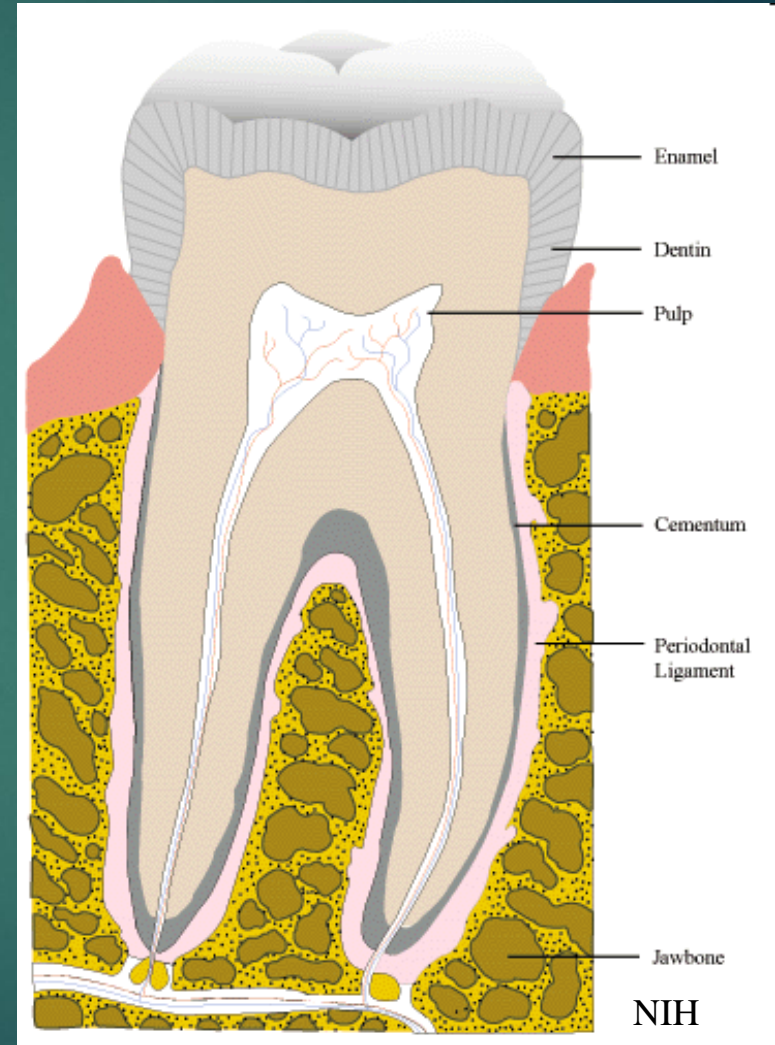

Normal Anatomic Variation in Intraoral Radiography

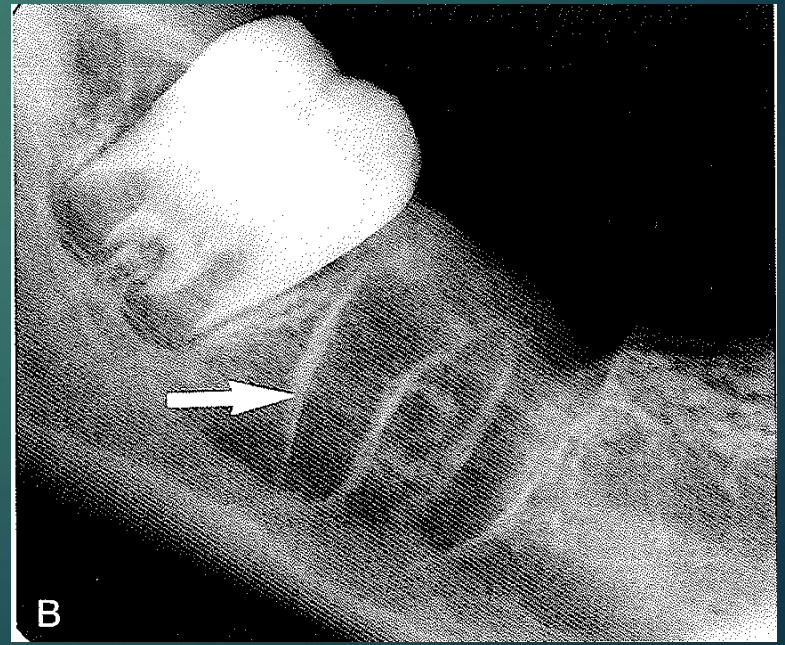
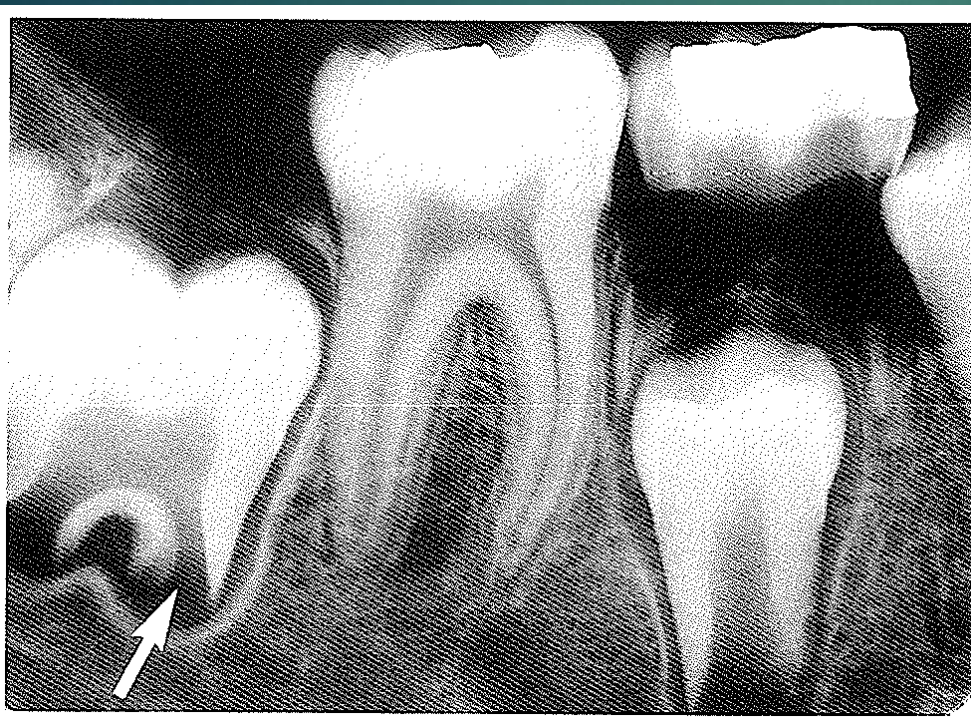
