

## **STAFNE BONE CYST IN THE ANTERIOR MANDIBLE: AN UNUSUAL LOCATION**

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## **1. Learning Objectives**

To describe clinical features of the anterior Stafne bone cyst.

To supply radiologist a guide for diagnosis and classification of Stafne bone cyst.

## **2. Background**

Stafne bone cyst (SBC) is a rare mandibular defect described by Stafne in 1942. It is not a real cyst but a bone defect of unknown origin. It is often a solitary and asymptomatic, incidentally discovered on routine radiological examination. It is mostly seen in aged males (between 50 and 70 years old), in the posterior portion of the mandible. Its anterior variant is uncommon and located in the premolar region of the mandible. Pressure of major salivary gland, with failure of normal bone deposition, is thought to be responsible of the SBC, even if the defect may contain other soft tissues. According to this widely accepted concept, the submandibular salivary gland is responsible for the posterior variants whereas the sublingual gland causes the anterior variant. A variety of imaging modalities, including conventional radiology, computed tomography (CT) or cone beam computed tomography (CBCT), magnetic resonance imaging (MRI) and sometimes sialography are employed to make the diagnosis.

### **Imaging techniques usefulness**

Conventional radiology, usually panoramic radiograph. Initial, often incidental, evaluation. Follow up.

CT. Better definition of cortical bone, location and relationship with surrounding structures, thanks to 3D representation. Also useful to define the content (i.e. fat, glandular tissue, etc.).

MRI. Better definition of content, due to higher contrast resolution for soft tissue. Non ionizing radiations.

Sialography. It allows to determine the presence of glandular tissue in the cavity, but is invasive and uncomfortable for patients.

### **Classifications**

#### **According to the location in the mandible**

Anterior (incidence: 0.009-0.3%; Fig. 1A).

Posterior (incidence: 0.1%-0.48%; Fig. 1B).

Ramus (about 20 cases reported).

c.jpg

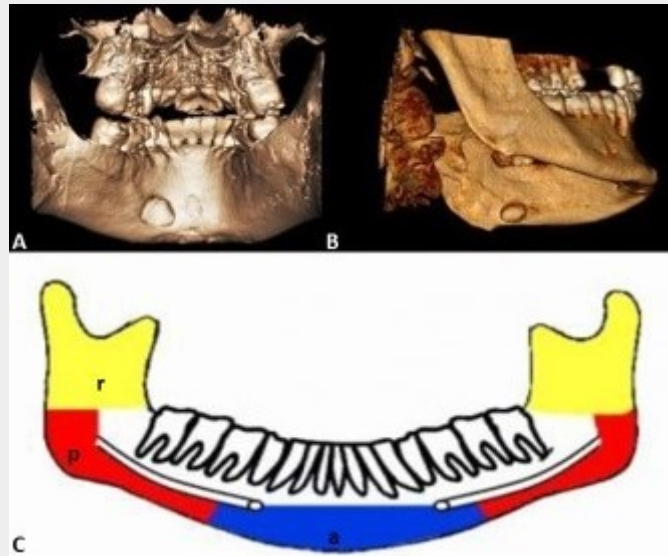


Figure 1. A) 3D reformatted CBCT image. Anterior Stafne cyst. B) 3D reformatted CT image. Posterior Stafne cyst. C) Schematic drawing of different location of Stafne cyst: a, anterior, p, posterior, r, ramus (modified from: Ogunsalu C, Pillai K, Barclay S. Radiological assessment of type II Stafne idiopathic bone cyst in a patient undergoing implant therapy: a case report. West Indian Medical J 2006; 55:447-450)

### According to the extension

Type I. The concavity does not reach the buccal cortical plate.

Type II. The concavity reaches the buccal cortical plate.

