at the end of orthodontic therapy (T1) and after following up from a minimum of 5 to a maximum of 10 years.
Teeth from 15 to 25 showing gingival recessions in the photos between T0, T1 and T2 were recorded.
Results: the data analysis showed that the gingival recessions recorded at time T2, almost doubled compared to those recorded at time T0, i.e., before treatment. In particular, the maximum possible increase in the incidence of recessions occurred between T0 and T1.
Conclusions: orthodontic therapy with aligners may increase the onset of gingival recessions during the treatment or in the retention phase. In future, it will be interesting to compare the occurrence of recessions, in the same time frame, between the treated and an untreated sample.

INVISALIGN® FIRST WITH MA TO SOLVE A SKELETAL CLASS II MALOCCLUSION: A CLINICAL CASE

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Aim: resolution of a clinical case of skeletal Class II malocclusion by using Invisalign® First with Mandibular Advancement (MA) device.

Methods: the treatment was performed on a 12-years-old male patient, brachyfacial, with hypodivergent pattern and convex profile, skeletal II class (SNA = 80°; SNB = 75°; ANB = 5°). Intraoral exam show a dental malocclusion II class I division, with increased ovj and increased ovb; presence of interincisal diastema; vestibular inclination of 2.1 and 2.2, extrusion of 5.3, palatoinclination and extrusion of 6.3, mesial derotation of 2.4, deviation of the upper midline to the lower midline; diastemature and slight crowding in both arches. The orthodontic treatment includes 3 jumps of mandibular advancement implemented through the Invisalign® aligners with vestibular Precision Wings features placed between the first molar and premolars, use of II elastic bands and attachments.

Results: through the Invisalign® First MA system, mesialization of the lower arch with wide correction of the dental class II and modest correction of the skeletal class (SNA = 80°; SNB = 79°; ANB = 1°) were obtained. Correction of overjet and overbite, closure of the central diastema and interarch spaces, flattening of the Spee curve, expansion, alignment and levelling of both arches, centered midlines, were achieved.

Conclusions: Invisalign® First with MA represents an efficient tool for the correction of dental-skeletal Class II malocclusion in a growing patient.

BAMP PROTOCOL: CLINICAL OUTCOMES OF CUSTOM-MADE MINIPLATES IN GROWING CLASS III PATIENTS

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Aim: bone Anchored Maxillary Protraction (BAMP) allows the correction of skeletal class III by maximizing anchorage control. The aim of this study is to compare surgery duration, anatomical risks, clinical complications and patient comfort of custom *vs* non-custom-made titanium miniplates in growing patients with skeletal class III.

Methods: patients were selected from the U.O.C. of Orthognatodontics, Sapienza University of Rome, following the inclusion criteria: age (9-14), SNA <80°, SNB >82°, overjet <1 mm. Overall, 4 patients were included: 2 were treated with custom-made miniplates, designed on *Creo PTC* software by matching the pre-surgery CBCT and digital dental scan stl files; 2 were treated with pre-shaped miniplates. In both groups, the pre-surgical CBCT allowed the evaluation of ideal bone thickness and miniplate positioning. Following the surgical placement of miniplates, patients underwent class III maxillary traction with elastics of growing intensity: 150 g, 200 g, 250 g.

Results: the surgery duration and associated risks resulted lower for custom-made miniplates. Patient comfort resulted greater for custom-made miniplates. No complications were observed in patients with custom-made miniplates, whilst mobility, fracture, pain, covering and mucosal inflammation were encountered with non-custom-made miniplates.

Conclusions: the implementation of custom-made miniplates shows promising results. However, due to the limited sample size, further investigations are required to draw a more reliable evaluation of the advantages and clinical implications related to custom-made miniplates.

AMCOP® DEVICE AS A TREATMENT OF CLASS II MALOCCLUSION SECOND DIVISION IN MIXED DENTITION

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Aim: almost one-third of patients requiring orthodontic treatment have Class II malocclusion. The most typical feature of this malocclusion is mandibular retrusion. Considering this topic, the purpose of this study is to describe a clinical case with a Class II skeletal relationship that was successfully treated using the AMCOP® device.

Methods: a 12-year-old female patient had a mandibular retrusion with an ANB angle of 6°. She also had a skeletal and dental Class II relationship. She displayed hypodivergence. She had palatalized central upper incisors and vestibulo-inclined lateral incisors. She had a 7 mm overbite and a 2 mm overjet. Her profile displayed a convexity and a very pronounced mentolabial sulcus.

AMCOP® appliance was used in this case to advance the retrognathic mandible.

The patient used the device actively for 1.5 hours throughout the day and passively the entire night. She was required to work on her breathing, swallowing, and chewing throughout the day.

Results: the clinical treatment shows that this case was intercepted and after the cephalometric analysis in T0 and T1 phase, it was verified that the SNB angle continued to increase achieving an ANB = 3°. The divergence has also improved with a FMA angle of 23°. Lip competency, facial convexity, and mentolabial sulcus improved as the mandible advanced. The patient's facial esthetics change was the most impressive part of his treatment.

Conclusions: it is possible to achieve favorable outcomes with functional management in Class II malocclusion patients, using AMCOP® device.

USING CLEAR ALIGNERS AND RUBBER BANDS TO SOLVE A MALOCCLUSION WITH LOWER MIDLINE SHIFT

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Aim: demonstration about the effectiveness of the combined use of orthodontic elastics and Invisalign® aligners in the functional asymmetry of the resolution caused by premature contacts between 2.3 and 3.3.

Methods: 17-year-old female patient in skeletal class I, dental class II in the right hemiarch, dental class II in the left hemyarch, OVB is 4 mm, OVJ is 2.5 mm, the mandibular midline is deviated to the left of 2.8 mm. The treatment included 3 series of Invisalign® aligners and 4.5 oz intermaxillary bands with a diameter of 6.4 mm placed between 1.6 and 4.3 and between 2.3 and 3.6.

Results: treatment lasted 11 months and achieved bilateral dental class I, centered the midlines, reached 2 mm OVB and 2,4 mm OVJ, corrected the dental torque, flattening the curve of Spee with anterior sectors intrusion and middle sectors extrusion.

Conclusions: the combined use of Invisalign® aligners and orthodontic elastics proved to be effective in the resolution of the overcrowded I class malocclusion and mandibular shift.

ORTHODONTIC-SURGERY TREATMENT OF A TRAUMATIZED TOOTH. A CASE REPORT

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Aim: the consequence of intrusive trauma to a deciduous tooth, as well as an abnormality in the structure of the permanent counterpart, may result in an alteration of its eruptive pathway, requiring orthodontic-surgical recovery. Timing of intervention is crucial to reduce the risk of impaction and improve prognosis.

Methods: our healthy patient presented at the age of 9. He reported a history of intrusive type of incisal trauma at the age of 2, as well as permutational anomalies. Radiographically, an anomaly of the eruptive pathway of tooth 21 was observed, with suspected corono-radicular dilatation as a result of the trauma.

Results: the treatment plan involved in a first cycle of rapid palatal expander.

Subsequently, orthodontic surgical treatment was performed with an elastic traction connected to the palatal expander. Upon eruption of the impacted tooth, direct aesthetic restorations were carried out.

Conclusions: it is crucial to promptly identify traumatic events involving deciduous teeth to manage their consequences and operate timely with minimally invasive techniques, as described in this case report.

AUTOTRANSPLANTATION SUPPORTED BY DIGITAL WORKFLOW: AN OPTION FOR SEVERE IMPACTED CANINES

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Aim: following third molar impaction, canines are the second most common evidence of teeth displacement. The canine tooth is relevant for aesthetics and function and its recovery should be performed as soon as possible. Orthodontic traction of impacted canines can be challenging. The disinclusion often requires a multidisciplinary approach and the success is not guaranteed.

Methods: this case report describes the orthodontic treatment of a young male patient, aged 8 years, with a class II malocclusion and transverse maxillary deficiency. The tooth element 1.3 e 2.3 are impacted. Initially it has been executed a rapid palatal expansion to overcome maxillary constriction and deciduous canines has been extracted to promote canine eruption. After two years the canines have not erupted, therefore it has been executed a CBCT exam. The exam showed an altered canine axis that does not allow orthodontic traction. Thus, it has been proposed the autotransplantation procedure following a digital assisted workflow combined to a fixed orthodontic treatment. The canine anatomy has been segmented through Mimics to define the real tooth morphology and dimension. The canine stl file has been imported in Blue sky Bio software to plan its placement and to realize a surgical guide for *in vivo* canine transplantation. The space in the arch has been obtained through fixed appliance, however the real canine dimension required a mesio-distal enamel reduction to allow the *in vivo* placement. Finally surgical extraction and fixation of the canine has performed with Orthodontic fixed appliance.

Results: after six months the canine was stable and vital. The orthodontic treatment has been continued.

Conclusions: the digital workflow guided surgical and orthodontic procedures. The digital planning previsualized the necessity of canine reduction and improved the accuracy of canine placement.

TREATMENT OF A PATIENT WITH CLASS III AND SCARRING RESIDUALS OF CLEFT LIP-PALATE

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Aim: this study examines a patient with III skeletal class malocclusion and residues of cleft lip palate. Patients with cleft lip-palate manifest problems with discrepancies between jaw bones.

Methods: a female patient, 7 years old, with mixed dentition, presented dental-skeletal class III malocclusion with negative overjet. Photos, rx opt, lateral teleradiography, cephalometry, and study impressions were taken and evaluated. It was planned for the first phase of treatment: E.R.P. for the upper jaw and lower plate with an expansion screw for the lower jaw. In the second phase of treatment, it was used Delaire's face mask to guide the growth of the upper jaw in sagittal e vertically.

Results: after 5 months the E.R.P. was removed to add arms with hooks for the elastic bands of Delaire's face mask and then the second phase of treatment had been started. It obtained a significant improvement in the growth and correction of jaw bone discrepancy, with good divergence control.

Conclusions: the interceptive devices are very useful to correct the transverse, vertical, and sagittal bone discrepancy in growing patients, and it is also important to have good patient cooperation in the use of removable devices.

ORTHODONTIC MINISCREW TO PREVENT BONE RESORPTION IN A GROWING PATIENT: A CASE REPORT

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Aim: to evaluate the validity, in contrasting bone resorption, of an orthodontic miniscrew inserted in an agenesis site, perpendicularly to the alveolar process from palatal to vestibular, supporting a prosthetic crown.

Methods: a 14-years old female, with agenesis of the element 1.2, was recruited. After the orthodontic fixed terapy, a CBCT of the maxilla was performed to evaluate the agenesis site. A bone thickness of 3.54 mm was showed. Thus, a self-drilling and self-tapping miniscrew (Orthoeasy Forestadent, 6 mm) was inserted, at the level of the first palatine ruga, with a flapless surgery, after local anesthesia. A prosthetic crown was connected to the miniscrew by a 0.021x0.025 SS wire.

Results: according to the Literature and the pilot study in question (Ciarlantini and Melsen, 2017), the following results should be expected: space and bone preservation for the future implant insertion. A CBCT evaluation of the agenesis site, after 15 months, has shown no radiographical bone loss.
Clinically, the vestibular-palatal width of the alveolar process has not be reduced, since the miniscrew was positioned bicortically.

Conclusions: thanks to oral function, such as chewing and speaking, the miniscrew undergoes stresses that are transmitted to the surrounding bone, with the result of increasing its turnover.
This case report shows a possible temporary solution to replace missing maxillary lateral incisor in a growing patient. To date the patient is fully satisfied with her own aesthetic and function.

ORTHODONTIC EXTRUSION AND SURGICAL CROWN LENGTHENING FOR TREATING A CROWN-FRACTURED TOOTH

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Aim: Orthodontic extrusion (OE) is defined as tooth movement favored by coronally directed orthodontic forces. Several authors proposed OE of fractured teeth, eventually in association with circumferential supracrestal fiberotomy (CSF), to get ferrule effect for prosthetic restorations. In addition, periodontal surgery was described as useful in some cases to re-establish supracrestal tissue attachment dimension after OE. The reported case describes a multidisciplinary approach to recover a fractured tooth, by means of orthodontic extrusion and surgical crown lengthening.

Methods: a 29 years-old female patient reported, after facial trauma, a deep crown fracture of tooth 2.5. After mobile crown fractured fragment removal, the sound tooth margin was detected 6mm apical to the gingival margin at palatal side. Then, OE was performed, to move the tooth coronally, with a 2 weeks routine follow-up. During OE, both endodontic treatment and a composite restoration were performed. After 10 weeks the fracture margin became more superficial, but still subgingival. It was then performed surgical crown lengthening to expose enough tooth structure for the prosthetic restoration. After complete tissue maturation, a monolithic zirconia crown was placed.

Results: the 2 years follow-up showed complete healing and stability of hard and soft tissues. The patient reported satisfaction with aesthetic and functional result.

Conclusions: OE can be a conservative but effective alternative to recover severely damaged teeth. In some cases, surgical crown lengthening is beneficial.

ORTHODONTIC TREATMENT FOR HARMONIC DEVELOPMENT IN GROWING PATIENT: A CASE REPORT

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Aim: dental crowding is still the most widespread orthodontic malocclusion. Early orthodontic treatment allows to work on the patient's growth pattern in order to reestablish the dental arches' harmonious development. The purpose of this case report is to describe a two-stage orthodontic treatment strategy to inducing the correct eruption of permanent teeth in cases of severe tooth crowding.

Methods: this is a case report of a female patient who started the treatment at the age of eight years. Aesthetic and cephalometric analysis of the patient reveals a Class II biretrusion profile, brachifacial biotype, and a horizontal growth pattern. Dental analysis revealed molar class I, palate contraction, and tooth crowding in the upper and lower arches of 8 and 9 mm, respectively. In the orthopantomography, the severe crowding of the upper arch represents a risk factor to the physiological eruption path of the permanent canines. An interceptive phase of orthopaedic expansion of the upper jaw with a HAAS-type expander was performed to increase intraosseous space. Avulsions of the upper and lower deciduous canines, as well as the first deciduous molars, were also performed to enable the eruption of the first definitive premolar and to stimulate spontaneous correction of the canine position. A trans-palatal bar in the upper arch and a lingual arch in the lower arch were applied to preserve the Leeway space. After two years from the beginning of the treatment an orthopantomography was performed to assess the intraosseous position of the canines: the eruption of the permanent canines resulted still obstructed. It was decided to extract teeth 1.4, 2.4, 3.4, and 4.4. After all permanent teeth had spontaneously erupted, the case was refined with 18 months of fixed therapy using self-ligating brackets in the upper and lower arch.

Results and conclusions: crowding was resolved by obtaining the first dental class, correcting overjet and overbite, dental midline coincidence, and closure of the extraction spaces. Early orthodontic treatment combined with serial extractions is a successful strategy for developing an adequate arch size and resolving dental crowding.

ORTHOPEDIC-ORTHODONTIC TREATMENT OF DENTO-SKELETAL OPEN BITE IN A GROWING PATIENT

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Aim: this study aimed to show the treatment of a class II malocclusion with open bite and atypical swallowing through lingual re-education, functional orthopaedics and finally straight-wire technique.

Methods: the case patient was a 9-year-old girl presenting with class II division 1 malocclusion, transverse maxillary deficiency, dento-skeletal open bite and positive overjet. The treatment plan included a first phase with logopaedic myofunctional therapy and bionator II functional appliance with a lingual shield. The patient was required to wear the appliance for about 12 to 14 hours; the upper rebate plane was periodically milled in order to achieve functional expansion of the upper arch. After 4 months of functional tongue re-education and about 10-12 months of application of the orthodontic appliance, a good soft tissue balance and a reduction of the overjet have been achieved. In a second phase, the correct molar and canine class I relationship was achieved through the straight-wire technique.

Results: post-treatment cephalometric values showed an improvement of the sagittal and vertical skeletal relations. Dental changes were also significant including a reduction of the overjet and an increase of the overbite.

Conclusions: the combination of the functional appliance and the logopaedic myotherapy allowed the achievement of hard and soft tissues correct relationships.

The straight-wire appliance finally allowed to correct the dental relationships and to achieve a functional occlusal stabilization.

RAPID DIGITAL PALATAL EXPANSION IN PATIENT WITH CLEFT LIP AND PALATE

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Aim: the rapid palatal expander is a frequently used orthodontic device to treat problems in the developmental age. With full digital techniques today, it is possible to make orthodontic artifacts customized to the patient's morphology and needs from the scanned arch model. The purpose of this work is to illustrate the advantages of the full digital technique in a case of palatal expansion in a patient with dental anomalies and cleft lip and palate by a rapid palatal expander device made by the digital cad-cam method.

Methods: the male patient, aged 8 1/2 years, presented with severe palatal contraction, severe crowding, incomplete cleft lip-palate and soft palate cleft, crossbite from 5.4 and 2.1, and hyper-divergent third dental-skeletal class. Elements 5.5 and 6.5 were found to be microdontic to accommodate the bands so it was evaluated to use an expander made by a complete digital technique using study models reprocessed with the scanner and transformed into STL files. The expander was cemented with the adhesive technique and the expansion protocol included 1 lap every 2 days for 42 days obtaining 5 millimeters of expansion.

Results: the crossbite was resolved by expansion by increasing the arch perimeter without incurring appliance debonding.

Conclusions: the full-digital technique allowed the fabrication of the custom device to be perfectly stable and adherent, despite the impossibility of inserting classic bands. Rapid digital palate expander eliminated the need for separators and the subsequent band trial appointment, redeeming the procedure faster and more comfortably for the patient.

MANDIBULAR PROPULSION THROUGH MAGNETIC ATTRACTION DEVICES

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Aim: the following case report describes the development and use of a new magnetic mandibular advancement device, evaluating its efficacy and its effects during the treatment of a patient affected by OSAS.

Methods: in the specific clinical case, the patient was treated in the dental clinic of the University of Messina using an experimental magnetic mandibular advancement device, in which passive mandibular propulsion was determined through the attraction of rare-earth magnets embedded in the thickness of thermoformed PET-G masks. This device is able to change the mandibular position leading to an increase in the patency of the respiratory tract, and reducing the resistance at the level of the nasopharyngeal tract. The device was delivered ti the patient and it was tested its advancement mandibular efficiency. It was ask the patient to wear the device every night. The following parameters were evaluated every 3 months. AHI (apnea-Hypoapnea Index), ODI (Oxigen Desaturation Index).

Results: a new polysomnographic examination was carried out at 3 and 6 months after the start of the mandibular magnetic attraction advancement device therapy. Compared with the pre-treatment values of AHI (24.8) and ODI (27.3), a progressive reduction was observed at three months after the start of treatment and a further decrease at six months; the AHI and ODI values were 11.0 and 10.6, respectively, at three months and 8.1 and 9.7 at six months.

Conclusions: the propulsion mandibular magnetic device was an efficient therapy for the resolution for moderate degree OSAS.

TWIN BLOCK IN HYPERDIVERGENT SECOND-CLASS THERAPY

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Aim: this study examined a case of hyperdivergent Skeletal class II treated with removable Twin Block orthodontic therapy. The Twin Block is an effective mandibular advancement device in class II malocclusions with mandibular retrusion that allows good control of verticality through posterior resin planes. All class II appliances increase the vertical dimension, which in hyperdivergent subjects is a side effect that should be avoided.

Methods: female patient, 10 years old, with mixed dentition, presented dento-skeletal class II malocclusion, hyperdivergent grown pattern, contracted arches and increased overjet (OJ). Cephalometric values ANB 5.9°, SNA 82°, SNB 76°, FMA 32°. The construction bite was made in a head-to-head relationship. To correct the transverse contraction of the upper and lower arches, an expansion screw was inserted into both the upper and lower plates, activating it 1 turn per week. The appliance was worn at least 14 hours a day for approximately 2 years.

Results: after 14 months, there was a significant improvement in the Class II with good divergence control. Final cephalometric values demonstrated a reduction in ANB of 3° and an increase in SNB of 3°, a reduction in FMA of 2.8°.

Conclusions: from the results, it is concluded that the Twin Block can be considered a valuable appliance for the resolution of mandibular retrusion second classes in growing subjects, allowing control of verticality, a key feature in hyperdivergent patients. Being a removable appliance, it is important to have good patient cooperation for malocclusion correction.

PREDICTABILY OF MAXILLARY EXPANSION WITH CLEAR ALIGNERS IN MIXED DENTITION

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Aim: the aim of this preliminary study was to evaluate the predictability of upper arch expansion in patients in mixed dentition treated with clear aligners.

Methods: the investigation was conducted on a sample of 44 patients (24 females and 20 males) treated with Invisalign First (Align Technology, Tempe, AZ, USA) clear aligners. The expansion planned with the ClinCheck software at the beginning of the treatment was compared with the expansion achieved at the end of the treatment, measured on the digital impressions. The expansion was measured at deciduous canines, deciduous molars and first permanent molars both at gingival and cuspidal level.

Results: the average age was 9,7 years and the average number of aligners used for the treatments was 26. The average predictability at cuspidal level was 59,7% for deciduous canines, 63,77% for deciduous first molars, 66,99% for deciduous second molars and 55,61% for permanent first molars, while at gingival level was 48,87%, 53,11%, 53,36% and 45,16% respectively.

Conclusions: with clear aligners it is possible to expand the upper arch in a predictable way. The predictability ranges between 45% and 67%. A key role is determined by overcorrection and digital treatment planning.

ALT-RAMEC PROTOCOL FOR THE TREATMENT OF THIRD SKELETAL CLASSES: A CASE SERIES

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Aim: the aim is to analyse the validity of the Alt-RAMEC protocol (Liou et al. 2003, 2005) for the correction of the skeletal class III malocclusion in a group of 9 patients (3 male with complete unilateral cleft lip and palate and 6 non affected female) between 9 and 12 years old.

Methods: after analysing orthopantomography, latero-lateral teleradiography, cephalometry, clinical photographs and plaster templates, the treatment plan is outlined following the Alt-RAMEC protocol, modified from the original (Yen Protocol, 2011). A double-fan expander is cemented with bands on first permanent molars and first premolars, with palatal arms up to the centrals and vestibular arms up to the canines with hooks for the Delaire mask, and a lingual arch cemented on first permanent molars with vestibular arms up to the canines with hooks for the third class elastic bands. For 7 weeks the activation was carried out every other week in opening and closing. The upper jaw has been shown movable, therefore the traction phase was started using the nocturnal Delaire mask and diurnal intraoral elastic bands.

Results: the skeletal class III malocclusion improves with therapy with evident upper jaw advancement and mandibular post-rotation.

Conclusions: in conclusion, it can be said that the Alt-RAMEC protocol is effective in correcting the skeletal class III malocclusion both in patients with complete unilateral cleft lip and palate and in non-affected patients.

THE TREATMENT OF OPEN BITE AS A CONSEQUENCE OF CONDYLAR PROCESS FRACTURES

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Aim: the most common malocclusion because of mandibular condyle fracture is Anterior Open Bite (AOB). Aim of the study is to evaluate different outcomes based on the use of four different functional treatments in patients with AOB.

Methods: we included patients with uni/bilateral condylar fractures with AOB (t_0). Patients were divided into 4 classes on the basis of AOB width and then referred to 4 different treatments. We proposed: a) orthodontic device, with sectional orthodontic wires and use of intermaxillary elastics; b) orthodontic device, anterior elastics and intermaxillary elastic traction with class II component; c) Intermaxillary Fixation (IMF) screws on maxilla and multi-brackets appliance on lower arch with the intermaxillary elastics to obtain rotation of the lower occlusal plane; d) monitoring and physiotherapy exercises. A second measurement was performed after 1 year of post-treatment follow-up (t_1).

Results: among 31 patients having 41 condylar fractures, 10 patients presented AOB (range 1-6 mm). At time t_0: 1 patient with AOB = 1 mm was treated by D therapy; 2 patients with AOB = 2 mm were treated by A therapy; 1 patient with AOB = 2 mm was treated by C therapy; 6 remaining patients with AOB range 3-6 were treated by B therapy. At time t_1 all patients had an open bite equal to zero.

Conclusions: accurate choice of treatment based on evaluation of the post-traumatic AOB leads to resolution of AOB in 100% of the sample.

MASTICATORY FUNCTION EVALUATION WITH CLEAR ALIGNERS: A PRELIMINARY STUDY

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Aim: the aim of this study is to objectively assess the masticatory function of subjects with transparent aligners, to obtain an evaluation about the wearing of these devices even during meals, to extend the time of use and thus the effectiveness of the treatment. Although the Invisalign® aligners are minimally invasive, is necessary to estimate whether the aligners' thickness compromise the chewing ability. An effective method of assessing masticatory function is the mixing test by using of two-coloured chewing gums and an optoelectronic analysis software.

Methods: it was used the ViewGum© software to detect the degree of mixing of two-tone chewing gum. 20 participants, with full dentition, a maximum DMFT index of 4 and without diagnosis of temporomandibular disorder were involved. To each subject was asked to chew two Hue Check Gum® chewing gums in two different colours (blue and pink) for 5, 10, 20 cycles with and without aligners. The samples were then pressed to 1 mm and scanned on both sides.

Results and conclusions: it was possible to take over that aligners do not cause alterations in masticatory function while they are worn, therefore the clinician can take advantage of the using of the aligners for chewing to obtain a better fitting of the plastic material to the dental surface and to the attachments and for the patient's benefit, in order to reduce the treatment time. The tests performed with Hue-Check Gum®, proved how the number of chewing cycles modify colour mixing results. From the comparison of the groups with and without aligners, with same numbers of cycles, the statistical analysis of the results obtained didn't show any statistically significant differences.

PROSTHETICALLY GUIDED ORTHODONTICS (PGO): INTREGRATION OF ORTHODONTICS AND PROSTHETICS

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Aim: treatment of partial prosthesis or the placement of veneers are typically involved in conformative rehabilitation. In this context, conformative rehabilitation is interested in creating an aesthetic prosthetic solution with the minimal possible of tissue removal while preventing the generation of occlusal input.

Methods: pre-prosthetic orthodontics aims to restore the perfect location or inclination of the adjacent or antagonist teeth, creating adequate space for the prosthetic crown. Clear aligners therapy (CAT) is an important tool in the management of prosthetic cases with a conformative approach. In the present study, we present and illustrate the concept of prosthetic guided orthodontics (PGO). In particular, we discuss three cases that were treated with the Invisalign GO system, which was created for the clinical management of multidisciplinary orthodontic-prosthetic cases with a conformative approach.

Results: all patients presented showed excellent functional and aesthetic outcomes. A comprehensive approach is necessary for aesthetic rehabilitation in order to meet patient expectations and preserve orofacial biological and functional principles. The use of prosthetically guided orthodontics (PGO) maximizes the maintenance of biological tooth preparation parameters and the efficacy of cosmetic rehabilitation.

Conclusions: clear aligner treatment (CAT) offers dentists a thorough digital planning tool for pre-prosthetic orthodontic movement and a clear aligner cosmetic orthodontic solution.

MANEUVERS CAN BE CARRIED OUT TO HELP ERUPTION OF ECTOPIC CANINES: SOME CASES

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Aim: among clinical orthodontic conditions requiring early interceptive treatment include dental inclusion of the maxillary canine. The absence of maxillary canine in the dental arche influence the aesthetics of the smile, being located in the angle on the dental arch that marks the transition between the anterior and the posterior teeth , and negatively affects the physiology of the chewing process, given its important guiding role during the chewing processes and mandibular in laterality (canine guidance).The aim of the study is to evaluate if the early extraction of the primary canine may constitute a manouvre valid for avoiding surgery for help eruption of ectopic canine. Scientific studies suggest that early extraction of deciduous canine could represent a valid alternative to the surgical-orthodontic approach.

Methods: we have analyzed the cases with ectopic canines, evaluating the different path taken by the tooth and the resolution of problem using which manouvers early extraction of the primary canine, and guided surgical therapy is required. Physical examination of oral cavity, medical history, intraoral photographs, orthopanoramic of the dental arches, lateral teleradiography were used in this study.

Results: the results of our study showed that early extraction of the deciduous canine in case of bone malposition of the permanent canine is a therapeutic aid in 80%of cases in patients between 10 and 13 years.

Conclusions: this approach couldn't guarantee the resolution of the problem.

TIMING IN TREATMENT OF CLASS III DENTOSKELETAL MALOCCLUSIONS DUE TO MAXILLARY DEFICIENCY

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Aim: highlight the importance of timing in the treatment of patients with class III dento-skeletal discrepancy with upper jaw deficiency.

Methods: three cases were analyzed at three different stages of growth (childhood, adolescence, adulthood) using the growth indices sought on PubMed, Scopus, The Cochrane Library until November 4, 2022 (vertebral index, open apex waiter method, second waiter molar indices, waiter's third molar index) for the choice of treatment in Border Line cases. The 3 clinical cases were treated at the Department of Orthodontics of the University of Cagliari.

Results: in the child there were good results with orthopedic therapy (Rep and mask), in the adult patient the treatment of choice was found to be orthognathic surgery, in the adolescent patient examined correction was achieved with orthopedic and orthodontic therapy.

Conclusions: n class III adolescent patients, growth indices are an important aid in the choice of treatment, as the age of the registry is not always correlated with the biological age of the patient. Therefore, the use of such indices allows adolescent patients to discriminate between orthopedic and orthognathic treatment allowing them to carry out a specific therapy for each individual patient, based on the values obtained with interceptive therapy in pediatric age pre peak growth and those of adulthood where there is no room for development.

DOES LIP BUMPER THERAPY INCREASE THE RISK OF SECOND MOLAR IMPACTION? A LITERATURE REVIEW

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Aim: the aim of this literature review is to investigate if lip bumper appliance increases the risk of second molar impaction.

Methods: this research has been conducted on the following databases: PubMed and Science Direct. The keywords used were: "lip bumper" AND "second molar impaction". The studies published from 2010 to present day were included, while book or book chapters, abstract and editorials were excluded.

Results: the research produced 30 results, of which only 4 met the inclusion criteria. Lip bumper therapy significantly increases the risk of second molar impaction. The negative predictors impaction were: the second molar's angulation greater than 30 degrees, and the initial anterior crowding. Incorrect fitting of the first molar bands but also incisal lip bumper position have been noted as the possible causes for second molar impaction.

Conclusions: the studies demonstrates that lip bumper is associated to a greater risk of second molar eruption disturbances like impaction and ectopic eruption, but the evidence was of very low quality. Methodologically sound prospective clinical trials are deemed necessary to provide higher levels of evidence.

THERAPEUTIC STRATEGIES OF PRIMARY MOLAR INFRAOCCLUSION: A SYSTEMATIC REVIEW

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Aim: infraocclusion of deciduous molars is a clinical disturbance that occurs during primary and mixed dentition and has some orthodontic implications. Infraoccluded teeth are believed to be potential sites of malocclusion, with a risk of tipping neighbouring teeth and losing space. This systematic review investigated the management of primary molars infraocclusion and gives an update guideline.

Methods: a literature search was performed using PubMed, Scopus, and Web of Science databases from 1 January 2017 to 28 November 2022 using this keyword: ("infraocclus*" OR "ankylos*" OR "submer*" OR "secondary retention") AND "molar". The inclusion criteria were: studies only on human subjects; open access studies, case reports, randomised trials, retrospective, and observational studies, and English language. In addition, studies that dealt with treatment and not studies on diagnosis and prevalence or correlation were selected.

Results: a total of 372 publications were identified from the databases and a final number of 9 studies were included in the review for qualitative analysis.

Conclusions: management of patients suffering from infraocclusion depends on the severity, age at diagnosis and presence of succeeded premolars. Early diagnosis of infraoccluded primary elements is fundamental and cannot be postponed. Preservation of the primary molars may be a valid option with long-term stability if there is no or moderate primary molar infraocclusion, root resorption of less than half of the root, and no decays or restoration.

A NARRATIVE REVIEW OF THE EFFECTS OF FR-4 IN THE TREATMENT OF AOB

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Aim: anterior openbite (AOB) is a malocclusion in which patients are unable to properly occlude with the anterior teeth and occlusion only happens in the posterior region.

For its multifactorial etiology it is difficult to treat effectively AOB. One of the possible treatments for the AOB is with the Frankel's function regulator IV appliance (FR-4). The aim of this study is to review the effectiveness of this device.

Methods: a search was conducted on Pubmed typing "(Fr OR Frankel) AND openbite" with no time range and without other filters. The results were 91 articles but only 7 were selected for the review process since the others were not pertinent to the specific argument of this review.

Results: although the treatment of the AOB is difficult, all the 7 studies analyzed have shown that the association of FR-4 with lip-seal training is a good option to correct the AOB malocclusion, according to the hypothesis of a postural etiology of the AOB.

In agreement with the articles reviewed, the FR-4 can produce or just skeletal effects, or only dentoalveolar effects, or both skeletal and dentoalveolar effects.

In the clinical trial of E Erbay et All in the treated group AOB was successfully corrected through upward and forward mandibular rotation, in accordance with the study of Frankel and Frankel.

Differently from them, B Haydar and A Enacar proved that FR-4 did not produce an anterior rotation of the mandible but rather caused backward rotation of the mandible.

Conclusions: despite the articles reviewed have shown that FR-4 is effective to treat AOB, further studies are needed to establish this with certainty.

EVALUATION OF RESPIRATORY PARAMETERS IN PATIENTS TREATED WITH FUNCTIONAL DEVICES

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Aim: the main objective of our study was to evaluate the clinical appropriateness of Mallampati score in patients with potential sleep disorders treated with functional orthodontic devices.

Methods: patients of the orthodontic operative unit of Rho hospital, age between 7 and 14 years old, needing an orthodontic therapy with functional appliances were evaluated. Patient were assessed at three time points evaluating the Mallampati score, a sleep questionnaire and panoramic radiographs and lateral cephalometric teleradiographs.

Results: 100 patients met the inclusion criteria and were enrolled. The 36% of the patients had a skeletal class I while the other 64% had a skeletal class II. The Mallampati score at T_0 was as follows: Mallampati II 47%, Mallampati III 38%, Mallampati IV 15% and the entity of sleep disorders reported in the questionnaire followed the trend of the Mallampati score. At T1, after 12 months, and at T2, after 15-20 months there were similar results: the 76% of Mallampati III and 47% the Mallampati II patients showed a decrease of the score while patients with stage IV were often diagnosed with macroglossia and only in the 30% of cases there was an improvement.

Conclusions: Mallampati score is a useful and appropriate index for the evaluation of respiratory parameters but we suggest to use it in association with other clinical and radiological indices for the purpose of a more complete evaluation of the patient without the use of further instrumental tests.

A QUESTIONNAIRE ABOUT LIFESTYLE, FOOD HABITS AND ORAL HYGIENE DURING INVISALIGN TREATMENT

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Aim: this study aims to collect data on home oral hygiene habits before and during treatment with aligners, the hygiene of aligners, eating habits and lifestyle, to elaborate a protocol to present.

Methods: this study was conducted on 35 patients (32 M, 23 F, 18-66 years old) at the department of oral Hygiene at the Vita Salute San Raffaele university - Milan.

A 35-question survey (divided into 6 sections) addressed the following aspects: home oral hygiene habits before and during treatment, the maintenance of aligners during the daily routine, eating habits, and lifestyle. The survey included a final question on how the Invisalign clear orthodontics aligners changed over time according to the patients.

Results: this study shows positive changes in home oral hygiene and lifestyle thanks to the motivation and education that most patients received at the beginning of orthodontic treatment.

Almost half of the patients use the same aids to clean the aligners that are used for home oral hygiene: toothbrush and toothpaste.

Patients notice a loss of transparency and yellowing of their aligners at the time of the change.

Conclusions: patient compliance and positive behaviour are essential for the therapy to be successful.

Further clinical studies with larger samples are needed to obtain more data and develop an ideal hygiene protocol to follow.

ASSESSMENT OF NEUROMUSCULAR STABILITY OVER TIME POST-ORTHODONTIC TREATMENT

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Aim: the study aims to evaluate the neuromuscular stability post-orthodontic treatment in patients wearing a splint fixed retainer and a removable retainer on the upper arch.

Methods: we evaluated 70 patients (39 males and 31 females) aged 14 to 25 years. Only healthy patients with no history of TMJ dysfunctions, craniofacial syndromes, or periodontal disease were accepted.

We analyzed the occlusal stability using Teethan surface electromyography system. The test was performed at different times.

The first test was at the time of debonding, which we considered as T_0. Then every year, we performed a new test: at 12, 24, 36, 48 and finally at 60 months from T_0.

Results: we analyzed all data through the Wilcoxon test ($p = 0.05$) to identify if there was statistical significance. All patients had normal and symmetrical occlusion at T_0. The data did not show any statistical difference between the different times. The only difference we found was between T_0 and T24 on the IMPACT data. However, this was only a statistical difference with no clinical consequence since there were no variations in the others follow-up. No significant difference was found in the other variables (POC, ASIM, BAR and TORS) during the follow-up period.

Conclusions: it is possible to assume that the fixed retainer from 3.3 to 4.3 and Essix on the upper arch maintained the occlusal and neuromuscular stability during the time.

CHARACTERISTICS OF RESPONDERS AND NON-RESPONDERS TO MAD SIMULATOR DURING DISE

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Aim: to compare the characteristics of responders and non-responders to mandibular advancement during drug-induced sleep endoscopy (DISE) in adults with obstructive sleep apnea (OSA).

Methods: this retrospective cohort study included 295 patients with a polygraphic diagnosis of OSA who underwent DISE with mandibular advancement simulator at 75% of antero-posterior mandibular excursion in order to predict the success of mandibular advancement device (MAD) therapy. The patients were monitored with a portable polygraphy set; obstruction sites were endoscopically evaluated. Success was defined by resolution or significant improvement of the apnea hypopnea index (AHI) for at least 5 minutes, associated with endoscopic evidence of improvement of the upper airway patency.

Results: non responders showed statistically significant higher body mass index compared with responders, with no differences being observed for age and sex. Responders had less severe polygraphic parameters at baseline (AHI, supine AHI, non-supine AHI, oxygen desaturation index, percentage of time spent at oxygen saturation below 90%, lowest oxygen saturation), except for mean oxygen saturation.

No between group difference was found for the percentages of obstructions at the velopharynx, tongue base and epiglottis level, while responders showed a lower percentage of obstruction at the oropharyngeal level compared with non-responders.

The number of obstruction sites did not differ between the groups.

Conclusions: lower body mass index, less severe polygraphic parameters at baseline and significantly reduced percentage of obstruction at the oropharyngeal level seem to characterize good responders to MAD simulator.

ELASTODONTIC THERAPY IN HYPERDIVERGENT CLASS II PATIENTS: A RETROSPECTIVE STUDY

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Aim: a skeletal class II malocclusion is frequently characterized by a retrognathic mandible and a hyperdivergent pattern of growth, which requires an appropriate treatment plane. The current study investigates the efficacy of elastodontic treatment using AMCOP® devices in treating children with hyperdivergent class II malocclusions, as well as the impact on upper airway patency.

Methods: the trial group included of 21 patients (10 males and 11 females) who had hyperdivergent skeletal pattern and a class II malocclusion treated with AMCOP® devices. AMCOP® devices were used on the patients for an average of 16-18 months. In severe high-angle subjects, AMCOP® OPEN was used first for 6-8 months, followed by the SC device; in slightly increased angle cases AMCOP® INTEGRAL was used first for 6-8 months, followed by the SC device. Cephalometric analysis was done both before (T_0) and after therapy (T_1).