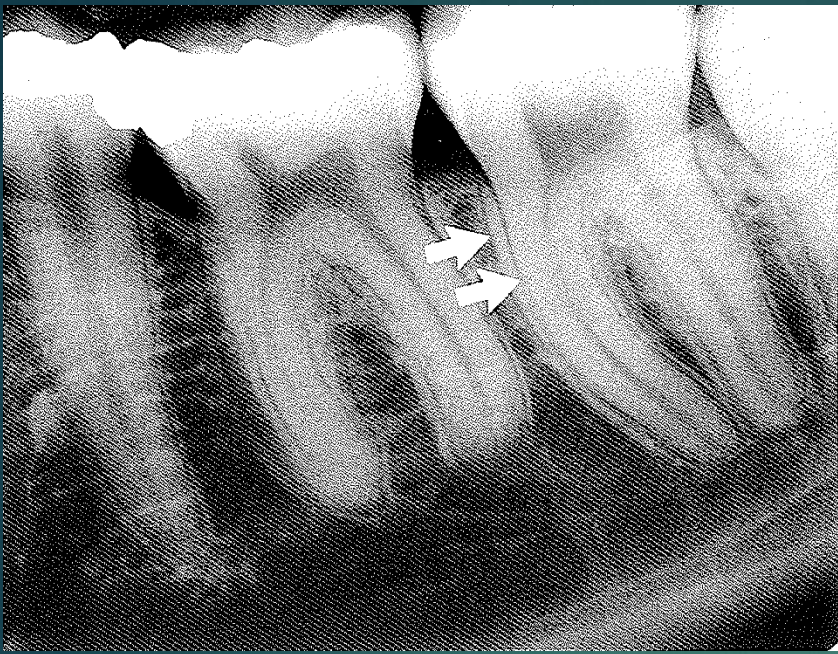
Dr.Ramtin Azar
Oral and Maxillofacial Radiologist
*Assistant professor of arak university of medical
sciences*