Type III. The concavity is characterized by buccal cortical plate expansion.

a.jpg

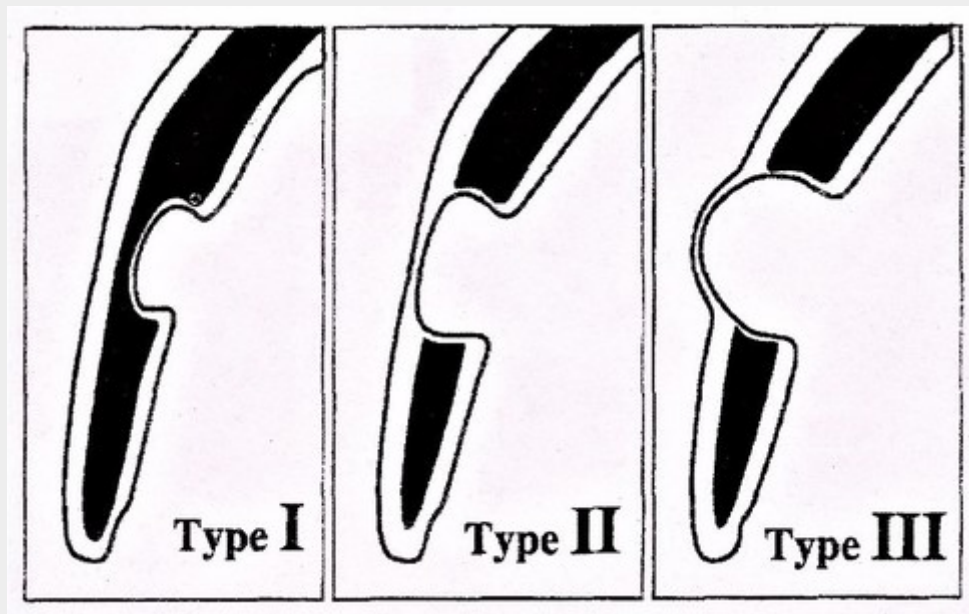


Figure 2. Modified from: Arijji E, Fujiwara N, Tabata O, et al. Stafne's bone cavity. Classification based on outline and content determined by computed tomography. Oral Surg, Oral Med, Oral Pathol 1993; 76:375-380

**According to the cortical defect margins**

Broad type.

Narrow type.

Smooth margin.

Irregular margin.

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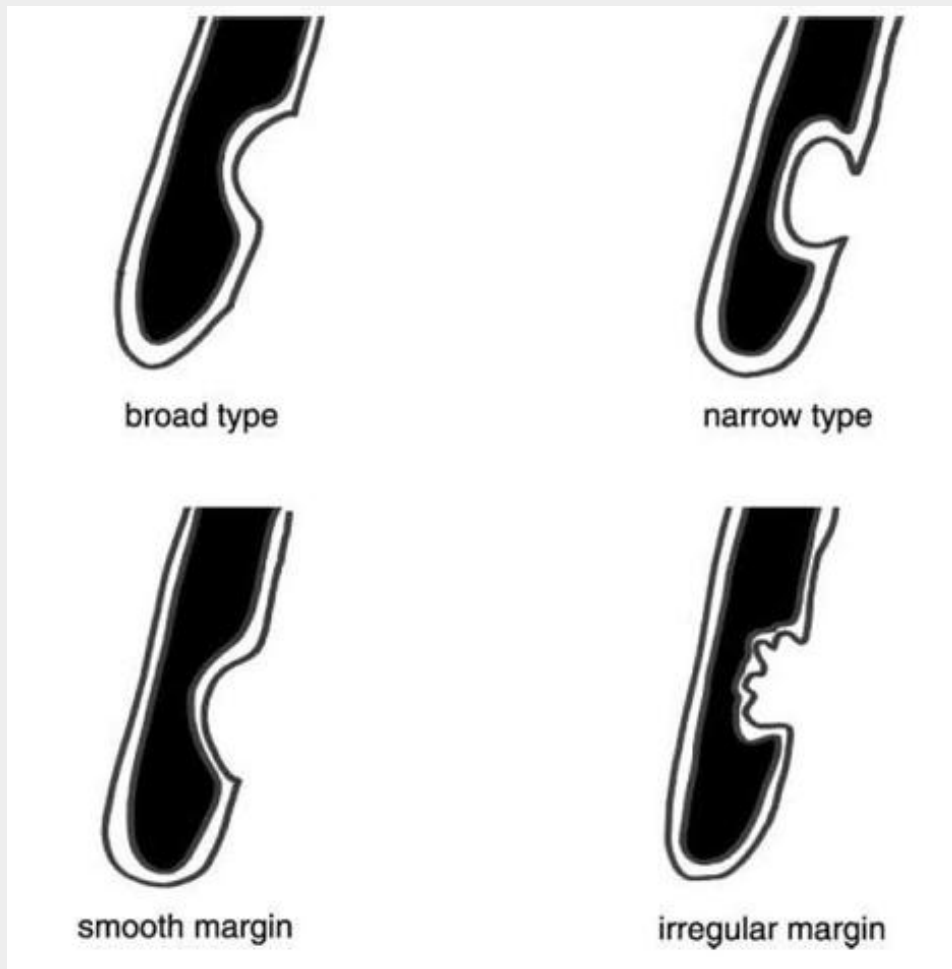