Results: after treatment, cephalometric study demonstrated a correction of the class ii malocclusion and a change of the development pattern with a decrease in divergence. There was also an improvement in upper airway space.

Conclusions: in growing patients, elastodontic treatment might be efficient in class II hyperdivergent malocclusion. The long-term stability of the acquired results has yet to be determined, and more research is necessary.

CLEAR ALIGNERS TREATMENT OF A PATIENT WITH CLASS I MALOCCLUSION AND MULTIPLE DIASTEMAS

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Aim: multiple diastemas in a teenage patient are an issue because they not only affect the appearance of the smile but can also have severe psychological effects. The purpose of this study is to demonstrate the efficacy of clear aligner orthodontic therapy.

Methods: a 16-year-old teenager with permanent teeth is the subject being treated. In frontal view, he exhibits a symmetrical face on extraoral inspection; nevertheless, in lateral view, the profile looks convex with a decrease of the lower third of the face. The patient exhibits a right and left first canine class as well as a right and left first molar class during an intraoral examination. He has a diffuse spacing between the upper incisors, an increased overjet, and a lower midline that is off to the left of the upper midline in the frontal view.

Results: after a 12-month of therapy, the upper and lower jaw diastemas were completely closed, and the deep bite was corrected by flattening the Spee curve.

Conclusions: the patient benefited from a noticeable improvement in facial aesthetics after the procedure. The upper diastemas have been closed, improving the incisors' exposure to the grin, which now appears more pleasing and in line with the lower lip edge.

BILATERAL CROSS-BITE CORRECTION USING A RAPID PALATAL EXPANSOR IN MIXED DENTITION

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Aim: the posterior crossbite is a very common malocclusion. Expanding the maxilla in patients with mixed dentition using the rapid palatal expansion has a positive impact on the treatment of associated deficits.

Methods: a 9-year-old male patient came to our attention with a skeletal and dental Class II relation by mandibular retrusion. He exhibits a hyperdivergent tendency. His upper incisors were very vestibolarized and the inferiors are normal. He had 2,5 mm of overjet, 4 mm of overbite. The following factors were revealed on oral examination: diastema between the central incisors and lack of space for lateral incisors eruption, bilateral posterior cross-bite and functional deviation of the median line. The patient received treatment with a Hyrax-modified type expander (A0621-11 "Micro" expansion screw, Leone, Italy) anchored on the first permanent molars.

Results: clinical treatment shows that this case was intercepted and after intraoral and cephalometric analysis in T_0 and T_1 phases, it was verified that the bilateral posterior cross-bites were resolved. Lip proficiency, facial convexity, and mentolabial sulcus improved with advancing mandible. The patient's facial and dental aesthetics change was the most impressive part of his treatment.

Conclusions: it is possible to obtain favorable results in both the transverse and sagittal planes in patients with Class II malocclusion using the RPE.

REHABILITATION OF UNILATERAL CROSSBITE USING INVISALIGN® AND RUBBER BANDS: A CASE REPORT

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Aim: orthodontic and functional rehabilitation in a III skeletal class patient with unilateral crossbite using Invisalign® clear aligners and III class rubber bands.

Methods: a healthy 40.6 years old female patient presented with a III skeletal and dental class malocclusion with hyperdivergence and open bite, facial asymmetry and unilateral cross (21-25), presence of diffuse and accentuated gingival recessions in the cross side. Temporomandibular disorders with pain and clicking, masticatory difficulty and absence of anterior canine guides were detected. The patient declined to undergo maxillofacial surgery. Treatment with Invisalign® aligners and III class rubber bands was performed to resolve dental and functional issues and improve smile and facial aesthetics. The treatment involved the use of 3 sets of aligners for 24 months with weekly replacement, III maxillary class rubber bands (4 oz., ¼") and final retainers with Vivera system.

Results: this technique allowed intrusion of the posterior segments and extrusion of the anterior elements with resulting closure of the open bite and anterotation of the mandible. It also allowed superior dentoalveolar expansion with compensation of the torque values without worsening gingival recessions. I class dental relations were obtained with resolution of TMDs. Facial and smile aesthetics were greatly improved.

Conclusions: the use of this technique has achieved good aesthetic and functional results avoiding the surgery.

POSTERIOR CROSSBITE CORRECTION BY CLEAR ALIGNERS: IS IT POSSIBLE?

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Aim: the aim of this Case Report is to treat a patient with class III malocclusion characterized by unilateral cross bite with clear aligners.

Methods: the treated patient presented on intraoral objective examination with a bilateral third molar class and monolateral cross on the right side. The cephalometric analysis revealed an ANB (^)-2.8. The patient refused orthodontic surgical treatment and therefore compensation treatment was carried out using clear aligners.

Results: the photo documentation and instrumental diagnostic records were collected before and after treatment and showed how the orthodontic device of serial clear aligners was able to successfully treat the malocclusion. At the end of therapy, intraoral objective examination, revealed adequate correction of the unilateral crossbite and a first dental class relationship. Post-treatment cephalometric analysis showed good control of vertical dimension and anterior limit of dentition. Objectives were achieved. The following arrangements were used: 1. Hypercorrection of anterior and transversal expansion was carried out on set-up. 2. To reduce linguo-buccal tipping of premolars and molars attachments with gingival undercuts were used on all teeth in cross. 3. Was asked to the patient to wear a criss-cross elastic on the second molars. A one-year follow-up with photo documentation was carried out and the result obtained is stable.

Conclusions: the use of clear aligners may be a valid device for the correction of a class III malocclusion with monolateral crossbite when the patient's refused elective surgical therapies.

A THIRD DENTO-SKELETAL CLASS WITH AN ANTERIOR OPEN BITE TREATED USING DAMON TECHNIQUE

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Aim: to show the success of a Damon approach (passive self-ligating) orthodontic procedure in a case of third-class dento-skeletal malocclusion, with an anterior open bite and moderate tooth crowding in both arches.

Methods: the case in question involves a 16-year-old patient who displayed good facial symmetry on external frontal examination. The patient presented as a hyper-divergent patient, with the middle-lower third increasing in proportion to the other two on the exterior profile analysis. The case was handled using fixed multibracket equipment with the Damon technique. Early class III elastics (2.5 oz 1/4) and vertical nocturnal canine-canine elastics (2.5 oz 1/4) were applied first on round arches (0.14 Cuniti, 016 Cuniti sequence), and then class III elastics (6 oz 1/4) and rectangular 14 x 25 Cuniti and 18 x 25 Cuniti arches were used in combination with them. Each three months, every wire was replaced. About 18 months were spent on active treatment and the stabilization, by which the outcome was achieved, was done using a retainer essix.

Results: by using the Damon technique, this orthodontic therapy was able to close the anterior spaces correctly and produce proper occlusion overall by obtaining an acceptable dento-alveolar compensation.

Conclusions: as a result, we show how passive self-ligating brackets and elastics work well together to produce a wonderful result from a dental and facial perspective, not to mention the positive effects of the new smile on the patient's quality of life.

SLOW EXPANSION IN MIXED DENTITION WITH THE QUAD HELIX: CASE REPORT

Carpentiere V.

Aim: to evaluate the therapeutic effect of the quad helix in a 9-year-old girl with dental crowding in both arches.
Methods: in this clinical study, the patient in the mixed dentition presented a reduced arch space in both jaws.
RX OPT, lateral skull RX, impressions of the dental arches, cephalometric analysis and initial photos of the case are carried out.
After a careful evaluation of the data obtained, it was decided to proceed with the insertion of a quad helix on the upper arch to obtain dento-alveolar expansion.
Every four weeks the appliance was checked and if necessary an appropriate intraoral activation was carried out.
Results: after 9 months of therapy the quad helix was removed and the therapy continued with the application of a superior utility archwire to correctly reposition teeth 11 and 21.
After 12 months of therapy it is possible to observe the resolution of the crowding teeth and good arch shape.
Conclusions: the use of the quad-helix in mixed dentition allows to obtain a dimensional gain of the intercanine and intermolar diameters and a greater symmetry of the dental arch.

ORTHODONTIC TREATMENT TO PREVENT INCLUSION OF THE PERMANENT MAXILLARY CANINE

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Aim: to demonstrate the potential of early treatment with rapid palatal expander and primary canines extraction to prevent maxillary canines inclusion.
Methods: the patient in early mixed dentition showed molar class I relationship and the presence of a conoid right lateral incisor. The radiographic evaluation made evident a deviation from the correct maxillary canines eruptive path. The treatment started using a RME appliance with bands on 55 and 65 and one daily activations for twenty five days. After 6 months the 5.3 and 6.3 elements were extracted. After the palatal expansion, the RME passively provided to retention for one years, then it was removed and a schwarz appliance was applied to maintain the space for permanent canines. After 12 months, the radiographic check showed an improvement of the correct eruptive path of the maxillary canine and after 18 months the 1.3 element appeared in the maxillary arch.
Results: after 18 months of orthodontic therapy, the spontaneous eruption of tooth 13 and the improvement of the pattern of eruption of 23 demonstrates the efficacy of the synergy of treatment with RME followed by early extraction of the primary canines.
Conclusions: as we find in literature, early intervention on the direction of eruption of the maxillary permanent canines makes it possible to reduce the incidence of the canine impaction and improve patient comfort since, if necessary, the second phase of treatment will certainly be faster and comfortable.

CORRECTION OF POSTURAL ASYMMETRY USING MYOBRACE® INTEGRATED IN A PHYSIOTHERAPY PROGRAM

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Aim: the term posture refers to the upright position in which there should be an alignment of the segments of the human body with each other and of the body with respect to space. In the determination of posture comes into play information provided by several districts, including the position of the jaw and the tongue.
The purpose of this case report is to describe the treatment of a postural asymmetry, characterized by elevation of the left shoulder and elevation of the right iliac wing, contextual to a mandibular deviation to the right, in a 13-year-old patient with Down syndrome and scoliosis spinal using a preformed myofunctional device, integrated into a physiotherapy program.

Methods: Myobrace® is a preformed silicone orthodontic device that is able to correct bad habits, promote the correct shape of the arch and the development of the jaws. It can change the posture of the jaw; in fact, if it worn during the night, for 10-12 hours, as indicated by the manufacturer, it induces neuromuscular re-education by forcing the jaw into a correct position.

Results: the use of a myofunctional oral device, integrated in physiotherapy, has allowed to obtain an improvement of postural asymmetry.

Conclusions: this case report confirms the need to consider the correction of an altered postural relationship of the jaw in a physiotherapy plan.

MAXILLARY MOLAR DISTALIZATION THERAPY WITH DISTAL SCREW: CASE REPORT

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Aim: the aim of this clinical case is to describe and verify the efficacy and efficiency of the terapy with Distal Screw.

Methods: a 14-year-old male patient arrived at the polyclinic of the University of Messina for a first dental visit. Dental examination reveals: agenesis of 1.2 and 2.2, bilateral molar and canine class II and deep-bite. We opt for distalization of the maxillary molars and subsequent space recovery for the replacement of the missing teeth. The first phase of treatment involved insertion of the Distal-Screw: after seven months, a bilateral class I relationship was obtained. A multibracket device of the Empower type was therefore positioned on the maxillary arch. We used a sequence of arches which allowed resolution of the crowding and distalization of the canines. After space opening, a Maryland bridge was applied to the upper arch while waiting for the final implant-prosthetic rehabilitation.

Results: the treatment allowed to obtain: resolution of the crowding in both dental arches, bilateral molar and canine class I, correction of the overjet and overbite, coincidence of the median lines, correction of the occlusal plane and space opening necessary for the implant-prosthetic rehabilitation of agenetic 1.2 and 2.2.

Conclusions: the Distal Screw seems to be effective in molar distalization and it doesn't cause any type of undesirable effect. The screws are stable during treatment and do not produce inflammation of the soft tissues.

TREATMENT OF A SEVERE DEEP BITE WITH CLEAR ALIGNERS

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Aim: to describe the orthodontic treatment of an adult patient with Class II malocclusion and deep bite with the use of clear aligners (CA).

Methods: a 19-year-old male patient presented to the Orthodontic department of "Federico II" University of Naples, with protruded upper frontal teeth, convex profile, a full permanent dentition, molar and canine Class II with increased overjet and overbite. Cephalometric tracing revealed a skeletal Class I relationship (ANPg = 3.9°), with hypodivergent growth pattern (SN/Go-Gn = 22.5°), and normal lower incisor inclination (L1/Go-Gn = 96.1°). The patient was treated with CA and Class II elastics, and the extraction of upper third molars was programmed one week before starting treatment. Treatment consisted of 54 aligners for each arch, with a weekly change protocol. The working set-up included a sequential distalization of upper arch (50% protocol), and a simultaneous staging for the leveling of the Curve of Spee. A finishing phase of 16 aligners was required.

Results: at the end of the treatment (after 1.5 years), molar and canine Class I relationship with a flat occlusal plane was achieved. Superimposition of pre- and post-treatment cephalometric tracings showed distal crown tipping and intrusion of upper first molar, extrusion and mesial crown tipping of lower first molar, and proclination of lower incisor (L1^GoGn = 102.1°) of 6°.

Conclusions: the use of CA with Class II elastics and the extraction of upper third molars can be an alternative for the correction of both Class II malocclusion and deep bite.

CLEAR ALIGNERS TREATMENT OF LATERAL INCISOR AGENESIS: A CASE REPORT

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Aim: missing maxillary lateral incisors create an aesthetic and functional problem with specific orthodontic and prosthetic considerations. The purpose of this case report is to describe a case of agenesis of the right maxillary lateral incisor treated with aligners and upper frontal teeth camouflage.

Methods: an eleven-year-old female patient was reevaluated following previous interceptive therapies with rapid maxillary expander and Frankel II. At the clinical exam she presented a bilateral class II with agenesis of 1.2, reduced size of 2.2, 1.3 incorrectly located. It was performed a diagnostic check-up of the patient and a digital planning of the orthodontic treatment with aligners to achieve a satisfactory occlusal relationship and an appropriate position of the frontal teeth. In fact, it was planned to perform a space closure of the 1.2 and a conservative rehabilitation by performing 1.3 camouflage and conservative treatment to the upper frontal teeth. After aligner treatment the conservative reconstruction of the teeth was performed and followed by a finalization with another aligners phase.

Results: at the end of the therapy, the patient achieved a good functional and aesthetic goal. A good control of the space closure and of the torque of the 1.3 root was achieved with clear aligners treatment.

Conclusions: clear aligners can be useful in performing multidisciplinary orthodontic and conservative/prosthetic rehabilitations achieving a predictable final position of the frontal teeth even in cases that require specific biomechanical needs.

MINIMALLY INVASIVE ULTRASONIC APPROACH TO ORTHODONTIC DEBONDING: AN *IN VITRO* STUDY

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Aim: to evaluate the experimental safety and efficacy of a new piezoelectric tool for orthodontic clean-up after bracket removal.

Methods: a total of 45 teeth removed for orthodontic reasons were used in the present *in vitro* comparative study. The test-tool (Treatment 1) was matched with two other procedures: One step finisher and polisher (Inverted cone One gloss Shofu Dental, Kyoto, Japan) (Treatment 2) and twelve- fluted tungsten carbide bur (123-603-00, Dentaurum, Pforzheim, Germany) and Sof-Lex discs Pop-On XT Kit (3M ESPE) (Treatment 3), accounting for n:15 samples in each group. Clinical safety (enamel volume loss) and efficacy (residual adhesive volume) were measured with the use of Atos Compact Scan 3D structured light scanner (GOM GmbH) with the support of Atos Professional software. The enamel surfaces were scanned three times to evaluate: (i) residual adhesive volume (RAV) after bracket debonding; (ii) relative residual adhesive volume (dAV) after clean-up; (iii) enamel loss volume (EVL) at the end of the procedure.

Results: the distribution of mean RAV (mm 3) and the mean EVL (mm 3) resulted asymmetrical between groups. Moreover, the data do not reveal a statistically significant difference from normal distribution.

Conclusions: the instrument tested demonstrated to be effective and safe for cleaning after orthodontic treatment. Even for orthodontic treatment by means of clear aligners, the possibility of using an ergonomic and fast instrument can benefit both patient and practitioner.

BONE THICKNESS OF MANDIBULAR BUCCAL SHELF FOR MINISCREW INSERTION: LITERATURE REVIEW

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Aim: the objectives of this systematic review were to analyze the buccal bone thickness and bone depth of the mandibular buccal shelf (MBS) to determine the most suitable sites for miniscrew insertion.

Methods: electronic research was performed on PubMed database, using the PRISMA (Preferred Reporting Items for Systematic Reviews and meta-analysis) checklist. Keywords used were: “Buccal shelf AND miniscrew”. Articles from 2013 to 2023 have been considered.

Results and conclusions: 20 articles were found and 13 articles, that met the inclusion and exclusion criteria of the review, were selected. 12 studies agreed that the site of the MBS with the optimal anatomic characteristics was the distal root of the second molar, and one study claims that it is not the ideal site. The three scan planes have been refocused. The axial view has been reoriented to pass through the bifurcation point of first and second molar. In the axial plane, two points were identified at the mesial root of the mandibular first molar and the distal root of the second molar to reorient the sagittal scan plane. The coronal plane was reoriented in the direction of the coronal two-thirds of the mesial and distal roots of the first and second molars. The thickness of the cortical bone of distal root of the second molar it was typically greater than 6 mm from the amelocement junction and where the ideal bone depth is it is located 4 mm from the amelocement junction. The thickness of the buccal bone is instead usually thinnest at the level of the distal root of the mandibular first molar. No statistically significant differences according to gender were found for the characteristics of the buccal shelf. Three studies analyzed the influence of the divergence on the bone thickness for mini-screws insertion, however the results aren’t in agreement with each other.

CAN INTERPROXIMAL ENAMEL REDUCTION (IPR) INFLUENCE TEETH'S SUSCEPTIBILITY TO CARIES?

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Aim: the aim of this study was to investigate whether the interproximal enamel reduction was associated with an increased incidence of caries.

Methods: the search was conducted through the PubMed browser database using a combination of keywords: interproximal enamel reduction AND cavities OR caries OR complication, without time limits. The search produced 27 results, only 12 were selected for relevance to the topic.

Results: some studies found that different IPR instruments might produce enamel surfaces with different degrees of roughness, which in turn might influence its integrity and susceptibility to caries. Polishing after this procedure is thought to be helpful to reduce these adverse effects. However, the majority of studies agrees that the occurrence of caries on surfaces previously treated with IPR was the same as that on intact surfaces, indicating that IPR does not increase the risk of caries and demineralization on treated teeth.

Conclusions: after the analysis of the data from included studies, it was concluded that the IPR procedures could be useful in orthodontic clinical practice without negative effects. However, more randomized controlled clinical trials with a longer follow-up time and high-quality studies are required to confirm these assertions.

PROPOSAL OF RELIABLE AND REPRODUCIBLE MIDSAGITTAL REFERENCE PLANES IN 3D CEPHALOMETRY

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Aim: this preliminary study aims to identify in the literature the most reliable midsagittal plane in 3D cephalometry to evaluate alterations and asymmetries of the maxillofacial complex and to compare it with results from anthropometric analysis performed on stereophotogrammetry.

Methods: a PubMed literature review was conducted to find all the midsagittal planes proposed in 3D cephalometry from January 2000 to September 2022. The following keywords were used: "midsagittal plane and 3D cephalometry", "3D cephalometric landmarks", "3D cephalometry". The selected planes were then set up in a dedicated software (SimPlant O&O, Lueven, Belgium). A sample of patient (age 18-55y) with an angioCT taken between January 2019 and May 2022 was selected from the Neuroradiology Department database of the Maggiore Hospital in Parma, IT; only subjects whose CT scans did not show bone pathology of any kind were chosen. Using SimPlant O&O software, 3D skull reconstructions were obtained from angioCT and planes traced. Stereophotogrammetry was then performed on these subjects, using Polishape 3D scanner technology (Face Shape 3D MaxiLine, Bari, IT); anthropometric analysis was conducted on these shots by an expert operator. The results of 3D cephalometry were compared with those from the anthropometric analysis to determine which 3D plane was most reliable in identifying facial symmetry.

Results: currently, 24 of the 34 mediosagittal planes found in literature analysis have been used in the 3D cephalometric software.

Conclusions: the statistical data analysis phase is still in progress.

EFFECT OF WHITENING AGENTS ON ADHESION STRENGTH OF ORTHODONTIC BRACKETS: SYSTEMATIC REVIEW

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Aim: fixed orthodontic devices require the adhesion of brackets on dental enamel, therefore the effect that whitening agents could have on the orthodontic enamel-brackets interface should be investigated.
The purpose of this systematic review is to evaluate the effect of whitening agents on the adhesion strength (SBS) of orthodontic brackets.
Methods: the literature research was based on the keywords: "bleaching AND brackets AND adhesion" and was conducted using the following databases: PubMed, Scopus, Web of Science, Cochrane, Embase and Google Scholar. The protocol was registered and published at OSF (https://doi.org10.17605/OSF.IO/UY62C).
Results: the bibliographic research produced 8689 articles; according to the criteria of inclusion and exclusion only 11 scientific articles were selected. The SBS values were collected and analyzed using an universal mechanical testing machine. As a result, whitening treatment can worsen the adhesion of orthodontic brackets when these two procedures take place over a short period of time.
Conclusions: the adhesion of the brackets after whitening treatment must be postponed by 14 days; instead, the application of antioxidant agents after dental whitening could improve the SBS. In addition, other factors such as the chemical agents used in the treatment, the type of bracket and the adhesive system can affect the binding forces.

SOFT TISSUE NASAL CHANGES AFTER NASOALVEOLAR MOLDING: A LITERATURE REVIEW

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Aim: the recovery of nasolabial soft tissues in patients with CLP is mainly obtained through surgery. However, patients often have collapsed nares, flattening of the nasal tip, enlarged alar base, short and angled nasal columella towards the non-cleft side. Tissue remodeling by NAM treatment before cheiloplasty leads to a better postoperative outcome. The objective of the review is to evaluate the effect of NAM therapy before surgery. The evaluation of the soft tissue morphology is carried out through 3D stereophotogrammetry.
Methods: a research on PubMed was performed using the following keywords: "NAM" - "soft tissue" - "change". The eligibility criteria were the type of study: Randomized Clinical Trials, Prospective Non-Randomized Controlled Studies and Controlled Clinical Trial, Systematic Review, Retrospective and Prospective Studies. The period of publication: after January 2013. Starting from 34 articles found, 6 were included in the Review.
Results: the 3D images of the craniofacial soft tissues, before and after NAM treatment, were measured using three-dimensional software. Significant changes were observed in nasal tip protrusion, columella length and width, and substantial modification in the position of subnasale and labius superius improved nasolabial symmetry.
Conclusions: the nasolabial shape is greatly improved by the combined treatment of NAM and surgical technique. There is a notable improvement in nasolabial anatomy after NAM, which further improves the results of primary reconstructive surgery.

ORTHODONTIC REPOSITIONING AFTER INTRUSIVE TRAUMA ON PERMANENT INCISORS: A SCOPING REVIEW

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Aim: intrusive luxation is defined as the displacement of the tooth apically into the alveolar bone due to a traumatic event and it is one of the most serious injuries of the periodontal ligament in dental traumatology; its prevalence is about 18-33% in permanent teeth. Aim of this review is to analyse available literature data to identify an accepted protocol for orthodontic treatment of intrusive luxations.

Methods: the research was conducted from September to November 2022 using Medline/PubMed, Scopus and Web of Science databases using proper keywords: dental traumatology; orthodontic splint; dental trauma; traumatic intrusion; intrusion injury.

Results: first screening of databases provided 236 articles, whom only 8 fully respected the inclusion criteria.

Therapeutic approach of immature apex is based on spontaneous re-eruption; the "watch and wait" choice in teeth with closed apices was used in a single case.

Orthodontic repositioning is an optimal treatment option when no evidence of re-eruption occurs in 3-9 weeks.

In 7 cases was used fixed multi bracket appliance; in only one case was sectional and bonded on the anterior incisors. At the end of active treatment the teeth returned in their original position with normal mobility and no sign of root resorption or periapical lesion. The follow up ranges from 30 months to 8 years.

Conclusions: orthodontic repositioning could be considered as a valide treatment option in >7 mm intrusion traumas involving permanent teeth with open and closed apex; currently a protocol about orthodontic repositioning is not proposed.

DECIDUOUS CANINE EXTRACTION IN INTERCEPTIVE THERAPY OF DISLOCATED CANINES: SCOPING REVIEW

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Aim: to analyze the effectiveness of deciduous canine extraction in mixed dentition in the presence of palatally displaced canines as an interceptive treatment to reduce permanent canine inclusion risk.

Methods: the search was set up following the PRISMA checklist. Different keywords were used (*palatally displaced canine*, *deciduous canine extraction*, *canine interceptive treatment*, *impacted canine)* on Medline, Pubmed, Google Scholar, the Cochrane Central Register of Controlled Trials and Scopus. There were included RCT with at least 12 months of observation after surgery, that analyzed patients in mixed dentition with the presence of unilateral or bilateral palatal dislocation of the permanent canine, that were focusing on the results of early extraction of the deciduous canine with no intervention or with the extraction of other deciduous elements and that reported clear results on the success rate of eruption of permanent canines.

Results: out of 1828 articles only 8 were included in the review providing data on the alpha angle change of the permanent canine and on the success rate of the permanent canine eruption.

The extraction of the deciduous canine represented a statistically significant benefit on the eruption of the permanent canine compared with no treatment; it did not produce any statistically significant results on the degree of the root resorption of adjacent elements.

Conclusions: early extraction of the deciduous canine may potentially increase the likelihood of successful eruption of palatally displaced permanent canine, even though more studies should be run.

THE NATURE AND ACCURACY OF INSTAGRAM POST CONCERNING OBSTRUCTIVE SLEEP APNEA

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Aim: to investigate origin and contents of Instagram posts as a source of information on obstructive sleep apnea (OSA).
Methods: using #sleepapnea the top 100 posts were collected from the "popular" tab.
Duplicates, irrelevant and non-English language posts were excluded. Posts were categorized in relation to account (health professional, academic, commercial, laypeople) and content type (personal experience, medical information, advertisements).
Accuracy was assessed based on the presence of claims regarding definition, symptoms, risk factors and management of OSA. A score from 0 to 3 was assigned for each category. All procedures were performed independently by 2 authors experienced in dental sleep medicine, with conflicts resolved by discussion.
Results: of the 45 posts included, most were health professionals (51%), followed by commercial (27%) and laypeople (22%). None were academics. Overall, 53% of posts promoted commercial products, followed by medical information (42%) and personal experiences (27%). Posts from laypeople reported more personal experiences compared with others ($p < 0.0001$); commercial posts promoted more products compared with laypeople ($p = 0.003$). Accuracy was poor: 10 posts were given a score of 0 and only 5 posts reached a score of 6 out of 12. Overall, symptoms and treatment were the most frequent themes (respectively, 44% and 36%).
Conclusions: the majority of Instagram posts fail to or do not properly address the most important aspects of OSA. Given the easy access to social media, efforts should be made to promote more accurate information.

ACCURACY OF EXPANSION WITH CLEAR ALIGNERS

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Aim: to assess the predictability of expansion with clear aligners, evaluating the upper and lower arch dentoalveolar transverse changes and the variations of the upper first molar inclination.
Methods: pre-treatment (T_0), virtual plan (T_1), and post-treatment (T_2) digital models of 39 dental arches (19 maxillary and 19 mandibular) were uploaded on a 3D metrology software (Geomagic Control X). Digital models were superimposed and buccal cusps tips and centres of gingival margins, were selected as landmarks to measure the transverse diameters of upper and lower canines, premolars, and first molars. The angle formed by the intersection of the vectors projected onto the coronal plane and passing through the distobuccal and mesiolingual cusps of both maxillary first molars was measured to determinate molar inclination. Molar inclination and transverse diameters (on both gingival and cusp sides) were analysed by assessing the Prescription (planned movement, T_1-T_0), the Achieved movement (T_2-T_0), the Accuracy as the amount of movement that clinically occurred compared with the movement planned in virtual plan, expressed in percentage (T_2-T_0)/(T_1-T_0) %.
Results: mean upper arch accuracy for expansion was 65% (71% at cusps and 60% at gingival), and 63% for the lower arch (67% at cusps and 59% at gingival). An accuracy of 40% was reported for molar inclination.
Conclusions: aligners do not achieve 100% of the prescription; thus, constant monitoring and an overcorrection of the expansion might be recommended.

RADIOGRAPHIC EVALUATION OF MANDIBULAR ASYMMETRY IN TWINS WITH III SKELETAL CLASS

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Aim: this study aims to evaluate mandibular deviation or asimmetries in couples of twins who have a skeletal III class through measurements made on frontal telecranium in postero-anterior projection.

Methods: twins with skeletal III class were selected because literature reports that patients with skeletal III class are more predisposed to mandibular asimmetry. Frontal telecranium in postero-anterior projection of 4 couples of twins were analyzed thanks to the permission of AAOF Craniofacial Growth Legacy Collection and Forsyth Institute. RX were all taken before the beginning of an orthodontic treatment. Measurements used were: distance between GA, AG and PM; GA/AG ratio; distance between GA and AG's perpendicular projections on MP (Mid-plane).

Results: 3 of the 4 couples analyzed had a GA/AG ratio less than 1, so there was a left transverse deviation. The other couple instead had a GA/AG ratio higher than 1, so a right transverse deviation. Every twin in each couple had a deviation on the same side (left or right). 3 of the 4 couples presented a normal range of vertical asymmetry (0+/-2 mm). The other couple had higher asymmetry respectively of 10 and 5 mm, both of them on the left.

Conclusions: despite a poor sample, all couples of twins had concordant transversal and vertical asymmetries. Other studies should be taken to validate this analysis.

PREDICTABILITY OF ALIGNERS IN DENTOALVEOLAR TRANSVERSE CHANGES: A RETROSPECTIVE STUDY

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Aim: this work aimed to compare the cross-sectional measurements of Nuvola simulation software with the final clinical result and evaluate the degree of dentoalveolar expansion achieved with Nuvola aligners on the maxillary arch.

Methods: this study retrospectively observed a sample group of 35 patients who underwent orthodontic treatment with clear aligners. A comparison between actual outcomes and planned treatment final position was made. The sample was divided into groups: group A, composed of 10 patients, and group B, consisting of 25 patients. Each model was provided at t_0 (pre-treatment), t_1 (post-treatment), and final digital setup (s1). Group A was treated with 12 aligners, while group B was treated with 24. Using a digital calliper researchers recorded the linear values of the widths of the jaw arches considering the tips of the cusps and the most palatal points of the gingival margin of the canines, premolars, and first molars.

Results: with reasonable doubt, the aligner treatment in group A (12) and group B (24) shows a good degree of adherence to the prescription, especially in the dental tip measures. On the other hand, the gingival measures show a higher degree of bias, and the differences were statistically significant. The effects, however, did not differ between the two groups (12 *vs* 24).

Conclusions: the evaluated aligners had proven useful, within certain limits, in determining the predicted movements in the transverse plane especially considering movements related to the vestibular-palatal inclination of the dental elements.

DISCREPANCY EVALUATION BETWEEN THE PLANNED AND FINAL INSERTION AXIS OF MINISCREWS

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Aim: the purpose of this study was to evaluate the accuracy of surgical guides obtained by 3D printing process, considering the digitally planned position and comparing this one to the axis of final orthodontic miniscrews.

Methods: 24 subjects were included with permanent dentition. It has been performed a preliminary CBCT examination to plan the insertion of miniscrews in the anterior palatine vault. Once inserted, the specific scanbodies were coupled with the miniscrews and their position were registered by performing a new intra-oral scan. The scan with scanbodies was superimposed, using EXOCAD Software (Exocad DentalCAD, exocad Gmgh Darmstadt, Germany) to the virtual analogues of miniscrew planned in the digital project. BluSkyPlan Software (Blue Sky Plan software version 4.7, Blue Sky Bio, LLC, Grayslake, IL, USA) was used to identify the maximum discrepancy between the planned and final miniscrew placement. The maximum insertion angle discrepancy and the maximum linear difference between the head and tip of the miniscrew were measured on the model with the planned miniscrew position superimposed to the model with final placed miniscrew.

Results: descriptive and inferential Statistics was performed. On average, there was a discrepancy between the planned insertion axis and the final insertion axis of 2,95 ° (SD +/- 1.13 °), with 10 mm miniscrew lenght.

Conclusions: digital planning for surgical guided miniscrew insertion has been shown to be reliable. However, 4.5° of discrepancy can cause clinically significant alterations at the apex between the planned position on the CBCT of the orthodontic miniscrew and the final clinical position.

CONDYLE CHANGES AFTER TREATMENT OF FUNCTIONAL POSTERIOR CROSSBITE: A CBCT STUDY

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Aim: to evaluate the morphological changes of mandibular condyle after miniscrews-assisted rapid palatal expansion (MARPE) in subjects affected by functional posterior crossbite FPXB.

Methods: the sample consisted of 20 adolescents with FPXB (10 boys, 10 girls) with a mean age of 13.8±1.1 years. The scans were taken CBCT before and after MARPE immediately. A specific 3D imaging technology was used to perform, firstly, semi-automatic segmentation of the condyles (Mimics software), and, secondly, digital registration between pre-treatment and post-treatment condyle (Geomagic software). Volumetric analysis and surface-to-surface analysis was performed to evaluate post-treatment changes. All data were statistically analyzed.

Results: significant differences were found in the condylar volume between both sides, with the volume at the CB side being smaller than non-CB side ($p > 0.05$). No significant difference in condylar volume were found between T_0 and T_1 at both sides ($p > 0.05$).

The deviation analyses showed no difference in the morphology of the condyle surface between pre-treatment and post-treatment condition.

Conclusions: within the limitation of this retrospective study, clinicians should not expect a significant morphological change of the condyles after treatment of FPXB with RME in youngsters.

CEPHALOMETRIC ASSASSMENT IN CLASS III MALOCCLUSION TREATMENT

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Aim: to validate the predictive model using the CondAx-MP variable proposed by Franchi and Bacetti to predict the long-term stability of early treatment with rapid maxillary expansion (RME) and facial mask (FM) in a sample of growing Class III patients.

Methods: the study was carried out between November 2020 and March 2021, examining the cephalometric records of 24 patients at the dental Clinic of Policlinic of Bari. From the inizial sample, 13 patients passed the selection criteria. Cephalometric surveys were performed at T_0 (before treatment) and T_1 (long-term follow-up). The mean age at T_0 was 7.1±1.6 years, while the mean age at T1 was 20±3.2 years after pubertal growth. The average period of active treatment was 1 year, characterized by the application of a palatal expander associated with Delaire mask traction. The angle examined in the predictive study was the CondAx -MP angle.

Results: of the 13 patients, 9 (69%) responded successfully and had a CondAx-MP angle of 147.8° below the critical value. 4 patients (31%) had a poor prognosis, specifically, 3 patients had an angle value greater than the critical value of 147.8° and thus concordant with the study, only one had a value of 145°, discordant with the angle examined.

Conclusions: the major variable determining the failure of early orthopedic treatment is the amount and direction of vertical growth understood as the post-rotation of the mandible during and after adolescence. The CondAx-MP variable is useful in predicting early treatment failure of the third skeletal classes.

RAPID PALATAL EXPANSION AND PEDIATRIC OSA: A CASE-CONTROL STUDY

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Aim: this study aims to compare respiratory parameters of patients undergoing rapid palatal expansion (RPE) positive and negative for OSAS.

Methods: 41 patients with maxillary transverse deficiency (22 M, 19 F, age 6-12) underwent to a first Home Respiratory Polygraphy (HRP) for two consecutive nights.
Their caregivers were asked to answer the PSQ to assess the risk for OSA. After the active phase of treatment, 31 of the 41 children underwent a second HRP. 12 months after the treatment, patients suffering from OSA underwent to a third follow up HRP.

Results: the initial HRP evidenced 11 patients with AHI >1. 14 initial PSQ resulted positive for OSA risk whereas after RPE treatment only 8 patients reported positive questionnaire. Out of 11 patients 7 manifested improvement in AHI after RPE while only one showed an increase of AHI due to weight gain.
The control group maintained normal respiratory parameters except for 5 children who recorded a slight worsening of the AHI.

Conclusions: this study showed the improvement in respiratory parameters in most of the OSA patients after RPE.
The control group maintained comparable values, with a slight worsening in some patients.

ORTHODONTIC APPLIANCES FOR OSA: A LITERATURE REVIEW OF EFFECTIVENESS AND COMPLICATION

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Aim: the aim of this review is to evaluate the effectiveness of different orthodontic appliances, with particular attention on the MAD appliance and Klearway appliance in treating OSA.
Methods: a systematic search was conducted on the PubMed database using the keyword "Orthodontic appliances OSA". The author considered articles published until 2015 and only referred to humans. The eligibility criteria were the type of study: Randomized clinical trials, prospective non-randomized controlled studies and controlled clinical trials, systematic review, retrospective and prospective studies. Of the 202 articles only 12 articles were selected from the review process.
Results: MAD and KW appliances were found to be effective in reducing the apnea-hypopnea index (AHI), and snoring frequency, and improving the quality of the patient's life, with minor side effects that improved over time. However, there were differences between the two types of appliances in terms of retention and construction methods, material flexibility, adjustability, freedom of jaw movement, and quantity of mandibular protrusion.
Conclusions: MAS and the KW appliance are effective in treating OSA, but their effectiveness and advantages may vary depending on the specific patient and the severity of their condition.
The KW appliance is particularly effective in reducing high apneic events during sleep and improving upper airway obstruction in the supine position. Clinicians should consider patient characteristics and condition severity when selecting the most appropriate appliance for OSA treatment.

CORRECTION OF A SKELETAL CLASS II MALOCCLUSION USING FORSUS APPLIANCE

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Aim: the purpose of this case report is to describe the management of the Forsus Appliance to correct a skeletal class II in an uncooperative patient.
Methods: 11.5-year-old female patient. Profile analysis shows a slightly open nasolabial angle, a tendentially convex profile with retroposition of the mandible. The intraoral examination allows us to appreciate the retroinclination of the upper incisors and the presence of a dental class II full right and left with deep bite. Cephalometric analysis confirms the presence of a skeletal class II (Wits Index = 3) from mandibular retrusion (SNA = 79°; SNB = 74°; ANB = 5°) in a normo-divergent patient. As the patient was still in the growth phase, the treatment plan included the use of a Forsus appliance during treatment with fixed straight-wire appliance. Since the lower incisors are correctly inclined relative to the mandibular plane (value of 95°), the undesirable mesializing effect of the Forsus appliance was managed clinically.
Results: as a result of overlapping cephalometric tracings, both skeletal and esthetic improvement was observed.
Conclusions: the Forsus Appliance, therefore, is an effective alternative in the treatment of moderate Class II skeletal malocclusions in uncooperative patients.

ORTHODONTIC MANAGEMENT OF IMPACTED TOOTH DUE TO THE PRESENCE OF SUPERNUMERARY: CASE REPORT

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Aim: pediatric dentists often have to handle with challenging situations during dental occlusion development, including deviations from the normal eruption sequence. Supernumerary elements are the main cause of delayed maxillary incisors eruption. This case report wants to show how early diagnosis of these conditions can led to less invasive management of included teeth.

Methods: in 2018, an 8-year-old male patient came to our observation.