Trabecular Pattern

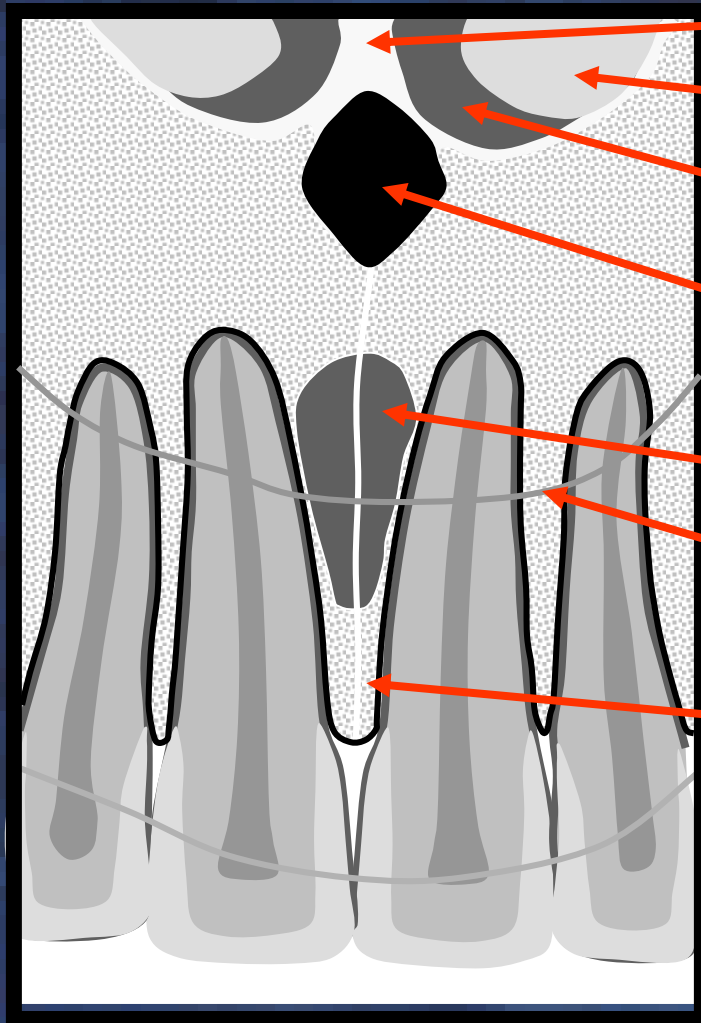
3





Maxillary Incisor

5



Nasal septum

Inferior concha

Nasal fossa

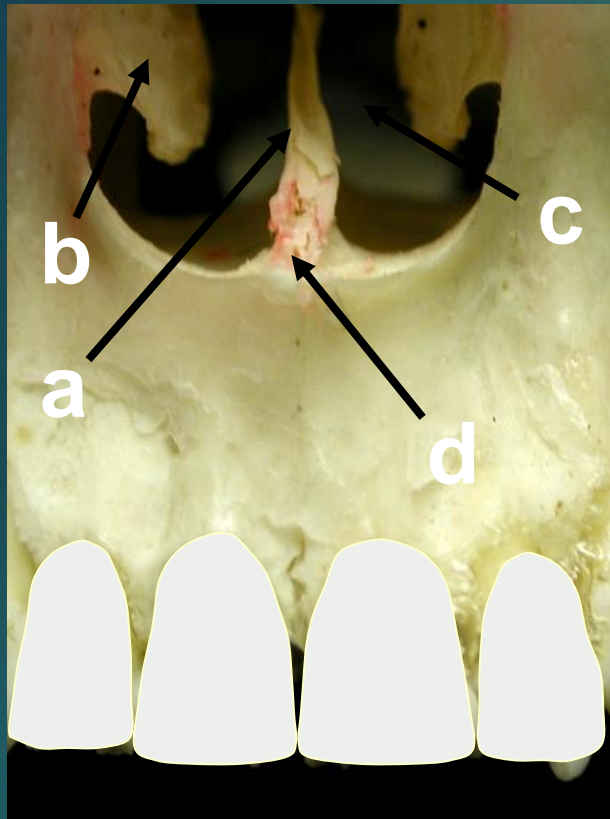
Nasal spine

Incisive foramen

Nose