Figure 3. Modified from Minowa K, Inoue N, Sawamura T, Matsuda A, Totsuka Y, Nakamura M. Evaluation of static bone cavities with CT and MRI. Dentomaxillofac Radiol 2003; 32:2-7

**According to the content**

Type F. It is filled only with fat density.

Type S. Soft tissue structure inside, as lymph node, vessel, connective tissue or other.

Type G. Salivary gland entrapped in or located close to the concavity.

b.jpg

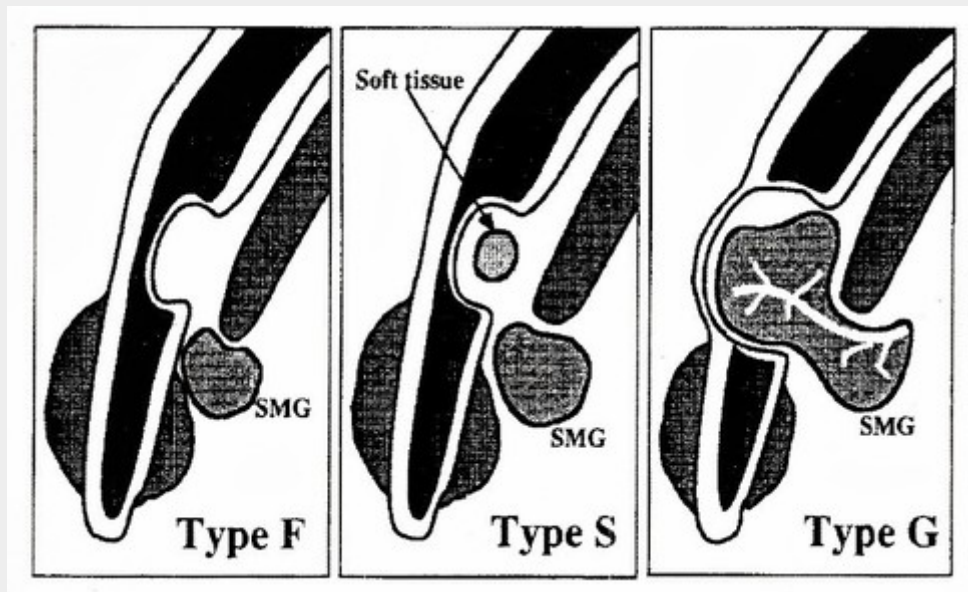


Figure 4. Modified from: Aiji E, Fujiwara N, Tabata O, et al. Stafne's bone cavity. Classification based on outline and content determined by computed tomography. Oral Surg, Oral Med, Oral Pathol 1993; 76:375-380

Stafne bone defect might be misdiagnosed as other cystic lesions of the mandible, such as solitary (traumatic) bone cyst, lateral periodontal cyst, radicular and residual cyst, keratocyst, and early stage focal cemento-osseous dysplasia.

No surgical treatment is required, but only periodic follow up, although the cavity is static and benign. Surgical exploration or biopsy should be performed in atypical cases.

### 3. Imaging Findings or Procedure Details

#### CASE REPORT

A 40 year-old-woman was referred by her dentist for further evaluation of a bone defect in the anterior mandible. The patient was asymptomatic and had previously made elsewhere a panoramic radiograph and a CBCT. A MR study was performed on a 1.5 T unit, before and after i.v. administration of a paramagnetic contrast medium, with TSE T1, T2 3D, STIR, and FFE T1 sequences.