Radiographically, element 12 was observed to be retained and obstructed in its eruptive pathway by the presence of a supernumerary element that was extracted.

After nearly 24 months of waiting, in the absence of spontaneous eruption of the element, we decided for the aid of a rapid palate expander (RPE) with bands on the sixths and fourths.

Results: after 20 RPE activations, 12 began to be palpable. After a total of 32 activations, the element was close to permutation, opting for the end of activations.

The intraoral radiography showed 12 erupting, although the apex was not clearly visible. At 10 months from the beginning of therapy, 12 was erupted in the arch.

Conclusions: management of an impacted tooth can be complex and often requires a collaborative approach among multiple dental specialties.

It is crucial having the skills to diagnose and to identify impacted teeth in the early stages in order to make the management of these cases less invasive, achieving the correct position of an element by taking advantage from the action of devices, such as RPE, also aimed at correcting co-present skeletal discrepancies.

ADOLESCENT PATIENT WITH 1.3 AND 4.3 CROSSBITE

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Aim: the aim of this case report is to consider the results achieved with a treatment of fixed orthodontics in an adolescent patient.

Methods: the patient is a 16-year-old girl, with permanent dentition. A study of the case was carried out with the collection of dental objective examination, Rx opt, lateral teleradiography, posteroanterior teleradiography, cephalometry, photos and impressions. It was obtained the diagnosis of dental skeletal class I, mesodivergence, dental deep bite, right lateral deviation, 1.3 and 4.3 in crossbite, superior and inferior dental crowding. A fixed orthodontic therapy was performed for management of this patient case.

Results: the orthodontic fixed therapy has been scheduled for 18 months. At the end of the treatment the problems above mentioned were resolved. A lower fixed retainer and a superior essix were used.

Conclusions: in conclusion, fixed orthodontic treatment can give excellent results for alignment and control of occlusal plane.

CLASS II LEFT SUBDIVISION IN ADULT PATIENT TREATED WITH INVISALIGN

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Aim: demonstrate the effectiveness of Invisalign® aligners in resolving a left subdivision Class II malocclusion with scissor bite, unilateral crossbite, strong tooth inclinations, moderate crowding, and deviated midlines.

Methods: patient female 27 years old. Frontal aesthetic analysis of the face at rest showed a mild increase of lower third compared to the middle and upper third. The analysis of the profile showed a normal profile. Second class left molar and canine and first class molar and canine with open bite tendency. Cross bite between elements 2.4 and 3.4 and a right unilateral scissor bite on 3.5. The lower arch showed moderate crowding and a rather irregular arch and elements 3.4 and 3.5 with a very unfavorable root torque. The patient underwent Invisalign® aligners treatment for approximately 18 months, consisting of a main phase of 34 weeks, 2 terminal refinement stages of 14 weeks and 10 weeks. During the treatment an interproximal reduction (IPR) was also carried out to allow the alignment of crowded elements. The aligners were worn carefully and constantly for 22 hours a day and changed after a week.

Results and conclusions: the dentoalveolar expansion was achieved with right unilateral cross bite and scissor bite correction, anterior crowding resolution, rotation corrections, and parabolic arch shape. The correction of the shape of the lower arch and of the root torque of the elements led to the resolution of the occlusal interferences allowing the resolution of the malocclusion and therefore the re-centering of the midlines. Furthermore, the aligners have made it possible to obtain a correct smile line, a greater fullness of the buccal corridors and an overall winning aesthetic result.

SPINAL FLEXION AFTER FUNCTIONAL THERAPY IN UNILATERAL POSTERIOR CROSSBITE

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Aim: to investigate the effect of functional treatment with the removable appliance Function Generating Bite (FGB) on spinal flexion in unilateral posterior crossbite (UPC) patients.

Methods: 38 Patients with UPC (M = 17, F = 21, mean age ± SD 8.6±1.7 [yr.mo]) and 35 control patients with normal occlusion (M = 19, F = 16, mean age ± SD 11.3±2.4 [yr.mo]) underwent spine alignment evaluation with the electronic inclinometer Spinal Mouse® system (Idiag AG, Switzerland) before the beginning of treatment (T_0), and after the correction of the malocclusion (T_1).

UPC was treated with FGB, manufactured with acrylic resin, expansion springs, and resilient, stainless steel posterior bites that prevent occlusal contacts between opposing teeth during swallowing.

Results: UPC was corrected in all patients (n = 38). The mean time between the spine alignment evaluations (T_0/T_1) was 1.8±1.7 [yr.mo] in UPC and 0.8±0.6 [yr.mo] in the control group. The pre-treatment (T_0) left and right flexion angles showed a significant difference in the UPC group ($p < 0.001$), with the crossbite side being more flexible compared to the non-crossbite side. After treatment with FGB (T_1), there was no difference between the left and right sides ($p = 0.44$ and $p = 0.15$, respectively) in UPC patients. No difference between the sides was observed in the control group at T_0 and T_1.

Conclusions: UPC in growing patients is associated with asymmetrical flexion of the spine. Functional treatment with FGB effectively treated the malocclusion and re-balanced spinal flexibility between the sides.

CONDYLAR ASYMMETRY IN CHILDREN WITH UNILATERAL POSTERIOR CROSSBITE MALOCCLUSION

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Aim: Unilateral posterior crossbite (UPC) is a common, severely asymmetric malocclusion characterized by maxillary hypoplasia and masticatory dysfunction. This research aims to evaluate the asymmetry of mandibular condyles and rami in orthopantomograms (OPG) of children with UPC.

Methods: this study included 33 children with UPC (F = 15, M = 18; mean age ± SD = 8.0±1.3 [yr.mo]) and 33 age- and gender-matched controls (F = 15, M = 18; mean age ± SD = 8.4±1.3 [yr.mo]. A line tangent to the most lateral points of the ramus and condyle (V) was traced on pre-treatment OPGs, followed by 3 perpendicular lines: one tangent to the highest point of the condyle (H1); one intersecting line V at the most lateral point of the condyle (H2); one intersecting V at the most lateral point of the ramus (H3). The distances H1/H2 (height of the condyle) and H2/H3 (height of the ramus) on each side were measured with digital calipers. The asymmetry index between the right (R) and left (L) sides was calculated with the formula |(R-L)/(R+L)|x100; asymmetry was considered present for values >6%.

Results: UPC showed a significantly increased asymmetry of mandibular left and right condyles (mean ± SD = 10.7% ±9, p <0.001) but not of rami (mean ± SD = 1.9% ±2.3), compared to control, who showed symmetrical condyles and rami.

Conclusions: the presence of an increased condylar asymmetry index in a developing patient with unilateral posterior crossbite is a sign of altered skeletal growth: it should be considered in the diagnostic process and treatment plan.

CARRIER MOTION *VS* SEQUENTIAL DISTALIZATION WITH CLEAR ALIGNERS IN CLASS II TREATMENTS

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Aim: to compare the type and entity of tooth movement of the maxillary arch obtained with clear aligners alone (CA) or with aligners in combination with Carrier Motion 3DTM (CM), in post-peak pubertal patients presenting class II malocclusion.

Methods: 2 groups of patients were analyzed: CA group (6 M and 7 F, 18 mean age +/- 5 yo) was treated exclusively with aligners, CM group was treated with Class II Carriere Motion 3DTM and aligners in the lower arch (4 M and 4 F, mean age 15 +/- 2 yo). The following inclusion criteria were observed: class II malocclusion with non extractive treatment plan; vertebral stage higher than CS3 and the visibility of rugae and palatine vault on digital models.

The *software* Geomagic Control X (version 2020.1.1, ©2020 3D Systems, Inc.) and Viewbox 4 (version 4.1.0.1 BETA, dHAL Software, Kifissia, Greece) were used to make the required overlaps and measurements.

Results: the following statistically significant results were found:

1. greater sagittal movement of molars in CA group.
2. Increased coronal-palatal retraction and loss of torque of the central incisors in the CA group.
3. Distal tipping of central incisors and vertical movement of canines were greater in CM group. In addition, intrusive movement was detected in the CA group canines.

Conclusions: class II sagittal relationship correction was achieved in both groups analyzed. Distalisation of the 1st molar was greater with clear aligners, but careful control of anterior tooth movement design is necessary to avoid unwanted movement.

FAILED RESTORATIONS IN ORTHO-TREATED PATIENTS: CORRELATION BETWEEN FUNCTION AND FRACTURES

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Aim: the possible influence of bruxism on the fracture of direct additive restorations was investigated in the present study, placing as a null hypothesis the inability of bruxism to condition them.

Methods: 12 comparable patients which were submitted to an ortho-resto treatment more than 5 years ago were recruited.

Of these patients, 6 had fractured restorations (group 1) while the other 6 had intact restorations (group 2). To all patients the muscular activity was measured with BruxOff device, while a Brux-Checker was performed to evaluate mandibular dynamic movements during night.

Finally, replica models of the composite restorations were performed and analyzed through SEM.

Results: BruxOff recordings showed that Group 1 had more marked activity of the masseter muscles than Group 2. In particular, between the two groups, the following variables were statistically significant: phasic contractions ($p = 0.003$), tonic contractions ($p = 0.003$), mixed contractions ($p = 0.002$), heart rate ($p = 0.027$) and total masseter contractions ($p = 0.0001$). Brux-Checker and SEM failure analysis underlines how fractured surfaces have steps resulting from the propagation of the initial crack through the adhesive interface.

Conclusions: given that there are no other studies in the literature investigating the correlation between bruxism and fracture of direct additive restorations and given that the sample analyzed is small, further studies would be needed to confirm the results of this study.

OCCLUSAL CONTACTS REGISTERED WITH INTRAORAL DIGITAL SCANNER AND ARTICULATING PAPER

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Aim: the recording of the occlusal contacts is a pivotal step of many dental procedures, yet the lack of a standardized method could introduce clinical errors. The introduction of digital impressions has provided an alternative method for the recording of occlusal contacts, although the precision of this technique when scanning a complete dental arch is still not clearly established. The aim of this study was to compare the occlusal contacts recorded with a digital intraoral scan to the contacts registered with articulating paper.

Methods: thirty adult patients were enrolled for this study. Digital impressions and intraoral photos of the colored marks impressed by articulating paper were both taken at the same time point for every patient.

Using a standardized occlusal template, two operators recorded the number of occlusal contacts for every tooth provided by the two techniques. Statistical analysis was used to compare the number of occlusal contacts recorded with digital scans versus articulating paper.

Results: the statistical analysis showed that there were significant differences between the number of contacts reported by digital impressions and the ones reported by the photographed articulation marks, except for upper central incisors and first premolars.

Conclusions: there is not a match between the occlusal contacts taken with the intraoral scanner and the one taken with the articulating paper.

INFLUENCE OF CLEAR ALIGNER TREATMENT (CAT) ON PERIODONTAL AND MICROBIOLOGICAL PARAMETERS

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Aim: clear aligner treatment (CAT) shows less plaque accumulation and periodontal risk compared to fixed orthodontic treatment.
This study aimed to evaluate changes induced by CAT after 2 months on periodontal status and oral microbiological composition by CAT compared to orthodontically untreated people within 2 months.
Methods: 40 patients were recruited considering the following inclusion criteria: age >12 years, good periodontal health, skeletal and molar class I, dental malocclusion, no periodontal treatment.
Patients underwent professional oral hygiene and after 14 days were recalled (t_0) to evaluate PPD, BOP, PI and to perform microbiological tests; they were divided into Group 1 (20 orthodontic patients) and Group 2 (20 untreated patients).
After 2 months (t_1) the same assessment was repeated.
Data underwent statistical analysis with significance at $p < 0.05$.
Results: no significant differences were found between the two groups neither for PPD, PI or BOP, nor for the specific bacteria strains expressed in copies/ml or as a percentage ($p > 0.05$).
The only increase in total bacterial count from t_0 to t_1 resulted significantly different in both groups ($p < 0.05$), but this parameter includes common oral microbiota bacteria, therefore not representing a clinically significant result.
Conclusions: CAT is a valid treatment as it does not significantly influence periodontal and microbiological parameters for the first 2 months of therapy.
Studies with longer follow-up and considering further laboratory parameters are needed to confirm the findings of the present study.

THE CARRIERE MOTION APPLIANCE FOR THE CORRECTION OF CLASS II MALOCCLUSION

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Aim: to evaluate dental and skeletal changes produced by the Class II Carriere Motion appliance, in growing patients with Class II malocclusion, through cephalometric analysis.
Methods: the sample included 13 subjects, aged between 9 and 13 years, with Class II malocclusion. Patients were treated with the Class II Carriere Motion appliance. Cephalometric tracings were performed at the beginning and at the end of treatment. Comparison was performed using the paired Student's t-test. P values <0.05 were considered statistically significant.
Results: in terms of skeletal changes, SNA remained stationary ($p = 0,98$) and SNB increased slightly ($p = 0,001$); there was a mandibular advancement, probably due to the removal of occlusal interferences. ANB and Wits decreased (respectively $p = 0,012$ and $p = 0,000$). No statistically significant changes were found in the inclination of the bispinal plane ($p = 0,39$), the occlusal plane ($p = 0,79$) and the mandibular plane ($p = 0,70$). Therefore, the lower Essix retainer is an effective tool in controlling the divergence.
In terms of dental changes, a statistically significant change was found in the proclination of the lower incisors ($p = 0,018$) and in the distalization of the maxillary molars ($p = 0,048$) but not in the proclination of the upper incisors ($p = 0,19$).
Conclusions: the results of this study have shown that the Carriere Motion Appliance is an effective method for distalizing maxillary molars. Dental effects, produced by this appliance, were more significant than skeletal effects. The compliance of growing patients was high.

UPPER CENTRAL INCISORS INCLUDED: LITERATURE REVIEW AND THERAPEUTIC STRATEGIES

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Dental impaction represents a significant challenge. It occurs when a dental element has been absent in the arch for more than 6 months compared to the physiological eruption and affects about 6% of the population if wisdom teeth are excluded. Among the causes there are systemic factors (drugs or pathologies that alter bone density, genetic alterations) and local factors (trauma, supernumeraries, neoformations, early loss of the deciduous tooth). Inclusions are classified according to the type of obstruction and position of the tooth: I incisors with buccal impaction; II palatal impacting incisors; III vertically impacting incisors. The only surgical removal of the obstruction to the eruption often allows the eruption of the retained tooth in 12-36 months in 65% of cases without orthodontic traction. The surgical orthodontic approach with traction is the most used: exposure to a cold blade is the most used, although the use of the diode laser is widespread (it reduces bleeding, the intake of painkillers and healing times; it has a biostimulant). The orthodontic traction is performed with: continuous arch, double arch system (piggy back), auxiliaries linked to a continuous arch, levers, equipment created in the laboratory and, recently, miniscrews, which reduce the orthodontic counter-effects. The literature shows that an approach to the inclusion of incisors must be as swift as possible: the surgical orthodontic approach with laser and the biomechanical approach with miniscrews are the best, fastest and safest system for the patient and the operator.

BIOMECHANICAL STRATEGIES FOR THE RESOLUTION OF SECOND CLASSES DIVISIONS 2

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Aim: class II Division 2 malocclusion is characterized by retroclination of the upper central incisors and severe overbite and has a reported prevalence of 7%-8% in Italy.
The aim of the study is to analyze the biomechanical strategies for the resolution of this malocclusion, respecting the final aesthetic result of the smile.
Methods: the inclusion criteria are malocclusions of class 2 division. All cases were treated with different biomechanical strategies, specific to each patient.
The first biomechanical step is to transform the malocclusion in division I by aligning the central incisors to the lateral incisors usually in an adequate position to favor a mandibular unlocking. In this way the anterior repositioning of the jaw is favored, with an initial correction of the class ratio.
Results: the cases ended in overlapping times, with the achievement of class I molar and canine on the right and left SIDE, normalized overjet and overbite, coincidence of the dental medians. In addition to the following objectives, special attention was given to the final exposure of the patients' smile.
Conclusions: since there is no single line of treatment of the second classes division 2, the most effective biomechanical strategy for the individual patient must be guided by the experience of the clinician, who will protect the final result from a functional and aesthetic point of view.

GERMECTOMY OF THE THIRD MOLAR IN ORTHODONTICS: A REVIEW OF THE LITERATURE

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Aim: germectomy is a surgical treatment defined as the removal of a tooth at the beginning of its development, when it has no contacts with the surrounding anatomical structures. The aim of the work is to present an international literature review to offer an overview on indications and ideal timing for this practice.

Methods: a literature review has been done on PubMed database [www.ncbi.nim.nih.gov/pubmed] looking for the articles dealing with indications, contraindications and discussions about this technique. Among the articles found, those ones published between 2013 and 2023 were selected.

Results: germectomy is a convenient, rapid, atraumatic technique without important post-surgical side effects. It's executable in local anesthesia and it's much less invasive than the traditional surgery of the third molar: for this reason a lot of authors are favorable to this practice.
Among the authors, the debate about the ideal timing to operate is still open.

Conclusions: despite the conflicting opinions found in the literature, it's univocally recognized the importance of a careful evaluation of each single patient, in order to establish/decide the real need of germectomy and the right period to operate.

THE ROLE OF ORTHODONTIST IN JUVENILE IDIOPATHIC ARTHRITIS

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Aim: Juvenile idiopathic arthritis (JIA) is the most common inflammatory rheumatic disease of childhood. The temporomandibular joint (TMJ) is one of the most frequently involved joints. When TMJs are affected, patients may present with pain at joint and masticatory muscles, and dysfunction with crepitus and limited jaw movement.
Moreover, TMJ arthritis affects mandibular growth, resulting in skeletal deformity (convex profile and facial asymmetry), and malocclusion. The aim of this review is to describe the role of the orthodontists in the management of patient with JIA and TMJ involvement.

Methods: this is an overview of evidence for the diagnosis and treatment of patients with JIA and TMJ involvement.

Results: orthodontists should be able to identify TMJ involvement by screening for orofacial manifestation of JIA. The treatment protocol of JIA with TMJ involvement requires an interdisciplinary collaboration between rheumatologist, radiologist and orthodontist. Orthopedic/orthodontic treatment and surgical interventions for the management of growth disturbances are recommended. Orthodontists are also involved in the management of orofacial signs and symptoms: the treatment protocol suggested includes behavioral therapy, physiotherapy, and occlusal splints.

Conclusions: since disorders of mandibular growth often appear during childhood, the orthodontist could be the first clinician to see the patient and can play a crucial role in the diagnosis and management of JIA patients with TMJ involvement.

NOONAN SYNDROME: CRANIOFACIAL AND DENTAL ANOMALIES

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Aim: Noonan syndrome (NS) is a multisystem disorder featuring unusual face, multiple malformations and congenital heart defects as Noonan and Ehmke described firstly.

Frequent craniofacial abnormalities are: high forehead, small and triangular face, large skull with narrowing at the temples and hypertelorism. These features usually occur with occlusal disorders, it can cause feeding difficulties and, if it's added to swallowing and digestive problems, frequent vomiting and decreased appetite, can cause a growth delay, which requires a multidisciplinary team help. It is vital, therefore, that doctors recognize clinical conditions of NS in order to accelerate diagnosis time and improve the clinical management of these patients.

Methods: a narrative revision of the literature was conducted using the PubMed and Google Scholar databases. Keywords: Noonan syndrome, dental, facial and orthodontics features, dental issues.

Results: the main occlusal disorders in NS are ogival palate, dental malocclusion, joint difficulties and micrognathia.

Other oral signs are periodontal problems, delayed eruption, agenesis, impacted teeth, hypodontics, taurodontism, macrodontia and giant cell mandibular lesions.

Conclusions: craniodental-facial anomalies can be related to important aesthetic and functional consequences, interfering with normal feeding and growth. According to systemic problems usually associated with NS, careful evaluation of craniodental-facial abnormalities and treatment planning by an appropriate multidisciplinary team can help to improve the quality of these patients' lives.

IN VIVO EFFECTIVENESS OF 3D-PRINTED TRANSFER TRAYS FOR INDIRECT BRACKET POSITIONING

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Aim: to assess *in vivo* the effectiveness of digital customized transfer trays for indirect bracket positioning.

Methods: the search for articles was carried out in PubMed, Scopus, Web of Knowledge and Google Scholar including articles published in English until December 2022.

The search identified every human study report potentially relevant to the review, applying a specific search strategy for each database.

After duplicate study selection and data extraction procedures according to the PICOS scheme, the methodological quality of the included papers was assessed by the Swedish Council on Technology Assessment in Health Care Criteria for Grading Assessed Studies (SBU) method.

Results: the initial search identified 126 articles, 43 of which were selected by title and abstract. After full-text reading, 3 papers were selected. The evidence quality for the selected studies was moderate.

Conclusions: the 3D-printed transfer trays have a transfer effectiveness which is clinically acceptable according to the American Board of Orthodontics (ABO), except in the vestibular-lingual direction. Therefore, Hence, 3D-printed transfer trays may be considered accurate for the *in vivo* indirect bracket positioning.

CHEWING PATTERNS AND MUSCULAR ACTIVATION BEFORE AND AFTER FUNCTIONAL THERAPY OF DEEP BITE

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Aim: deep bite, a frequent malocclusion with a tendency to relapse, is associated with craniofacial features that need to be considered during orthodontic treatment. This study evaluates the masticatory patterns and muscular activation in deep bite patients before and after functional therapy with Function Generating Bite (FGB).

Methods: this study included 81 patients with deep bite malocclusion (11,4±1,1 [yr.mo]; M = 32 F = 49) and 14 age- and gender-matched controls (9,11±1 [yr.mo]; M = 5; F = 9). Patients with deep bite malocclusion received functional treatment with FGB (n = 25). Chewing cycles and masticatory muscle EMG activity were recorded concomitantly before treatment in both groups (n = 95). Following the malocclusion correction, a second recording occurred (n = 25).

Results: kinematic variables showed the same dependency on bolus hardness in those with deep bite and in controls ($p < 0.001$). Masticatory muscle EMG activity was increased in those with deep bite and decreased as a result of functional treatment ($p < 0.05$). In addition, chewing patterns showed a tendency towards a reduced lateral component, which significantly increased after treatment ($p < 0.01$), indicating that functional therapy impacts neuromuscular coordination of mastication as well as dental positioning.

Conclusions: deep bite is a complex malocclusion involving chewing and masticatory muscle activity alterations. Considering the results of this study, orthognathodontic treatment of this malocclusion should consider and correct not only teeth position but address muscular hyperactivity.

EFFECTS OF MAXILLARY EXPANSION IN IMPROVING SAGITTAL PARAMETERS OF CLASS II MALOCCLUSION

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Aim: the present systematic review aimed to assess the effectiveness of maxillary expansion (ME) in improving sagittal dental and skeletal parameters in growing patients with Class II malocclusion.

Methods: relevant literature published in English without date restrictions was searched across Cochrane Library, Scopus and MEDLINE/PubMed databases, using the keywords: palatal expansion OR maxillary expansion AND Class II. Changes in SNA, SNB, ANB, 6/6 molar relationship, OVJ were analyzed. The risk of bias of nonrandomized and randomized studies were assessed through MINORS and Rob2 tools, respectively. A narrative synthesis of results was performed.

Results: the selection process brought 10 studies, including 745 growing patients, characterized as having either Class II dental malocclusion or skeletal discrepancy. Patients 546 received ME treatment, and 199 were untreated. Changes in 6/6 molar relationship (-1.44 mm), SNB° (from +1.24° to +2.25°), and ANB° (from -1.36° to -2.03°) were reported after ME. Moreover, when assessing treatment effect in relation to control, significant improvement were found in 6/6 molar relationship, OVJ, and ANB°. However, only two studies were randomized clinical trials with potential evidence quality. Remaining non-randomized clinical trials included presented several inadequacies related to control groups and lacked of adequate statistical analysis.

Conclusions: our results pointed out the need for better planned studies in order to confirm the effectiveness of ME treatment in improving sagittal parameters of Class II malocclusion.

PALATAL EXPANSION IN LABIO-PALATAL CLEFT PATIENTS: A SCOPING REVIEW

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Aim: the purpose of this study is to provide, through a literature review, an overview of the orthodontic treatment in cleft lip and palate and to examine the dentoalveolar outcomes of palatal expansion in patients with cleft lip and palate; obtained with different devices orthodontics. The hypothesis is that the dentoalveolar effects of the expansion performed with the various devices are similar.

Methods: a bibliography research was conducted through different databases (PubMed, Scielo, Lilacs) and it was performed independently by two authors, for a period of time from January 1990 until December 2022. All articles selected are written in English, and concern palatal expansion in human patients with labio-palatal cleft.

Results: after full reading of 1133 articles only 11 of those met the inclusion criteria.

The orthodontics appliances that have been used are: Quad Helix, Hyrax, 4-band expander, Haas, Maxillary Expander with Differential Opening (EDO). Overall, all the appliances used have proven effective in correction of cross-sectional problems of patients with labio-palatal cleft, with little statistically significant difference.

Conclusions: slow expansion with quad helix, though requiring a longer treatment time, allows to have more control over molar rotation.

The use of devices with anterior expansion screws can be useful for expanding mainly the anterior sector, which is particularly contract in these patients.

As for the side effects of dental tipping, the results of this review are controversial and make it impossible to draw a definitive conclusion.

RELATION BETWEEN DENTAL ANXIETY AND SELF-RATED DEGREE OF MALOCCLUSION IN ADOLESCENTS

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Aim: to assess the relation between dental anxiety and subjective degree of malocclusion in adolescents.

Methods: Adolescents (10-18 years old) were recruited at the Clinic of Orthodontics of the University of Naples Federico II. Dental anxiety was measured with two scales: the Modified Dental Anxiety Scale (for subjects <14 years old), and the Dental Anxiety Scale (for subjects 14-18 years old). The self-rated degree of malocclusion was assessed with the Aesthetic Component of the Index of Orthodontic Treatment Need (AC-IOTN). The sample was divided according to the AC-IOTN scores: AC-IOTN <4, no/mild malocclusion and AC-IOTN ≥4, moderate/severe malocclusion). Means and standard deviations were computed for the anxiety score. An unpaired sample t-test was used for the between-groups comparison and a linear regression analysis was used to measure the association between variables. Significant levels were set at $P < 0.05$.

Results: thirty-one (31) subjects were recruited (17 M; 14 F). More than half of them (N = 17) rated themselves as having no/mild malocclusion.

Subjects with moderate/severe malocclusion presented significantly higher anxiety score as compared to individuals with no/mild malocclusion (17.8±5.8 *vs* 11.5±5.5). Also, a significant association between dental anxiety and self-reported malocclusion was found (B = 6.3; C.I. 95% 2.1-10.5, P = 0.004).

Conclusions: self-perception of a more severe degree of malocclusion is associated with increased anxiety levels in adolescent individuals.

3D EVOLUTION OF THE LIP-TO-TEETH RATIO AS A FUCTION OF AGE IN A HEALTHY GROUP

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Aim: this study aims to evaluate the effects of aging on the relationship between the deep and superficial structures of the face, in particular the lip area, by analyzing in the three dimensions of space the lip line (LL), the occlusal plane (OP) and the position of the teeth.

Methods: twenty-nine Caucasian adults were selected without major facial disharmonies, without caries or periodontal disease, with complete dental arches and in Angle class I. Participants were divided into two age groups: G1 (18 subjects - 21 to 34 years) and G2 (11 subjects - 34 to 50 years). Using dental plaster, impressions of the skin surface and labial mucosa were taken. Using a computerized electromechanical digitizer, several points on standardized vertical and horizontal lines were digitized for both casts. Through a commercial software for the 3D creation of solids, starting from single reference points, the casts were digitally reconstructed and modeled using NURBS (non uniform rational B-spline) curves. On the digitized solid, OP, LL and teeth position were analyzed and compared using Student *t*-test.

Results: LL values in relation to OP were significantly lower in G2 than in G1. Age significantly influences the morphological characteristics of the labial area ($p < 0.05$).

Conclusions: labial area significantly varies with age. 3D reproduction could be a non-invasive solution to evaluate the relationship between the effects of aging, deep structures, teeth and lips.

PARENTS' KNOWLEDGE ABOUT EARLY ORTHODONTIC CONSULTATION: A SURVEY STUDY

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Aim: orthodontic treatment during growth has a crucial role in the interception of dental-skeletal developmental problems. The aim of this study was to evaluate parents' knowledge about early orthodontic consultation and treatment for their school-aged children.

Methods: an anonymous online 26-items survey was developed with the help of Google Form and spread to parents of children aged between 6 and 11 years from Southern Italy. The items were grouped in 3 sections: (1) sociodemographic characteristics of parents/children; (2) parents' perception of their child dentoskeletal issues; (3) parents' awareness about early orthodontic treatments. Descriptive statistics was performed, and frequencies and percentages were computed for each item.

Results: survey participants were 142 (83.8% mothers, 16.2% fathers), mainly aged between 40 and 50 (46.5%). More than half of the respondents thought that their children had problems with the alignment of their teeth, and most of them also performed a first dental consultation.

Almost all parents who perceived skeletal problems consulted a dentist for these problems. In addition, only 12 parents observed problems in the oral functions of their children, of which 9 considered appropriate to have a dental examination and 11 a consultation with other specialists. Most parents believed that early orthodontic treatment could resolve jaw development issues and could reduce the need for further treatment during adolescence.

Conclusions: a satisfactory level of awareness regarding the need for early orthodontic consultation and interventions was observed in the studied population.

DEVELOPMENT OF NEW INSTRUMENT FOR THE EVALUATION OF ORAL BEHAVIOURS IN CHILDREN

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Aim: the aims of this study are to create an oral behavior checklist (OBC) questionnaire intended for children and adolescents and to evaluate its reproducibility.

Methods: two questionnaires were submitted to 255 students at school. Both questionnaires were suitable for children and adolescents, the first version include 21questions written in a more understandable language with only 3 options of answer and 21 corresponding images and emoticons, was administrated to 128 pupils (mean age 10.39).

The second questionnaire was without images or emoticons and was administrated to 127 pupils (mean age 10.64). For the evaluation of the reproducibility of the questionnaire, they were administered to both groups on the same day, in order to subsequently compare the two answers for each question of each pupil.

Between one administration and the next, the pupils were given a lesson in oral hygiene and prevention of dental caries, in order to forget the first answer given.

Results: analysing the total Cohen's K coefficient of both the number of pupils and that referred to the individual answers, there are no differences in terms of reproducibility between the questionnaires with images and without images, therefore, the linguistic translation performed was sufficient for understanding. Even if the submission of the two questionnaires on the same day brought some advantages , a longer period of time would have been necessary between one questionnaire and another.

Conclusions: this study created a new adapted version of the OBC-21 for children and adolescents. In this study both version with and without images were reproducible.

UPPER AIRWAY CHANGES IN II CLASS PATIENTS AFTER THE APPLICATION OF AN INTERCEPTIVE DEVICE

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Aim: mandibular retrognathia in II skeletal classes is often associated with reduced air passage in the upper airways because of their dimensions.

This study aims to analyze the effects of Twin Block appliance on sagittal pharyngeal dimensions in growing skeletal class II patients.

Methods: cephalometric analyses were performed at the beginning (T_0) and end of treatment (T_1) with Twin block of 16 growing patients (12 M and 4 F) with II class malocclusion recruited at the Department of Orthodontics of Policlinico of Bari.

The statistical analysis was carried out using T-test to analyze the cephalometric differences between T_0 and T_1. The level of significance was set at $p < 0.05$. Then, a simple linear regression was conducted to identify a correlation between sagittal and vertical changes and pharyngeal dimensions at five different levels (P1, P2, P3, P4, P5).

Results: cephalometric comparison of SNB and Go-Me revealed mandibular advancement after treatment.

It also found a statistical correlation between the changes in mandibular length and the changes in the volume of the airway at P3 and P4.

Conclusions: this study reported that sagittal upper airway dimensions are related to the sagittal position of the mandible. Use of devices that promote mandibular advancement in growing patients results in increased upper airway diameters.

DENTOALVEOLAR EFFECTS RELATED TO MAXILLARY EXPANSION: COMPARISON OF TREE DEVICES

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Aim: maxillary transverse deficit is most common problems in craniofacial region; evaluation of dento-alveolar effects was performed on growing patients treated with REP (Hyrax expander), SME (Leaf expander) and Invisalign First.
Methods: all digital models in STL format were analyzed with Mimics Materialize. Points and lines of upper and lower arch were identified: 5.3-6.3-5.4-6.4-5.5-1.6-2.6-3.6-4.6 mesiobuccal cusps of the corresponding teeth G16 and G26: gingival margins palatal permanent molars; measurements were evaluated T_0 and T_1 after expansion and statistical analysis was carried out on three groups studied using the Ttest, ANOVA test and post hoc Tukey's test with Bonferroni's correction.
Results: comparable maxillary deficits of groups at T_0 and a same amount of device expansion, similar maxillary expansion on 5.5-6.5 in LEAF and REP group. FIRST group shows similar values to other two groups for first molars, but REP group expands more on deciduous canines than FIRST group. LEAF group expands more on deciduous molars and canines than FIRST group.
Conclusions: FIRST group showed improvement in shape of maxillary arch, unlike REP and LEAF groups, retained the initial triangular shape in the anterior portion of maxilla.
FIRST group is able to induce significant morphological changes in shape of arch as in REP and LEAF groups, but the characteristic feature of this group compared with the other two is that the increased space in the incisal sector, is immediately used for the correct positioning of the central and lateral incisors.

CEPHALOMETRIC EVALUATION OF THE UPPER AIRWAYS CHANGES ASSOCIATED WITH THE PENDULUM

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Aim: the aim of the following study was to describe if any dimensional changes occurred in the upper airways in growing patients with class II malocclusion after therapy with the Pendulum appliance.
Methods: to analyze changes in the upper airways, the cephalometric tracings of 88 growing patients were analyzed, including 36 patients in skeletal class II and 54 patients in the skeletal class I who represented the control group. A specific cephalometry was formulated and used for the evaluation of the upper airways. Cephalometries were drawn before starting the therapy (T_0) and after the Pendulum therapy (T_1). The average age of patients was 12 years and 6 months at T_1, and the average duration of the therapy with Pendulum appliance was 7 months.
Results: in the assessment of the values obtained, no significant changes in thicknesses, spaces, and distances of the upper airways between T_0 and T_1 was observed in patients in skeletal class I (control group), whereas in skeletal class II the values remained rather stable with the exception of a significant reduction of the IPS and EPS pharyngeal spaces between T_0 and T_1.
Conclusions: treatment with the Pendulum appliance in growing skeletal class II patients did not cause major changes in the upper airways other than a reduction in the pharyngeal spaces.

3D ANTHROPOMETRIC STUDY OF MOUTH AND LIP AREA IN HEALTHY YOUNG ADULTS

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Aim: this study aims to describe three-dimensionally the morphometric characteristics of the mouth of healthy young adults, with a focus on the lips area, volume and thickness.

Methods: an anthropometric investigation was performed on young adults who met the following criteria: white Caucasians, Angle class I, OVJ <5 mm; exclusion criteria were: history of craniofacial trauma, congenital anomalies and/or surgery, prosthodontic and/or conservative restorations of frontal teeth. 21 subjects (12 men, 9 women, age range 21 to 34 years, mean age 25.6 years) were enrolled in the study. Impressions of the extra-oral (cutaneous) and intra-oral (mucosal) surfaces of the lips were taken and cast in dental stone. Afterwards, landmarks on standardized horizontal and vertical lines were digitized using an electromechanical digitizer (Microscribe G2, Immersion Corporation, USA); casts ware digitized through a software for 3D modelling of solids (Rhinoceros 3.0; Robert McNeel & Ass.) and shaped using NURBS (Non Uniform Rational B-Spline) curves from single landmarks. Data concerning vermillion surface area, lip volume and lip thickness was gathered. Comparisons between women and men were made using Student's t-test.

Results: vermillion area of upper and lower lips resulted to be larger in men than in women, however statistical significance was not reached. Volume of both upper and lower lips was significantly larger in men (upper lip: $p = 0.037$; lower lip: $p = 0.007$). Mean lip thickness was smaller in women ($p = 0.002$).

Conclusions: sexual dimorphism for labial volume and thickness was highlighted.

PERIODONTAL REGENERATION OF DEEP INFRABONY DEFECT WITH XENOGENEIC 3D MATRIX: A CASE REPORT

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Aim: the present case report aims to evaluate the healing process of an infrabony defect, mesial to tooth 1.1, treated by means of periodontal regenerative surgery with a combination of enamel matrix derivatives (EMD) and a 3D volume stable xenogeneic collagen matrix (XCM) at 4 years follow-up. Primary outcomes were PPD reduction, CAL gain, and the amount of bone fill (BF) by means of periapical radiographs. Secondary outcomes were Recession Width (Rec) and PROMs.

Methods: the defect was approached with a papilla preservation incision and a single flap elevation, on the buccal aspect. At the end of instrumentation, EMD was applied on the clean root surface. After EMD application, a XCM was trimmed according to the space and morphology of the defect and inserted to fill it. Finally, a suture was applied to reach primary tension-free closure of the flap at papilla level.

Results: the PPD, at the mesial-buccal aspect, shifted from a baseline value of 12 mm to 5 mm at 4 years follow-up; CAL gain was 7 mm; the infrabony component of the defect was completely filled, with a residual suprabony component of the PPD; no soft tissue recession was recorded at papilla level; PROMs, evaluated with Visual Analog Scale (VAS, 0-10), was rated 1.

Conclusions: within the limitations of the present case report, the use of XCM in combination with EMD for the treatment of a deep infrabony defect proved to be effective since it achieved promising results in terms of PPD reduction and CAL gain.

COMBINED PERIODONTAL/RESTORATIVE TREATMENT FOR DEEP GINGIVAL RECESSION AND NCCLS

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Aim: gingival recessions associated with non-carious cervical lesions (NCCLs) compromise the smile esthetics. This study aimed to present a combined periodontal/restorative approach for the treatment of deep marginal recessions and NCCLs.

Methods: two patients with deep multiple gingival recessions and NCCLs in the maxillary arches came to our attention complaining esthetic dissatisfaction. After medical and dental anamnesis, radiographic evaluations, dental/periodontal parameters record and smile analyses, combined periodontal/restorative treatments were proposed. First, NCCLs were restored with a resin composite and its adhesive system up to the maximum root coverage level. After 2 weeks from the restorations, the periodontal surgery consisted in coronally displaced flaps with site-specific application of connective grafts, using the classes V restorations as pre-surgical guidance. Recalls were periodically fixed, to monitor the complete healing of the periodontal tissues.

Results: no pain or dental sensitivity were reported over the 1 yr follow up and the patients were satisfied with the esthetic results. Complete root coverage was achieved in all included teeth, and no discoloration or retention loss were observed in the restorations.

Conclusions: the combined periodontal and restorative treatments allowed to finalize the clinical cases of gingival recessions and NCCLs with high esthetic standard and patient's satisfaction.

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M-MIST SURGERY: CASE REPORT

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Aim: the aim of this study is to show that an M MIST flap and a gently elevation flap should be considered for an improved esthetic outcome due to a minimized risk of prospective scar-tissue formation.