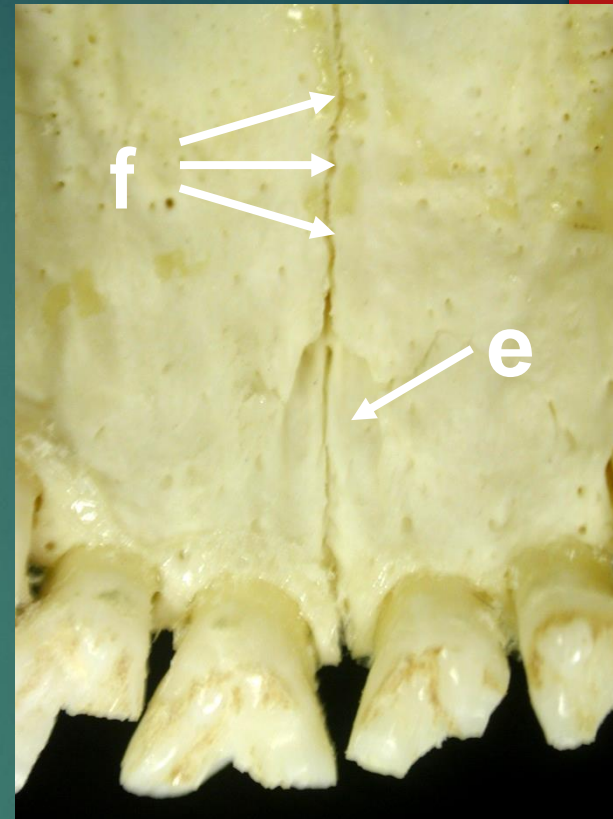
Median palatine suture

facial view



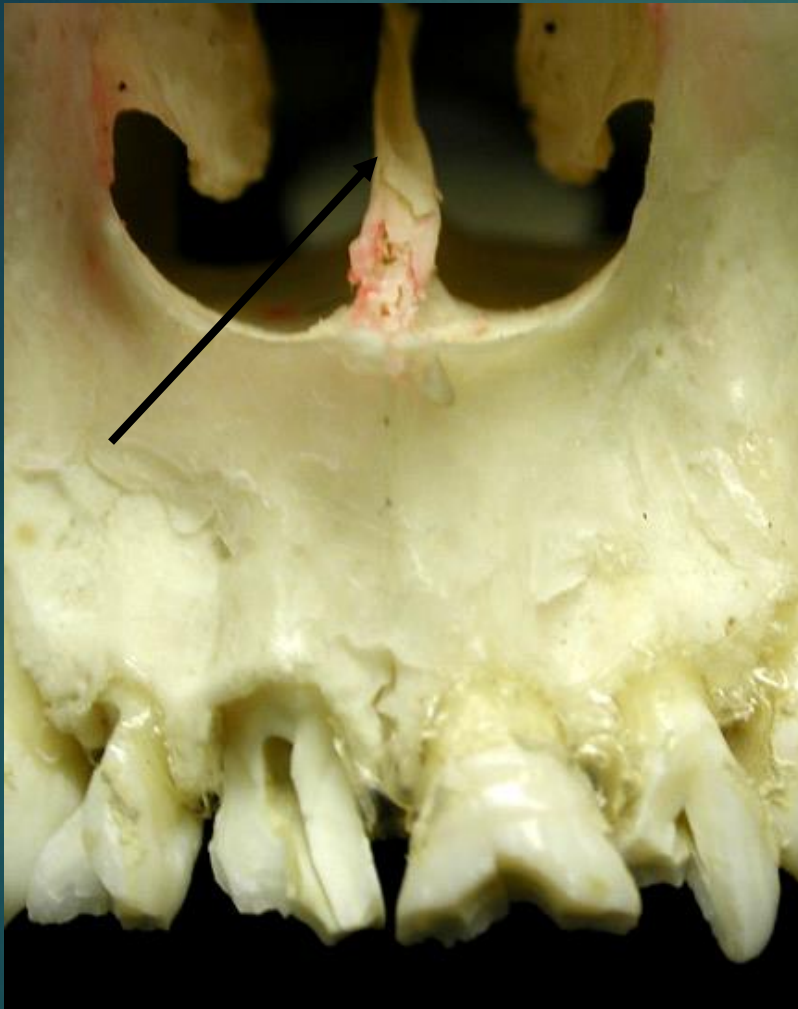
- a = nasal septum**
- b = inferior concha**
- c = nasal fossa**
- d = anterior nasal spine**