#### Panoramic radiograph

On the panoramic radiograph an unilocular, oval radiolucency with well-defined margins (white arrow) was appreciable as an incidental finding in the anterior left mandible, premolar region. Panoramic radiograph was repeated in 2017 for follow up with no changes.

e.jpg



Figure 5. Panoramic radiograph in 2016 (A) and 2017 (B).

### Cone-beam computed tomography (CBCT)

The CBCT made after in 2016 showed a well-defined, unilocular, corticated, round shape hypodense lesion in the anterior mandible (white arrow). The mandibular bone defect involved the lingual cortical bone but not reached the vestibular one.

f.jpg

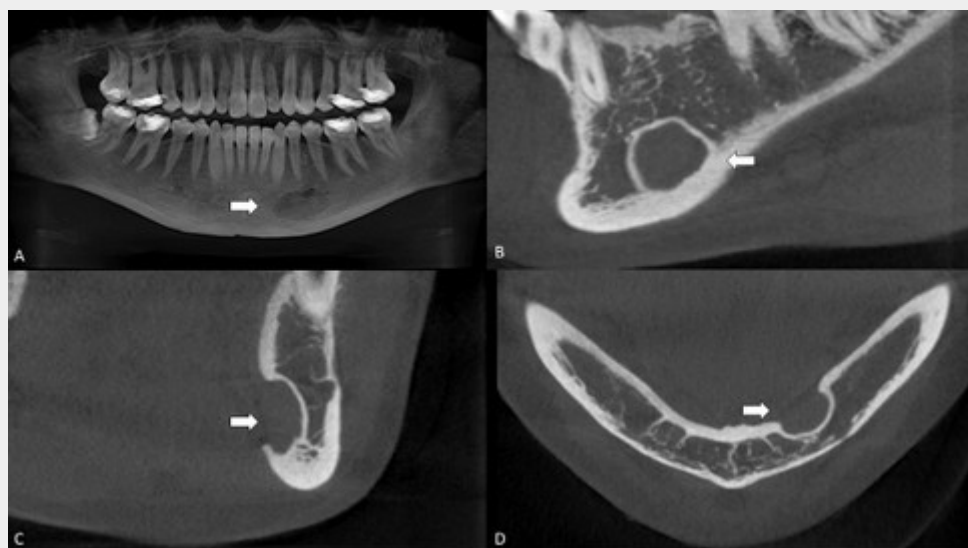


Figure 6. CBCT. A) panoramic reformation. B) sagittal, C) coronal and D) axial planes.

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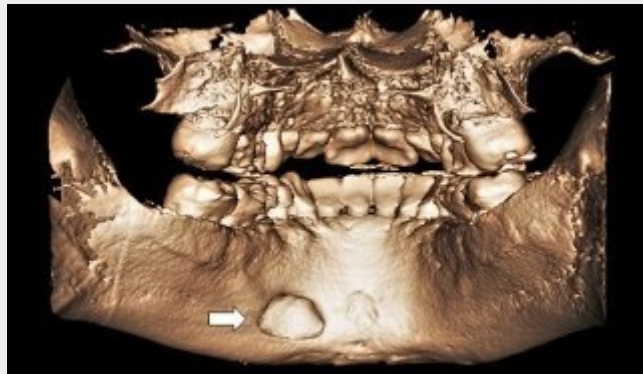


Figure 7. 3D reformatted CBCT.

### Magnetic resonance imaging (MRI)

On the MRI study performed in 2017 the left sublingual gland, herniated within the anterior Stafne cyst, was observed,

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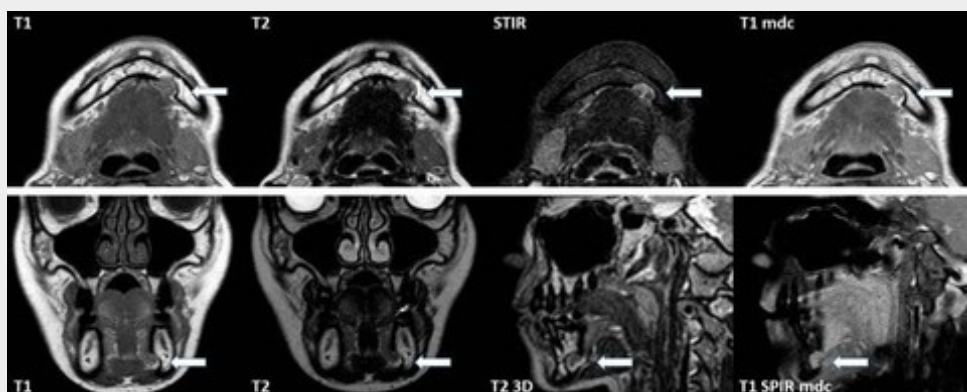