Methods: before performing surgery we waited at least 6 months after the non surgical periodontal treatment. The surgical approach was an M MIST, consisting of a limited interdental incision in which only a buccal triangular flap is elevated, while the papilla is left in place. The palatal/lingual tissues are not involved in the surgery. The Patient is female, 55 years, probing depth 9 mm. We start the reflection of flap with micro instruments to clean and remove inflammatory tissue too. We used ultrasonic instrument and mini five manual curette. During the manual phases we used H_2O_2 solution and Clorexidine 0,2% to clean into the intrabony defect. We decided to use a mix of biomaterials and some autogenous blood too. We performed a Laurell Gottlow suture with a Prolene 6/0 to close the wound.

Results: effect of tissue regeneration surgery with M MIST technique shows a preservation of blood vessels for a better healing and an immediately esthetics healing achievements during the following weeks. radiographic control also shows a visible gain, as periodontal stability.

Conclusions: the M-MIST is not always applicable, when a defect wraps around the lingual aspect of a tooth, elevation of the interdental soft tissues becomes necessary and a Minimally Invasive Surgical Technique (MIST) becomes the preferred approach.

LATERAL BILAMINAR TECHNIQUE IN SURGICAL MANAGEMENT OF MULTIPLE RECESSIONS

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Aim: the aim of the present study was to describe multiple bilaminar technique with a lateral approach as a therapeutic solution for root coverage in multiple gingival recessions.

Methods: in this study the mucogingival surgery was performed by coronally advanced flap combined with two connective tissues grafts. From the first molar to the canine, all horizontal incisions were made paramarginal, oblique and converging to the line passing through the center of the buccal surface of the canine.

A vertical releasing incision was made from the mesial aspect of canine to the alveolar mucosa. Next, the epithelium-connective tissue was separated from the underlying muscular and periosteal layer by superficial incisions parallel to the mucosal plane. The connective grafts were sutured to the periosteum by resorbable sutures.

Results: after 5 years surgery, the development of a keratinized gingiva band at the buccal surface of the teeth 46, 45, and 44 can be noticed and it has ensuring good camouflage of the treated area in terms of color and thickness relating to adjacent soft tissue.

Conclusions: the multiple bilaminar technique with lateral approach performed by coronally advanced flap with a mesial vertical releasing incision and two connective tissues grafts can certainly be considered for the treatment of multiple gingival recessions on mandibular posterior teeth with an inadequate proportion of keratinized mucosa.

BIOLOGICAL EFFECTS OF CANNABIDIOL ON ORAL CELL POPULATIONS: *IN VITRO* STUDY

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Aim: the aim of the study is to investigate the *in vitro* biological effects determined by acute and chronic administration of Cannabidiol (CBD) on human gingival fibroblasts and human oral keratinocytes.
Methods: human fibroblasts and keratinocytes were treated for 24 and 72h with CBD concentrations ranging from 1 to 100 μM, administered continuously (acute treatment) or for 30 minutes every 8h (chronic treatment). Viability was determined using MTT assay, cell morphology with SEM analysis, cell migration by Scratch assay, apoptosis and cell cycle with cytofluorimetry and RT-PCR analysis, DNA damages with Immunofluorescence.
Results: CBD showed significant cytotoxicity, increase in apoptosis, and decreased cell migration with 6 μM during acute treatment and with 50 μM in chronic treatment for both cell lines. SEM analysis confirmed morphological alterations. At 25 μM for 72h a rise in keratinocytes migration was observed, also related to a significant reduction in apoptosis and cell cycle related gene expression, and a decrease in cannabinoid receptors expression. CBD induced a dose dependent DNA damage in keratinocytes with all doses and at both time points, and no significant increase in the percentage of γH2AX foci positive cells was detected.
Conclusions: acute treatment causes significant effects compared to chronic treatment due to high concentrations of CBD that were strongly toxic on both oral populations, while at 1 μM CBD results were biocompatible. Intermediate concentrations, such as 25 μM, show lower cytotoxicity and improve wound closure, compared to chronic treatment.

THE IMPORTANCE OF SURGICAL TECHNIQUE IN GTR. EXPERIMENTAL STUDY WITH CLINICAL, RADIOLOGIC

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Aim: aim of our work is to evaluate the importance of the partial thickness flap in guided bone regeneration by comparing two different surgical techniques (full thickness flap and partial thickness flap) in order to demonstrate the importance of the periosteum in osteogenesis and how the partial thickness flap preserves the bone and increases the success rate allowing rapid bone regeneration.
Methods: 30 patients with periodontal problems (two-walls and three-walls defects) were selected.
On the same patient, on one side the partial thickness flap and on the other side the full thickness flap were performed. Results were evaluated in radiological, clinical recovery and clinical attack terms, probing reduction and post-operative bone resorption.
Results: it can be evaluated how in patients on whom the partial thickness flap was carried out, there is a significantly better result in terms of: increase in bone crest levels on radiographic examination, recovery of clinical attack on clinical inspection examination, reduction of pocket depth at the survey. The clinical, radiological results are compatible with the concept of "periodontal health".
Conclusions: based on the study we can say that the technique of the Partial Thickness Flap, assisted by an adequate selection of the case to be treated, allows us to obtain excellent results. It can be seen that the healing times with this technique are much lower than those obtained with bone regenerations carried out with other methods, which often give infectious problems or that present difficulties of handling.

CONSERVATIVE PARADIGM, PERIODONTAL APPROACH TO ROOT FRACTURE IN VITAL TEETH. CASE SERIES

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Aim: as reported in the literature, the root fracture is a rare occurrence. We are reporting two cases of root fracture in vital teeth in periodontal involved patients with long follow up. As suggested by Andreasen et al root fracture could interest coronal third, middle third, or apical third; the more apical the fracture, the more possibility to remain vital the tooth has. Teeth interested by apical fracture have 89% of survival rate; the vitality could be due to the elasticity of the pulp tissue.

Methods: cases courtesy by Prof Franco Vezzoni. Two adult patients with periodontal pathology after traumatic injuries come to clinical observation; after a general control of the oral cavity, X-ray were taken and a fracture rime was discovered. Patient C fractured, after a frontal trauma, 11 in the apical third and 22 on the incisal margin in 1975; Patient S fractured 21 and 22 in the middle third in 2018. Therapy consisted in 40-day immobilization by splinting.

Results: according with data present in literature, during long-term follow-up teeth have tended to remain vital and no high grade of mobility could be detected.

Patient C has 20 yy of follow-up, Patient S has 3 yy of follow-up.

Conclusions: maintaining fractured elements with opportune treatment can be considered a valuable therapeutic option, mostly in patients with periodontal implications and with a reduced number of therapeutic options.

Clinicians should take into consideration the importance of maintaining an occlusal stability through the presence of the highest possible number of elements in arch.

PERI-IMPLANTITIS INDUCED MEDICATION-RELATED OSTEONECROSIS OF THE JAW

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Aim: the aim of the present study is to report a case series of patients with peri-implantitis induced medication-related osteonecrosis of the jaw (MRONJ), describing the clinical and radiologic features of the condition and the surgical treatment outcome.

Methods: thirty-six consecutive patients with clinical diagnosis of peri-implantitis associated with MRONJ were retrospectively included in the study. Surgical treatment was performed with a standardized operative protocol, involving implant removal, sequestrectomy, debridement of soft tissue and bone curettage. Follow-up evaluating surgical outcome was performed at 12 months after surgery.

Results: patients were almost equally distributed in terms of underlying diseases in osteoporotic and oncologic patients. All MRONJ lesions were symptomatic, and in 15 patients bone exposure was detected. In total, 123 implants were evaluated, with MRONJ being present around 68 implants. Twenty-four patients were diagnosed with Stage III MRONJ, and twelve patients with Stage II MRONJ. Surgical treatment leaded to complete healing in 84.4% of cases, with 100% success for maxillary MRONJ.

Conclusions: the clinical signs of peri-implantitis may reveal the presence of an underlying MRONJ diagnosis in patients under pharmacological treatment with anti-resorptive/antiangiogenic drugs.

Surgical treatment seems to have a positive impact on MRONJ treatment in cases of peri-implant involvement.

COMPARISON BETWEEN CLINICAL AND ULTRASONOGRAPHY MEASUREMENT OF GINGIVAL THICKNESS

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Aim: gingival thickness plays a fundamental role in planning regenerative and mucogingival treatments as well as determining success rate of these therapies. The objective of this study was to investigate the accuracy of gingival thickness measurement by two methods of clinical evaluation and intraoral ultrasonography.

Methods: the gingival thickness was measured on 30 patients in the midbuccal area of elements 1.2 and 1.6. For clinical measurement a #15 hand K-file equipped with a rubber stop was vertically inserted into the gingiva, measuring the length with a digital caliper.

Ultrasonographic measurement was performed using an intraoral probe with a frequency of 12 MHz on the gingival surface, in the entry point of the file. Statistical analysis was performed by paired t-test, correlation coefficient and receiver operating characteristic (ROC) curve ($\alpha = 0.05$).

Results: in the anterior region there was not significantly difference ($p = 0.434$) between test and control, at the 95% confidence level. In the posterior region, the mean gingival thickness measured by the two methods was significantly different ($p = 0.006$).

The power of ultrasonography in both regions was significant (>50%). The power in the anterior region was greater than in the posterior region. The sensitivity of ultrasonographic evaluation in both regions was 0.833, while the specificity in the anterior region (0.611) was more than the posterior one (0.583).

Conclusions: the use of ultrasonography with an intraoral probe seemed to provide an acceptable accuracy for the determination of gingival thickness.

INFLAMMASOME EXPRESSION IN PERIODONTITIS AND PERI-IMPLANTITIS

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Aim: this study evaluated for the first time the expression of inflammasome-related genes in the gingival tissue of peri-implantitis (PI) patients as compared to periodontitis patients (PE).

Moreover, a qualitative histological description and semi-quantitative assessment of inflammatory score were performed.

Methods: gum tissue was collected from 5 stage III/IV periodontitis and 5 peri-implantitis patients during surgical procedures. Total RNA was extracted, quantified, reverse transcribed to cDNA and analyzed by a qRT-PCR system. The expression of the inflammasome NLRP2, NLRP3, AIM2 and related transcripts CASP1, ASC, IL-1β, IL-18 was assessed.

The gingival tissue was also histologically assessed and different stains were employed to evaluate the presence of inflammatory cells and to define their phenotype by immunohistochemistry.

Results: a significantly higher expression of AIM2, IL-1β and NLRP3 was suggested in the PI group, whilst IL-18 had a higher expression in PE patients.

The histological assessment showed a high intra-group variability in terms of inflammation score, with different amounts of lymphocytes CD20+, CD4+, CD8+; plasma cells and histiocytes.

Conclusions: based on these preliminary data, a higher expression of specific inflammasome related transcripts is suggested in peri-implantitis patients.

The data warrant confirmation in a larger sample of patients to draw more robust conclusions but they open the way for the search of potential future therapeutic targets.

GINGIVAL RECESSION: PREVALENCE IN A GROUP OF UNIVERSITY STUDENTS

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Aim: this study aimed to investigate the prevalence and distributions of gingival recessions in a young population and identify potential risk factors.

Methods: this study was conducted on 100 students (75% attending the degree course in Dentistry) the mean age of the sample (55% male) was 24.92±2.16 years.

The patients were subjected to a questionnaire to investigate their oral hygiene habits. Subsequently, a periodontal evaluation was performed using a Hu-Friedy PCP-15 periodontal probe.

Results: the mean FMPS and FMBS detected were 15.2±14.8 and 3.3±4.0, respectively. Data analysis showed that 65% of the subjects used a manual toothbrush and that the force applied during brushing maneuvers was self-reported as high in 25% of cases. 82% of students had at least one gum recession, out of a total of 418 recessions experienced, 75% had a depth of 1 mm, 21% had a depth of 2 mm, 3% of 3 mm, and 2 gingival recessions were 4 mm.

68% of gingival recessions were found on the mandibular arch, with a greater prevalence at the level of the lower right canine, 36% of students not attending dental school use a horizontal brushing technique. No statistically significant differences were found between electric and manual toothbrushes.

Conclusions: the prevalence of gingival recessions is higher in male subjects. The presence of recessions has been associated with the use of a toothbrush with medium and hard bristles. However, a higher prevalence was found among students attending other degree courses, where a horizontal brushing technique is common.

PRELIMINARY STUDY ON PCL-BMB 3D-PRINTED SCAFFOLD FOR ALVEOLAR BONE REGENERATION

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Aim: 3D-printing technology for scaffold realization, is a valid solution to optimize results and minimize collateral effects of maxillary surgery. Periodontal ligament stem cells (PDLSC) and adipose stem cells (ASC) have been plated on composite 3D-printed scaffolds (polycaprolactone (PCL) bovine-derived mineral bone (BMB)).

Methods: the comparation was carried out on three different types of materials: PCL/BMB 70/30, pure PCL and pure BMB. Dry technique was used to prepare PCL/BMB 70/30. All Scaffolds were 3D-printed with same standard parameters to hold PDLSC and ASC cells. Viability at 3, 7 and 14 days was carried out using CellTiter-Glo kit to test cells proliferation. Cells were also subjected to osteogenic medium to observe *in vitro* differentiation for 2 months and then a Real-Time PCR was performed to evaluate the expression of COLL1, RUNX2, OCN, and ALP genes. Morphological analysis was realized with SEM, and EDX was used to analyze collagenic matrix.

Results: between all materials there is a statistical difference in ASCs proliferation on neat PCL. Regarding BMB, PDLSCs shows a relevant proliferation rate. PCR data indicate a significant expression of COLL1 in all samples. OCN expression is higher in PDLSCs with an enhanced calcification compared to ASCs and it is confirmed by SEM and EDX.

Conclusions: PCL/BMB blend showed an improved osteoinductivity and biocompatibility compared to neat PCL. This result represents a relevant starting point for a customizable, resistant and osteoconductive material for tissues regeneration.

PERIODONTAL CONDITION IN CIRRHOTIC PATIENT AWAITING LIVER TRANSPLANTATION

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Aim: the aim of this study was to evaluate the dental and periodontal status of cirrhotic patients (CP) who were candidates for liver transplantation.

Methods: twenty cirrhotic patients and twenty control patients (C) were investigated (mean age 52 years). The dental and periodontal examination was performed and the following parameters were recorded: CPITN, DMFT, PLI, BOP, CAL and PPD. The two groups underwent periodontal treatment and were reevaluated after 6 weeks.

Results: 140 cirrhotic subjects were selected and proposed to participate in the study, 29 were enrolled. The mean DMFT% value in the two groups was found statistically different 42% in cirrhotic patients and 23.4% in healthy patients, more than double (p <0,05). Cirrhotic showed a mean value of BOP (20,07) and CAL (2,56) not significantly different respect to control BOP (25,30) and CAL (3,12), the PLI (65,85) of healthy patients was statistically greater respect to CP-PLI (41,72) (p <0,05). The mean variation of the periodontal indices in the two groups after the treatment was similar. An important reduction of purulent sites was highlighted in the CP group and there was a greater decrease in B.O.P.

Conclusions: DMFT index was statistically greater in CP respect to control, meaning a worse oral condition in subjects with liver disease Many of the cirrhotic patients had gingival inflammation despite less plaque index than the control. A greater motivation of the patient is necessary to immediately carry out a dental check-up, in order to be able to arrive at the transplant in the best conditions of oral health.

INTENSIVE PERIODONTAL TREATMENT IN T2DM: EFFECTS ON LIPID PROFILE AND ENDOTHELIAL FUNCTION

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Aim: local eradication of periodontal infection could potentially have a much broader impact on the diabetic condition by also contributing to the modification of the lipid profile, which is directly compromised in the alteration of endothelium-dependent vasodilation. The aim of this trial was to assess the benefits of intensive periodontal treatment (IPT) on the lipid profile and endothelial function of diabetic patients.

Methods: this was a 6-month, randomized controlled trial involving diabetic patients with generalized periodontitis. The study group comprised 290 individuals who were randomly assigned to receive Intensive Periodontal Treatment (IPT, Intervention Group) or conventional adult prophylaxis (Control Periodontal Treatment, CPT, Control Group). Outcomes encompassed lipid profile involving serum total cholesterol, serum triglyceride, low-density lipoprotein cholesterol, high-density lipo-protein cholesterol, and flow-mediated vasodilation (FMD) as an index of endothelium-dependent vasodilation (primary outcomes); periodontal indices and high-sensitive C-reactive protein were evaluated at baseline, 3 and 6 months after periodontal treatment.

Results: an increase in endothelium-dependent flow-mediated dilatation (FMD) was observed in the Intensive Periodontal Treatment group in comparison with Control (p <0.001), but results are not statistically different. There were no differences in lipid profile in individuals of both groups.

Conclusions: an intensive periodontal treatment might improve endothelial function, suggesting a direct beneficial effect on the vasculature, possibly mediated by systemic inflammatory reduction.

However, no statistically significant differences between groups were observed, and no benefits were proved on lipid profile.

PERIODONTAL TREATMENT ON PLASMA LEVELS OF ADMA: A RANDOMIZED CONTROLLED CLINICAL TRIAL

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Aim: endothelial dysfunction is one of the early pathogenic events of the atherosclerotic process. Severe periodontitis is considered to be an independent contributing risk factor for the pathophysiology of endothelial dysfunction. High blood concentration of asymmetric dimethylarginine (ADMA), an L-arginine analogue that inhibits nitric oxide (NO) formation, has emerged as one of the most powerful independent risk predictors of cardiovascular disease. Abrogation of periodontal inflammation might have clinical relevance, affecting the ADMA.

Insufficient clinical evidence exists for drawing clear conclusions regarding the long-term effects of periodontal disease on endothelial function, and even less evidence is available specifically on ADMA concentrations and their relationship with periodontitis. The objective of this study was to evaluate the effects of intensive periodontal treatment in modulating the endothelial function via the assessment of plasma ADMA concentration in patients diagnosed severe periodontitis.

Methods: this was a 6-month randomized controlled trial, including 140 patients between 41 and 63 years old who were diagnosed with severe periodontitis, free from cardiovascular disease (CVD), and had traditional cardiovascular risk factors. All patients underwent a complete medical and clinical periodontal examination, a laboratory analysis of ADMA, and an ultrasound assessment of FMD of the right brachial artery. After the screening, they were randomly assigned to receive either intensive periodontal treatment (test group, n = 70) or community-based periodontal care (control group, n = 70). A full examination was carried out at baseline, 3 and 6 months after the periodontal treatment.

Results: a total of 236 individuals diagnosed with periodontitis were screened. One hundred forty participants were enrolled. No statistically significant difference was observed over the time in ADMA concentration after the intensive periodontal treatment within the test group. No differences were revealed between the groups in the ADMA concentration at baseline and during follow-up.

Conclusions: intensive periodontal treatment does not affect the plasma levels of ADMA in patients without any risk for cardiovascular disease.

EFFECT ON TISSUE THICKNESS BY MANAGING EMERGENCY PROFILE IN THE CORONALLY ADVANCED FLAP

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Aim: to evaluate tissue modification tendency when performing Class V restoration in patients planned for recession reduction through coronally advanced flap.

Methods: 50 teeth were recorded, 47 were affected by the vestibular recession (Miller 1), and 3 were without recessions. 17 had a cervical abrasion. Patients underwent the following protocol. Firstly, Class V restoration has been executed followed by alginate impressions. After that, a plaster cast have been developed. Finally, a periodontal chart has been performed. At baseline and at follow-up (average elapsed time = 132 days ± 48) were scanned to create STL files matched and analyzed with software.

Results: the modified emergence profile obtained through the composite resulted in inducing a tissue change in horizontal and vertical dimensions. This leads to an increase in thickness at the level of the free gingival margin.

Conclusions: Class V restorations with an increased emergence profile have shown to be effective in changing tissue thickness during an average observation time of 3 months.

VOLUMETRIC CHANGES AT EDENTULOUS SITES AUGMENTED WITH VCMX OR SCTG

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Aim: comparing soft tissue volumetric and linear changes at intercalated edentulous ridge defects after augmentation procedure using a volume-stable collagen-based matrix (VCMX) or a subepithelial connective tissue graft (SCTG). Demonstrating the non-inferiority of VCMX compared to SCTG would provide a less invasive and better tolerated technique for soft tissue augmentation to optimize the aesthetics of the prosthetic rehabilitation.

Methods: a single-center, randomized, non-inferiority study was conducted with two parallel groups and a 1:1 allocation ratio. 13 patients with a Seibert class I were randomly assigned to the test group (VCMX) and the control group (SCTG) and had soft tissue augmentation by an envelope flap. Optical impressions were taken using an intra-oral 3D scanner at baseline (T_0), one month after surgery (T_1) and 3 months after surgery (T_2). The images were exported as STL files to be superimposed and analyzed.

Results: the mean volume gain was 41.4±20.6 mm^3 between T_0-T_2 for VCMX group, whereas in the SCTG group the mean volume gain was 65.4±35.0 mm^3. For the VCMX group, the mean linear changes between T_0-T_2 at 1, 3, and 5 mm were 0.42±0.43 mm, 0.83±0.39 mm and 0.86±0.45. For the SCTG group, the mean of linear changes between T_0-T_2 at 1, 3, and 5 mm were 1.03±0.33 mm, 1.58±0.64 mm and 2.29±0.82 respectively.

Conclusions: these preliminary findings suggest that both SCTG and VCMX can be used in crestal augmentation in class I Seibert defects: both groups achieved positive volumetric and linear changes at 3 months follow-up; SCTG group achieved a greater increase.

EFFECT ON SUBGINGIVAL MICROBIOME BY SUBGINGIVAL AIR-POLISHING WITH ERYTHRITOL: RCT

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Aim: the aim of this study was to evaluate the effect on periodontitis-related subgingival microbiome of air-polishing during non surgical treatment of deep bleeding pockets in stage III-IV periodontitis patients.

Methods: 40 patients with stage III-IV periodontitis were selected and pockets with probing depth 5-9 mm and bleeding on probing were selected as experimental sites (ES). All patients underwent a full-mouth session of supragingival air-polishing and ultrasonic instrumentation. The test group received additional subgingival air-polishing at ES. Subgingival microbial samples were taken from the deepest ES at baseline. Microbiological outcome was the change of microbiome at 3 months: analysis of periodontal pathogens and other subgingival plaque bacteria sampled was performed through a real-time quantitative PCR microarray.

Results: in the test group, we observed a statistical increase of some good species (*Abiotropha defectiva, Capnocytophaga sputigena*, and *Lautropia mirabilis*) and a decrease of pathogens such as *Actinomyces israelii, Catonella morbi, Filifactor alocis, Porphyromonas endodontalis, Sele-nomonas sputigena, Tannerella forsythia, Treponema denticola* and *Treponema socranskii*.

In the control group, we observed statistical significance only in the decrease of *Filifactor alocis, Tannerella forsythia,* and *Treponema socranskii*.

Conclusions: subgingival air-polishing seems to cause a shift of the periodontal microbiome toward a more eubiotic condition compared to a conventional treatment in deep bleeding periodontal pockets.

CAF CTG *VS* CAF FOR THE TREATMENT OF RT2 MAXILLARY RECESSIONS: 10-YEAR RESULTS OF A RCT

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Aim: the aim of the present study was to report the 10-year follow-up of a randomized clinical trial evaluating root coverage outcomes at single RT2 maxillary recessions after a Coronally Advanced Flap (CAF) with or without the addition of a Connective Tissue Graft (CTG).

Methods: 21 of the original 29 patients (11 treated with CAF + CTG and 10 with CAF), were available for the 10-year follow-up. A calibrated blind examiner performed all the measurements. Outcome measures included complete root coverage (CRC), recession reduction (RecRed), Root coverage Esthetic Score (RES), and Keratinized Tissue (KT) Gain. Visual Analogue Scale (VAS) was used to evaluate patient satisfaction.

Results: complete root coverage was maintained in 60% of the test group and 20% of the control group after ten years, with a significant difference (OR = 39) favoring CAF + CTG. The addition of CTG was associated with greater KT gain ($p = 0.0002$) and greater papilla tip recession ($p = 0.023$) than CAF alone.

No difference was detected regarding RecRed, RES, and patient satisfaction.

Conclusions: the addition of a CTG under the CAF improves the possibility of maintaining complete root coverage up to 10-years after the treatment of single maxillary RT2 recessions.

ADJUNCTIVE THERAPY WITH A SPERMIDINE-BASED GEL FOR THE TREATMENT OF PERI-IMPLANT MUCOSITIS

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Aim: peri-implant mucositis is an inflammatory lesion which, if not correctly treated, could rapidly progress to peri-implantitis, leading to an irreversible marginal bone loss and implant failure. Although the efficacy of non-surgical therapy, only 43.7% of the treated implants achieve a complete inflammatory resolution. Spermidine is a biogenic polyamine used in medicine due to its anti-inflammatory and immuno-modulating properties, although it has not yet been used in peri-implant therapy. Therefore, the aim of this study is to evaluate the efficacy of a spermidine-based gel as an adjuvant to non-surgical treatment of mucositis.

Methods: six patients with peri-implant mucositis were selected. The clinical variables were BoP (Bleeding on Probing; %), PD (Probing Depth; mm) and mPII (modified Plaque Index; 0-3). After a non-surgical therapy performed by means of an ultrasonic scaler with a PEEK tip, the spermidine-based gel "A-Trophic" was first applied in the peri-implant sulcus with a blunt-tipped needle, followed by gel "B-Sealing". All parameters were recorded at baseline and at 21-day. Data analysis was performed with Wilcoxon test ($p < 0.05$).

Results: the results showed a statistically significant reduction for BoP (61±29%) and PD (0.94±0.66 mm), while no differences were recorded for mPII ($p < 0.102$).

Conclusions: despite the small number of patients, spermidine-based gel could represent an effective additional aid to the treatment of peri-implant mucositis. Nevertheless, the study results will still need to be confirmed at 3-month follow-up.

LASER MICROTEXTURED COLLAR IMPLANTS *VERSUS* SMOOTH COLLAR IMPLANTS: 10 YEARS OF FOLLOW-UP

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Aim: the objective of this study is to compare clinical outcomes of implants with laser microtextured collar (LM) to implants with smooth collar (SC) after 10 years of follow-up.

Methods: this study was designed as a retrospective analysis in which seven SC implants and four LM implants were selected.

The clinical and radiological variables were Probing Depth or PD (mesial, distal, buccal, oral; mm) and Marginal Bone Loss or MBL (mesial and distal; mm).

All parameters were recorded at baseline and at 10-year follow-up. Intra-group analysis was performed by Wilcoxon signed-rank test, while Mann-Whitney test was adopted for inter-group comparison.

Results: the SC group showed a statistically significant difference for mesial MBL (0.87±0.3) and distal MBL (0.89±0.3), while no statistically significant differences were observed in LM group. Inter-group comparison did not demonstrate statistically significant differences for mesial PD (SC: 4.86±0.4; LM: 4.75±0.5), distal PD (SC: 4.71±0.5; LM: 4.50±0.6), buccal PD (SC: 4.00±0.6; LM: 4.50±0.6), oral PD (SC: 4.43±0.5; LM: 4.50±0.6), mesial MBL (SC: 1.11±0.2; LM: 1.03±0.2) and distal MBL (SC: 1.11±0.2; LM: 1.10±0.2) at the 10-year follow-up.

Conclusions: despite the small numbers of patients, the results suggest that LM implants provide more favorable clinical conditions (MBL) compared to SC implants, although both ensured an implants survival at 10 years.

TOPICAL OZONE THERAPY. OZONATED OLIVE OIL AND SALIVARY MMP-8: A CLINICAL STUDY

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Aim: extracellular matrix metalloproteinases (MMPs) play a key role in the periodontal tissue damage in patients with periodontitis. Scaling and root planning (SRP) try to control the amount of oral biofilm and to decrease the bacterial load. Non-surgical periodontal treatment can be combined with drug treatment and physiotherapeutic procedures such as topical ozone. The aim of this study was to assess in a group of patients diagnosed with periodontitis: (1) the efficacy of non-surgical periodontal treatment supported using ozonated olive oil mouthwash on salivary metalloproteinase (MMP-8) and (2) the variation of periodontal indices.

Methods: ninety-six subjects with diagnosed periodontitis were included in the study and randomly allocated to the study group (SRP + mouthwash) or the control group (SRP). The duration of the study was 3 months. Data on MMP-8, plaque index (PI), bleeding on probing (BoP) were recorded at T_0, T_1 (14 days), T_2 (1 month) and T_3 (6 months). Differences between groups were assessed using Student's t-test for independent samples.

Results: significant improvements in PI, BoP, and salivary MMP-8 levels were observed in both groups. Analysis of the differences in the relative changes in the indices showed the effectiveness of ozonated olive oil in reducing MMP-8 levels. At the same time, ozonated olive oil slowed down the level of MMP-8 also with a decrease in the BoP index.

Conclusions: scaling and root plating with the help of mouthwash with ozonated olive oil were more effective in reducing salivary MMP-8 than scaling and root plating alone.

CORONALLY ADVANCED FLAP IN MULTIPLE RECESSIONS TREATMENT

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Aim: the aim of the present study was to evaluate the effectiveness of coronally advanced flap for treatment of multiple gingival recessions on teeth 1.6, 1.5, 1.3 placing keratinized tissue apically.

Methods: after a professional hygiene session, a mucogingival surgery was performed by coronally advanced flap technique. The oblique paramarginal incision has to converge at the "fulcrum tooth", that is the axis around which the flap rotates and moves coronally. The oblique incision also allows the apex of surgical papilla to be moved toward the apex of the corresponding anatomical papilla. At the apical level, the flap was partial thickness. After exposed root surface scaling and root planing, the de-epithelialization of anatomic papillae was required in order to create a recipient bed for the surgical papillae. Suture removal was performed 15 days after surgery.

Results: one year after surgery, it can be noticed that the coronal keratinized tissue increased in volume and width and remained stable over time without anesthetic scars. It also provided a good camouflage of the treated area in terms of color and thickness compared to the adjacent soft tissues.

Conclusions: in case of multiple recessions in patients with aesthetic needs, the coronal advanced flap can be considered satisfactory with good results after one year follow-up and few postoperative discomforts.

PAPILLA PRESERVATION TECHNIQUE: A CASE SERIES

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Aim: the aim of this study was to describe the clinical and surgical approach of two case series treated with the entire papilla preservation technique.

Methods: two clinical case series of intrabony defects on mandibular molars were treated with the entire papilla preservation technique. A buccal full-thickness muco-periosteal flap extended to the defect-associated papilla was performed. The defects were rinsed with sterile saline and the exposed roots were treated applying EDTA (Ethylenediaminetetraacetic acid). Enamel matrix derivative was applied onto the root surfaces and, after that, the heterologous bone chips were placed in the intrabony defects.
The flap was sutured with 5/0 suture.

Results: the entire papilla preservation technique is a new surgical approach similar to tunneling for the regenerative treatment of large and deep intraosseous defects. This approach was proposed in 2017 to preserve the whole integrity of defect-associated papilla providing a tunnel-like undermining incision. The entire preserved papilla provided an intact gingival chamber to stabilize the blood clot and improved wound healing. This technique could promote primary healing above the biomaterial and increase the stability of clot formation within the intraosseous defect.

Conclusions: in the two clinical cased the papilla preservation technique showed excellent healing results and seemed to provide ideal clinical conditions to promote the early and late healing phases.

THE EXPRESSION OF INFLAMMASOMES IN PERIODONTITIS PATIENTS

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Aim: the aim of this study was to compare the expression of inflammasome-related genes (AIM2, NLRP2, NLRP3, ASC, CASP-1, IL-1β, 1L-18) in the gingival tissue of periodontitis and healthy patients.
Methods: 5 healthy (H) and 5 stage III/IV periodontitis (P) patients were recruited. Total RNA was extracted and quantified from samples of gingival tissue collected during surgeries. A reverse-transcription to cDNA and a qRT-PCR were then performed to analyse the mRNA levels. The gingival tissue was also histologically assessed and different stains were employed to evaluate the presence of inflammatory cells and to to define their phenotype by immunohistochemistry.
Results: similar levels of expression are suggested for ASC and IL-1β, while NLRP2 and NLRP3, CASP-1 and IL-18 had a non-statistically significant trend for overexpression in the P group. AIM2 tended to have a higher expression in the H group ($p > 0.05$).
Despite a significant intra-group variability was observed, it was histologically observed that the inflammatory infiltrate was higher in the P group, with rare granulocytes and the predominance of CD4+ and CD8+ T-cells, B-cells (CD20+), plasma cells and histiocytes.
Conclusions: the gene expression level and histology/immunohistochemistry analyses suggest a high intra-group variability. While inflammasome-related genes might correlate with the higher inflammation identified in periodontitis patients, no significant differences were detected. A higher sample size is warranted to draw more robust conclusions.

GASEOUS OZONE THERAPY AND PERIODONTAL TREATMENT ON OXIDATIVE STRESS MEDIATORS IN T2DM

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Aim: chronic inflammation and cumulative oxidative stress have been theorized as two common pathways of the interconnection between periodontitis and diabetes. Improvement in oxidizing status has been demonstrated in periodontal patients with diabetes treated with proper non-surgical periodontal treatment. In addition to periodontal treatment, Gaseous ozone therapy has been reported to possess anti-inflammatory properties and the ability to stimulate the endogenous antioxidant defence mechanism. To date, the antioxidant effect of gaseous ozone, in addition with periodontal treatment in diabetic patients, has been examined in only one study. The aim of this study was to determine the efficacy of gaseous ozone therapy as an alternative approach to 2 supporting non-surgical periodontal therapy (NSPT), aimed at improving antioxidant machinery and interfering with ROS production on plasma levels in diabetic individuals diagnosed with moderate or severe periodontitis.
Methods: one hundred and eighty patients with periodontitis and type 2 diabetes mellitus were randomly assigned to receive non-surgical periodontal treatment (NSPT) plus gaseous ozone therapy (A) NSPT alone (B). Clinical and periodontal parameters and plasma levels of oxidant-antioxidant (TOS-TAS) levels, glutathione (GSH), and malondialdehyde (MDA) were recorded at baseline and at 3- (T1) and at 6-months (T2) after treatment.
Results: both treatments were efficacious in reducing clinical parameters. However, there were no significant differences regarding oxidative stress parameters in group A compared to group B, and the levels of TOS and TAS ($p > 0.001$) were registered.
Conclusions: in the present study, gaseous ozone therapy did not enhance the effect of periodontal treatment in reducing oxidative stress in plasma levels of periodontitis patients with type II diabetes. Trial registration: The study was registered with ISRCTN17281691.

A CLINICAL AND HISTOLOGICAL ANALYSIS OF DENTIN MATRIX IN ALVEOLAR RIDGE PRESERVATION

Russo V.

Aim: the aim of the study is to evaluate the clinical and histological efficacy of Autogenous Tooth-Derived Mineralised Dentin Matrix (DDM) covered with free gingival graft (FGG) in the Alveolar Ridge Preservation Technique in periodontally maintained patients.

Methods: for this study it was used a split-mouth protocol, in which 14 patients requiring double extraction of a single-rooted tooth were enrolled. After the extraction, the tooth was cut in small pieces and inserted in milling machine to obtain DDM. Sites were randomized in two different groups: the test group, characterized by the introduction of DDM covered by free gingival graft (FGG) and the control group, characterized by spontaneous healing associated with FGG.

Results: all enrolled patients successfully completed the study. the statistically significant parameters were:
Viable bone was 30.22% t 14.48% in the control group compared to 34.23%‡13.56% in the test group.
Connective tissue, the control group showed an average of 29.23%‡10.16% compared to 27.36% t 9.65% in the test group.

Conclusions: the use of mineralised autogenous dentin grafts has resulted in greater viable bone formation and less tissue dimensional changes than spontaneous healing. Consequently, the use of mineralised matrix grafts derived from autogenous teeth for alveolar ridge preservation has the potential to become a viable substitute for other grafting materials in the field of implants.

BIOLOGICAL PROPERTIES OF 3D-PRINTED PCL-ATZ SCAFFOLDS FOR PERIODONTAL REGENERATION

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Aim: biological properties of polycaprolactone (PCL) 3D-printed scaffolds w/ or w/o alumina toughened zirconia (ATZ) were evaluated as suitable substrate material for alveolar bone and periodontal ligament (PDL) regeneration.

Methods: the ATZ was incorporated in PCL by solvent casting method. PCL/ATZ 80/20 w/w%, 60/40 w/w% composites and pure PCL were prepared. A scaffold with a porous and circular geometry was 3D printed for biological assays with ASC52 hTert cells line. 24h adhesion test and cell viability assay at 3, 7, 14 days was performed by CellTiter-Glo kit. Scaffolds were held in osteogenic medium for 2 months, then ALP, COLL1, OCN and RUNX2 were quantified with Real-Time PCR (RT-PCR). SEM micrographs of the 3 scaffolds were acquired along with EDX analysis to quantify the presence of calcium deposition.

Results: all the scaffolds allowed ASC adhesion and growth, in particular PCL/ATZ 80/20 w/w% showed better biocompatibility, although the osteoinductivity was reduced with the addition of ATZ. There were no significant differences on ALP and RUNX2 expression, while both COLL1 and OCN were reduced in presence of ATZ filler. These results were consistent with SEM images and EDX quantification of calcium aggregates in the new tissue formation.

Conclusions: the presence of ATZ powder in PCL reduced the osteoinductivity of the scaffolds. This plays a relevant role in the final choice of the material to be used in PDL regeneration, as it could limit the possibility of tooth ankylosis. Future tests will be focused on other biological and mechanical properties of the blends.

COMPARISON OF CYTOTOXICITY BETWEEN PREHYDRATED AND DRIED ACELLULAR PORCINE DERMAL MATRICES

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Aim: the aim of this study was to compare, *in vitro*, the indirect and direct cytotoxicity of a porcine dried acellular dermal matrix (PDADM) versus a porcine hydrated acellular dermal matrix (PHADM), both used for periodontal and peri-implant soft tissue regeneration.

Methods: for evaluated the direct cytotoxicity was used the Trypan exclusion method (TEM) and the reagent WST-1 test, using human primary mesenchymal stem cells (HPMSCs) seeded directly into a PDADM and PHADM after seven days. Two standard indirect cytotoxicity tests namely, lactate dehydrogenase (LTT) and MTT (3-[4,5-dimethyl-2-thiazolyl]-2,5-diphenyl 2H-tetrazoliumbromide) were performed using HPMSCs cultivated in eluates from the matrices incubated for 0.16 h (10 min), 1 h, and 24 h in a serum-free cell culture medium. A one-way analysis of variance (ANOVA) with a Tukey's post-hoc test was used for multiple comparisons and was considered to be significant with a ($p < 0.05$).

Results: the direct cytotoxicity levels were significantly lower values of HPMSCs on the PHADM compared with the PDADM, instead the indirect cytotoxicity levels were low for both the PHADM and PDADM. They were lower for the PHADM with a statistically significant difference ($p < 0.005$).

Conclusions: the increased cellular viability hypothesized by the hydrated form allowed better cell adhesion and proliferation and faster and earlier revascularization. Hence the results of the present study demonstrated a different biological behavior between PHADM and PDADM, with the hydrated form showing lower direct and indirect cytotoxicity.

LONGITUDINAL STUDY ON THE TREATMENT OF PERIODONTITIS: PROGNOSTIC FACTORS FOR TOOTH LOSS

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Aim: to investigate factors potentially predicting tooth loss in periodontal patients after at least 10 years of SPT.

Methods: the analyzed sample consisted of 20 subjects, treated and maintained in different periodontal specialist practices. A statistical analysis was conducted at patient and tooth level, using tooth loss at 10 years as the primary outcome. In addition, a sub-analysis was performed on elements with PPD ≥5 mm at re-evaluation.