palatal view



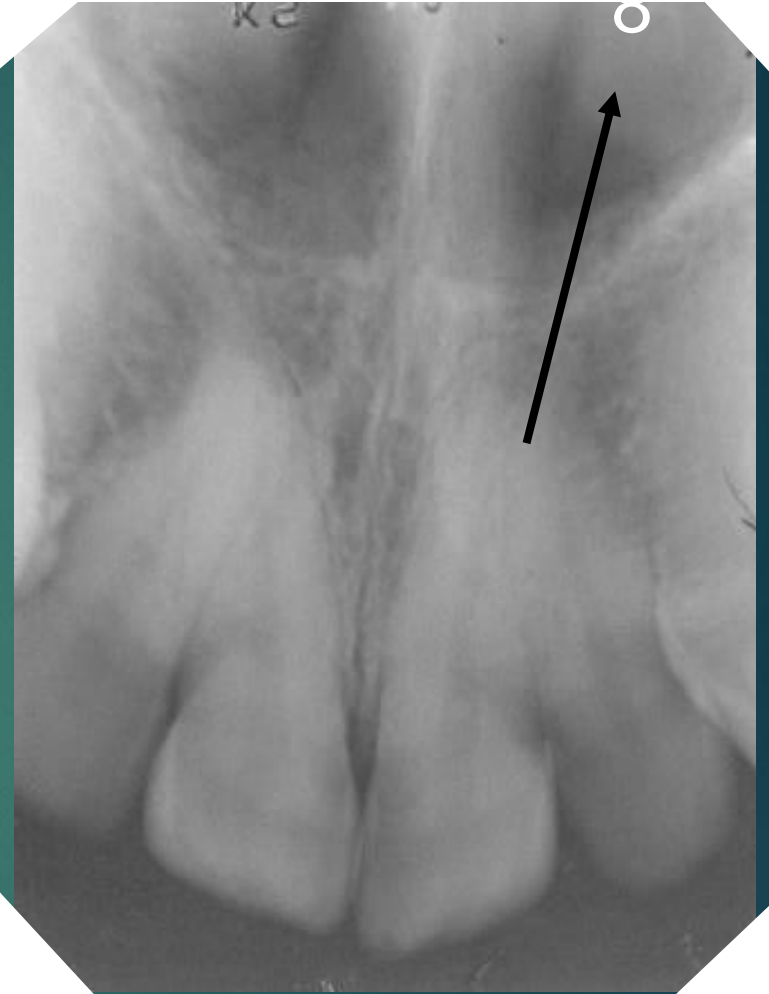
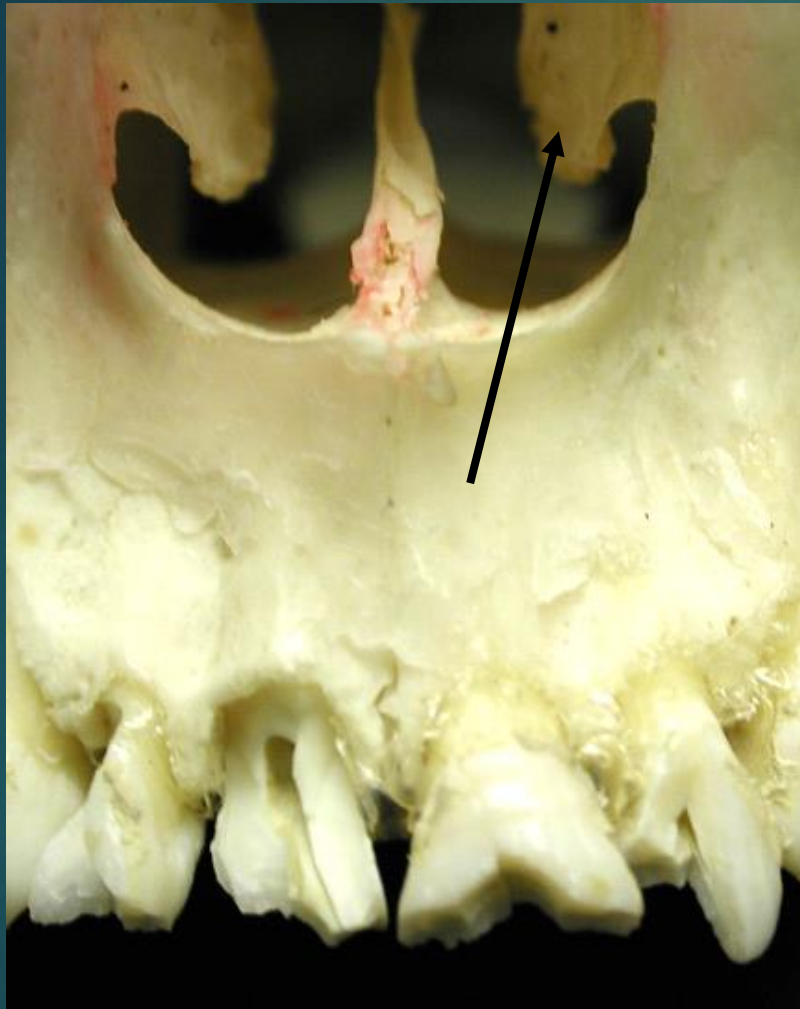
- e = incisive foramen**
- f = median palatal suture**