Figure 8. MRI study performed on a 1.5 T unit with the following multiplanar sequences: TSE T1 without and with fat saturation after i.v. administration of a paramagnetic contrast medium, T2 3D, STIR, and FFE T1 3D with fat saturation after i.v. administration of a paramagnetic contrast medium.

### Case report classification

|                                          |                                    |
|------------------------------------------|------------------------------------|
| According to the location                | <b>ANTERIOR</b>                    |
| According to the extension               | <b>TYPE I</b>                      |
| According to the cortical defect margins | <b>NARROW TYPE - SMOOTH MARGIN</b> |
| According to the content                 | <b>TYPE G</b>                      |



Table 1. Classification of the anterior Stafne cyst reported, according to the main classifications in the literature.

#### 4. Conclusion

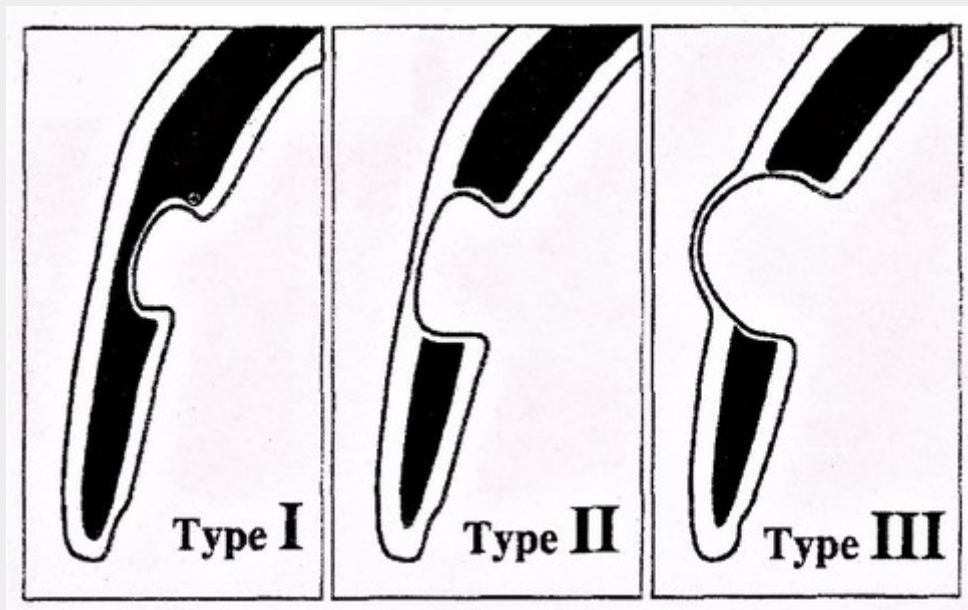
Anterior Stafne cyst is a rare, usually incidental occurrence on a panoramic radiograph. CT is useful for differential diagnosis with other cystic lesions of the mandible and classification. MRI, demonstrating sublingual gland herniation in the mandibular defect, can avoid bioptic or surgical procedures in asymptomatic patients.

