Aim: Class II malocclusion is a condition related to a dento-skeletal sagittal discrepance and an increase of overjet. It is classified as Class II/1 and Class II/2. The purpose of Class II/1 malocclusion treatment is to reduce the overjet and skeletal alteration by improving the mandibular sagittal growth and by blocking the maxillar one. Both removable and fixed appliances can be used to achieve the goal. The aim of this study was to compare the different effects (skeletal and dento-alveolar) of Elastodontic Appliance (EA) and Three Bite Plane (TBP) therapy in growing patients with Class II/1 malocclusion.
Methods: Twenty patients (mean age 11 years old) with Class II/1 malocclusion were selected and examined. Inclusion criteria were: ANB ≥2°; overjet ≥2 mm; Class II division 1 relationship; distal step type deciduous molar relationship; late mixed or permanent dentition; adequate growth potential. Growth potential was evaluated using the cervical-vertebral maturation method (CVM). Children were divided in two groups of 10 patients respectively: group 1 was treated with EA and group 2 with TBP. The Shapiro-Wilk normality test was used to evaluate the type of data distribution. The associated sample T-Test was used to evaluate group comparisons. Statistical significance was set at $P<0.05$. The cephalometric parameters analyzed are: SNPO° angle, SNGoMe° angle, SNPP° angle, ArGoMe° angle, Lower Facial Height, Condilion-Gnation distance. For each patient, the differential values for single cephalometric parameter were calculated. The differential values were established subtracting the pre-treatment cephalometric values from the post-treatment ones.
Results: The most significant results concern the following parameters:. 1. Lower Facial Height: TBP allows an average increase in facial height lower than 0.7 mm, while EA allows an average increase of 8.847 mm. This difference shows an important statistical significance ($p<0.01$): it represents the main difference between the two devices. 2. Condilion-Gnation distance: Both the devices let increase CoGn distance: for TBP the value is 7.349 mm, while for EA is 16.82 mm. This difference shows an important statistical significance ($p<0.05$): it means that the average growth of the lower jaw is greater in patients treated with the EA.
Conclusions: TBP is more indicated in patients with II skeletal Class associated to hyperdivergence.
EA is indicated in II skeletal Class associated to hypodivergence. Specifically, TBP, thanks to the presence of the metal bites, leads to an intrusion (or rather to a "non-extrusion") of the diatoric teeth, allowing greater control of the patient's vertical dimension. EA has an extrusive effect on the diatoric teeth, being more indicated in cases where an increase in the vertical size of the patient is required. Regarding the sagittal mandibular growth, Condilion-Gnation distance values show the main effect of the functional devices in question: they allow a sagittal release of the jaw, "freeing" the lower arch from the occlusal contacts with the upper one, so that the jaw is free to slide forward, allowing its physiological development.

Pain control during orthodontic treatment first

Bilello G., Fazio M., Puma A., Caradonna C., Messina P., Scardina A.

Dept. of Surgical, Oncological and Oral Sciences, University of Palermo, Palermo, Italy

Aim: The introduction of aligner treatment has recently modified patients' expectations regarding orthodontic treatment. Since their demand for smart, fast and comfortable treatments cannot be neglected, interest for new techniques and devices in this field has raised. Among these, AcceleDent® (OrthoAccel Technologies, Inc., Houston, TX) has been drawing the attention of the scientific community. AcceleDent® is a vibrating device (frequency 30 Hz, force 20 g), which, through a daily 20 minutes usage, promises to accelerate orthodontic tooth movement and reduce treatment-related pain. This device is currently being employed during both fixed orthodontic appliance and aligner therapy all over the world and received FDA approval and CE marking. In particular, pain control has been little investigated up to now. It seems to be due to reduction of periodontal ligament compression and/or to 'gate control' mechanism activation. Both theories are valid, but we still need a good amount of data to assess if this effect is clinically relevant or not. Therefore, our aim with this study is to investigate the effectiveness of vibrational forces in reducing aligner treatment-related pain during initial alignment.
Methods: Adult patients who began an aligner treatment (Lineo®, Micerium, Italy) were allocated to two arms. The first one (group A) used 20 minutes per day the AcceleDent® device, while the second one (group B) did not use any additional device. We registered pain perception during first week of treatment, which is usually the most troublesome when it comes to patients' pain and discomfort. We made use of VAS analogic scale to record pain perception and quantify it. Strict selection and exclusion criteria were applied in order to obtain a sample as much homogeneous as possible.
Results: Twenty-four patients were allocated to group A or B depending on the acceptance of AcceleDent® use. Four patients discontinued treatment and ten of each group were analysed. The two groups were found to be homogeneous for age and malocclusion

type. Group A, which used AcceleDent®, reported a lower perception of pain, with a mean value of 2,4±1,0 versus an average of 4,4±1,4 in group B. According to Student's t-test, the difference is statistically significant ($p<0,05$).