facial view



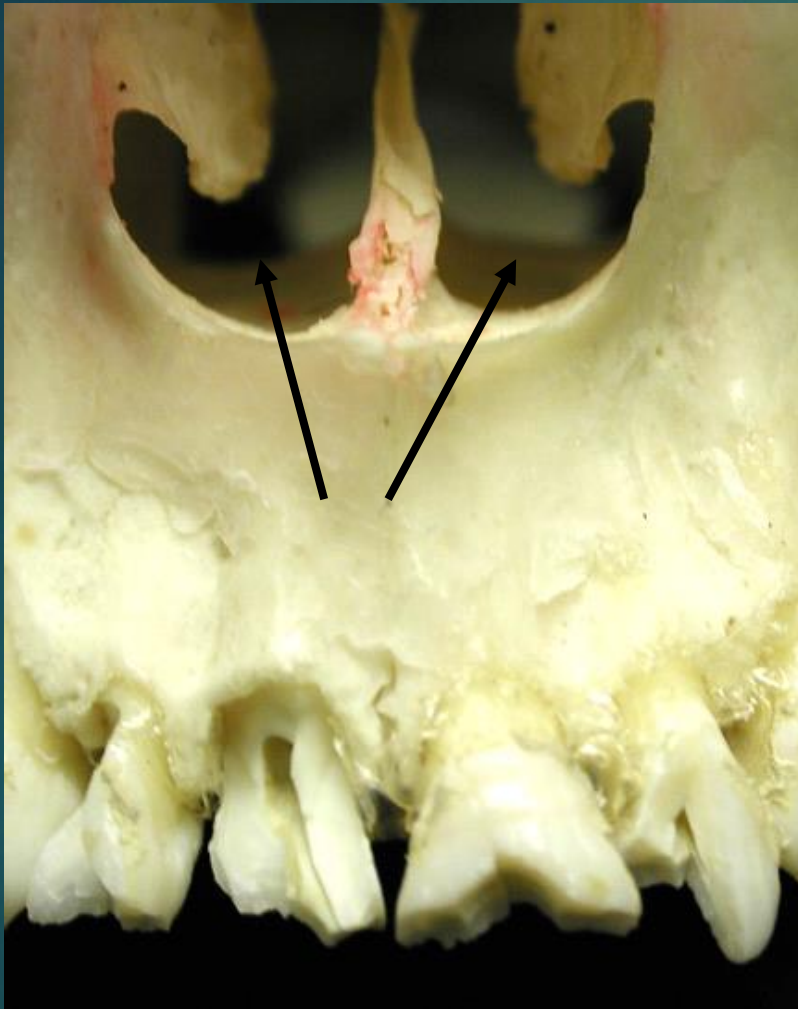
Nasal septum

facial view