Results: 512 teeth were present at baseline. During steps 1 and 2, 23 teeth were extracted. After re-evaluation, 121 teeth underwent periodontal surgical therapy. Out of the 489 teeth present at re-evaluation, 44 were lost at 10 years. Stage IV Periodontitis patients tend to lose more teeth than stage III patients. Mobility was found to be correlated to the risk of tooth loss (OR = 3.1). In addition, molars had a more than four-fold increased risk of being lost at 10 years and teeth with more than 4 pockets were found to be at higher risk for tooth loss (OR = 50.2).

On teeth presenting residual pockets after steps 1 and 2 of therapy, periodontal surgery appears to be a protective factor to tooth mortality with an OR = 7.9.

Conclusions: the stage of periodontitis correlates with the likelihood of tooth loss after 10 years in subjects treated for periodontitis and placed in a maintenance system. Molars, mobile teeth and elements with ≥5 pockets tend to have a higher chance of being lost after 10 years. Periodontal surgery at teeth with residual pockets after re-evaluation significantly decreases tooth loss.

AGREEMENT IN DEFINING THE PERI-IMPLANT HEALTH STATUS ACCORDING TO THE 2018 CLASSIFICATION

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Aim: to evaluate the agreement between examiners in defining the peri-implant health status according to the 2018 Classification of peri-implant health and diseases and their accuracy against a reference diagnosis.

Methods: ten undergraduate dental students, 10 general dentists and 10 experts in implant dentistry participated in this study. All examiners were provided with clinical and radiographic documentation of 25 dental implants. Eleven out 25 cases were also provided with baseline readings. They were asked to diagnose all cases using the 2018 Classification. Agreement among examiners was evaluated using the Fleiss kappa statistics. Accuracy was estimated using percentage of complete agreement and quadratic weighted kappa for pairwise comparisons between each examiner and a gold standard diagnosis.

Results: pairwise comparisons between each examiner and the gold standard showed a mean quadratic weighted kappa value of 0.544. The percentage of complete agreement with the gold standard diagnosis was 59.8%. Expertise in implantology affected accuracy positively ($p < 0.001$) while the absence of baseline readings negatively ($p < 0.001$). With respect to the inter-examiner agreement, Fleiss kappa was 0.50 (95% CIs: 0.48 - 0.51).

Conclusions: both inter-examiner agreement and accuracy in defining the peri-implant health status according to the 2018 Classification were mostly moderate. Some difficulties arose in presence of specific challenging scenarios.

SEX-SPECIFIC IMMUNOLOGICAL FEATURES OF ORAL MICROBIOME IN DISEASED AND HEALTHY INDIVIDUALS

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Aim: to exam if a sex-based dimorphism exists in the humoral immune response to the periodontal microbiota (outcome), in a propensity score matched (PSM) population of adult men and women.

Methods: one-to-one PSM was applied to adult individuals (≥40 years) enrolled in the National Health and Nutrition Examination Survey (NHANES) III, to obtain exact matches for age, ethnicity, periodontitis diagnosis and severity, smoking habits, body mass index (BMI) between sexes. Participants underwent determination of serum antibodies to 21 periodontal microorganisms and periodontal and biochemical evaluations. Machine learning (ML) approaches were applied to test if specific antibodies could predict sex and if a sex-specific immunological phenotype could discriminate between healthy and individuals with periodontitis.

Results: 2724 matched female and male participants (n. 1362/group) were included in the study. Antibody titers to various microorganisms were found to be significantly different between men and women, both in healthy and periodontitis individuals. In ML, antibody titers to oral microbiome predicted sex with a sensitivity up to 67% and a specificity up to 55% during periodontitis, but not in healthy individuals.
Age, BMI, and smoking did not substantially improve classification capacity.

Conclusions: humoral immune response to periodontal microbiota appears to be sex-specific. Future investigations are needed to clarify the clinical meaning of our findings, and if a sexual dimorphism in the immune response carries prognostic implications in health and disease.

THE USE OF MOUTH RINSES IN PERIODONTAL PRACTICE AND THEIR SIDE EFFECTS: A REVIEW

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Aim: the main goal of this review was to search the literature for side effects reported in clinical trials investigating the efficacy of several mouthwashes on plaque, gingivitis, and halitosis.

Methods: three databases (Cochrane central register of controlled trials, Medline via PubMed and CINAHL via EBSCO) were searched up to September 2022, paper written in English, Spanish, French and Italian were included in the selection.

Results: after a thorough screening of the databases and after removing duplicates 514 articles were retrieved. 155 articles remained after reading the abstracts and were subsequently fully reviewed. Only 86 publications met the eligibility criteria and were included in our study. Staining was the most common adverse effect reported in these studies, particularly when associated with the prolonged use of chlorhexidine - based mouth washes but, in most cases, study relied on patients reports and not on quantitative measurements.

Among the reviewed actives there were chlorhexidine, chlorhexidine + hyaluronidase, hyaluronic acid and hydrogen peroxide, cetylpyridinium chloride and essential oils.

Conclusions: the lack of side effects reported may be due partly to a lack of a uniform method of reporting the side effects and a lack of objective measures and adequate duration, which makes it difficult to contextualize it. New and more complete research as well as specific guidelines for reporting adverse events are needed in order to draw conclusions.

EFFECTIVENESS OF HYALURONIC ACID APPLICATION IN SURGICAL TREATMENT OF GINGIVAL RECESSION

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Aim: the aim of this systematic review was to provide further scientific evidence on the efficacy of application of hyaluronic acid in the coverage gingival recessions in terms of recession reduction (RD), clinical attachment level (CAL) gain and pocket depth (PD).

Methods: an electronic search of the literature on the main databases was conducted. Only articles written in English and without time exclusion criteria until May 2022 were screened. Initially, 405 articles were identified. Finally, 4 studies were included after the review process. It was not possible to perform a meta-analysis of the articles selected because of the differences among the surgical treatments and commercial formulations and compositions of hyaluronic acid.

Results: in this research, both RCTs examined RT1 gingival recessions were treated with coronally advanced flap (CAF). Recessions were treated with either Modified Coronally Advanced Tunnel (MCAT) or LCT Laterally Closed Tunnel (LCT) combined with (subepithelial connective tissue graft) sCTG and hyaluronic acid in all case series. The obtained results of RD reduction are in accordance with the literature in both the two RCTs and the two Case Series.

Conclusions: the studies analyzed no significant variation was found in PD variable.

Modifications of CAL are connected to variations of RD. HA seems to improve the clinical outcomes of the described surgical treatment. However, the limitations of this systematic scoping review do not allow to draw significant conclusions about the application of HA in surgical gingival recession treatment.

PERIODONTITIS AND CARDIOVASCULAR DISEASE RISK: IMPACT ON MIRNA PROFILES

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Aim: recent literature has shown the involvement of miRNA in several epigenetic processes linked with periodontal disease, increased oxidative stress and cardiovascular disease (CVD). Aim of this study was to assess the impact of periodontitis on gingival crevicular fluid (GCF) miRNA expression associated with CVD risk; other aim was to evaluate possible confounders that influenced this association.

Methods: 115 subjects were enrolled and divided into 4 groups: healthy controls (n = 28), subjects with CVD (n = 28), periodontitis (n = 30) and periodontitis+CVD (n = 29).

All subjects underwent regular periodontal examinations and blood sampling. After GCF sampling, miRNA 7a-5p, 21-3p, 21-5p, 100-5p, 125-5p, 200b-3p, and 200b-5p expression was analysed using a real-time quantitative polymerase chain reaction (RT-PCR).

Results: the results showed that periodontitis and periodontitis+CVD subjects presents significantly different GCF miRNAs expression compared to healthy controls and CVD subjects: there were higher GCF miRNA 7a-5p, 21-3p, 21-5p, 200b-3p, and 200b-5p ($p < .05$) and lower miRNA 100-5p, and 125-5p levels ($p < .05$). In addition, the multivariate regression analysis evidenced that periodontitis (miRNA 21-3p, 100-5p) and periodontal inflames surface area (PISA) (miRNA 7a-5p, 21-3p, 21-5p, 100-5p, 125-5p, 200b-3p) were significant predictors of GCF miRNAs concentration ($p < .05$).

Conclusions: the results of this study highlighted that the periodontitis and periodontitis+CVD group showed higher GCF miRNAs expression than the other two groups. In addition, periodontitis and its extent (PISA) were revealed as significant predictors of GCF miRNAs associated with CVD risk.

USE OF SONIC INSTRUMENTS IN PERIODONTOLOGY

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Aim: the study aims to evaluate how Sonic Line instruments by Komet® can treat compromised periodontal pockets. In addition, the study aims to determine how these instruments perform better than other ultrasonic instruments, even when treating implant-related tartar.

Materials and Methods: twenty patients (aged 30-45 years) were selected. The selection criteria were based on:

- completion of the periodontal portfolio: six-point periodontal probing for each dental element, recording of PD, CAL, bleeding, multi-rooted tooth furcations, dental mobility, gingival recessions.
- Recording of the presence of dental implants.
- Evaluation of the periodontal risk.

The subjects selected were treated in two sessions: the first, using Komet® Sonic Line Scaler instruments. The second, for recall and control, was set up 40 days after the first, and the periodontal indices were compared to those obtained at the first visit using a millimeter periodontal probe.

Results: the results focused on the Komet® SF10 sonic tips. These tips allowed for less invasive scraping of the tooth root, resulting in a greater periodontal recovery and reduced postoperative sensitivity.

For teeth showing furcations, it is possible to use the SF11 sonic tip, which, thanks to its specific shape, allows for the atraumatic removal of plaque while respecting the soft tissues.

Conclusions: within the clinical cases treated in this study, sonic instruments allowed for gentle and precise removal of supra- and sub-gingival tartar, with easy cleaning of pockets deeper than 4 mm.

INFLUENCE OF PD AND CVD ON LEVELS OF SOLUBLE UROKINASE-TYPE PLASMINOGEN ACTIVATOR RECEPTOR

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Aim: this study aimed to assess soluble urokinase plasminogen activator receptor (suPAR) as a biomarker of periodontitis and coronary heart disease (CHD) by examining the effects of gingival health, periodontitis, and CHD on suPAR levels in plasma and saliva.

Methods: the enrolled patients were divided into four groups: healthy controls (n = 33), patients with periodontitis (n = 31), CHD (n = 29), and a combination of periodontitis + CHD (n = 29). All patients underwent clinical and periodontal evaluation and were assessed based on socioeconomic status, smoking history, serum lipids and glucose level, high-sensitivity C-reactive protein (hs-CRP) testing, and plasma and salivary suPAR levels.

Results: compared to CHD and healthy controls, patients with periodontitis (P <.001) and periodontitis + CHD (P <.001) had higher median plasma and salivary suPAR levels. Furthermore, univariate regression analysis demonstrated that plasma and salivary suPAR levels were significantly negatively affected directly by both hs-CRP (P <.001) and periodontitis (P <.001). Periodontitis was the only significant predictor of plasma suPAR (P = .035), and hs-CRP was the only significant predictor of salivary suPAR (P <.001), according to the results of the multivariate regression analysis.

Conclusions: in comparison to CHD and healthy controls, individuals with periodontitis and periodontitis + CHD had greater levels of suPAR in both saliva and plasma.

Furthermore, the elevated suPAR levels in plasma and saliva were only significantly predicted by periodontitis and hs-CRP, respectively.

DIFFERENT TECHNIQUES OF CROWN LENGTHENING FOR RESTORATIVE APPROACHES IN ESTHETIC SECTOR

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Aim: Crown lengthening (CL) is one of the most common periodontal surgical procedures for restoring sub-gingival caries, crown or root fractures and for aesthetic enhancement. Its aim is to re-establish the biological width in a more apical position. In this study we compare three different aesthetic CL surgical approaches and describe the main indications and recommendations.

Methods: the first one is gingivectomy and subsequent osteotomy in a single step.

The second one consists of an osteotomy and an erbium laser gingivectomy after a 4-month healing.

The last one consists of a flapless technique in which the osteotomy and gingivectomy are performed at the same surgical time without the need of a full thickness flap.

Results: for thick phenotype patients, wide keratinized tissue and wide vestibular plate, the one phase technique achieves a faster result.

The two phases approach reduces the risk associated with removal of soft tissue and permits to achieve better results preserving keratinized tissue width. It is ideal for patients with a thin phenotype and the total treatment time is not relevant avoiding the necessity of provisional restorations.

Flapless procedure is the chosen technique in medium or fine biotypes. This approach is indicated when buccal bone is thin and the height of the final keratinized tissue is 3.0 mm minimum.

Conclusions: the techniques depend on the initial clinical situation and the periodontal biotype. The periodontal diagnosis and operator experience are critical factors in clinical outcome.

CT BUCCAL BONE EVALUATION AFTER ORTHODONTITC PROCLINATION OF THE LOWER CENTRAL INCISORS

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Aim: this is a work-in-progress retrospective study whose purpose is to evaluate the buccal bone remodeling of the lower central incisors after orthodontics proclination using CT.

Methods: CTs were selected according to the inclusion and exclusion criteria. From the owned records it was possible to select 31 patients which were satisfying the criteria. Between these patients 46 teeth were electable for the measuring evaluation. Using a software (Weasis Dicom Viewer) the bone height and thickness were measured, before and after the treatment. The bone height represents the distance between the CEJ and the highest point of the buccal bone. The bone thickness represents the section area. It's a work in progress and the statistical analysis was not completed yet; It will be necessary to confront the measurement at T_0 and T_1.

Results:

1. In 16 teeth it was found an increased thickness and a decreased height.
2. In 14 teeth both the values were decreased.
3. In 9 teeth the thickness and the height were increased.
4. In 4 teeth the height was increased while the thickness was decreased.
5. In 3 teeth the height didn't change, and the thickness was decreased.
6. In no cases the heigh didn't change and the thickness was increased.

Conclusions: it's interesting to see how the remodeling pattern changes between the selected teeth, considering that the same treatment was used.

For further evaluations the statistic analysis is needed. In the final study we aim to evaluate if the remodeling patterns change according to the degree of proclination and the collected data will be combined with periodontal charts and clinical photos.

A NOVEL POINT-OF-CARE TEST FOR PERIODONTAL BIOMARKERS DETECTION

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Aim: in this study a novel highly sensitive point-of-care test (POCT), based on an optical biosensor exploiting the principles of surface plasmon resonance (SPR) to detect periodontal biomarkers, has been tested for the analysis of salivary MMP-8.

Methods: a plastic optical fiber (POF) was suitably modified and functionalized by an antibody self-assembled monolayer (SAM) for MMP-8 plasmonic detection. A white light source and a spectrometer connected to the biosensor were used to quantify MMP-8 level in both buffer and real matrix (saliva) by analysing the shift of the resonance wavelength determined by the specific antigen-antibody binding upon the SAM.

Results: dose-response curves by serial dilutions of human recombinant MMP-8 were realized, obtaining a limit of detection (LOD) of 40 pM in buffer and 225 pM in saliva, markedly lower than the LODs reported in the literature for other currently available POCTs for MMP-8. As a proof of concept for future biomedical applications, the proposed POCT was also able to discriminate between saliva samples from a periodontitis patient and a periodontally healthy subject.

Conclusions: although the present promising findings need to be validated by well-designed clinical studies, the proposed SPR-POF technology, also employable for simultaneous multiple biomarkers detection (patent application submitted), may represent an adjunctive low-cost diagnostic tool to real-time monitor periodontal conditions and intervene with even more targeted and timely therapy, preventing the onset of local and systemic complications.

EFFICACY OF PERIORISK ON PSYCHOLOGICAL OUTCOMES IN ANXIOUS AND/OR DEPRESSED PATIENTS

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Aim: to evaluate (i) the psychological profile and level of supragingival plaque control at first periodontal consultation and (ii) the efficacy of communicating periodontal risk on psychological outcomes and supragingival plaque control in patients with moderate to severe anxiety/depression (A/D) and matched controls (C).

Methods: pnts presenting for first periodontal consultation were enrolled in a randomized trial. The periodontal visit was followed by a 8' consultation performed as usual (Treatment as Usual; TaU) or implemented with the communication of *PerioRisk* level (RISK). Psychological outcomes were assessed before and immediately after TaU/RISK using the Positive Affect Negative Affect Scale (PANAS) and Protection Motivation Theory (PMT). In patients presenting at 8-12 weeks, Plaque Index (PII) was re-evaluated.

Results: thirty patients (15 D/A, 15 C) were included. Before TaU/RISK, A/D patients showed lower scores for positive emotions ($p < 0.001$) and higher scores for negative emotions ($p = 0.003$) compared to C patients. Although the consultation had positive effects on several PANAS and PMT items as well as PII, no significant differences in treatment effect was found between TaU and RISK.

Conclusions: an 8' consultation either implemented or not with the communication of *PerioRisk* level can effectively improve psychological outcomes and supragingival plaque control, even in A/D patients.

GUT MICROBIAL CHANGES AFTER STEP II OF THERAPY IN PATIENTS WITH STAGE III-IV PERIODONTITIS

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Aim: to compare the composition of the intestinal microbiome between subjects with stage III-IV periodontitis and periodontally healthy controls and to longitudinally evaluate the effect of periodontal treatment on the gut microbial composition.

Methods: stool and saliva samples from stage III-IV periodontitis patients (P; n = 47) were collected and analyzed by 16S rRNA gene sequencing, before and 3 months after steps I-II of periodontal treatment. Periodontally healthy matched subjects (H; n = 47) were used as controls. Principal component analysis (PCA) was carried out to identify oral-gut microbial profiles. P and H were compared in terms of PCA and microbial taxa; P were longitudinally compared before and after treatment.

Results: gut microbial profiles of P significantly differed from H ($p < 0.001$), being characterized by lower beta-diversity. Periodontal treatment was associated with a significant change in gut microbiota ($p < 0.001$), with post-treatment profiles tending to H ($p > 0.05$).

Genera *Bacteroides, Faecalibacterium*, and *Lachnospiraceae* were the most represented in P fecal samples, whereas genus *Lactobacillus* was more enriched in H. Periodontal treatment significantly reduced gut genera *Bacteroides*, *Eubacterium*, *Lachnoclostridium*, *Lachnospira*, *Lachnospiraceae*, *Oscillospiraceae*, *Roseburia* and *Ruminococcaceae*.

Conclusions: discriminating oral-gut microbial signatures of periodontitis were found.

Periodontal treatment significantly reversed the gut microbial composition, raising novel clinical implications about the relevance of the gum-gut axis.

ORAL ERYTHROPLAKIA: A CASE REPORT

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Aim: Oral erythroplakia (OE) is a very rare potentially malignant lesion of the oral mucosa, which occurs after the age of 45, especially in men. It's a magenta-red spot or plaque with moderate to severe dysplasia. Transformation rates are considered to be the highest among all oral precancerous. Surgical excision is the treatment of choice.
Methods: it reports the case of a patient referred to the Oral Pathology Service of the A.O. Ordine Mauriziano di Torino.
Results: T.P., male, age 54, smoker 20 cigarettes a day, occasional alcohol.
July 2022: abscess of half-occluded 48 taumatizing the buccal mucosa, given antibiotics.
August 2022: extraction of 48, remains red spot.
September 2022: incisionale biopsy with diagnosis of OE (moderate dysplasia); the patient stops smoking.
October 2011: Excision biopsy of the lesion *in sano*.
February 2022: 5-month follow-up no recurrence of the disease.
Conclusions: surgical excision of the OE, together with the elimination of the risk factors smoking and chronic traumatism, contributed to the patient's recovery.

MONOSTOTIC FIBROUS DYSPLASIA OF THE ANTERIOR MANDIBLE: A CASE REPORT

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Aim: Fibrous dysplasia (FD) is a bone disorder caused by a genetic defect altering osteogenesis and leading to the replacement of normal bone with an excess proliferation of fibrous tissue. It can affect a single site (monostotic fibrous dysplasia, MFD) or multiple sites (polyostotic fibrous dysplasia, PFD). FD is usually observed in adolescents and young people stabilizing in adulthood. In this paper we present a case of MFD involving the left anterior region of the mandible.
Methods: the 29-year-old female patient came to our attention without any symptoms in the affected region. On OPG a radiolucent lesion with irregular margins and non-uniform appearance was found, entirely involving element 3.3. After CBCT analysis, conservative surgical removal of the lesion and extraction of 3.3 was performed. Intra-operatively, a regenerative surgical approach using a pin-stabilized membrane was adopted.
Results: histological examination and radiological picture suggested the diagnosis of FD.
Postoperatively, the patient reported transient paresthesia of the affected area. Follow-up with mapping of the hypo-sensitive area was performed and pharmacological therapy was prescribed.
Complete recovery was achieved within 30 days.
Conclusions: fibrous dysplasia accounts for 7% of benign bone tumors. At the diagnostic stage, it is important to perform thorough clinical, radiographic and histological examinations to refute the differential diagnosis with other more aggressive tumors.
Conservative surgery is the most frequently adopted treatment, followed by osteoplasty through an intraoral approach. Observation and follow-up should be maintained closely.

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ORAL METASTASIS OF THYMOMA: A CASE REPORT

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Aim: the aim of this study is to report a rare case of oral metastasis of thymoma.

Methods and Results: in October 2022, a 62-year-old Italian man was visited at the Oral Medicine department of the Policlinico A. Gemelli referring a fast growing not ulcerated swelling on the left buccal mucosa.

The patient referred difficulties in chewing and mouth closure due to the lesion.

The patient's medical history reported a thymoma diagnosed in 2019 treated with thymectomy. Anamnesis was negative for smoking and alcohol consumption. The clinic examination revealed a swelling with well-defined and regular margins on the left half of the face. The oral examination confirmed the presence of an asymptomatic, non-ulcerated, blue color exophytic lesion localized on the left retromolar trigone. The Computed Tomography revealed an osteolytic area in the posterior mandible. Through a needle aspiration and incisional biopsy, siero-hematic material and a lesion sample were collected. The histo-pathological analysis reported a B3 type thymoma metastases.

Conclusions: this is only the second reported case of oral metastasis of thymoma. Although it seems to be an extremely rare event, oral metastases of thymoma are possible. Therefore, this disease should be considered in the differential diagnosis of mandibular osteolytic lesions when the anamnesis accounts for a thymoma.

ORAL ERYTHROPLAKIA: THE IMPORTANCE OF EARLY DIAGNOSIS IN THIS UNCOMMON ENTITY

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Aim: Oral erythroplakia (OE) is defined as any lesion of the oral mucosa that presents as bright red velvety plaques which cannot be characterized clinically or pathologically as any other recognizable condition. It is classically considered as oral potentially malignant disorders (OPMDs) with the highest rate of malignant development. This lesion is little seen in clinical practice, so the aim of this study is to report 3 clinical cases of OE describing their characteristics.

Methods: we collected data from each patient regarding the first dental visit, medical and pharmacological history, spoiled habits like smoking and type of lesion manifested in the mouth. A biopsy investigation was subsequently performed for each patient in conjunction with histopathological evaluation.

Results: time frame of the visits was between 2018 and 2022. On 2 cases the oral sites involved were the floor of the mouth, while on the third one was the mucosa of soft palate. Biopsy was performed and histopathological analysis revealed the diagnosis of OSCC in 2 out of 3 cases. In one case metastasis was already present at the level of the lateral-cervical lymph node.

Conclusions: OE is classified as the OPMD with the highest percentage of degeneration into oral cancer, therefore early diagnosis is essential. In the event of an oral lesion with the characteristics of an OE, a biopsy should be performed immediately. OE is a rare lesion, knowing its clinical and histological characteristics is important to be able to manage it correctly and avoid misdiagnosis.

BLACK HAIRY TONGUE TREATED WITH OZONIZED WATER: A NEW APPROACH

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Aim: to report a refractory Black Hairy Tongue (BHT) case treated with ozonized water.

Methods: a 55y/o man with negative anamnesis came to us with a lingual lesion for about 2 years. He referred he drank alcohol regularly and smoked about 40 cigarettes per day. At the objective exam we observed elongated filiform papillae (6 mm) and a brownish color of its dorsum. We diagnosed a BHT. A biomolecular analysis revealed a number of T. forsythia 36 times higher in the affected areas. To reduce bacterial load, irrigation sessions with ozonized water (OW) have been scheduled. Fresh OW was dispensed from a special device (Aquolab, Sweden&Martina, Milan, Italy), with a concentration of 0.060 mg/l for a total of 2 minutes, for two sessions carried out one week apart from each other.

Results: after 14 days from the first session, a notable improvement could be appreciated both in the reduction of the length of the filiform papillae and in the extension of the lesion itself on the lingual dorsum. The patient became asymptomatic and did not want to continue with other irrigation sessions with OW. Despite our warnings the patient continued to smoke, also during the period of therapy.

Conclusions: BHT is a common lesion in the oral cavity especially in heavy smokers and immunosuppressed subjects. Oral dysbiosis has been strongly associated with the occurrence of BHT.

No specific protocol has been described in the literature, especially for refractory and relapsing cases. Irrigations with ozonized water could be a winning strategy in these cases.

A NEW METHOD TO COUNTERACT BIOFILMS OF THE ORAL CAVITY: AIRFLOW COLD ATMOSPHERIC PLASMA

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Aim: in this study, we aim to evaluate the effectiveness of an airflow Cold Atmospheric Plasma (CAP) source in selectively eradicating biofilms formed by oral pathogens without damaging gingival cells.

Methods: two different biofilms have been formed starting from a pure culture of *S. mutans* UA 159 and a mixed culture of microorganisms isolated from a saliva sample of a patient with periodontitis. *S. mutans* biofilm was exposed to the CAP source at a distance of 6 and 12 mm for 30 s, 60 s, 120 s, 180 s and 240 s treatment time, whilst the biofilm developed from saliva was treated at a distance of 6 mm for 60 s and 120 s. Colony Forming Units (CFU) count and XTT metabolic assays were used to evaluate the CAP's Minimum Biofilm Eradication Concentration (MBEC). In addition, CAP effects at 6 mm distance and for 30 s, 60 s, 120 s and 180 s treatment time were assessed on human gingival fibroblasts (HGF) viability and morphology by MTS assay and Toluidine Blue at 24, and 48 h.

Results: CAP treatment at 6 mm distance significantly reduced both metabolic activity and CFU count when applied for 60 s on both *S. mutans* and saliva biofilm. CAP treatment at 12 mm distance was effective in eradicating *S. mutans* biofilm when applied for 180 s. HGF cells viability and morphology were almost unaffected by 30 s CAP treatment, whilst at 180 s a peak of reduction by ~50% after 24 h and by ~75% after 48 h was reached.

Conclusions: CAP treatment can eradicate preformed biofilms developed by both *S. mutans* and the complex mixture of saliva microorganisms, suggesting the use of this CAP source to counteract oral biofilms.

AN ABNORMAL SIZED MUCOEPIDERMOID CARCINOMA: A RARE CASE REPORT

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Aim: the aim of this study is to report a rare case of a large mucoepidermoid carcinoma (MEC) involving the upper lip and hard palate.

Methods: a 72-year-old man came to our attention for the presence of an extensive mass on the upper lip and hard palate in the last 30 months and never treated. He was a heavy smoker and a considerable consumer of alcohol and spices. The diagnostic process included a clinical examination, instrumental tests (CT, MRI), laboratory investigations for tumor markers and a biopsy followed by a histological examination.

Results: clinically we detected a voluminous neoformation extending from the upper lip to the hard palate (7 cm x 4 cm) with a hard-elastic consistency and absence of mobility. CT and MRI revealed significant involvement of soft tissue and invasion of the maxillary bone. Total body CT and systemic tumor markers were negative for metastasis. An excisional biopsy was performed which confirmed the diagnosis of MEC.

Conclusions: although MEC accounts for 30% of all salivary gland cancers, it comprises only 10% of all salivary gland tumors and less than 5% of head and neck tumors. Furthermore, MEC are often less than 1 cm to 3 cm. In the present study, we report a MEC with abnormal size and rare extension from palate to upper lip. Because of rarity of this pathology in clinical practice and lack of specific symptoms and characteristic appearances, its clinical diagnosis may be challenging. This should lead clinicians to consider this tumor in differential diagnosis, to provide an early diagnosis, essential to avoid extensive surgery.

ORAL ADVERSE DRUG REACTIONS OF SECUKINUMAB IN A PATIENT AFFECTED BY PSORIATIC ARTHRITIS

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Aim: Psoriatic Arthritis (PsA) is a chronic inflammatory disease of the joints. PsA may be treated with Secukinumab. Adverse drug reactions (ADR) to Secukinumab involving the oral mucosa are rarely reported.

Methods: we report a case of a man affected by PsA who attended the Oral Medicine Sector (AOUP "P. Giaccone" Palermo, Italy).

Results: a 66-year-old Caucasian man showed up in September 2018 reporting pain localized in the tongue, exacerbated by spicy and hot foods. His medical history included a diagnosis of PsA, in treatment with Secukinumab. The clinical examination showed: atrophic and hyperkeratosis/hyperplastic areas in the dorsal surface of the tongue. The clinical diagnostic hypothesis was an oral manifestation of ADR to Secukinumab with suspected infection with *Candida Albicans*. A lingual swab was taken, and the patient was also instructed on proper maneuvers of oral hygiene and avoiding irritating foods. The presence of *Candida Albicans* was confirmed and local antifungal therapy was prescribed. The patient was also referred to his rheumatologist to switch therapy to Ixekizumab. After 14 days from the switch of therapy, a considerable clinical improvement was observed and the patient reported the absence of symptomatology.
The patient is still under treatment for PsA; he is undergoing periodic follow-up visits, and oral lesions are resolved.

Conclusions: ADR of Secukinumab in the oral cavity may worsen the quality of life of patients affected by PsA. This case report shows that a correct clinical framework and the switch of therapy can resolve oral ADR.

ORAL MUCOCELE IN PEDIATRIC PATIENT

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Aim: the present case report shows the diagnostic and therapeutic iter adopted in treating bluish-purplish colour, submucosal lesion of the left lower lips with clinical features compatible with mucocele.

Methods: an 8-year-old patient referred to the dental department reporting the appearance of rounded, painless, tense-elastic, blue-coloured neoformation on the lower lip, which underwent a significant increase in size (up to 2 cm-wide), in the last two weeks. The lesion was associated with discomfort during chewing and speech. After evaluating the medical history and clinical data, an excisional biopsy was performed. Surgical management requires local infiltration of mepivacain 2%, cold blade incision, soft tissue dissection and removal of the whole lesion.

Results: histopathological examination confirmed "retention-type mucocele", showing the presence of minor salivary glands with modest ectasia of major ducts and minimal chronic nonspecific inflammation.

Conclusions: mucocele is a common salivary gland disorder characterized by a reactive pseudo-cystic neoformation containing mucous. The major etiologic factor is chronic tissue trauma, commonly caused by lip-biting and other parafunctional habits where mucous extravasation/retention phenomenon follows-well documented in the pediatric population, without gender or racial predilection.

It's a common benign condition, but if left untreated, mucocele may last for several weeks or months, with periodic regression behaviour followed by recurrence or spontaneous rupture.

INNOVATIVE TESTS USEFUL TO PREDICTE THE DEVELOPMENT OF ORAL CANCER

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Aim: this preliminary study was conducted to verify if the Cytobrush biopsy is effective in collecting OSCC selected biomarkers from an oral cancer lesion. It represents a fundamental point for making early diagnosis.

Methods: patients enrolled for the study were diagnosed with primary OSCC staged I-IV (TNM). Three non invasive cytobrush biopsies were taken from the mouth of each patient. Cytobrush tips were inserted in sealed Eppendorf vials, cataloged and stored in the cold 0-4°C and sent to the lab for analysis in refrigerated boxes. The samples obtained were processed through a high sensibility ELISA test analysis. An important exclusion criterion is the absence of a previous histological diagnosis.

Results: we selected six biomarkers: EGFR, p53, Ki67, PD-L1, B7-H6, HLA-E. We divided the collected samples from each patient in three groups:

those taken form the center of the tumor lesion always showed high levels of all the markers searched (6 out of 6 markers were present).

Those taken form the margin showed high levels of 4 to 6 markers searched (4,5 or 6 out of 6 markers).

Those taken form healthy oral mucosa showed very low levels of all the sought-after markers (a maximum of 2 out 6 markers).

Conclusions: this study showed the possibility of obtaining an early diagnosis by the brushing of the anatomical locations where oral cancers are frequently encountered.

ORAL STATUS SCORE FOR THE EVALUATION OF THE ORAL HEALTH IN PATIENTS AT RISK OF MRONJ

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Aim: evaluate the agreement on a new and objective system for determining the ONJ onset risk in a group of 50 patients in need to start antiresorptive medications following a diagnosis of osteoporosis, multiple myeloma, or bone metastases.

Methods: a questionnaire was devised that assigns scores clinical and radiological parameters that the clinician must consider when assessing the risk of developing MRONJ. The final score ranges from 0 to 30 and indicates the patient's oral health status. A further score is added in case the patient has already developed MRONJ.

Results: from the analysis of the total score emerged that the average score is equal to 6.7±4.2, with a much higher score in the case of non-issue of the authorization for the start of the therapy (10.7±4.0) than in cases of release (5.2±3.3) ($p < 0.0001$). No statistically significant difference emerged between the three operators who gave the scores (dentist, expert student, inexpert student), who report similar score values both in mean and in standard deviation.

Conclusions: thanks to the use of the score questionnaire both a more experienced clinician and a less experienced one were able to evaluate the oral health status of patients at risk of ONJ. The status is considered as a tool that allows not only to identify the infectious foci but also to identify the patient's health in a general way, assessing whether the patient is taking care of himself or not.

If the patient neglects his oral health, the status allows to evaluate the need to adopt strategies to improve it, reducing the possibility of developing ONJ.

OCT-TRAINED LEARNING ALGORITHMS FOR ORAL CARCINOGENESIS: PROJECT PHASE I

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Aim: Optical Coherence Tomography (OCT) and Artificial Intelligence (AI) have been proposed as prospective diagnostic support in oral carcinogenesis. However, *in vivo* standardized procedural sequences for training OCT-AI, from site-specific surgical sampling to OCT and histological evaluations, are still lacking and needed. This study proposes the first phase of a novel multiphasic project aiming to perform an AI software applied to Oral Squamous Cell Carcinoma (OSCC) optical diagnosis.

Methods: the selection of clinical, OCT and histological OSCC images has been conducted using target site-specific instrumental procedures, pre- and post-diagnostic biopsy. Specific standardized OCT diagnostic patterns were used and matched with histological outcomes, to generate a dedicated primary dataset for AI computerized software.

Results: 70 OSCC were enrolled and preliminarily scanned by OCT pre-targeted site-specific biopsy, obtaining 120 OCT scans per lesion, for a total of 8400 scans. Each set of OCT scans per lesion was linked to the corresponding histological confirmatory image to realize the matched dataset for clinical/OCT/histological data of OSCC.

Conclusions: this project phase I proposes a primary standardized procedure for OCT-AI applications in OSCC diagnosis to reduce operator-dependent data registrations and interpretations and customize more appropriate decision-making guidance.

COMBINING RADIOMICS AND MACHINE-LEARNING TO DIAGNOSE OSTEOPOROSIS FROM ORTHOPANTOMOGRAPHY

Troiano G.

Aim: the aim of this study was to develop a radiomics -based machine learning model to diagnose osteoporotic patients from orthopantomographies.

Methods: a cohort of 100 patients for which an orthopantomography (OPT) and a dual-energy X-ray absorptiometry (DXA) were available, at "Casa Sollievo della Sofferenza" hospital in San Giovanni Rotondo were included. Patients were categorized as "healthy" (T-score <1) and "osteoporotic" (T-score >2.5). Patients' OPTs were uploaded on the LifeX software. A region of interest (ROI) was drawn, including the external part of the mandibular ramus distally to the mandibular lingula and mesially up to the mental foramen. The radiomic features were extracted and uploaded on Orange software. After normalization, ranking methods were performed including: Infogain, Gain Ratio, Gini Index, ANOVA, X2, ReliefF and Fast Correlation Based Filter (FCBF). Machine learning models including Logistic Regression, Support Vector Machine, K-Nearest Neighbors, Decision Tree, Random Forest, Artificial Neural Network, Gradient Boosting and Naive Bayes were applied to the radiomic features selected by the FCBF.

Results: gradient Boosting and a Naive Bayes algorithm showed the best general prediction performance with an AUC equal to 0.822 and 0.773, a sensitivity of 66.0% and 72.3%, and a specificity of 82.0% and 74.0%, respectively.

Conclusions: by combining Radiomics with AI-based algorithms, promising prediction models can be developed for the diagnosis of osteoporosis from 2D OPTs. The results need to be confirmed in an external validation setting.

SELF-PERCEIVED LONELINESS DURING COVID-19 PANDEMIC IN BMS PATIENTS: A MULTICENTRIC STUDY

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Aim: to evaluate self-perceived loneliness during COVID-19 pandemic in patients with Burning Mouth Syndrome (BMS) compared to healthy controls (HC).

Methods: 100 BMS patients and 100 HC, matched for age and gender, were recruited in two Italian Universities. All participants were administered the General Health Questionnaire (GHQ-12), the Depression Anxiety and Stress Scale (DASS-21), the Insomnia Severity Index (ISI), the UCLA Loneliness Scale (ULS-8), the Multidimensional Scale of Perceived Social Support (MSPSS-12) and the Suicidal Ideation Attributes Scale (SIDAS).

Results: BMS patients lived with fewer people during lockdown and were less satisfied with their relatives. GHQ, DASS, ISI, ULS and MSPSS high scores were reported in both BMS and HC. No statistically significant difference in GHQ, ISI, ULS, MSPSS and SIDAS scores was found between groups. Differently, BMS patients perceived higher levels of stress than HC with a higher DASS total score: 16[10-24.2] in BMS *vs* 10[4-17] in HC; p <0.001**. In multivariate logistic regression DASS and MPSS scores showed the greatest increase in R2 for ULS (30.86 p <0.001** and 18.55 p <0.001** respectively) in BMS group while in controls a moderately significant R2 change for loneliness prediction was determined only by DASS score (7.41 p <0.004**).

Conclusions: Covid-19 pandemic profoundly affected self-perceived loneliness in both BMS and HC. A difference in ULS predictors was found between groups. The higher level of stress and the lower social support were significantly related to loneliness prediction in BMS patients.

COMBINING DEEP LEARNING AND CASE-BASED REASONING FOR EARLY DETECTION OF OSCC: A PILOT STUDY

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Aim: dentists are responsible for secondary prevention of oral squamous cell carcinoma (OSCC) and the recognition of oral lesions, but a cursory oral examination during dental and medical recalls may be typical. OSCC is diagnosed at a late stage, indicating also potential case of professional liability for delayed diagnosis. Deep Learning (DL) and Case-Based Reasoning (CBR) can be used to detect and classify oral lesions, detecting suspicios OSCC and providing explanations for diagnosis. This study aims to explore the potential of combining DL and CBR to improve patient outcomes.

Methods: a DL-CBR decision support system was developed using a modified Faster-R-CNN (Region-based Convolutional Neural Network) FPN+ architecture trained on 30 cases of oral ulcers belonging to three classes: neoplastic, aphthous, and traumatic.