Conclusions: Our initial aim was to assess if vibrational forces had a potential of reduction of pain perception in subjects undertaking an aligner treatment. Data contained in this controlled clinical trial show that AcceleDent® has a significant effect on patients' pain perception, if compared to patients that are not using any device. Authors believe that pain control effect can be added to other reported effects of vibrational forces, such as shortening of treatment duration and complex dental movements' facilitation.

Treatment of a Class III malocclusion with anterior open bite and prevention of bone resorption in agenesis site placing an orthodontic miniscrew

Femia M.[1], Bazzini E.[2], Quatrale A.[3], Bogni V.[3], Soria G.[3], Garattini G.[4]

[1]Post graduate student, Università degli Studi di Milano, Italy
[2]Visiting Professor, Università degli Studi di Milano, Italy
[3]Student, Università degli Studi di Milano, Italy
[4]Associate Professor, Università degli Studi di Milano, Italy

Aim: To show a possible treatment of a Class III malocclusion with anterior open bite and agenesis of a maxillary lateral incisor, in a growing patient, and to validate the effectiveness of preventing bone resorption in agenesis site through the placement of an orthodontic miniscrew, which supports a fixed prothesis, waiting for a subsequent implant rehabilitation.

Methods: A 6-year-old female patient with Class III malocclusion, anterior open bite, narrow palate with bilateral cross-bite, agenesis of the element 1.2, macroglossia and bad habits (constant use of pacifier) was recruited. Firstly, the bad habits were eliminated, and a bonded rapid palatal expander with vestibular hooks was cemented, anchored to the deciduous molars and to the first permanent molars. After 14 activations distributed in 7 days (0.5 mm per day), extraoral traction of the upper jaw was performed using a Delaire mask for 9 months (with an average force exerted per side of 350g). At the age of 10 years, a second cycle of expansion of the upper jaw was performed using Pendex appliance (0.25 mm per day for 3 weeks) with bands on the permanent first premolars and first molars and, only after the expansion, the activation of the arm for the distalization of the element 1.6 was carried out. Subsequently, brackets were bonded on all the teeth in the upper and lower arch. Immediately after debonding and before lingual retainer bonding of lower and upper arch, at the age of 14 years, a CBCT of the upper maxilla was performed. It showed a vestibular-palatal bone thickness of the agenesis site of 3.54 mm and a bone highness of 20.3 mm (measurements obtained through OsiriX software). Therefore, a self-drilling and self-tapping miniscrew (Orthoeasy Forestadent, 6 mm) was placed perpendicular to the alveolar process, at the level of the first palatine wrinkle, with a flapless surgery (Ciarlantini and Melsen, 2017). A prosthetic crown was connected to the miniscrew by 0.21x0.25 SS wire.

Results: After two expansion cycles and postero-anterior traction, the anterior open bite, the Class III malocclusion and the bilateral cross-bite were corrected. With the subsequent multibracket treatment, using also Pendex appliance as anchorage and to distalize the element 1.6, teeth alignment and the space required for the future prothesis of element 1.2 were obtained. In accordance with what is reported in literature, the placement of an orthodontic miniscrew in the agenesis site clinically and radiographically showed absence of bone resorption after 1 year.

Conclusions: This clinical case corroborates the effectiveness of orthodontic treatment of a Class III malocclusion with anterior open bite in a growing patient, without resorting to a surgical procedure. In addition, it tends to support the efficiency of a prosthetic rehabilitation of an agenesis element through a crown that anchors itself to an orthodontic miniscrew, waiting for the end of growth and a definitive rehabilitation. In this way, a mechanical stress, useful to bone preservation, is transferred to the bone through normal oral function. Moreover, aesthetic patient satisfaction and function are guaranteed.

Reliability of the presurgical orthodontic virtual planning

Feresini M.F.M., Maciocco G.R., Rusconi F.M.E.

Department of biomedical Surgical and dental Sciences, University of Milan, Italy - A.S.P. Pio Albergo Trivulzio

Aim: To evaluate the reliability of the pre-surgical orthodontic virtual planning performed at the Department of Orthodontics of the Dental Clinic of Milan directed by Prof A.B. Giannì. The degree of discrepancy between the situation prospected by the pre-surgical orthodontic virtual planning and the one actually recorded at the end of the pre-surgical orthodontic was evaluated.

Methods: The study involved 14 patients at the end of growth (7 males and 7 females) undergoing orthognathic surgery treatment at the Department of