#### 5. References

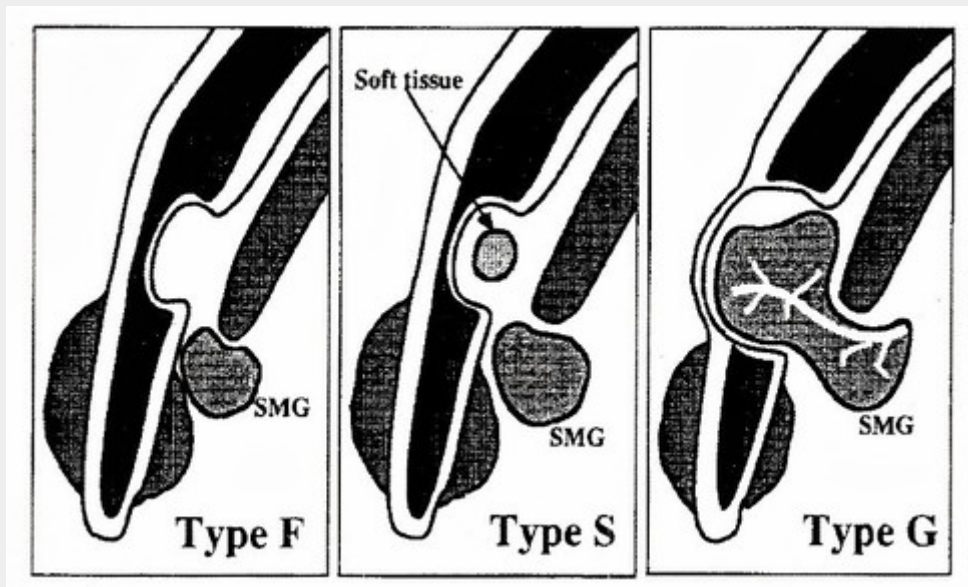
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6. Mediafiles