Results: DL has achieved state-of-the-art performance in detecting and classifying clinical images, with detection rates of 82% and classification rates of 90% (98% for neoplastic *vs* no-neoplastic binary classification).

DL-CBR decision process was tested by 9 residents and 6 specialized doctors in 10 challenging cases. This study revealed that resident doctors are more likely to rely on CBR than on DL.

Conclusions: the DL-CBR system provides reliable and effective support to medical professionals and has potential for supporting even less experienced doctors in diagnosing challenging cases.

The system and associated cases will be soon publicly available to promote collaboration and knowledge sharing among clinical centers and DL development centers.

ANALYSIS OF SALIVARY MIRNAS IN WOMEN AT HIGH RISK OF BREAST AND OVARIAN CANCER DEVELOPMENT

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Aim: the present pilot study aims to evaluate the effect of a nutritional and lifestyle intervention on miRNA expression (nutriepigenomics) in Breast Cancer (BRCA) 1-2 genes mutated females. Subjects with a germ mutation of the BRCA 1-2 genes are more predisposed to develop ovarian cancer (16-59%) and breast cancer (55-60%). Here we report the preliminary results on the modification of salivary miRNA expression since the beginning of sperimental intervention up to 12 months.

Methods: twenty-five females, aged between 18 and 40 years, with a germ mutation of the gene BRCA1-2 were included in the study. The experimental intervention involves a preliminary visit conducted in association with the Breast Unit of the Academic Hospital of Parma which includes medical history, diagnostic exams, dental visit, salivary and blood collection, questionnaire on the quality of life and a nutritional counselling. The patients underwent to periodic visits (6, 12, 18, 24 months). The whole saliva collected was spat into a sterile container, for a total of 2 mL of saliva. Presence and concentration of 84 selected miRNAs were evaluated through real-time polymerase chain reaction (RT-qPCR).

Results: forty-three salivary samples of 17 enrolled woman were analyzed. Nineteen miRNAs did not amplifyin any sample. Instead, miR-27 a, miR221, miR-191, miR-16 had a proportional change in their expression with the beginning of the nutritional and lifestyle intervention.

Conclusions: salivary diagnostics is revolutionizing the concept of early diagnosis and monitoring of oral and systemic diseases.

THE IMPACT OF A PROGRAM OF PRIMARY PREVENTION ON THE INCIDENCE OF MRONJ

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Aim: the aim of the study was to investigate the incidence of medication-related osteonecrosis of the jaw (MRONJ) after the set-up of structured programme of primary prevention before commencement and during treatment with zoledronic acid therapy taken for the treatment of bone metastasis in oncologic patients.

Methods: in a prospective cohort study performed at the unit of dentistry and oral surgery of the university of Pisa, from September 2017 until December 2020, all oncologic patients with radiographic evidence of bone metastases and eligible for treatment with zoledronic acid were included and followed up until December 31, 2020.

Results: of the 605 patients, MRONJ developed in 11 (1.8%) during the follow-up.

Female gender (OR 4.4; 95% CI 1.8-22,1; P = .043) and statin treatment (OR 25.1; 95% CI 0.1-2822; P <0.001) were associated with an increased risk of MRONJ.

Conclusions: in conclusion, MRONJ remains a significant risk associated with the use of antiresorptive drugs in the setting of malignancy.

Importantly, this work reinforces the importance of a tailored program of prevention based on the evaluation of systemic and local risk factors.

IMPACT OF TWO TOPICAL TREATMENTS ON ORAL *LICHEN PLANUS*: A RANDOMIZED CLINICAL TRIAL

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Aim: to assess the impact of two topical treatment strategies on oral lichen planus (OLP) by analyzing the signs and symptoms of the disease and the risk of side effects.

Methods: 38 subjects with proven OLP were selected and randomly allocated with a 1:1 ratio to receive tacrolimus 0.1% ointment (T group) or an anti-inflammatory mouthwash (M group) containing calcium hydroxide 10%, hyaluronic acid 0.3%, umbelliferone, and oligomeric proanthocyanidins. OLP symptoms, signs and disease severity score have been recorded during the 3-month follow-up.

Results: both protocols have significantly induced an improvement of OLP severity. However, at 3 months (T3), tacrolimus has been related to significantly reduced OLP signs (p = 0.035), symptoms (p = 0.045), and disease severity scores (p = 0.041) compared to the mouthwash. Furthermore, the Spearman analysis revealed a significant correlation between OLP signs and symptoms at each follow-up session in all patients.

Conclusions: although both effective, tacrolimus induced a greater improvement in OLP symptoms and signs compared to the mouthwash.

COMPARATION OF TWO TOPICAL TREATMENTS FOR ORAL *LICHEN PLANUS*' MANAGEMENT: A RCT STUDY

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Aim: Oral *lichen planus* (OLP) is a chronic, inflammatory, immune-mediated disease, which can alter the quality of life of patients. The clinical management of OLP remains a current challenge when searching for new drugs that can control its symptoms and signs with minimal side effects. The purpose of this randomized clinical trial was to compare the efficacy and therapeutic safety of clobetasol oral gel 0.05% versus an anti-inflammatory oral solution (mouthwash) in the management of patients with symptomatic OLP.

Methods: the sample size calculation was determined to be at least 32 individuals for an alpha error of 0.05 and a power of 80%. Forty patients with OLP were selected according to the clinical and histopathological criteria of van der Meij and van der Waal. Through a randomized design, 20 patients received Clobetasol 0.1% oral gel (group C) and 20 an anti-inflammatory mouthwash (group M) consisting of 10% calcium hydroxide, 0.3% hyaluronic acid, umbelliferone, and oligomeric proanthocyanidins. At baseline (T_0) and after 3 months (T_1), patients underwent dental and dermatological examinations to assess symptoms by Numerical Pain Scale (NRS) and signs by Thongprasom score. Statistical analysis was performed using the SPSS Windows package (version 25; SPSS, Chicago, IL, USA). Data were calculated using the t-test for the dependent variable, Wilcoxon's test, and Mann-Whitney's u-test.

Results: both clobetasol and mouthwash resulted in statistically significant reductions in signs ($p < 0.001$ and $p = 0.02$, respectively) and symptoms ($p < 0.001$ for clobetasol and $p = 0.02$ for anti-inflammatory). Clobetasol caused a higher occurrence of side effects than mouthwash, which was shown to be safer.

Conclusions: the mouthwash was less effective in determining the reduction of signs and symptoms in patients with severe OLP, compared with clobetasol, which is confirmed to be the first-line drug for the treatment of severe forms of OLP. The mouthwash could be used in the treatment of mild-moderate forms of OLP, as it resulted in good symptom control and significant activity in preventing lesion progression.

ULTRASONOGRAPHY: A PRECIOUS ALLY IN THE ASSESSMENT OF INTRA-ORAL LESIONS

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Aim: to evaluate the usefulness of ultrasound investigation when a oral soft tissue lesion is detected, as part of the overall and/or preoperative evaluation.

Methods: between March, 2019 and January, 2023 9 patients were examined, referred by Oral Pathologist following the clinical findings of lingual or oral mucosae swellings or other irregularities.

Ultrasound investigations were conducted using linear probes (3-12Mhz), via intraoral and/or extraoral approach, based on the localization of the clinical lesion. Color-Doppler study protocol was always applied for better characterization of the findings.

Devices: GE Logiq Q7 Expert, Siemens Acuson NX3 Series.

Results: ultrasound examinations were always capable of identifying the clinical finding, describing the lesion's dimension, its echogenity (and consequently its consistency, if solid, liquid or both), edges, and the presence or absence of blood flow and its characteristics, providing useful information for further actions.

Conclusions: the execution of an ultrasound investigation of the clinical findings allows a more accurate evaluation of the intra-oral lesions, also as part of preparation for surgery, through an easy, rapid to perform and non-invasive exam, which doesn't require specific preparation nor implies exposure to radiations. Ultrasound can also direct towards the need for a more detailed examination (MRI, CT).

OZONE THERAPY FOR MEDICATION RELATED OSTEONECROSIS OF THE JAW: A CASE REPORT

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Aim: to evaluate the effectiveness and safety of ozone gel as a conservative treatment for medication-related osteonecrosis of the jaw (MRONJ) and related symptoms in a patient with multiple myeloma.

Methods: V.B., age 77, affected by multiple myeloma developed MRONJ as consequence of 14 Zometa infusions. Exposed bone areas were present in the mandibula, where ozone gel was applied. The application consists of sub mucosal injection of ozone (Ozosan® Gel) through a composite needle with metal tip into the mucosal margin surrounding the bone exposure for five minutes each time. Pain before and after every application was assessed using a visual analogue scale (VAS). The primary outcome of the therapy effectiveness is based on the clinical aspect of the lesions and on the reduction of painful symptoms (measured with VAS).

Results: preoperative VAS was 2. After 5 applications VAS reached 0. After 18 treatments, spontaneous bone sequestration was achieved in both lesions with complete epithelialization of the mucosa. In the majority of the applications, the patient did not report any painful symptoms related to procedures, neither during nor after treatment.

Conclusions: ozone application has been found to be an effective treatment for osteonecrosis-related pain and even bone exposure.

CLINICAL ORAL MEDICINE AT THE SAPIENZA UNIVERSITY OF ROME: A YEAR RETROSPECTIVE STUDY

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Aim: the objective of this study was to characterize a one-year outpatient clinical oral medicine (OM) services at a dental school-based setting and highlight the importance of an underrecognized practice to the general public.

Methods: this was a retrospective medical records review of all patients seen at the oral medicine clinic (Momax) of Sapienza University of Rome by OM experts. Demographic, past medical/social history, reason for referral, distance between patients' home and Sapienza, as well as clinical diagnosis and clinical procedures were collected and entered into a deidentified electronic spreadsheet.

Results: throughout 2022 there were 1291 consultation encounters for 580 patients (44.9%; 58% females) with a median age of 60 (range:11-96). Patients lived a median distance of 14 (range: 1-1044) km from the OM clinic. About 70% of the patients came for a second evaluation from an OM expert, whereas about 20% came for a dental evaluation prior to cancer treatment.

Most common clinical diagnoses included dental caries (16.2%), mucosal benign conditions (9.7%), chronic periodontitis (9.1%) and oral leukoplakia (6.9%). Biopsy was the most frequent procedure performed at consultation.

Conclusions: this single-center OM services study stresses the importance of an underrecognized practice amongst the dental and medical community whose aim is to improve the quality of life of medically complex, and cancer patients. Larger studies are needed to determine the importance of OM practices in the Italian and European public health settings.

PSYCHOLOGICAL PROFILE AND SALIVARY COMPLAINTS IN BMS: A CROSS SECTIONAL STUDY

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Aim: xerostomia and sialorrhea are often reported as additional symptoms in Burning Mouth Syndrome (BMS) even without a measurable alteration in saliva quantity. The aim of the study is to evaluate any differences among patients referred only burning (B), burning/xerostomia (BX), burning/sialorrhea (BS) and burning/xerostomia/sialorrhea (BXS).

Methods: 500 patients were enrolled and divided into four groups: B (140), BX (253), BS (49), BXS (58). Education, BMI, smoke, alcohol consumption, comorbidities, drugs, intensity/quality of pain and psychological profile were recorded.

Results: no statistically significant differences were found in the four groups about sociodemographic profile and risk factors. BX group reported higher percentage of globus (43.1%); BXS group reported higher percentage of dysgeusia (58.6%); BS group reported higher percentage of tingling (28.6%). All subjects reported high scores of anxiety and depression tests and poor sleep quality. 8.7% of patients with BX were taking blood thinners (p: 0.002**). The results of multivariate analysis show that globus, BMI, smoking and dysgeusia are statistically significant in B; globus and blood thinners in BX; male gender and tingling in BS; alcohol, quality of pain and dysgeusia in BXS.

Conclusions: BMS patients exhibit a complex symptomatologic pattern with xerostomia representing the most frequent symptom in addition with burning. Sociodemographic and psychological profile, pain, risk factors, systemic comorbidities and drug intake could not explain the variability of symptomatology in the four groups considered.

AMELANOTIC BLUE NEVUS OF THE ORAL MUCOSA: CASE REPORT AND LITERATURE REVIEW

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Aim: we describe a case of amelanotic blue nevus of the oral mucosa and narrative review of the literature.

Methods: a caucasian 48-year-old smoker woman presented for evaluation of an upper labial mucosal lesion. She presented with a 3 mm papula on the labial mucosa of the left upper hemilabrum. The asymptomatic lesion showed a slightly increased consistency, was normochromic with relaxed mucosa and ischaemic appearance with a small marginal bluish area with tractional mucosa with labial eversion. Anaesthesia was performed with mepivacaine 3% paraperiosteal. A scalpel lozenge including the neoformation and 1mm healthy perilesional margin was performed, 980 nm diode laser photocoagulation in continuous mode at 1.5W for haemostasis. Histological report: Macroscopic finding (specimen received in formalin); material sent for examination as "3 mm upper lip neoformation"; fully processed material for histological examination. Achromic proliferation of unpigmented spindle cells. Extensive immunohistochemistry was performed on the specimen: smooth muscle actin-, HMB45+, MelARED+, S100+.

Results: a narrative review of the last ten years of scientific literature available in the PubMed database was performed: No other cases with a finding of amelanotic nevus of the oral cavity were found.

Conclusions: amelanotic nevi of the oral mucosa are very rare and due to the fact that they are usually asymptomatic, they are often incidental findings during routine examinations.

PLEOMORPHIC ADENOMA OF THE MINOR SALIVRY GLANDS

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Aim: the aim of this study is to evaluate the surgical approach and outcomes of pleomorphic adenoma affecting the minor salivary glands.
Methods: fifty-five years old man referred to the Dental Department of the University of Milan for a neoformation in the oral cavity. He reported for five years the presence of a lesion with slow growth in the upper vestibular area. The lesion was tense-elastic, around about 1 cm in diameter, covered by normal mucosa, non-fixed and painful to palpation.
After evaluating medical history (good general health and no smoking) and clinical data (no trauma of the area), the excisional biopsy was performed.
After one week, a good healing of mucosal tissue could be observed without the presence of relapse or pathological alterations.
Results: histopathological examination allowed us to make a final diagnosis of adenoma pleomorphic.
Conclusions: Pleomorphic adenoma is the most common benign salivary gland neoplasm. The age range of occurrence is 30-50 years and is found mainly in the parotid gland (85%), while it is rare in the submandibular gland (8%) and minor salivary gland (7%). Annual incidence is estimated to be 2,5-3 cases/100.000 people.
Histologically, a fibrous capsule can be detected. Neoplastic tissue is made by epithelial cells of ductal origin, and myoepithelial cells immerse in a mesenchymal stroma.
Surgical enucleation is the first-choice treatment, which should be accurate and precise to avoid relapse. In 3-5% of cases, a malignant lesion, called carcinoma ex pleomorphic adenoma, can evolve.

ORAL KAPOSI'S SARCOMA IN AN HIV-NEGATIVE PATIENT: A CASE REPORT

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Aim: the aim of this study is to present a rare clinical case of oral Kaposi's sarcoma as opportunistic infection in an HIV-negative patient treated chronically *per os* with Metilprednisone.
Methods: an 80-year-old male affected by moderate psoriasis vulgaris treated chronically *per os* with Metilprednisone, underwent tooth extraction of 2.7. Three months later he came to our attention due to an asymptomatic palatal neoformation. Incisional biopsy of the lesion was performed, prior local anesthesia. Histopathological exam showed localization of Kaposi's Sarcoma. Patient underwent HIV blood testing with negative results. Afterwards, the patient was hospitalized and excisional biopsy of the whole lesion and latero-cervical lymphectomy was performed, under general anesthesia.
Results: the gold standard to diagnose Kaposi's sarcoma is histopathological exam, which in this case showed left palatal involvement and lymphonodal metastasis.
Nowadays, no signs of recurrence are shown.
Tapering and following suspension of corticosteroid therapy was decided, as Metilprodnisone is an immunosuppressive drug.
Conclusions: as other studies show, oral Kaposi's sarcoma can occur in patients treated systemically long-term with corticosteroids, even in HIV-negative or non-transplanted cases.
This study reports the first clinical case of oral Kaposi's sarcoma in a patient treated chronically *per os* with Metilprednisone, at our knowledge.

SYNCHRONOUS ORAL SQUAMOUS CELL CARCINOMA AND HIGH-GRADE DYSPLASIA: A CASE REPORT

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Aim: Field cancerization (FC) describes the increased risk of cancer development in tissues adjacent to the primary tumor after exposure to carcinogens. This concept suggests that synchronous or metachronous tumors may develop within the same epithelial tissue field due to the occurrence of genetic alterations. The aim of this paper is to describe a case of FC in a woman that developed synchronous lesions.

Methods: we report a case of a patient who was referred to our sector of Oral Medicine (AOUP "Paolo Giaccone", Palermo, Italy) for the presence of a neoformation of alveolar lower mucosa and a lesion of upper gingiva.

Results: an 84-year-old woman came to our attention in 2022 reporting synchronous lesions in different sites. Clinical examination revealed the presence of a multifocal verrucous-exophytic neoformation localized in the V sextant on lower edentulous ridge, and a hyperkeratotic-erosive dishomogeneous lesion localized in the II sextant on masticatory mucosa. Because of the suspicion of malignancy, multiple incisional biopsies were carried out. Based on the histological and radiological findings, the diagnosis was of OSCC for the lower lesion and high-grade dysplasia for the upper lesion. The patient was referred to the Plastic Surgery Unit for management.

Conclusions: the FC emphasizes that the entire oral cavity may be at risk for cancer, which means that even areas that appear normal may undergo changes that could lead to the development of synchronous tumors. Hence, observation of areas adjacent to a primary tumor, periodic follow-up is crucial to diagnose new lesions.

ORAL INVOLVEMENT AS FIRST MANIFESTATION OF LARGE B-CELL LYMPHOMA: A CASE REPORT

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Aim: diffuse large B-cell lymphoma (DLBCL) is the most common Non-Hodgkin lymphoma. We report here a case of a DLBCL whose first manifestation was in the oral cavity.

Methods: a 58-years-old woman went to the emergency unit for pain and dental mobility present from 4 months, they prescribed antibiotic therapy and then referred her to the Oral Medicine Section, CIR Dental School of Turin.

At oral examination there was exposure of necrotic bone of the left mandibula with oral floor's ulcer.

There was mobility of 3.4, 3.2 and she referred recent loss of 3.3. There were sub-mandibular lymphadenopathies. The patient denied bisphosphonates intake.

An incisional biopsy of the ulcer was performed on the same day and a panoramic radiography was requested.

Results: radiography showed extended bone destruction and the pathologist's examination of oral biopsy revealed a diffuse large B cell lymphoma. The patient was immediately referred to the haematology department. The PET revealed an atypical and intense signal in the mandibular region, with bone remodelling. Also, parotid space and left tonsillar pillar were involved. Diagnosis of DLBCL was confirmed.

Discussion and conclusion: Some of the patient's manifestations, such as oral ulcer and dental mobility are common manifestations of LBCL. In addition, our patient presented necrotic bone exposure, which rarely was reported in literature. Dental practitioner must know NHL typical oral manifestations and when an osteonecrosis appears in a patient without history of medication or radiotherapy related, neoplasm such as DLBCL must be suspected.

IN VIVO AND *EX VIVO* EVALUATION OF OSCC PATTERNS BY OCT: SS-OCT *VS* SD-OCT

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Aim: OCT is a non-invasive imaging test that uses light waves in order to obtain images of biological tissues, depending on their optical properties, and that therefore can be valid in the screening, diagnosis and monitoring of potentially malignant disorders (OPMD) and neoplastic diseases (mainly OSCC) of the oral mucosa. The aim of this study is to evaluate the ultrastructural indicators of oral malignancy comparing *in vivo* scan by Swept Source OCT and *ex vivo* scan by Spectral Domain OCT.

Methods: a 68-year-old man showed a non-homogeneous indurated and ulcerated lesion clinically compatible with OSCC on the right lateral surface of the tongue. The lesion was evaluated through OCT and conventional histological examination. Indeed, previously to perform biopsy, it was used *in vivo* SS-OCT and, after the biopsy, the specimen was analyzed *ex vivo* through SD-OCT. The histological examination confirmed the diagnosis of OSCC.

Results: both SS-OCT and SD-OCT images allow to observe the typical indicators of oral malignancy: superficial loss of substance, limited areas of hyperkeratosis in anatomical sites not characterized by keratinization and general disruption of tissue architecture with absence of basement membrane, so that the sharp demarcation of epithelial and subepithelial layers is not assessable.

Conclusions: the images provided *in vivo* by SS-OCT agree with the SD-OCT images obtained *ex vivo* through SD-OCT, that allows better definition due to 3D technology.

Therefore, in *vivo* scan by SS-OCT is reliable and has potential validity in the assessment of suspected OSCCs.

ENIGMATIC FORMATIONS FOUND IN ROUTINE ORTHOPANTOMOGRAPHY: A CASE REPORT

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Aim: the aim of the current paper is to present three clinical cases where rare incidental radiographic findings on OPGs were investigated to determine their significance.

Methods: the first case involved a 77-year-old patient referred to us for further investigations after incidental findings were observed on OPG. CBCT revealed spherical formations with varying dimensions and radiopacity in the left major salivary glands (excluding parotid due to FOV settings).

The second case involved a routine check OPG of a 67-year-old patient with spherical formations localized to the right parotid gland.

A subsequent low-dose CT scan revealed such masses with better resolution. The relevant anamnestic data about both patients is that they underwent a sialography many years before they came to our attention.

The third case involved a 77-year-old woman with an irregular nodular radiopacity on OPG located posteroinferiorly to the mandibular angle and hyoid bone, close to the intervertebral space C3-C4. In her medical history we found hypertension, in therapy with Olmesartan, and familial hypercholesterolemia, in therapy with Atorvastatin.

Results: in the first two cases, contrast medium retention in the parenchyma of the major salivary glands and their excretory ducts due to a prior sialography was hypothesized. The third patient was diagnosed with a left carotid artery calcification (CAC) and shortly after she underwent a left carotid artery stent surgery.

Conclusions: careful examination of OPGs obtained in clinical settings is crucial to identify enigmatic formations that can lead to important diagnoses.

CALCIFYING ODONTOGENIC CYST (COC) OF THE ANTERIOR MAXILLA: CASE REPORT

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Aim: this report is about a case of a 63 year-old female patient who presented an osteolytic lesion on the anterior maxilla in correspondence to element 2.2. Within the lesion it was possible to distinguish the presence of calcifications. The aim of this study is to present a case of calcifying odontogenic cyst (COC) and its clinical, radiological and histological characteristics.
Methods: the lesion was initially highlighted by a radiological examination. Subsequently, a histopathological examination was performed, which made the final diagnosis of calcifying odontogenic cyst. The lesion was treated surgically in general anesthesia.
Results: at the clinical follow-up the lesion appeared completely healed, with no edema or signs of inflammation.
Conclusions: COC is a rare lesion and it is little described in the literature. The clinical and radiological characteristics are also typical of other osteolytic lesions of the upper jaw, therefore the histological examination appears to be the fundamental component for the diagnosis. The indicated treatment is surgical enucleation and long-term follow-up is recommended to prevent recurrence.

SQUAMOUS CELL CARCINOMA (SCC)OF THE TONGUE IN 24-YEAR-OLD MALE PATIENT

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Aim: Oral squamous cell carcinoma (OSCC) is among the 20 most frequent cancer worldwide. About 40% of OSCC arises on the ventral or lateral surfaces of the tongue and on the floor of the oral cavity. Tobacco smoking and alcohol abuse are the main etiologic factors. Recently, chronic mechanical irritation (CMI) to the oral mucosa has been included in this group. We report a case of OSCC of the tongue in a young male patient, related to CMI.
Methods: a 24-year-old male patient was referred to the Department of Oral Medicine and Surgery of the University of Parma in October 2021 for a painless, whitish lesion of approximately 2 x 1.5 cm, located on the left lingual margin. In the medical history, the patient referred to a previous lymphoma. Occasional smoker. On oral examination we noted that the lesion was in correspondence with the cusps of the moral teeth. We proceeded with amyloplast and with the manufacture of a nocturnal bite. At a 2-month follow-up visit, the lesion decreased. In September 2022 the patient broke the bite and the lesion reappeared, as exophytic, non-homogeneous, with a hard consistency to the palpation.
We decided to perform an excisional biopsy with scalpel, maintaining 1.0 cm of resection margins, followed by histopathological examination.
Results: histological examination revealed the presence of well-differentiated squamous cell carcinoma infiltrating the muscle bundles. The resection margins were undamaged. The Magnetic Resonance did not detect nodular lesions or volume alterations in the later cervical lymph nodes. The patient was placed on a monthly follow-up program.
Conclusions: rapidly growing lesions on the lingual margin that regress eliminating the traumatic factor but recur when re-exposed should be investigated.

TRAUMA-RELATED MULTIPLE DENSE BONE ISLANDS OF THE MANDIBLE, 10-YEAR FOLLOW-UP

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Aim: Dense bone islands (DBI) are sclerosing, asymptomatic, non-malignant lesions, incidentally seen on routine X-rays wherewell delineated radiopaque bony structures with smooth or irregular borders are surrounded by normal bone. DBI are probably the result of a reactive process, related to mild and prolonged inflammatory event or occlusal trauma.
Methods: a 36 female patient, with negative medical history, was referred for the appearance of radiopaque lesions of the jaw, not evident in previous orthopantomography, dating back 10 years. Osteosclerotic symmetrical lesions were observed in right and left mandible angle sites, where third molars were previously extracted; other bone islands were detected in 3.6 periapical region, on both roots, where endodontics treatments, had been performed. A bone biopsy was performed, revealing sclerotic cortical bone tissue, with depopulated osteocyte lacunae; this result was consistent with diagnosis of DBI.
Results: patient was followed-up for 10 years, the osteosclerotic lesions remained radiologically unchanged over time. In November 2021 a new bone biopsy was performed in lower right third molar site, where occasional pain was reported, with histological result consistent with the previous diagnosis.
Conclusions: the reported DBI were related to patient medical history, with their appearance following previous surgical traumas or inflammatory events. After an attentive differential diagnosis leading DBI, surgical treatment is not indicated.

STRATIFYING THE RISK OF LYMPHOMA IN SJOGREN'S SYNDROME: PRELIMINARY EVALUATION

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Aim: Lymphoma is the most severe late complication of primary Sjögren's syndrome (pSS). It appears that a focus score (FS) ≥3 on histology could be a threshold prognosticating the risk of lymphoma development.
The aim of this study is to evaluate the potential role of Ultra-High frequency Ultrasonography (UHFUS) in the identification of patients with a FS ≥3, in order to stratify the risk for patients affected by pSS.
Methods: patients with suspected pSS were enrolled and underwent minor salivary glands UHFUS and surgical biopsy for diagnosis confirmation and FS estimation. UHFUS images were evaluated according to the OMERACT scoring system (0 = normal glandular parenchyma to 3 = diffuse presence of hypoechoic areas in the absence of normal glandular parenchyma, glandular fibrosis).
Results: out of the 168 patients included a diagnosis of pSS was confirmed in 81 patients (48.2%, mean age 55.17±14.34). Seven patients presented a FS ≥3. None of the patients with UHFUS score 0 presented a FS ≥3; only the 3.7% of patients with UHFUS score 1-2 displayed a FS ≥3, whereas the 16.7% of the patients with a UHFUS score 3 had a FS ≥3 ($p < 0.05$).
Conclusions: UHFUS score 3 could support the identification of patients with a FS ≥3, thus highlighting the high correspondence between the UHFUS scoring and the histology. UHFUS application could improve risk assessment and stratification for lymphoma development in pSS patients.

ROLE OF ULTRASONOGRAPHY AND HISTOLOGY OF MINOR SALIVARY GLANDS IN SJOGREN'S SYNDROME

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Aim: the characterization of glandular involvement in primary Sjögren's syndrome (pSS) is extremely relevant for disease staging and treatment. The aim of this study is to evaluate the potential role of Ultra-High frequency Ultrasonography (UHFUS) in evaluating minor salivary glands by means of Ultra-High Frequency Ultrasound in patients with suspected pSS.

Methods: consecutive patients were enrolled and underwent a complete rheumatological diagnostic work-up, UHFUS of minor salivary glands, and surgical biopsy. UHFUS images were evaluated according to the OMERACT scoring system (0 = normal glandular parenchyma to 3 = diffuse presence of hypoechoic areas in the absence of normal glandular parenchyma, glandular fibrosis). The patients were diagnosed with either pSS or sicca syndrome depending on histology.

Results: in total, 168 patients were included. Out of them a diagnosis of pSS was confirmed in 81 patients (48.2%, mean age 55.17±14.34). UHFUS scores significantly differed between pSS and sicca patients with UHFUS scores 2 and 3 being significantly more frequent in pSS than in sicca patients ($p = 0.0001$).

UHFUS score ≥1 was able to reliably identify patients with disease (98.9% sensitivity)

Conclusions: UHFUS showed extremely high sensitivity in detecting glandular alterations.

The possibility to redefine the indication for labial glands biopsy and the utility of UHFUS as a non-invasive screening tool may represent a valid support in the evaluation of suspected pSS patients.

LIQUID BIOPSY IN THE ASSESSMENT OF MICRORNAS IN THE MANAGEMENT OF OSCC AND OPMDS

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Aim: the aim of the study was to evaluate the expression of plasmatic and salivary miRNAs in patients with oral squamous cell carcinoma (OSCC) and oral potentially malignant disorders (OPMDs).

Methods: a total of 15 patients (8 M; 7 F) were enrolled at MoMax (Oral Medicine and Maxillofacial) project and divided into 3 groups according to pathology: 5 patients affected by OSCC (G1), 5 patients affected by OPMD (G2) and 5 healthy controls (G3). Tissue and liquid biopsy were performed at T_0 in G1 and G2; liquid biopsy was performed at T_1 (3 months after OSCC resection or OPMD treatment) in G1 and G2. In G3, liquid biopsy was performed only at T_0.

After collecting blood and saliva samples, the expression of miRNA -21, -31, -138, -145, -424, and -184 was evaluated by real-time PCR at the department of Molecular Medicine. Statistical analysis was performed by R statistical package version 3.6.1. Wilcoxon test was used to evaluate the difference in the miRNA levels between T_0 and T_1 (statistical significance as $p < 0.05$).

Results: at T_0, G1 and G2 patients showed overexpression of miRNA levels compared to G3. At T_1, miRNA levels were decreased in G1 and G2, particularly in blood samples. The difference between the expression of miRNAs from T_0 to T_1 was statistically significant ($p < 0.05$) in blood samples but not in saliva samples in G1 and G2.

Conclusions: our preliminary results are promising, showing a reduction of miRNA expression in OSCC and OPMD patients between T_0 and T_1. Further studies are required to introduce liquid biopsy in the daily practice for OSCC and OPMDs management.

ORAL HEALTH AND WOMAN IN MENOPAUSE WITH CHRONIC KIDNEY DISEASE

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Aim: the decrease of estrogen level affect negatively on the periodontium health and it could also be related to the progression of chronic kidney disease (CKD). The aim of our study is to assess the potential effects of menopause on the severity of periodontal disease in CKD patients.
Methods: we performed to an accurate pathological anamnesis and all enrolled patients underwent to the nephrological and dental examinations and to a questionnaire that evaluates the clinical history of menopause. We also monitored the inflammatory state. Finally, we collected the experience after the menopause hormone therapy (MHT). From the data obtained, a bivariate inferential analysis was performed.
Results: 28 out of 64 CKD menopausal patients examined, showed that 35% of women reported the onset/increase of periodontal disease after menopause. Compared to the control group, there is a significative difference for the percentage of sites with PD >4 mm. Interestingly, 46% of the SG are smokers or former smokers, presenting a condition of generalized gingivitis, compared to CG with localized gingivitis, and a lower number of dental elements. There were other oral conditions, such as xerostomia, TMJ disorders and dental hypersensitivity.
Conclusions: the changes in the sex hormones level can be correlated to the health state of periodontium. Among the risk factors, there is smoking, which increases the inflammatory processes. Questionnaires showed that 70% of patients goes to visit only when they have pain. Menopausal women should receive special preventive and therapeutic care from dentist.

A FERROPTOSIS GENE SIGNATURE PREDICTS IMMUNE INFILTRATION AND PROGNOSIS IN OSCC PATIENTS

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Aim: Oral squamous cell carcinoma (OSCC) has poor prognosis and low survival rate. Here, we built a prognostic model around ferroptosis to predict the overall survival (OS) of OSCC patients.
Methods: RNA-seq data of ferroptosis-related genes (FRGs) and clinical information of OSCC (training set, n = 407) were collected from TCGA. A FRG-signature of prognosis (FPS) was established by univariate and multivariate Cox hazard analyses. The reliability of the model was validated in a testing set (n = 35). GSEA together with TIMER and CIBERSORT algorithms were compared to evaluate cellular immune responses associated with FPS.
Results: 17 FRGs were found differentially expressed in OSCC tissues *vs* healthy mucosa (|log2FC |>1, p <0.05). The univariate and multivariate Cox analyses showed that a signature of 6 FRGs, defined by high levels of *ALOXE3*, *TFRC*, and *ACSF2* and low levels of *GOT1* and *HSF1* correlated with a better OS both in the training set and in the testing set (p <0.05) independently from the confounding factors. FPS also correlated with lower TNM stage, smoking, no chemotherapy and no tumor recurrence (p <0.05). GSEA revealed that immune-related pathways, including inflammatory response and neutrophil activation, were enriched in patients with FPS. TIMER and CIBERSORT algorithms confirmed that patients with FPS showed a higher proportion of intratumoral neutrophils and monocytes.
Conclusions: we developed a FRG-based model that provides novel insights into the prediction of OSCC prognosis and identifies the relevance of the immune microenvironment for patient outcomes.

SEXUAL DYSFUNCTIONS IN PATIENTS WITH ORAL *LICHEN PLANUS*: A CROSS-SECTIONAL STUDY

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Aim: to evaluate sexual dysfunctions (SD) in patients with Oral Lichen Planus (OLP) compared to healthy controls (HC).

Methods: 60 OLP and 60 HC, matched by age and gender, were recruited in two different universities (Naples and Santiago de Compostela). All participants were administered the Hamilton Rating Scale for Anxiety and Depression (HAM-A/D), the Pittsburgh Sleep Quality Index (PSQI), the Epworth Sleepiness Scale (ESS), the Oral Health Impact Profile (OHPI), the Sexual Desire Inventory (SDI), the Female Sexual Function Index (FSFI) and the International Index of Erectile Function (IIEF).

Results: HADS-A, HADS-D, PSQI and ESS scores were comparable between OLP and HC and were higher in females. A significantly higher OHIP score was found in OLP (12.48±9.37 *vs* 5±5.66). Patients reported a lower dyadic sexual desire (35.92±17.25 *vs* 38.81±16.86) with a slightly lower SDI total score while solitary SDI score was marginally higher in OLP than in HC. We registered a lower IIEF score in OLP than in HC (18.25±4.64 *vs* 21.50±4.03) whereas a low FSFI score was reported both in patients and controls without a statistically significant difference between groups.

Conclusions: OLP significantly impacts people's QoL and interfers with dyadic sexual desire. A higher SD prevalence was found in males with OLP. Conversely, in female population, we reported the same high prevalence of SD in OLP and HC. This difference may be related to the higher levels of anxiety and depression and the poorer sleep quality reported in females. Other studies are needed to corroborate our results.

HPV INFECTION, VACCINATION AND OROPHARYNGEAL CANCER: KAP AMONG ITALIAN DENTAL STUDENTS

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Aim: HPV is a mainly sexually transmitted virus associated with cervical, anogenital, and oropharyngeal cancer (OP-C). Dentists play a key role in the primary/secondary prevention of infection and HPV+ OP-C. The study aims to assess Knowledge (K), Attitude (A) and Perception (P) on HPV infection (HPV-I), HPV+ OP-C and HPV vaccination (HPV-V) among Italian dental students.

Methods: Students received a questionnaire with 81 quizzes divided into 4 sections: i) sociodemographic data (gender/age range/year of study), ii) HPV+ OP-C/HPV-I/HPV-V K, iii) HPV+ OP-C/HPV-I/HPV-V A, iiii) HPV+ OP-C/HPV-I/HPV-V P.

Results: 412 students were recruited. In relation to K the mean of correct answers was 64.52% ±14,53 (HPV+ OP-C), 51.26% ±14.86 (HPV-I) and 62.4% ±12.19 (HPV-V). For A, a distribution of 81.1% and 87.1% was found in "strongly agree" / "agree" responses respectively in discussing with patients and updating on HPV-diseases. Regarding P, 82.5% and 87.9% of participants agreed/strongly agreed respectively in perceiving the role of dentist as important in HPV-disease and in promoting the vaccine. Using chi-square test, statistically significant differences were observed in relation to sociodemographic parameters ($p \leq 0,05$).

Conclusions: this is the first study aiming to assess KAP on HPV+ OP-C/HPV-I/HPV-V among students. Findings from the current study are encouraging, but students expressed the need for acquiring more information about HPV-disease and vaccine. Improving educational training programs will place future dentists in the front line of HPV-diseases primary and secondary prevention.

ORAL MUCOUS MEMBRANE PEMPHIGOID IN MARCHE REGION: A RETROSPECTIVE EPIDEMIOLOGICAL STUDY

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Aim: mucous membrane pemphigoid (MMP) is a rare autoimmune, subepithelial blistering disorder involving 2-10 cases per 100,000 individuals. The study aims to provide an epidemiological characterization of MMP in Marche region.

Methods: all cases of MMP of Marche patients, treated at Dentistry Clinic, Marche Polytechnic University, from 2016 to 2022, were included. Demographic and clinical data were collected from the archives of Dentistry Clinic and the Pathology Institute. For epidemiological analysis, the sample size was the Marche population according to the yearly population for the period 2016-2022, reported by the Italian National Institute of Statistics (ISTAT).

Results: a total of 11 patients (9 females, 2 males) with a mean age of 58.2±19.5 years were included in the study. During the same period, the crude annual incidence of MMP in Marche region was 0.89 patients/million/year, ranging from 0.65 (2017) to 1.33 (2021) patients/million/year. MMP life prevalence in Marche region was 7.39 per million.

The involved sites were gingiva (7 cases), alveolar mucosa (2 case) and palatal mucosa (2 cases). All patients reported the presence of erythema, erosions, pseudomembrane, and sometimes clear signs of blistering disease.

No skin involvement nor apparent scarring was observed. In all patients, direct immunofluorescence showed a continuous deposit of IgG, IgA and/or C3 in the epithelial basement membrane zone.

Conclusions: the annual incidence is similar to those reported in other European countries.

MANAGEMENT OF ORAL CANDIDIASIS USING LACTOFERRIN IN PHOTODYNAMIC THERAPY: *IN VITRO* STUDY

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Aim: the aim of this work was to evaluate, through an *in vitro* study, the efficacy of lactoferrin (LF) as a photosensitizer (PS) in photodynamic therapy (PDT) against oral multidrug-resistant isolates (MDR) of Candida spp.

Candida species are a common cause of severe oral infections that have recently proven resistant to antifungal drugs. For this reason, novel therapeutic procedures are urgently requested. Following this aspect, among the non-pharmacological therapies, we have performed a PDT protocol by using lactoferrin, a transferrin, as PS. In fact, its chemical structure bound to its light absorption to 310-350 nm suggested the use of LF as a promising candidate in the PDT against oral candidosis.