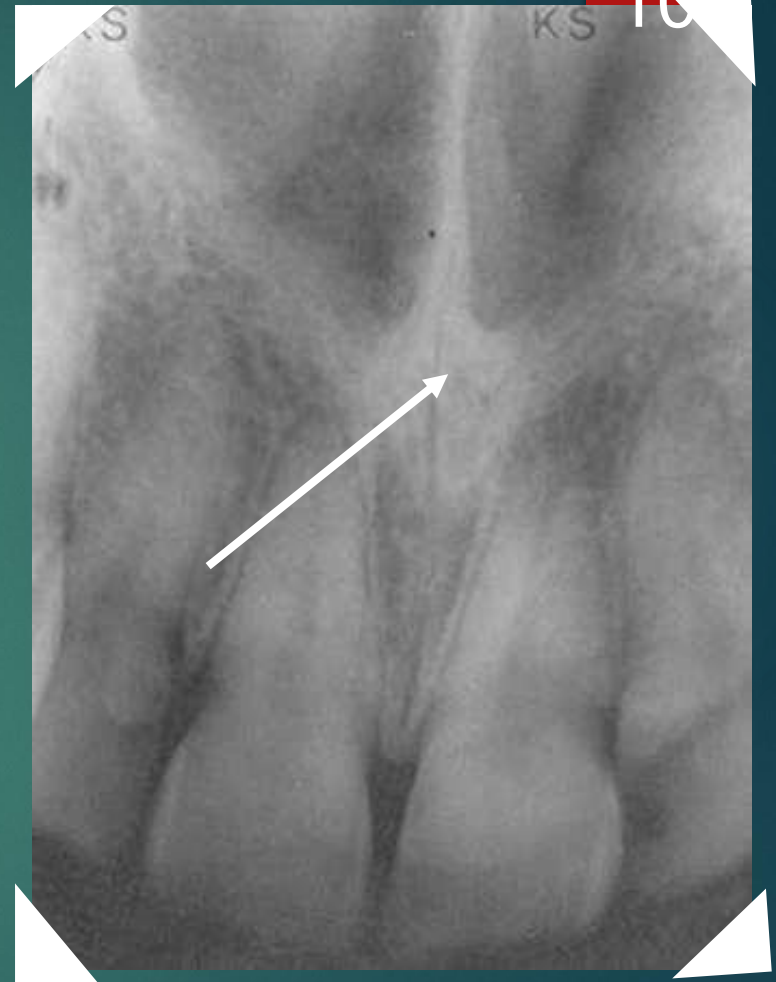
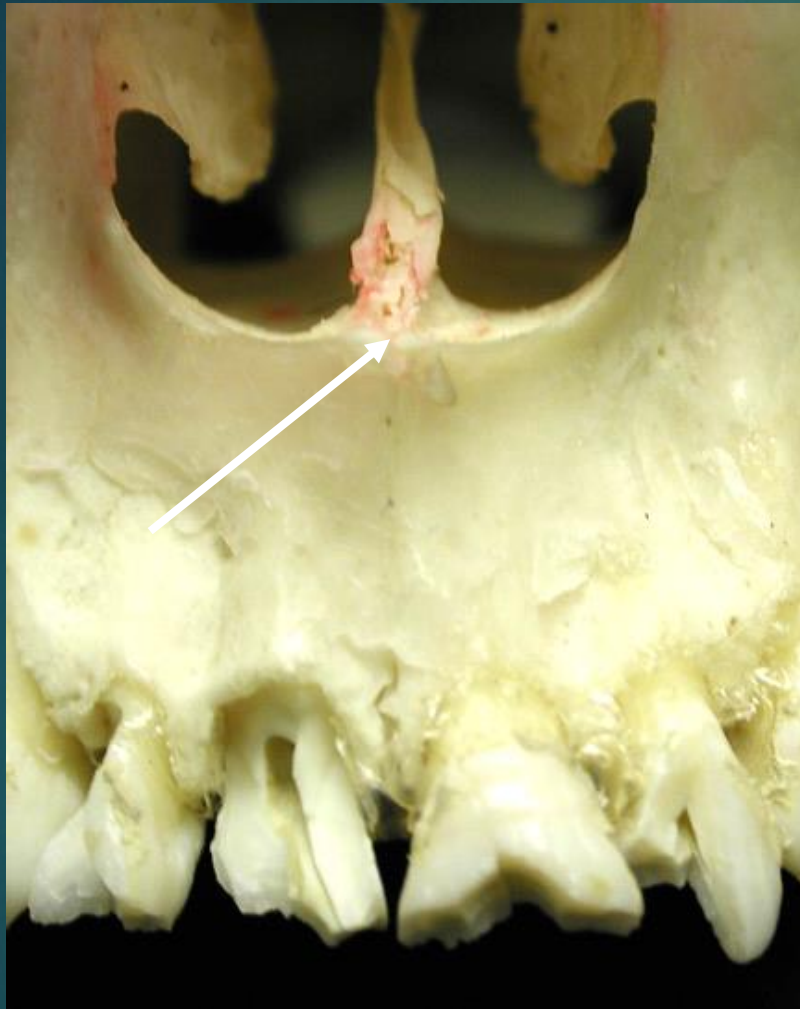
Inferior concha