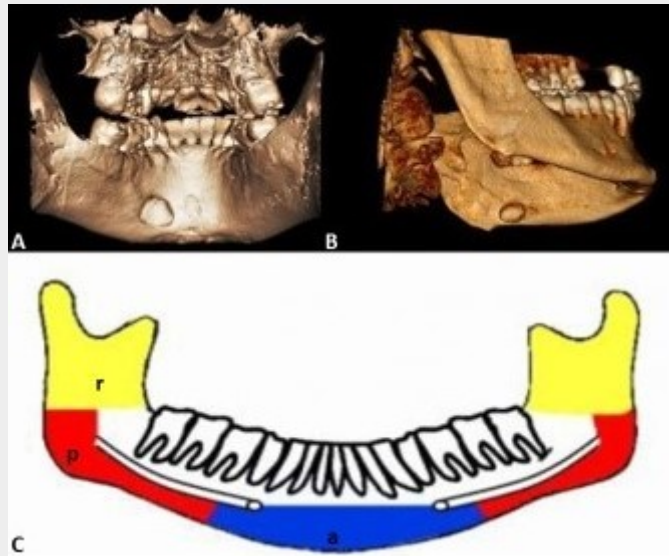
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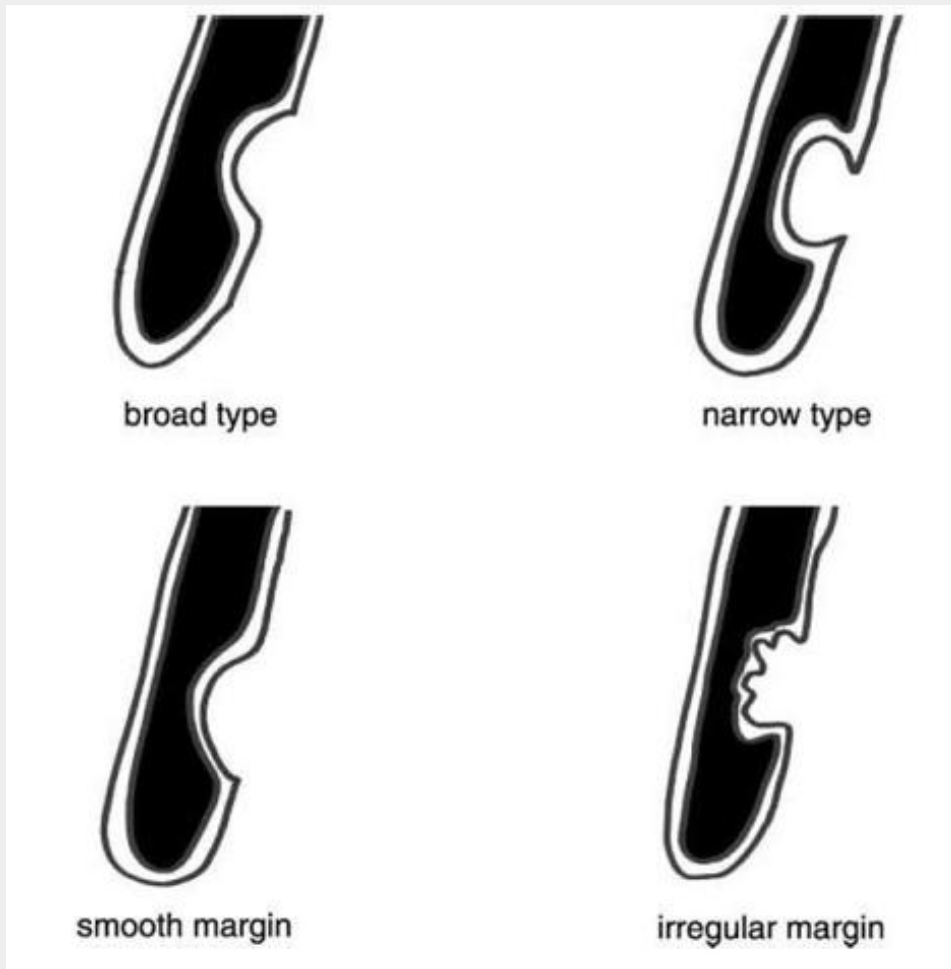
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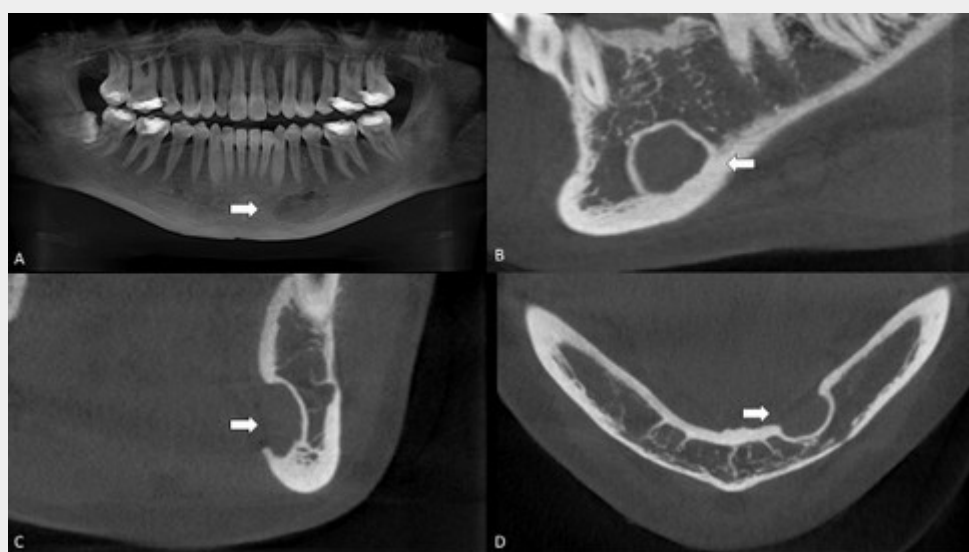
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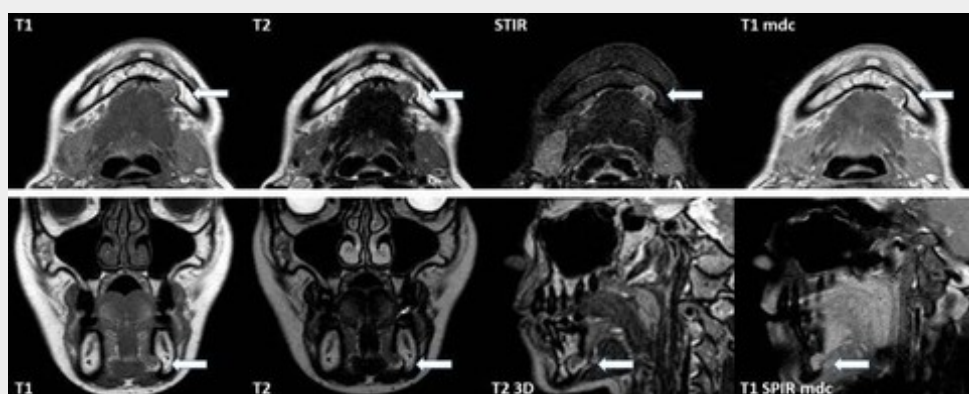
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