Methods: MDR oral isolates of *C. albicans, C. kruseii,* and *C. glabrata* were used and inoculated in a petri dish with a suspension of 1 10^6 cells/mL. 20 mg of bovine lactoferrin was dissolved in 1 mL of Sabouraud broth; this solution was used in four different combinations in a Kirby-Bauer test (Eucast protocol):

(i) solution as it is
(ii) solution activated with 3% H_2O_2
(iii) solution activated by light at 310-350 nm
(iv) solution activated both with 3% H_2O_2 and light at 310-350 nm The Petri dishes were then incubated at 37 °C for 48 h.

Results: group (iv): LF, H_20_2, and light showed the best results, with inhibition haloes ranging from 30 to 40 mm for all analyzed strains.

Conclusions: solutions based on H_2O_2 and lactoferrin can be considered a promising PS in PDT and in the eradication of Candida spp. MDR.

QUANTITATIVE ANALYSIS OF ZOLENDRONATE AND ALENDRONATE IN MRONJ-RELATED BONE SEQUESTATION

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Aim: medication-related osteonecrosis of the jaw (MRONJ) is a severe complication of bisphosphonates (BPs) and anti-resorptive drugs prescribed for treatment of severe osteoporosis and bone malignancies. The purpose of this study is to assess the concentration of BPs (zolendronate and alendronate) in bone tissue and to evaluate possible correlations with the dosage, the length of the therapy or its suspension.

Methods: patients experiencing bone sequestration surgical or spontaneous removal for MRONJ were enrolled. The patients referred at the Dental Unit (Asst Santi Paolo e Carlo and Papa Giovanni XXIII Hospital). Socio-demographic and clinical data were collected. Bone specimens were sent to the toxicology laboratory.

Results: 97 patients were recruited (111 bone specimens). The mean concentration of zolendronate was 13.8±24.2 ng/ng, while for alendronate was 653.2±1151.2 ng/ng. No specific correlation in the amount of BPs could be found with the length of anti-resorptive therapy either the drug suspension. BPs could be detected in the bone tissue even after years from their suspension.

Conclusions: BPs accumulate in the bone tissue and can be detected in sequestered bone. Our findings support the presence of the drug even years after its suspension, suggesting a long-term risk correlated to MRONJ also in those patients who stopped the drug. The amount of BPs in the bone sequestration appeared to not be significantly dependent from the length of the therapy or its suspension.

A RARE EPITHELIOID HEMANGIOENDOTHELIOMA OF THE TONGUE: A CASE REPORT AND SYSTEMATIC REVIEW

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Aim: Epithelioid haemangioendothelioma (EHE) is a rare vascular tumour caused by the proliferation of endothelial cells. The purpose of this study was to describe a rare case of EHE of the tongue and to perform a systematic review of the literature reporting oral EHE.

Methods: a 58-year-old woman was referred to our Oral Medicine Department for evaluation of a slowly growing ulcerative lesion of the tongue. The patient's past medical history was non-contributory. Oral examination revealed a soft swelling ulcerated mass with hypertrophic margins and yellowish base, on the right lateral border of the tongue (2 x 3 cm). An incisional biopsy was performed and the histological exam revealed hyperplasic epithelium, site of proliferation of epithelioid endothelial elements. Immunohistochemistry showed positivity for ERG. So, a final diagnosis of EHE was made. After excisional surgery, no local recurrence was reported at 8 months follow-up. A systematic review was conducted on PubMed database, following PRISMA guidelines.

Results: among 28 included study, 40 cases of EHE were identified including our case report (20 male, 18 female), with a mean age of 35 years (±19). The most frequently site was the gingiva followed by tongue (18 and 10). After excision, the recurrence was noted in 20% of cases (8/40). Only 1 case of metastasis was described.

Conclusions: differential diagnosis of oral soft swelling should include vascular tumours. Patients with EHE diagnosis should be followed-up for prolonged periods due to the tendency of local recurrence and due to uncertain malignant nature.

COLD ATMOSPHERIC PLASMA INDIRECT TREATMENT TO TARGET ORAL CANCER CELL LINES

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Aim: Cold atmospheric plasma (CAP) is an innovative therapeutical approach, which allows the production of plasma activated media (PAM) with many biological applications. The mixture of reactive oxygen and nitrogen species is mainly responsible for the plasma activity. Since the effectiveness of CAP in human cancer was already reported, here we investigated the anti-tumoral activity of different PAMs in non-malignant oral cells (HGFs) and in oral squamous cell carcinoma (OSCC) cells (HSC-2, HSC-3, HSC-4, A 253).

Methods: PAM was obtained using a Jet plasma with air gas, provided by PBRC, Kwangwoon University Seoul. The working distance was fixed at 6 mm and the volumes of culture media activated by CAP (5, 10, 20 min) were 2 ml and 5 ml. Effects on cell viability were assessed by MTS assay at 24, 48 and 72 h and apoptosis induction was analyzed by flow cytometry at 24 h.

Results: MTS assay revealed that all the PAM treatments remarkably reduced cell viability in all OSCC cell lines, with the 2 ml samples being more effective than 5 ml ones, while barely affected HGFs viability. Flow cytometry analysis revealed that apoptosis was induced, in a comparable manner, by the 2 ml treated for 5 minutes and the 5 ml treated for 20 minutes. In the HSC-2 cells exposed to 5 ml PAM, a time-dependent trend was found in the occurrence of late apoptosis.

Conclusions: these preliminary results highlight that CAP is a promising and selective treatment for OSCC and may open a new window of opportunities for an innovative approach for the management of OSCC and beyond.

MANDIBULAR ANGLE METASTASIS FROM BREAST CANCER: A RARE CASE REPORT

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Aim: breast cancer is the most common cancer and the second cause of cancer-related death in women. We aimed to report a rare occurrence of a bony metastasis from breast cancer involving the mandibular angle.

Methods: a 32-year-old woman came to our attention with a suspected diagnosis of osteonecrosis or metastasis due to experiencing paresthesia/anesthesia in the left mandibula. She underwent a radical bi-mastectomy 3 years earlier for invasive lobular carcinoma of breasts. In addition to chemotherapy and radiotherapy, intravenous zoledronic acid was prescribed. CBCT, PET exams were performed for diagnosis confirmation.

Results: clinical examination did not reveal any mucosal ulcer or fistula, but palpable left regional submandibular lymph nodes and swelling of the lateral area of the mandibular angle. CBCT showed small poorly diffused radiopacity in proximity to the mandibular angle, both medial and lateral surfaces. PET showed fluoro-2-deoxy-D-glucose uptake in the mandible in the left angle surface area. The patient's clinical history, signs, symptoms, and CT/PET evidence led to the diagnosis of mandibular metastasis.

Conclusions: breast cancer manifestations in head and neck are rare, mostly bony metastasis to the mandible and maxilla. Despite their rarity, metastatic tumors should be considered in the differential diagnosis of inflammatory and reactive lesions of the jaws. This case emphasizes the importance of a complete and careful workup with particular attention to detailed medical history as well as careful clinical examination and reading instrumental data.

IMMUNOHISTOCHEMICAL EVIDENCE OF SARS-COV-2 PERSISTENCY IN LONG-COVID ORAL LESIONS

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Aim: a growing evidence exists about Post-COVID conditions as sequelae of the Sars-CoV-2 infection in healed patients with up to 200 different symptoms, as reported by WHO, develop during or after infection and continue for more than 12 weeks with a pathogenesis related to virus persistency.
Methods: we selected 6 patients recovered from COVID-19 and with negative RT-PCR test affecting the oral mucosa (mainly ulcers) overlapping those occurring in the acute phase, persisting up to 20 days and thus needing an incisional biopsy with histological investigation and spike-protein evaluation by immunohistochemistry.
Results: at the histological examination epithelial ulceration, inflammatory infiltrate, vessels with increased diameter, flattened endothelium but no thrombi formation were detectable along with a weak epithelial SARS-CoV-2 positivity, only limited to the basal/spinosum layers and progressively decreasing towards the periphery, and also of the intra-epithelial lymphomonocytes, endothelium and perivascular pericytes too.
Conclusions: these findings provide evidence that SARS-CoV-2 can persist also in the oral epithelium/mucosa after the healing from the acute phase and that it can be responsible for oral mucosa lesions; as for other organs/systems, the pathogenetic mechanism should be better investigated especially in term of how/when/why but certainly such occurrence represents the oral cavity counterpart of the long-COVID.

HYPOSALIVATION IN DIABETICS PATIENTS

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Aim: Hyposalivation is a reduced salivary flow, which may occur due to different conditions, such as drug intake (anti-hypertensives, anti-cholinergics, chemiotherapy), head and neck radiotherapy and systemic disorders including Sjögren syndrome and diabetes. The aim of this study was to evaluate the correlation between diabetes and hyposalivation.
Methods: salivary flow was measured by means of spitting method, which consists in spitting in a graduated test tube the saliva produced in 60 seconds, repeating the procedure 5 times (basal sialometry). The stimulated salivary flow was obtained using the same procedure, but asking each individual to chew a pellet of wax. 10 diabetic patients (2 of them with poor glycemic control) and 20 non-diabetic patients, as control group, were recruited.
Results: both groups presented a reduced salivary flow, due to patients' systemic disorders and drug intake. Hyposalivation resulted higher in diabetics.
Conclusions: it is important for the dentist to monitor the patients' salivary flow, especially in case of patients affected by diabetes, in order to early diagnose and manage hyposalivation and related oral complications, such as caries, periodontal diseases and oral candidiasis.

NECROTIZING SIALOMETAPLASIA TREATED WITH CONCENTRATED GROWTH FACTOR FOR FAST HEALING

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Aim: necrotizing sialometaplasia is a rare and self-limiting disorder affecting the minor salivary glands of the hard palate in 80% of cases. It is a diagnostic challenge since it may mimic malignancies such as oral cancer. This study analyzes the benefit of using concentrated growth factor (CGF) in the treatment of aseptic ulcers of the hard palate.

Methods: seven patients (4 males and 3 females, mean age 48.6 years) were referred to Maxillo-facial surgery Department, Ospedali Riuniti (Ancona) between 2020 and 2022 for necrotizing sialometaplasia of hard palate mucosa. Therapeutic protocol consisted in a peripheral blood sample from a large-caliber vessel. Within 2 minutes of collection the tubes were placed in the centrifuge/phase separator. The separation cycle lasts about 13 minutes, followed by 20-30 minutes of rest. Later, the fibrin block with CGF was washed with physiological solution and thinned depending on the defect to be filled. Finally, the block was transferred to the site and sutured with resorbable sutures.

Results: none of the patients experienced discomfort. Check-up were carried out after 7 days; thereafter, patients were re-evaluated every 3 days until complete recovery. After 7 days, 4 patients showed total remucosization and 3 patients, whit the greater size defects, displayed partial remucosization.

Conclusions: CFG is a preparation with excellent potential, whose clinical use is promising in the healing of ulcers of soft tissue caused by necrotizing sialometaplasia.

TRAUMATIC ULCERATIVE GRANULOMA WITH STROMAL EOSINOPHILIA OF THE HARD PALATE

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Background: traumatic ulcerative granuloma with stromal eosinophilia (TUGSE) is a rare and benign condition affecting the oral cavity. It is usually localized on the tongue but can involve other areas of the oral mucosa.

It is a self-limiting and self-regenerating lesion; due to its rapid onset and clinical appearance, it can mimic a malignant lesion (squamous cell carcinoma or oral lymphoma), but has a complete healing after surgical trauma.

Case report: We report a case of a palatal lesion in an 86-year-old diabetic, non-smoking patient urgently referred by her family doctor for odontogenic abscess refractory to antibiotics.

At dental examination, there was a swelling of the anterolateral mucosa of the hard palate approximately 3 cm in diameter, non-painful, with ulcerated surface, non-fluctuant, and taut-elastic consistency. According to the patient the lesion had grown over 20 days; oral trauma were not reported, dental elements responded positively to vitality tests and patient didn't wearing a prosthesis.

The clinical history and the appearance of the lesion justified immediate biopsy. Hemostasis was achieved by compression. Histologically, the lesion was predominantly composed of a lympho-granulocytic infiltrate of the chorion with numerous eosinophils. The epithelium showed acanthosis and absence of dysplastic or malignant cells. Immunohistochemical analysis of the lymphocyte tumor panel confirmed the normal expression of CD3, CD20, ki67. Analysis for HHV8, HPV, CKMNF116, p16, ERG, S100 were negative.

At the clinical follow-up, the lesion was almost completely healed.

ORAL HEALTH STATUS IN TWO COHORTS OF CANCER PATIENTS: A CASE-CONTROL STUDY

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Aim: Bone Metastatic Cancer (BMC) patients and Head and Neck Cancer (HNC) patients require specific dental care in order to prevent and manage the adverse effects of radiotherapy (RT) and bone antiresorptive (AR) drugs. The aim of this observational case-control study was to compare the oral health (OH) status between HNC patients (case group) and BMC patients (control group). Moreover, secondary outcome was to identify any risk factors associated with poor OH status.

Methods: fifty patients were enrolled in the case group and 50 patients in the control group, matched by age and sex. All patients were evaluated at Fondazione Policlinico A. Gemelli, Rome. The OH status was clinically and radiographically evaluated using a DMFT index, a full periodontal charting and radiological examination (orthopantomographs). The OH status was defined as "poor" in cases of DMFT≥13 and/or stage III or IV periodontitis.

Results: among 100 patients included in this study (mean age 59.4, SD: 12.9), 56 patients (56%) had a poor OH. Among the HNC patients, 34 (68%) were affected by poor OH; compared to 22 (44%) among the BMC patients (χ2-test: $p < 0.05$), with a RR = 2.6, p = 0.05. The following risk factors were independently associated with poor OH status: age (RR: 0.5, $p < 0.05$); smoking (RR: 3.4; $p < 0.05$).

Conclusions: this is the first study to examine the OH status in two different cohorts of cancer patients. HNC patients have a poorer OH compared to BMC patients at first dental visit. Nevertheless, smoking habit and age remain the most important risk factors for poor OH.

MRONJ AND ORAL HEALTH-RELATED QUALITY OF LIFE: A CASE-CONTROL PILOT STUDY

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Aim: the objective of the present study was to evaluate the oral health-related quality of life (OHRQoL), the quality of life (QoL), and the psychological profile in patients affected by medication-related osteonecrosis of the jaws.

Methods: a case-control pilot study was conducted by enrolling MRONJ patients and an equal number of controls matched for age and gender. All the participants were clinically evaluated and completed a predefined set of questionnaires. The Oral Health Impact Profile-14 (OHIP-14), the Short Form 36 Health Survey Questionnaire (SF-36) and the Hospital Anxiety and Depression Scale (HADS) were administered.

Results: a total of 50 participants, 25 MRONJ patients and 25 controls were included. MRONJ patients presented a poorer OHRQoL compared to the controls (OHIP-14 total score p-value: 0.003). Also, the general QoL of MRONJ patients was significantly impacted, especially in the "physical functioning", "physical role", "body pain", "general health", "vitality" SF-36 items (p-values: 0.001, 0.001, 0.013, 0.001, 0.020 respectively). While the SF-36 items "social functioning", "emotional role" and "mental health", failed to detect any difference between the groups, the mean sub-scores of the HADS, both the anxiety and depression scores (HADS-A, HADS-D) were significantly higher in the MRONJ patients compared to the controls (p-values: 0.002, 0.009 respectively). However, the "mental health" SF-36 item showed to be correlated with both HADS-A and HADS-D scores (p-value: 0.003, 0.031).

Conclusions: a comprehensive clinical examination of MRONJ patients should take into account the assessment of the OHRQoL, QoL and of the psychological status with different questionnaires, in order to gather detailed information on patients' physical and psychological status and better tailor treatments.

USE OF INTEGRA® DERMAL REGENERATION TEMPLATE FOR MUCOSAL DEFECTS AFTER ORAL CANCER SURGERY

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Aim: reconstructive options for mucosal defects of the oral cavity resulting from the resection of tumors, consist of primary closure, mucosal and split thickness skin grafts, pedicle flaps, and microvascular free transfer of tissues. To preserve the oral cavity functions, the maintenance of oral mucosa lining and tongue mobility is necessary. Dermal matrix such as Integra® is an alternative approach for the reconstructive surgery of small intraoral mucosa defect, particularly indicated in the cheek mucosae because allows the re-epithelialization of the wound.

Methods: between 2020 and 2022, 47 patients treated for early oral squamous cell carcinoma at the Maxillo-facial surgery Department, Ospedali Riuniti (Ancona) were subjected to oral mucosa reconstruction with bilayer Integra®. In all cases, the oral defect was site at the check mucosae with greatness in size about 3 × 4 cm.

Results: as emerges from the results obtained in our study, the dermal matrix such as Integra® represents a valid alternative in oncologic reconstructive surgery for small/medium intraoral mucosa defect because it allows re-epithelialization of the wound.

Conclusions: the simplicity of the reconstructive act by positioning Integra®, the reduced duration of the reconstructive phase, the good restoration of functionality and the low percentage of complications are the strengths of this reconstructive option which will be implemented in the future and always applied more widely for the reconstruction of oral cavity defects.

NEW DIAGNOSTIC SURVEY IN HYPOSALIVATION DIAGNOSIS: A COHORT PROSPECTIVE CLINICAL STUDY

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Aim: develop a new diagnostic questionnaire called Real Hyposalivation Survey (RHS) designed to screen xerostomia patients with real hyposalivation.

Methods: for this study, 30 adult patients presenting a subjective sensation of dry mouth were included. The development of RHS required the previous performance of a systematic literature review using PubMed, Web of Science, and SCOPUS electronic databases to identify suitable questions for screening real hyposalivation patients (4 major criteria and 6 minor criteria). RHS was administered to patients and, in two distinct medical examinations (T_0 and T_1), basal and stimulated salivary flows were measured through the spitting method.

Statistical analysis was carried out with R software, and linear regressions were performed to assess whether the results of the sialometry regressed significantly on the RHS scores (P <0.05).

Results: all tested parameters had a significant effect on RHS score: T_0 (P = 0.000406, P = 0.000801), T_1 (P = 0.000616, P <0.0001), and mean basal and stimulated salivary flow (P = 0.000496, P <0.0001).

Moreover, mean basal and stimulated salivary flow values were significant effects on the number of major criteria of RHS (P = 0.00143, P <0.0001).

Conclusions: the results of this study suggest the usefulness of RHS as a screening tool for xerostomic patients with real hyposalivation.

Future multicenter case-control studies are needed to confirm the results of this study on a larger sample of patients in different populations, including evaluating the sensitivity and specificity of the survey in a population of non-xerostomic patients.

BRAFVP600E MUTATION IN PERIPHERAL AMELOBLASTOMA: A RETROSPECTIVE STUDY ON 12 CASES

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Aim: peripheral ameloblastomas are benign, rare odontogenic tumors that are clinically like several other diseases. According to the WHO, the mutation of the BRAF gene is one of the causes of these tumors. The aim of this retrospective study is to check the presence of this mutation by reviewing the cases of peripheral ameloblastoma referred to the Unit of Odontostomatology of the Aldo Moro University of Bari from 2002 to 2022.

Methods: all patients underwent panoramic radiograms, nuclear magnetic resonance imaging, and computed axial tomography. After a minimally invasive preoperative diagnosis by fine needle aspiration biopsy and cytology, the patients underwent surgical excision. Patients underwent clinical and radiographic follow-up panoramic radiogram on the 7th postoperative day, and every three months for one year. Whenever possible, immunohistochemistry for the BRAFpV600E mutation was performed on histological sections.

Results: 12 peripheral ameloblastomas occurred among the 73 odontogenic tumors considered in this study. Healing was complete and no recurrences were observed in all cases. Immunohistochemistry was performed in only 5 cases and 4 showed the BRAF gene mutation.

Conclusions: the BRAFpV600E mutation is an additional method useful for the differential diagnosis of peripheral ameloblastomas. Further investigations will be necessary to establish a targeted therapy in cases showing this mutation.

COST CALCULATION OF OSCC TREATMENT: THE VALUE OF AN EARLY DIAGNOSIS

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Aim: clinical and epidemiological aspects of Oral Squamous Cell Carcinoma (OSCC) are well-documented in literature, but the economic burden of OSCC still lacks evidence. The aim of the present study is to retrospectively evaluate the direct costs of OSCC treatment and post-surgical surveillance in a tertiary Italian hospital.

Methods: the study population consisted of 63 consecutive patients surgically treated for a primitive OSCC at S. Orsola Hospital in Bologna (Italy) between January 2018 and January 2020. We used billing records of Emilia Romagna healthcare system and institutional costs to derive specific costs of the following clinical categories: operating theatre costs, intensive and ordinary hospitalization, radiotherapy, chemotherapy, post-surgical complications, visits and exams during follow up period.

Results: 17 patients were classified at stage I OSCC, 14 at stage II, 8 patients at stage III and 24 at stage IV. The estimated mean total direct cost for OSCC treatment and post-surgical surveillance is € 26338.48 per patient (stage I average cost: € 10733, stage II: € 19642.9, stage III: € 30361.4, stage IV: € 39957.2).

One way ANOVA with multiple range test revealed that diagnosis at stage I is a variable significantly related to a lower cost of OSCC treatment and post-surgical surveillance.

Conclusions: data suggest a direct correlation between early diagnosis and costs of treatment. Redirection of funds used for OSCC treatment to screening measures may be a good strategy to improve overall health outcomes and optimize national health resources.

A SINGLE-CENTER RETROSPECTIVE SURVEY ON ORAL BIOPSIES: ANALYSIS OF 1,397 SPECIMENS

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Aim: a correct diagnosis is the most important step in the treatment of oral lesions and each oral lesion has specific clinical features that provide clinical diagnosis. However, some of these features are common among different lesions. In these situations like a gold standard, biopsy and histopathological examination are indicated. The aim of this study was to evaluate the correlation between raters' expertise and histological diagnosis of oral lesions in patients undergoing oral biopsy from 2017 to 2022.

Methods: in this retrospective survey, patients referred during a 6- year period were collected through archives files and clinical findings and compared with histopathological reports. The recorded information in files included age, gender, lesion's location, clinical and histopathological diagnoses, biopsy methods and raters' expertise.

Results: a total of 1,397 biopsies were included and analyzed. In regard to location, the highest concordance of clinical and histopathologic diagnoses was observed in the alveolar mucosa (20,5%). Scalpel method was the most frequent biopsy method executed in 42,3% of cases. The NBI endoscopy was applied to observed lesion sites according to the intraepithelial papillary capillary loop pattern. A greater concordance was found between raters' expertise and final diagnosis.

Conclusions: NBI endoscopy-correlated rater expertise improved diagnostic accuracy and the ability to detect high-grade dysplasia/carcinoma.

EFFECTIVENESS OF VEA FILME OS IN THE REDUCTION OF VAS-D ON THE BIOPTIC SAMPLE SITE

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Aim: the purpose of this study is to evaluate the effectiveness of topical applications of Vea filme os (Tocopherol Acetate) in reducing pain in patients undergoing oral biopsy.

Methods: it is considered as primary variable the pain-related visual analogue scale (VAS-D) on the first and sixth post-operative day in patients who applied topical Vea filme os three times a day for seven days on single or multiple oral mucosal biopsy samples.

Concomitant intake of painkillers was recorded and evaluated. The statistical analysis was done with a Student's t-test, and it was carried out with R 4.1 (R Foundation for Statistical Computing, Vienna, Austria). A p-value of less than 0.05 was considered statistically significant. The postoperative discomfort assessment was conducted by telephone on the sixth day.

Results: the test was conducted on 17 patients, 7 women and 10 men, the gender was irrelevant in the difference in reduction of VAS-D. The final VAS-D (1.15) was significantly lower than the initial VAS-D (2.88) (p-value 0.01) with 95% confidence interval.

The intake of painkillers did not entail a significant decrease in pain on the sixth day, 10 patients took painkillers while 7 did not (p-value 0.84).

Conclusions: the use of Vea filme os has proved to be effective in reducing VAS-D at the bioptic sample site.

DENTAL PANORAMIC RADIOGRAPHY MARKERS FOR MONITORING OF ANTI-RESORPTIVE THERAPY

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Aim: studies have shown that it is possible to correlate different radiographic markers measured on Dental Panoramic Radiography (DPR) with Bone Mineral Density (BMD).
The aim of our retrospective study is to evaluate changes in DPR radiographic markers in patients undergoing antiresorptive therapy with denosumab.
Methods: we evaluated two morphometric indexes: Mandibular Cortical Width (MCW) and Panoramic Mandibular Index (PMI), in patients undergoing antiresorptive therapy with denosumab at T_0 (before starting the therapy) and at T_1 (after 12 months) comparing results with a control group (CTRL) of healthy patients who performed two DPRs at a one-year time distance.
Results: the study included 18 patients (DEN) and 26 controls (CTRL) according to specific inclusion and exclusion criteria. The groups were homogeneous regarding gender and age. MCW index didn't show significant changes between time points and between the two groups. Instead, PMI index increased significantly in the DEN group ($p < 0.0001$) from T_0 to T_1. At T_0, PMI was significantly lower in the DEN group ($p = 0.036$), consistently with lower BMD. One year after therapy (T_1), there weren't any differences (p = NS). In addition, we observed a significant decrease in the PMI of the CTRL group from T_0 to T_1 ($p = 0.0013$).
Conclusions: our results show how PMI can be used as a radiographic marker to assess the efficacy of antiresorptive therapy with denosumab. Further studies are warranted to increase sample size and to assess possible correlations with MRONJ risk.

CANALICULAR ADENOMA: LITERATURE REVIEW AND A CASE REPORT

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Aim: canalicular adenoma is a sporadic benign lesion of intraoral salivary glands. It mainly affects the upper lip (around 80%), the latter is then followed by buccal mucosa and hard palate. This kind of tumor never concerns the major salivary glands.
The purpose of the current paper is to present a literature review about canalicular adenomas and to show diagnostic features, clinical management and surgical treatment with non-invasive approach of a truly unique case.
Methods: patient, sent by his trusted dentist, comes to the Dentistry Department of San Raffaele Hospital asking for a specialized opinion about an evident swelling of the left upper labial mucosa. The lesion appears movable in palpation, well circumscribed and covered by mucosa in normal conditions. Patient does not complain about any painful symptoms and there were no swollen cervical lymph nodes. An early potential diagnosis of canalicular adenoma has been suggested, however taking into account that only the histological examination could have confirmed that hypothesis. Tumor was surgically removed under locoregional anesthesia; it was about 1 cm in diameter.
Results: clinical follow-ups were conducted 1 month and 1,5 months after the surgery. The first one showed total disappearance of the swelling and excellent wound closure by primary intention. Likewise, second follow-up revealed a perfect disposal of pathological features and a remarkable rehabilitation.
Conclusions: complete surgical excision represents the gold standard in managing cases of canalicular adenoma, therefore diagnosis confirmation through histological investigation is necessary in order to achieve unmistakable results. Histopathologic analysis is crucial to avoid misdiagnosing canalicular adenomas with other benign or malign tumors or, as frequently happens when diagnosis is just based on intraoral examination, with mucocele.

TREATMENT OF PRIMARY HERPETIC GINGIVOSTOMATITS: A SYSTEMATIC REVIEW

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Aim: Herpes simplex virus 1 (HSV-1) is the main pathogen responsible for herpes infections. In 13-30% of the cases primary HSV-1 leads to the primary herpetic gingivostomatitis (PHGS), often a self-limiting infection; however, it can limit the ability to drink/eat with sometimes the need for hospitalization. Multiple therapeutic methods were proposed. This systematic review aims to collect and critically appraise the available evidence about the clinical management of PHGS.

Methods: literature search, study design, and data analysis were performed following PRISMA guidelines according to SPIDER and the PICO tools (PROSPERO n° CRD42023391386).

Results: 5 studies on a total of 364 patients (average age: 7.6 y) were identified. The treatment regimens were summarized in: acyclovir (24.5%); acyclovir+honey (13.7%); maalox+diphenidpamine (9.6%); CHX+mucosyte (8.2%); CHX+ialuronic acid (8%); topical antiviral+ antimicrobical photodynamic therapy (aPDT) (4.4%); aPDT (4.1%); CHX (4.1%); topical antiviral (3,8%); fluids and analgesic (3%); lidocaine (1.9%); others (14.3%).

Conclusions: PHGS is a disease with a high worldwide prevalence, the lack of consensus about therapeutic management indicates gaps in existing evidence. Most of the proposed treatment consist in symptomatic drugs with empiric regimens which are ineffectiveness for the viral replication. The main limit to realize randomized clinical trial is due to the rapid onset and remission of the disease. In fact, the diagnostic delay, estimated in 72 hours, decreases the effectiveness of the antiviral drugs.

LOCATION AND GENDER DIFFERENCES IN MRONJ: A META-ANALYSIS AND TRIAL SEQUENTIAL ANALYSIS

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Aim: the objective of this systematic review is to identify and quantify whether there is a proportionally greater risk of MRONJ in male or female subjects and whether there is evidence of greater involvement of osteonecrosis at the various extraction sites, differentiating them into mandibular or maxilla and in the anterior or posterior sector.

Methods: the revision protocol followed the indications of the Cochrane Handbook and was recorded in Prospero while the drafting of the manuscript was based on PRISMA.

All prospective and retrospective studies and RCTs reporting data on location and gender of BRONJ, MRONJ, or ARONJ in patients who underwent dentoalveolar surgery were considered potentially eligible.

The risk of bias was calculate using the ROBINS-I tool.

Results: the results of the systematic review after the study identification and selection process included 24 studies. The results of the meta-analysis report: Odd Ratio (Random-Effects Model): 1.476 (0.684 3.184) between male and female; Odd Ratio (Random-Effects Model): 1.390 (0.801, 2.412) between mandible and maxillary and Odd Ratio value of 0.730 (0.250 2.137) between anterior and posterior extraction sites.

Conclusions: in conclusion, we can evaluate that there is a trend in the onset of MRONJ as a complication of dentoalveolar surgical procedures which proportionally mostly involves the male sex and the posterior mandibular sectors, however, further studies are needed to confirm this trend.

ORAL PROBIOTIC ADMINISTRATION IN PERI-IMPLANT MUCOSITIS: A SYSTEMATIC REVIEW

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Aim: assess the efficacy of oral probiotic administration in patients with peri-implant mucositis (PiM), both individually and in association with non-surgical debridement therapy (NSDT).
Methods: the research was performed through the electronic databases PubMed, Scopus, and Web on Science, using the following combinations of MeSH terms "oral cavity AND probiotics AND mucositis", and "probiotics AND dental implants AND mucositis". We considered the studies published between January 2015 and February 2023. Starting from 91 studies and after the application of the inclusion and exclusion criteria, we selected 11 studies.
Results: three studies assess the efficacy of probiotic treatment (PT) individually. It's been encountered an improvement in the inflammatory clinical signs, a reduction in pro-inflammatory cytokines and cariogenic microorganisms' levels, and an increase in IgA levels.
Six studies assess the efficacy of PT in association with NSDT. It's been found a general clinical signs improvement both in the test and in the control group, which was bigger in the test group. Two studies encountered also a reduction in *P. gingivalis* and pro-inflammatory cytokine levels. The last two studies didn't find any relevant variation between the test (NSDT+PT) and control (PT) groups.
Conclusions: nine studies found relevant variations following the administration of PT. It emerged that it is an effective instrument in preventing and treating PiM. Further studies are needed to standardize the used microorganisms, the pharmaceutical form, and the dosage of the PT.

THE MOST COMMON GENERA DETECTED IN SALIVARY MICROBIOTA OF PATIENTS AFFECTED BY ORAL CANCER

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Aim: oral squamous cell carcinoma (OSCC) is one of the most prevalent cancers worldwide. Despite advances in diagnostic and surgical techniques, in the last years, the incidence of OSCC increased and the survival rate is still low. The causal correlation between oral microbiota and carcinogenesis has not yet been demonstrated representing a real challenge.
The aim of this review is to investigate the most common genera in the salivary microbiota of OSCC patients.
Methods: PRISMA guidelines have been followed to perform this systematic review. Observational studies about the composition analysis of salivary microbiota in human subjects with histological diagnosis of OSCC were selected.
Results: searching through the various databases yielded 558 articles; a total of 5 articles were included. The salivary microbiota of 373 patients was analyzed. There were 273 patients affected by OSCC, and there were 100 healthy patients. Despite the great heterogeneity of the included articles, the most common genera detected in the OSCC patients were *Fusobacterium*, *Prevotella,* and *Capnocytophaga*. Interestingly, these three bacteria are periodontal pathogens. Therefore, a potential implication of periodontal pathogenesis mechanisms in oral carcinogenesis was evaluated.
Conclusions: identifying a specific microbiota pattern involved in oral carcinogenesis could be useful for improving early diagnosis and focused therapy of patients affected by OSCC. Further studies are necessary to determine a causal association between salivary microbiota composition and oral carcinogenesis.

TREATMENT OPTIONS FOR ORAL LEUKOPLAKIA: A REVIEW

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Aim: the aim of this work was to highlight the most important findings regarding treatment options for oral leucoplakia, a white lesion with a potentially malignant evolution. There are several forms of oral leukoplakia with a various rate of malignant transformation, related to alcohol and tobacco consumption, gender, population, lesion size and type and level of dysplasia.

Methods: two databases (Medline via PubMed, Web of Science) were searched up to July 2022 and the most relevant papers on the topic were selected. Hand search was carried out too focusing on new and promising techniques regarding oral leukoplakia management options. Only papers written in English or Spanish were included in the research.

Results: the management options for oral leukoplakia are varied and diverse, they may involve a regime of observation even with use of new and promising salivary biomarkers, a topical or systemic use of drugs, a surgical approach including laser ablation or a non-surgical approach using photodynamic therapy (PDT). There is a rising interest in PDT, which proved to be an interesting minimally invasive approach for oral leukoplakia, reducing lesions size or removing the lesion in its totality, depending on the histopathological stage of the lesions and other variables linked to the type of PDT and the number of sessions. PDT works through the interaction between a light source and a chemical dye or photosensitizer in the presence of oxygen resulting in the formation of reactive oxygen species (ROS), which cause oxidative damage.

Conclusions: despite promising results, longer clinical trials are required in order to define a protocol, evaluate potential side effects of PDT and demonstrate its effectiveness.

FINITE ELEMENT ANALYSIS ON A NOVEL DENTAL IMPLANT MATERIAL: ZIRCONIA DENTAL IMPLANT

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Aim: the aim of this study is to evaluate in silico mechanical performance of zirconia fixtures with Finite Element Analysis.
Methods: the investigation was performed on a single PatentTM Dental Implant (Zircon Medical®, Altendorf, Switzerland) in two configurations: without offset (Test I) and with offset (Test II, 1.5 mm within the cortical bone). The components of the dental implants were tested using a compression load of 400 N along the implant axis. The Patent Implant system consists of two components: the implant with integrated abutment and the fibreglass post.
Results: the chewing load generates anomalous stress distribution on the bone, therefore, the offset configuration should be avoided.
Conclusions: Test I has better results than Test II to generate lower compressive stress on the cortical bone and higher stress on the cancellous bone.

REPRODUCIBILITY OF THE PATIENT'S REAL OCCLUSAL PLANE: ARTICULATOR *VS* FACIAL SCANNER

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Aim: the purpose of this study is to evaluate the reproducibility of the patient's real OP in the three planes of space, in anticipation of a prosthetic rehabilitation, by comparing the data obtained from an analog method, with data obtained from the digital Facial Scan (FS) technique.
Methods: analogue procedure sees the recording by the same operator of five facial arches of the patient, with different settings, for each of the two categories analyzed: Artex and Reference and subsequent static assembly in the corresponding articulator. Digital technique has seen as the first step the intraoral scan of the patient and subsequent Facial Scan (FS) through the Zirkonzahn face hunter scanner; from the same scan, five 3D patient reconstruction projects were carried out by the same operator using the associated software. For all the five couples of each category of Facial Arches analyzed and for all the five digital projects, the reproducibility of the OP in the three planes of the space was assessed. OP has been analyzed in different views. The angles formed between the OP and the corresponding reference plan for each category were quantified. Finally, the average values of the five reference planes of the Artex category were compared with the average values of the five reference planes obtained in the Digital Projects through data analysis; in the same way it was done for the Reference category with digital projects.
Results: data obtained from the data analysis which saw the comparison of the average values of the five reference plans of the Artex category with the mean values of the five reference plans obtained in the Digital Projects, show a p-value equal to 0.0022 (p </= 0.05). Same protocol has been applicated to Reference's category, has been obtained a p-value equal to 0.0034 (p </= 0.05).
Conclusions: digital approach of Facial Scanning presents an effective design of interventions with an accuracy and reproducibility not found in analogue methods, also providing the possibility to plan the work on a 3D "virtual patient" faithful and corresponding to the real situation.

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IN VITRO STUDY ON ACCURACY OF THREE FACIAL DETECTION SYSTEMS FOR PROSTHODONTIC PREVIEW

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Aim: the aim of this study was to compare the accuracy of three different devices for facial images acquisition, suitable for prosthodontic esthetic preview.

Methods: bidimensional extraoral photographs (Nikon D300), facial scans (Bellus3D) and 3D digital stereophotogrammetry photos (3dMD Face System) were acquired from 15 patients. The intraoral impressions of all subjects were digitally taken through a scanner (i500; Medit). Files obtained from each acquisition method were transferred on Exocad Software, and the measurements of the frontal teeth were performed and compared with those of the intraoral scans, assumed as reference. The data were statistically analyzed by the Friedman test for matched groups and the Dunn test for multiple comparison (P <0.05).

Results: no significant difference emerged between 2D digital photography and intraoral scans, both in height and width, for central and lateral incisors.

Measures obtained with Bellus3D significantly differed from the reference data in width of all teeth, except for central incisors (P <0.05).

Values referred to canines were those more subjected to significant distortions in width for all devices.

Conclusions: within the limits of this study, measures of frontal teeth acquired by 2D digital photography were similar to those of intraoral scans both in height and width, while those obtained with 3D facial scanners were more subjected to distortions in mesial-distal dimension.

READING DEPTH WITHIN THE SULCUS OF IOSS VARYING RADICULAR EMERCENCE PROFILE AND HUMIDITY

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Aim: the aim of this *in vitro* study was to evaluate the effect of the angle of radicular emergence profile, the gingival sulcus depth and the humidity level on depth of reading within the gingival sulcus of 4 intraoral scanners (IOSs).

Methods: a juxtagingival chamfer preparation was performed on a maxillary premolar of a phantom model. The model was scanned and .stl file was modified varying the angle of radicular emergence profile (0°, 6°, 12°, 20°, 25°) and sulcus depth (1 mm, 2 mm) to manufacture ten different 3D printed models. In addition, 3 different levels of humidity were simulated: dry, wet (1 µl of artificial saliva) and full wet (5 µl of artificial saliva). Each model was scanned 5 times using 4 IOSs: Trios 3, Trios 4, Omincam and Primescan. Differences in means were compared using Three-way ANOVA with interactions. The level of significance was set at P = 0.05.

Results: a deep gingival sulcus, an accentuated angle of radicular emergence profile and a great level of humidity made more difficult the reading within the gingival sulcus. Three-way ANOVA analysis revealed an interaction between these 3 factors.

The reading within the gingival sulcus was only partial with all tested IOSs in the presence of 25° of radicular emergence profile, a 2 mm-deep gingival sulcus, and a high humidity level. Trios 3 and Trios 4 showed an adequate depth of reading inside the gingival sulcus up to an angle of 12° of radicular emergence profile.

Conclusions: in the most complex clinical situations simulated in the present study the depth of reading was incomplete, suggesting that deep preparations into the sulcus were difficult to detect with IOSs.

DIGITAL WORKFLOW FOR THE IMPLANT-PROSTHETIC TREATMENT OF TEETH AGENESIS: PROSPECTIVE STUDY

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Aim: the main objectives of the present clinical prospective study were to evaluate the survival and the success of implant-supported zirconia single crowns produced with a digital workflow for the rehabilitation of mono- and bilateral agenesis of maxillary lateral incisors, after 2 years of clinical function. Furthermore, biological and technical parameters affecting the prosthetic restorations were recorded, as well as the patient satisfaction rate.

Methods: twenty-two patients affected by monolateral or bilateral agenesis of the maxillary lateral incisors were included in the study, and a total of 30 narrow diameter implants were inserted. Thirty screw-retained monolithic cubic zirconia crowns (5Y-TZP) with internal connection were fabricated. Objective evaluations were performed by means of the FIPS (Functional Implant Prosthodontic Score), whereas the degree of patient satisfaction was evaluated by means of VASs (Visual Analog Scales). Descriptive statistics was performed by means of Kaplan-Meier analysis.

Results: after 2 years of clinical function, the overall average FIPS found in the present study was 9.2, whereas the average patient satisfaction score was 8.7. The Kaplan-Meier analysis at 2-year follow up reported a cumulative success rate of 93.3% and a cumulative survival rate of 100%.

Conclusions: implant-prosthetic rehabilitation produced with digital workflow has proven to be a reliable procedure for the esthetic-functional treatment of the agenesis of maxillary lateral incisors in the short-term, although further clinical investigations are required to validate this treatment option in the long-term.

INTRAORAL SCANNER ON VERTICAL DEEP SUBGINGIVAL MARGINS: 3D ANALYSIS AND ACCURACY

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Aim: the aim of this study was to evaluate the accuracy of an intraoral scanner (IOS - Medit i700) on tooth abutments with vertical preparations at different depths below the gingival margin, and to determine if the IOS can detect the surface beyond the finish area of this preparation geometry.

Methods: two abutments of a standard maxillary first molar were designed using a CAD software with vertical preparation geometry 1 and 2 mm deep in the gingival margin. These abutments were printed in resin and placed each on a reference model. Ten scans were made with the tested IOS on each sample to obtain 2 study groups. The experimental scans were named “V-1” (vertical preparation at 1 mm under the gingival margin), “V-2” (same, at 2 mm). The scans were analyzed using a dedicated software to evaluate trueness and precision in µm. Descriptive statistics (95% C.I.) and independent sample test were performed to analyze differences among groups ($\alpha = .05$).

Results: statistically significant differences were not found both for trueness ($p = .104$) and precision ($p = .409$), between the tested geometries. The mean values for trueness were V-1 = 37.5 [31.4-43.6]; V-2 = 32.6 [30.6-34.6].

About the precision, the mean values were V-1 = 20.5 [8.4-32.5]; V-2 = 18.4 [8.2-28.5]. In both the study groups, it was possible to record the surface beyond the finish area.

Conclusions: vertical preparation design allows to register tooth anatomy beyond the finish area with IOS.

Moreover, the mean accuracy values were clinically acceptable at both 1 and 2 mm below the gingival margin.

ACCURACY OF IOS ON THE EDENTULOUS MAXILLA WITH DIFFERENT PALATAL MORPHOLOGIES: 3D ANALYSIS

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Aim: with the increase in life expectancy, there is a greater demand for prosthetic rehabilitation in edentulous patients. In this regard, an intraoral scanner (IOS) is a useful device for digitalizing the edentulous arches to fabricate prostheses. The present study aimed to evaluate the trueness and precision of scans made with an IOS (TRIOS 4) on a completely edentulous maxilla, in the cases of different palatal morphologies.

Methods: six different typodonts were fabricated for several palatal morphologies with flat, medium, and deep palates, with or without palatal wrinkles. Each morphology was named as follows: WM, WD, and WF in the case of a palate with wrinkles, respectively, at medium, deep, and flat palatal depths; SM, SD, and SF respectively, for medium, deep, and flat palatal depths but without rugae. Ten scans were made with the IOS for each experimental group. The scans, in STL format, were imported into a dedicated software program, then trueness and precision were evaluated in µm. Descriptive statistics and power analysis were conducted, while the Kruskal-Wallis and Dunn tests were run to analyze differences among groups.

Results: the mean values for trueness were WM = 48.7; WF = 85.9; WD = 161.7; SM = 48.1; SF = 349.1; SD = 349.9. Significant differences were found for SM *vs* SD ($p < .001$), SM *vs* SF ($p < .001$), and WF *vs* SF ($p = .003$). The mean values for precision were WM = 46.7; WF = 48.9; WD = 46.9; SM = 46; SF = 72.6; SD = 105.9. Significant differences were found between WD and SD ($p = .015$).

Conclusions: the best accuracy was found in the case of medium palatal depth. Moreover, in the case of the deepest palates, the trueness values were better for typodonts with palatal wrinkles than the smooth ones. Finally, the mean values of both trueness and precision were clinically acceptable for each experimental group.

EVALUATION OF PRECISION AND ACCURACY OF 4 DIFFERENT INTRAORAL SCANNERS: AN *IN VIVO* STUDY

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Aim: in dentistry, impression-taking is a fundamental step of the treatment plan. Anyway, with the conventional impression technique there can be many error variables. Intraoral scanning can lead to fabrication of short-span prostheses but also extensive restoration with equal or even improved results. The aim of this study is to evaluate precision and accuracy of 4 different scanners *in vivo*, in order to consider the influence of factors such as saliva, tongue and interaction with the patient.

Methods: the 4 scanners used are: Carestream-3600, Medit-i-700, Marathon-MT-1000 and 3Shape TRIOS 3. The program "Geomagic Control X 3D" was used to match the references (the STL files of the plaster model obtained by scanning two precision impressions in PVS taken in a young male patient and two virtual models obtained by directly scanning upper and lower arches). From each overlap, descriptive and inferential statistical analysis were obtained.

Results: Marathon-MT1000 and 3Shape TRIOS 3 obtained the best results in terms of trueness. In all the scanners, the results showed a reduction on trueness in the lower arch compared to the upper arch. Similar results were obtained using both the plaster and the virtual model.

Conclusions: despite the transition from upper to lower arch affects the trueness of a scanner, 3Shape TRIOS 3 was found to be the most accurate scanner, in terms of precision and trueness.

INTRAORAL SCANNER PRECISION ANALYSIS AID BY 3D SOFTWARE

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Aim: intraoral three-dimensional scanning techniques could be used to improve dental practice, leading to an improved overall quality of the prosthetic devices and improved comfort for the patient. An accurate and precise intraoral scanner allows proper diagnosis, follow-up evaluation, and prosthesis application. The aim of this research is to evaluate the precision of an intraoral scanners (Medit i500) using open-source software. Precision was compared through repetitions of the scanning process of the upper dental arch, following superimpositions in the whole 3D arch area.

Methods: the present study included 65 intraoral scans of 13 voluntary participants. Decayed, missing, filled teeth index (DMFT) of patient was considered 0 excluding all the third molars. Volunteer's maxilla and mandibular was scanned 5 times in sequence, after a ten-minute rest period, by same skilled operator, with a conventional intraoral scanner. Operator is defined as skilled as they graduated in dentistry more than 10 years ago and use an IOS on a daily basis. 3D superimposition and Cloud compare are processed and statistical analysis was performed.

Results: it was possible to display colorimetric maps for qualitative comparison, and deviations of the values were classified as clinically acceptable. Within limitation of study, the clinically acceptable in vivo frequency of points' deviation, or the precision, was obtained in 98.8%±1.4%

Conclusions: therefore, the use of open-source software can be a viable option in the digital workflow, improving patient follow ups with the 3D model superimposition.

ONE-YEAR RCT ON CLINICAL DIFFERENCES ABOUT EQUATOR® AND LOCATOR SUPPORTING AN OVERDENTURE

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Aim: it highlights the efficacy of overdenture implantation as a treatment option for complete edentulism and highlights the evolution of attachment systems from traditional ball-and-socket designs to new low-profile options, such as the OT Equator®.

Methods: a multicenter randomized controlled trial was conducted between two different attachment systems: the Locator and the OT Equator. The prosthetic procedure started 8 weeks after the placement of the dental implants, in which a new removable metal-reinforced prosthesis was delivered within 4 weeks, following an early loading protocol. After a few days, the healing abutments were removed and the attachments connected to the new removable prosthesis.

Results: positive results were found in both groups. This type of abutment (OT) has significant clinical and biomechanical advantages compared to similar abutments.

Conclusions: the results of this study are important as they provide valuable information to dental professionals on the most effective attachment systems to use in the treatment of elderly patients with dental implants. Overall, the study demonstrates the efficacy of implant therapy in elderly patients and underscores the importance of ongoing research in this field.

DETERMINATION OF THE VERTICAL DIMENSION IN A REMOVABLE PROSTHESIS

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The aim of this study is to demonstrate the use and efficacy of cephalometry and analysis of the golden proportions of the face in the planning of prosthetic treatments in totally edentulous patients.
In addition to the classical procedure, the method is performed with latero-lateral and postero-anterior radiographs.
Two complications for totally edentulous patients are the establishment of the vertical dimension and the new position of the occlusal plane.
The analysis of the divine proportion was done by the use of a golden divider.
The prosthetic protocol was divided into three phases and, for better understanding, it was selected a case.
Phase 1: allows us to determine the vertical dimension.
Phase 2: Cephalometric skeletal verification of the vertical dimension and determination of the divine occlusal plane.
Phase 3: phonetic test.
A prosthesis made according to cephalometric parameters and divine facial proportions helps to improve the patients aesthetics, skeletal and tissue relationships, which also improves the function of chewing and swallowing, avoiding muscle fatigue and protecting the TMJ.

EVALUATION OF INTRAORAL DIGITAL IMPRESSION FOR FULL DENTAL ARCHES

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Aim: the purpose of the study was to assess the accuracy of an intraoral scanner (Medit i-500) in the full dentate arch, with and without gum.
Methods: the trueness is analyzed by overlapping the scans dataset made with Medit I-500 with the scans dataset made with the lab scan and the values of ABS AVG, RMS and (90°-10°)/2 method are reported. Precision is evaluated by using the same values of trueness coming from the intra-group overlapping.
The first set describes impression of both gums and crowns, the second one only crowns.
Results: the trueness values are 24 µm (SD:3.6) for ABS AVG, 70 µm (SD:28) for RMS and 28 (SD:4.5) µm for (90°-10°)/2 method for the group with gum and 33 µm (SD:4) for ABS AVG, 103 µm (SD:18) for RMS and 30 µm (SD: 5) for (90°-10°)/2 method for the group without gum. The precision values for the group with gum are 17 µm (SD:4.6) for ABS AVG, 52 µm (SD:15.8) for RMS and 23 µm (SD:6.3) for (90°-10°)/2 method and for the group without gum are 15 µm (SD:6) for ABS AVG, 26 µm (SD:37) for RMS and 25 µm (SD:6.5) for (90°-10°)/2 method.
Conclusions: the large dispersion of the ABS AVG and RMS values and the statistically significant difference between the group with gum and the one without gum, suggests that the (90°-10°)/2 method should be considered the recommended procedure for the accuracy evaluation of an IOS.

SUPERLATTICE *VS* MACHINED ABUTMENT ON PERI-IMPLANT TISSUES: A 1-YEAR FOLLOW-UP

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Aim: the aim of the present multi-center split-mouth randomized controlled trial was to compare traditional machined abutments and chromium nitride/niobium nitride (CrN/NbN) coating (superlattice) abutments in terms of implant survival, marginal bone loss and periodontal indexes.

Methods: two adjacent implants were inserted in posterior mandible or maxilla in 20 patients. Ten patients were treated in Turin and 10 patients were treated in Genova. A machined abutment was randomly screwed on either the mesial or distal implant, while the superlattice abutment was screwed on the other one. Implant survival rate, peri-implant probing depth (PPD), plaque index (PI), and bleeding index (BI) were collected 6 months and 1 year after surgery. Marginal bone loss (MBL) was evaluated immediately after surgery, at 6 months and 1 year later.

Results: at 3 months from surgery, one implant with superlattice abutment failed. The reason of the failure was attributed to a non-osseointegration of the implant. Overall implant survival rate was 97.7%.

At 1-year follow-up a mean MBL of 0.83±0.55 mm was recorded for superlattice abutments, while a mean MBL of 0.85±0.45 mm was recorded for the abutment with machined surface.

A mean PPD of 1.3±0.23 mm was recorded for the superlattice group, and a mean PPD of 1.3±0.31 mm was recorded for the machined surface group. PI was of 0.59±0.52 for superlattice group and 0.6±0.50 for machined group, while BI was of 0.48±0.46 for superlattice group and of 0.47±0.41 for the machined one.

No statistically significant differences were observed between the two groups ($p > 0.05$).

Conclusions: within the limits of this study, our results indicate that both machined abutments and superlattice abutments achieved similar clinical performance.

IMPLANT-PROSTHETIC BIOMECHANICAL COMPLICATIONS IN ORAL SURGERY: STATE OF THE ART

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Aim: an FDA document states that "computational, nonclinical *in vivo* and clinical modelling and simulation studies can be used to evaluate the safety and efficacy of medical devices". However, there remains, of exclusive clinical concern, the issues related to the choices of type, number and location of implants chosen during the implant-prosthetic planning phase.

Methods: the bioengineering methods that can be used in dentistry are different. Thanks to finite element simulation it is possible to simulate the distribution of forces with the Von Mises method and evaluate the fracture resistance of materials.

Results: inclined implants function perfectly when placed in geometries of number and position that enhance their position.

Creating an unfavorable angle between the prosthetic restoration, occlusal load, and implant device, on the other hand, poses an extremely high biomechanical risk to both the recipient tissue and the integrity of the device.

Conclusions: the purpose of our study is to go and evaluate, in light of the state of the art in oral surgery, the biomechanical complications of implant prosthetics.

10-YEAR CLINICAL AND RADIOGRAPHIC OUTCOMES IN A MANDIBULAR OVD RETAINED BY SINGLE IMPLANT

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Aim: overdenture retained by a single mandibular implant (SIROD) is considered a less invasive approach in the rehabilitation of edentulous patients. The study tests if a single implant in support of a complete mandibular denture improves the threshold of thickness discrimination and chewing capacity over 10 years. Implant survival, radiographic and prosthetic maintenance data were also recorded.

Methods: 13 edentulous patients were selected from the group of patients applied for complete dentures at the Prosthodontics department of the Dental School in Turin. After the realization of complete dentures, one implant was placed with a delayed loading protocol. Thus, a Locator attachment was placed, and the connection blocked. Thickness discrimination and registration of masticatory capacity were performed five times and radiographs were taken at different times over 10 years.

Results: thickness perception and chewing capacity improved up to the first year and remained stable over 10 years. No implants were lost, and radiographs after 10 years showed a bone loss of 1.34 mm. The data on prosthesis maintenance confirmed the results of the literature.

Conclusions: a mandibular overdenture retained by a single implant may be considered a trustable treatment option, for patients that need a low surgical impact.

TEMPORARY PROSTHETIC BRIDGE MANUFACTURED WITH ADDITIVE *VS* SUBTRACTIVE CAD/CAM TECHNIQUE

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Aim: the aim of this study is to evaluate the fracture toughness of three-element provisional bridges on stump produced by subtractive (PMMA and composite) *VS* additive CAD/CAM techniques.

Methods: provisional bridges were placed on a metal master model, simulating a single edentulous situation of element 1.6 (stumps on elements 1.5 and 1.7). Static load tests of the three-element prostheses were performed by Instron 5884 universal testing machine which records the load force, in relation to a constant speed displacement of 2.5 mm/min, until the break of the specimens, detected as a sudden decrease in the applied force.

Results: maximum values in breaking force were observed in the CAD/CAM subtractive PMMA group, while the minimum values were recorded by the CAD/CAM subtractive composite group (Mean+SD analysis).

The one way ANOVA test showed a statistically significant difference between the groups (p Value <0.05). In contrast, *post hoc* t-test according to Bonferroni (significance level for alpha of 0.05 corrected to 0.0166) found significant differences between the subtractive group with PMMA and the additive group (p Value <0.01).

Conclusions: considering the analysis of our data both the use of additive CAD/CAM and subtractive CAD/CAM techniques for the manufacturing of three-unit provisional fixed prostheses appear to be viable and feasible solutions.

MULTIDISCIPLINARY PLANNING OF PROSTHETIC PATIENT IN ORTHOGNATHIC SURGERY

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Aim: the correction of severe skeletal malocclusions generally requires surgery combined with orthodontic or prosthodontic treatment. An orthodontic camouflage or a pure prosthetic treatment may result in an unsatisfactory and unstable outcome. Patients partially or totally edentulous and patients with prosthetic fixed crowns represent a limit and, therefore, a challenging treatment. The aim of this work is to show a complete multidisciplinary approach and planning for patients with II or III dental-skeletal malocclusion, who present a total or partial edentulism or a fixed-type rehabilitation and require a combined orthognathic surgical treatment with prosthetic rehabilitation.

Methods: this study is a retrospective review and it is conducted on 15 patients with II or III malocclusion with total or partial edentulism or with fixed-type prosthetic rehabilitations, rehabilitated in Implantoprostesis Department of Policlinico "Umberto I", Rome.

Results: the crucial element for successful orthognathic surgery in partially or completely edentulous patients is occlusal stability. All patients underwent a first prosthetic and orthodontic phase; based on the occlusal stability, orthognathic surgery was performed. Six months after surgery, fixed prosthetic rehabilitation was finalized in all patients.

Conclusions: different approaches have been proposed, the key to success in such treatments lies in the multidisciplinarity of the entire diagnostic and therapeutic path, which necessarily provides for close collaboration between the different specialist figures, such as the surgeon maxillofacial, the orthodontist, and the prosthetist.

LISI CERAMIC RESTORATIONS PRE-TREATED WITH A SELF-ETCH CERAMIC PRIMER: A CLINICAL CASE

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Aim: different ceramic surface treatments have been proposed as alternative to hydrofluoric acid (HF) to enhance bonding procedures. This clinical case presents a full mouth rehabilitation with lithium disilicate (LiSi) ceramic pre-treated with a self-etch ceramic primer.

Methods: a 55-yr old male patient complaining esthetic dissatisfaction came to our attention. After medical, dental, radiographic and photographic examinations a diagnosis of caries and severe tooth wear with reduction in the vertical dimension occlusion (VDO) was made.

The treatment plan consisted in a combined periodontal/restorative approach with the preparation of adhesively-bonded indirect LiSi ceramic restorations and implant-supported zirconia crowns. Prior to definitive bonding procedures, LiSi restoration surfaces were pre-treated with a self-etch ceramic primer (Monobond Etch&Prime, Ivoclar Vivadent; MEP) according to manufacturer's instructions.

Results: no pain, dental sensitivity or discomfort were reported and the patient was satisfied with the esthetic results. At the 1 yr follow-up, periodontal parameters were normal with no signs of retention loss and discoloration of the restoration nor material's fractures.

Conclusions: the single bottle self-etch ceramic primer seemed a faster and safer alternative to the gold standard HF for the conditioning of LiSi ceramic surface restorations. Indeed, thanks to its formulation (i.e. trimethoxypropyl methacrylate and polifluoride), MEP would provide etching, silaning and decontamination of the restoration in one single application.

IMPLANT-SUPPORTED PROSTHESIS FOR EDENTULOUS PATIENT REHABILITATION: A SINGLE CASE REPORT

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Aim: this study stems for the idealization of a new protocol to simplify the supported oral rehabilitation representing the first of a whole series of cases that demonstrate its utility.
This case report is about an edentulous patient who went to the dentist looking for a rehabilitation with total prosthesis in order to overcome psyco-physical trauma, functional and social problems related to being a prosthesis wearer.
Methods: in this manuscript, a patient was considered and shown according to a complete photographical documentation all the phases. Rehabilitation included the use of Osstem (Seoul, Korea) and equator type abutments (Rhein83, Bologna, Italy).
Results: the rehabilitation of oral functions allows the patient to speak, chew, smile and feel confident in his own aesthetics and therefore improve his well-being in social relations.
Conclusions: in conclusion, an important step in oral rehabilitations is to evaluate their type and therapeutic timing.

PROSTHETIC AND ORTHODONTIC MANAGEMENT OF A PATIENT WITH ECTODERMAL DYSPLASIA

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Aim: ectodermal dysplasia is a rare congenital disease affecting ectodermal structures, requiring orthodontic and prosthetic solutions to improve speech, masticatory function, and facial esthetics.
Methods: this case report describes a 12-year-old Italian girl with ectodermal dysplasia-induced oligodontia. An intraoral examination revealed that the patient had only ten teeth (upper primary second right molar, upper permanent first molars, upper permanent canines, upper permanent central incisors, lower primary right canine, and lower permanent canines). Her upper permanent incisors had a history of dental treatment, including two major restorations. The patient had a deep overbite and thin atrophic knife-edge alveolar ridges, as well as vestibular height loss. A panoramic radiograph revealed the absence of other dental elements during radiographic investigations.
The treatment began with an orthodontic phase to close the gap between elements 11 and 21, using a sectional appliance with aestetic brackets and a 0.016 NiTi archwire. The two elements were splinted with a fix retainer and conventional dentures were constructed for the patient.
Results: the multidisciplinary orthodontic prosthetic treatment made it possible to effectively rehabilitate the young patient's stomatognathic apparatus both functionally and aesthetically.
Conclusions: orthodontic and prosthetic rehabilitation in children with ectodermal dysplasia can improve their overall quality of life by improving speech, masticatory function, and facial esthetics.

BIOLOGICALLY ORIENTED DIGITAL IMPRESSION TECHNIQUE

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Aim: the purpose of this prospective case series study is to evaluate clinical and aesthetic results of single, metal-free restorations, fabricated according to a new digital impression protocol that doesn't require the use of retractor cords for final impression on a natural tooth previously prepared according to the principles of the B.O.P.T. technique.

Methods: patients of 18 years of age or older, with at least one single tooth prepared according to the principles of the B.O.P.T. technique in the aesthetic area (between maxillary premolar), were considered eligible for this research. At the time of definitive impression, a first impression of the temporary restoration was taken. After that, the temporary restoration was removed and the dental abutment cleaned. No retraction cord was used. A second impression of the dental abutment was taken. Then, an impression of the whole temporary restoration, including the finish line and the emergence profile was taken and automatically matched with the previous impressions. Using the same software (Medit Link) the impression of the temporary was used to define the finish line and the emergence profile of the dental abutment impression, by means of a Boolean subtraction. Finally, the definitive crows were fabricated.

Results: four patients with five teeth to be rehabilitate were treated. Al the patients were satisfied with their prosthesis. Pink esthetic score was 13.60±0.55.

Conclusions: the results from this prospective case series study encourage the proposed technique. The main benefits are the respect of the periodontium and easier prosthetic procedure in the dental lab. Further study with larger sample and control are needed to confirm this preliminary results.

PRECISION OF THREE-DIMENSIONAL PHOTOGRAPHIC ANALYSIS WITH FACIAL SCANNER

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Aim: measuring facial proportions can provide useful information for designing proportionate and aesthetically pleasing prostheses. The currently accepted gold-standard tool for these measurements is the caliper. However, these measurements can be time-consuming and difficult in uncooperative patients. The market offers various systems for scanning the face with digital technologies, which facilitate measurements and represent a useful tool for studying patient morphology and clinical evaluations. However, the precision of these new tools is not yet known. The aim of this study is to evaluate the accuracy of facial scanning with digital technique for small (less than or equal to 6.5 cm) and large (greater than 6.5 cm) measurements, comparing them to measurements obtained with analog methods.

Methods: fourteen points were traced on the face of a 29-year-old woman. A scan was then performed with the Planmeca ProMax 3d using the ProFace program. The measurements were divided into 2 groups:

Group A: small distances (less than or equal to 6.5 cm): AB, AC, AF, AI, CG, CL, EH, EM, IL, LM, IG, NP.

Group B: large distances (greater than 6.5 cm): AD, AE, AN, AP, EO, EP, GM, IP, MP, LP, AL, EL.

Among the traced points, 24 distances were measured *in vivo* with a caliper and the Romexis Viewer software. The paired T test was used to evaluate whether there was a significant difference between digital and analog measurements for groups A and B.

Results: the paired T test used to measure data in group A did not show statistically significant results ($p = 0.8194$). The paired T test applied to group B ($p < 0.05$) showed statistically significant results.

Conclusions: facial scanning with digital technique shows measurements overlapping with analog technique for measurements less than or equal to 6.5 cm, with significant deviation for points with a distance greater than 6.5 cm.

HARMONIC PALATAL OBTURATOR: A NEW TECHNIQUE FOR LIGHTER PROSTHESIS. A CASE REPORT

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Aim: the aim of this case report is to apply an innovative technique to a post-maxillectomy total upper obturator prosthesis, in order to ensure an easier insertion and removal of the same as well as minimization of its weight.
Methods: a female patient is examined after hemi-maxillectomy surgery for a squamous cell carcinoma. Her pre-existing full denture is relined and provisionally modified with a tissue conditioner (Hydrocast). After 6 months the definitive obturator prosthesis was planned. Once the prosthesis with obturator was built, before delivering it, a cut was made on the protruding part of the obturator to eliminate all the inside resin, reducing the majority weight of the final prosthesis. The same portion was re-assembled and delivered to the patient.
Results: the patient immediately perceived a sense of lightness and comfort of the prosthesis, immediately showing an improvement in the nasal voice.
Conclusions: the follow-up after 1 and 3 months confirmed a high degree of patient satisfaction both in terms of aesthetics and in the restoration of normal masticatory, swallowing, phonatory and breathing functions. An important fact was also the retention of the prosthesis in the oral cavity, being very lightened. The use of adhesive pastes improved the tensile strength.

INDIRECT ANTERIOR RESTORATIONS WITH NO PREP TECHNIQUE AESTHETIC AND BIOLOGICAL EFFICACY

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Aesthetic outcome in the ceramic restoration of anterior teeth has always been a challenge in clinical practice, and in such cases, success depends on the skills of the clinician and the dental technician. In current dentistry, the main goal is to pursue esthetic results while preserving biological structures. This technique was developed to meet the needs of patients who desire an aesthetic and functional solution for their teeth but do not wish to undergo invasive and painful procedures. Minimal tooth preparation is at the heart of the noprep technique. Such preparation results in minimal wear of the tooth tissue and minimizes the need for local anesthesia, making this methodology less invasive and more comfortable for the patient. The technique is particularly suitable for creating dental veneers, as these require less material than dental crowns. Dental veneers are used to improve the appearance of the front teeth to correct the shape, position and color of the teeth. The noprep technique can also be used to treat patients with special aesthetic needs, such as changing tooth shape, closing diastemas, or improving tooth color. The noprep technique has proven to have a high success rate due to the use of high-quality adhesive materials and minimal tooth preparation. In addition, the noprep technique is less invasive than traditional tooth preparation techniques, which means that the healing time is shorter and the risk of postoperative complications is lower. In conclusion, the noprep technique is an innovative methodology that offers patients an aesthetic and functional solution for their teeth without the need for invasive and painful procedures. Due to minimal tooth preparation and the use of high-quality adhesive materials, the noprep technique has proven to have a high success rate and can be used for a wide range of dental restorations. The noprep technique is therefore an excellent option for patients who want a more beautiful and healthy smile without having to undergo painful and invasive procedures.

A NOVEL CHEWING-GUM FOR THE OBJECTIVE ASSESSMENT OF MASTICATORY PERFORMANCE

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Aim: the present study aims at assessing the reliability of a novel chewing-gum for the measurement of masticatory performance (MP). Moreover, the impact of a full-digital individualized workflow on the restoration of MP was also evaluated.
Methods: eligible participants were adults, in need of complex rehabilitation due to masticatory dysfunction. Participants underwent a comprehensive diagnostic examination. Participants performed the two-color mixing ability test. Hue-Check Gums (University of Bern, Switzerland), Control Group (CG), and m-Gums (Innovative Medical Applications & Research, Italy), Test Group (TG), were chewed for 20 chewing cycles. Boluses were flattened to a standard thickness of 1 mm and digitalized using a flatbed scanner. The images were analyzed optoelectronically to obtain the variance of hue.
Results: the study involved 12 participants, consecutively treated, and rehabilitated with fixed prosthesis using a full-digital individualized workflow. The chewing-gums in TG were comparable to the ones in CG, p >0.05. A MP of 0.480±0.207 and 0.576±0.084 was recorded at baseline, respectively in GC and TG. A significative improvement in MP was observed at prosthetic prototype application (p <0.05), 0.358±0.166 and 0.328±0.053, and after the delivery of the final prosthesis (p 0.01), 0.088±0.043 and 0.102±0.061, respectively in CG and TG.
Conclusions: the tested chewing-gums can be used interchangeably for the assessment of MP. The rehabilitation process obtained by the full-digital individualized workflow allowed to achieve a significative improvement in MP.

DIFFERENCES BETWEEN SCREW AND CEMENT-RETAINED SINGLE IMPLANT CROWNS: A SPLIT MOUTH STUDY

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Aim: to compare clinical, radiographic and biochemical conditions: proinflammatory cytokines in peri-implant crevicular fluid (PICF) at screw or cement-retained Cr-Co metal-ceramic single crowns.
Methods: in total, the study examined 25 single screw-retained crowns and 25 contralateral cement-retained crowns, in 25 systemically and periodontally healthy subjects. Levels of IL-1β, IL-1RA, IL-6, IL-8, IL-17, b-FGF, G-CSF, GM- CSF, IFN, MIP-1β, TNF-α, and VEGF were assessed in PICF using the Bio-Plex 200 Suspension Array System. Plaque index (PI), probing depth (PD), bleeding on probing (BOP), and gingival recession (REC) were recorded. Radiographic marginal bone levels (MBL) were assessed at the mesial and distal aspects of the implant sites with an individualized acrylic resin device that was fixed to the residual dentition. Measurements were performed at 1, 3, 6, 12, 24 months from the delivery of the final restoration.
Results: PI, PD, BOP, and REC values had no significant differences in either group. The levels of IL-1β, IL-6, IL-8, GM-CSF, and MIP-1β and TNF-α were higher at screw-retained metal-ceramic crowns than in cement-retained crowns. However, only IL-1β, IL-6, and TNF-α values presented significant differences between these groups.
Conclusions: after two years, the results obtained show a difference in the level of inflammation in a screw-retained crown, attributable perhaps to the greater amplitude of the micro-movements or to the different interface material at the level of the implant connection (Cr-Co/Ti for screw-retained and Ti/Ti for cement- retained).

CLINICAL STUDY ON FRACTURE RESISTANCE OF CERAMICS INVOLVED IN RETENTION OF PARTIAL DENTURE

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Aim: stability of the removable prosthesis is an important issue and is required and desirable in all cases. The effectiveness of the dental implant procedure can be impacted by the patient's age. Older people recover quicker because there is less bone formation around an implant. Cingulum rests on healthy abutment teeth, occlusal clasps, and clasps can all be used to create support. However, the detachable partial denture installed on unhealthy abutment teeth can be supported by implants or crowns. This research looked into two different all-ceramic restoration types that were used as abutments for the framework of removable partial dentures.

Methods: zirconia and IPS e.max Press ceramics, two different kinds of ceramic materials, were used to make the crowns. Computer-Aided Design/Computer-Aided Manufacturing (CAD/CAM) was used to mill the final restoration, such as zirconia samples or wax with IPS e.max Press and RPD samples, to standardize the sample fabrication and dimension. The removable partial denture framework was made from the metal alloy cobalt-chrome. Twenty samples were made, with two all-ceramic crowns on each linked by a removable partial denture saddle framework, and two occlusal rest seats on abutment crowns merged distally in the first premolar and mesially in the second molar.

Results: a universal testing device was used to compare the mean fracture strengths of ten samples from each set (IPS e.max Press and zirconia). After performing a single cycle of the fracture strength test at a speed of 1 mm/min, the results revealed that neither group's ceramic crowns fractured, so these results were disregarded. Both ceramic crown materials had their breaking strength tested using a universal testing apparatus. The RPD framework's highest load for the zirconia group was 400 N, and its maximum deflection was 1.9409 mm. The lowest load, however, was 206 N, and the maximum deflection was 1.9014 mm. The maximum load and maximum deflection for the RPD framework with the IPS e.max Press group were 374 N and 2.3335 mm, respectively. The lowest load and minimum deflection were 174 N and 1.1745 mm, respectively.

Conclusions: the findings showed that all-ceramic crowns did not fracture, but partial denture frames did deform. With the study's limitations, it can be said that zirconia and IPS e.max Press ceramic can be used as abutments to give the detachable partial denture enough support.

THE CLINICAL EVIDENCE OF PROSTHETIC REHABILITATION WITH OT EQUATOR®

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Aim: the OT equator is the smallest and most innovative overdenture attachment. In fact, the average size of the total vertical, male and female connection and the housing is only 2.1 mm. The width is 4.4 mm. The purpose of this paper is to mechanically analyze the characteristics of two different prosthetic retention devices. Through the use of engineering tools such as the finite element method (FEM) and Von Mises analysis, we studied how the implants resist force during chewing cycles.

Methods: the review sees the comparison of publications and related papers on the topic published and available on scientific search engines, with observation also of the characteristics of products offered in the market.

Results: from the reading inherent to this topic, it can be deduced that in narrow diameter implants (NDI) connected to the locking cone, Equator attachments showed stable clinical behavior as retention of mandibular overdentures (MO) for edentulous patients with clinical mandibular atrophy this, especially when compared with other attachment systems where the result may vary depending on them. The literature suggests that the Equator attachment also offers fewer biomechanical complications and failures than the Locator attachment.

Conclusions: this system has greater flexibility and multipurpose capability ranging from single-attached overdentures to multi-bar technologies to fixed rehabilitations with the OT equator.

NEW DIRECT RETAINERS INTO REMOVABLE PARTIAL DENTURES FOR EDENTULOUS SPACES: A CASE REPORT

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Aim: the increasingly prominent social demand in removable prosthodontic rehabilitation's field is to combine both functionality and aesthetics in prosthetic device design. The aim of this study has been to prove predictability, reliability, aesthetics, and functionality through new retentive means's design.
Methods: it has been described a clinical case highly impacting aesthetics and functionality of a male patient S.A, 58 years old and HIV+, with partial upper edentulism with intercalated edentulous. Patient's occlusion and parafunctions have been examined. Plaster model's study made most aesthetic desirable undercuts possible. The new design of retentive means arises from the proximal plate modification making it more adherent and retentive and designing two small extensions on both sides of the tooth that embrace the upper part of the undercut.
Results: the patient immediately accepted the removable partial denture with modified retention means, as the aesthetics, retention, and stability of the device during masticatory function have satisfied the patient.
Conclusions: long term follow-up and the high degree of satisfaction reported by the patient confirmed the prosthetic stability, the correct restoration of masticatory, phonetic and swallowing functions associated with high aesthetic performance, demonstrating the predictability and reliability of the new retention means design.

PASSANT SCREW OF DENTAL IMPLANTS: AN *IN VITRO* SEM STUDY

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Aim: the use of dental implants in oral rehabilitations has become increasingly common, thanks to the safety and predictability of these rehabilitations.
The purpose of the study is to highlight what surface alterations could be using different screwing pairs or repeating the screwing process several times analyzing through a SEM.
Methods: in this study, 40 through screws (Osstem, South Korea Dental Implant Ebony Gold) were examined in the scanning electron microscope (SEM) Zeiss EVO LS 10, with an acceleration voltage of 20 kV. The through screws have been divided into 4 groups: tightening torque of 30 Nmm; maximum tightening torque; tightening torque of 2 times 30 Nmm; no screwing, new (control group).
Results: this observational study did not reveal any defects or fractures through SEM analysis in the different groups, claiming a 100% success rate. Surely, thanks to this study and others that will follow, it will be possible to optimize these materials.
Conclusions: in the SEM images no significant differences were found in the surfaces of the through screws, and 100% of the through screws are free of defects or fractures. Further studies and investigations will certainly be needed to improve these devices.

QUALITATIVE EVALUATION OF SEEGER RINGS AND SCREWS IN ALL-ON-4 OT-BRIDGE AFTER LOADINGS

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Aim: this study aimed to evaluate the seeger rings and screws wear of a simulated all-on-four mandibular model using OT-Bridge system after one-year of cyclic loadings.

Methods: a Co–Cr prosthetic framework with OT-Bridge system for an all-on-four model was fabricated through milling. The system underwent 400000 bilateral cyclic loadings on a 7 mm distal cantilever. Depending on the presence or absence of one or two anterior screws, three groups were created: Gr.1 (3 screws), Gr.2 (2 screws), CTR (4 screws). The loading cycle was repeated five times for each group; after each test the seeger rings and the screws were evaluated under a stereomicroscope.

According to the level of wear, a score from 0 to 3 was established for each component. Wear levels found were related to the loss of preload of the screw at each abutment position and data were statistically analyzed.

Results: the results showed a statistically significant difference in screw wear among the three groups with Gr.1 showing the highest mean screw wear levels. The mean seeger deformation in Gr.1 and Gr.2 was significantly higher than in CTR. The loss of preload of each screw after cyclic loadings was directly related to the seeger wear and indirectly to screw wear.

Conclusions: posterior screws experienced more wear than anterior ones while anterior seegers showed higher deformation at the internal margin compared to posterior because of the distal cantilever loadings. The relation between preload loss and wear pattern of screws and seeger rings means that the components of the OT-Bridge system work synergically.

DIAMOND-LIKE CARBON COATING REDUCES CONNECTION SCREW HEAD STRIPPING AFTER MULTIPLE TIGHTEN

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Aim: the stability of implant-abutment joint is fundamental for the long-term success of implant rehabilitation. The screw loosening, fracture and head deformation are among the most common mechanical complications. Several surface treatments of titanium screws have been proposed to improve their resistance and stability. Diamond-like carbon (DLC) coating of the materials is widely used to increase their wear resistance and durability. The aim of the present study was to evaluate the effect of carbon fiber coating of the screw head on screw removal torque and screw head stripping.

Methods: 100 titanium implant screws were used, 50 without coating (Group 1) and 50 with DLC coating of the screw head (Group 2). Each screw was tightened with a torque of 25 Ncm and unscrewed 10 times. For each loosening the removal torque was measured with a digital cap torque tester. Optical 3d measurement of the screw head surface was performed by a fully automatic machine before and after multiple tightening in order to investigate surface modifications.

Results: the reverse torque values showed a decreasing trend with repeated tightening and loosening cycles in both groups, without significant differences ($p > 0.05$). Optical measurements of surface dimensions revealed average changes of 0.0357 mm in Group 1 and 0.02312 mm in Group 2, that resulted to be statistically significant ($p < 0.001$).

Conclusions: the DLC coating of retention screw head can prevent its distortion and wearing, especially after multiple tightening. Further studies are needed to confirm its clinical relevance.