facial view



Nasal fossa

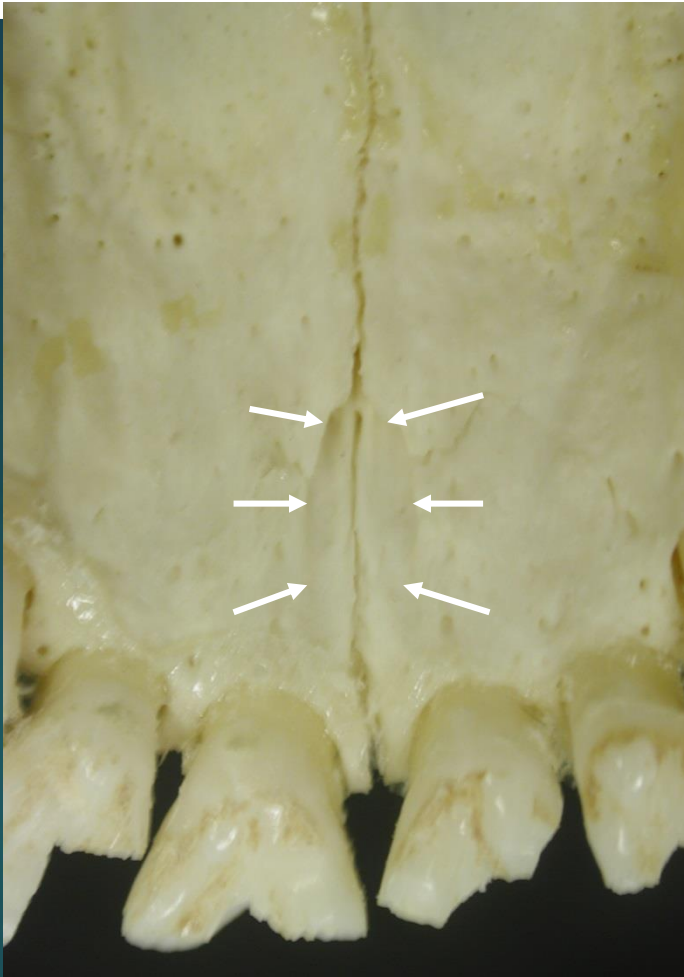
facial view



Anterior nasal spine

palatal view

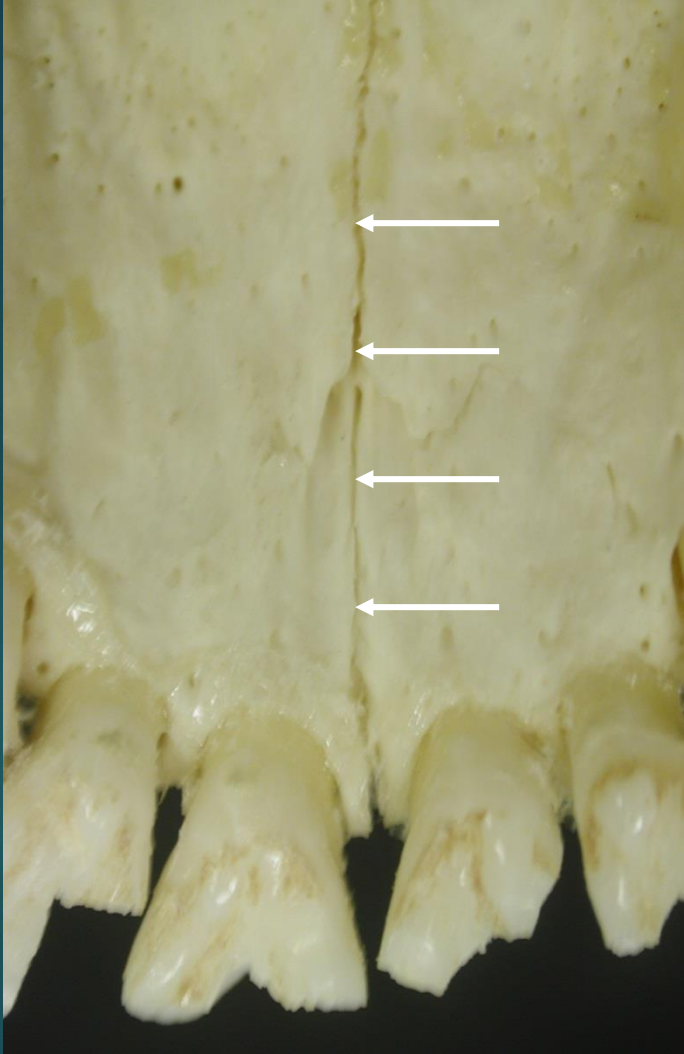
11



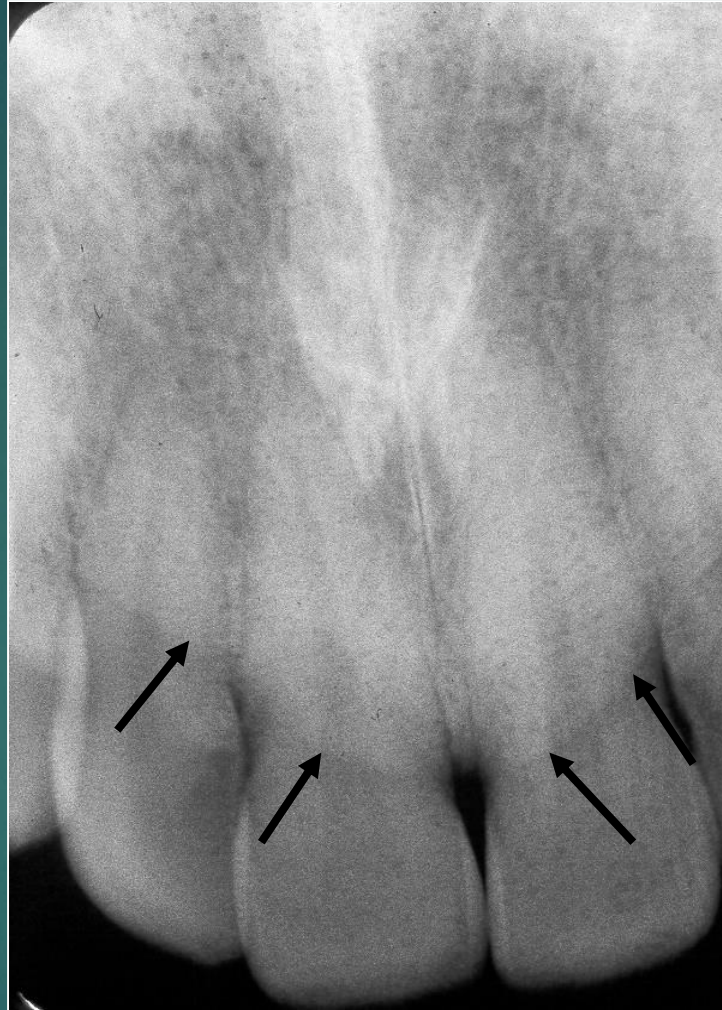
Incisive foramen

palatal view

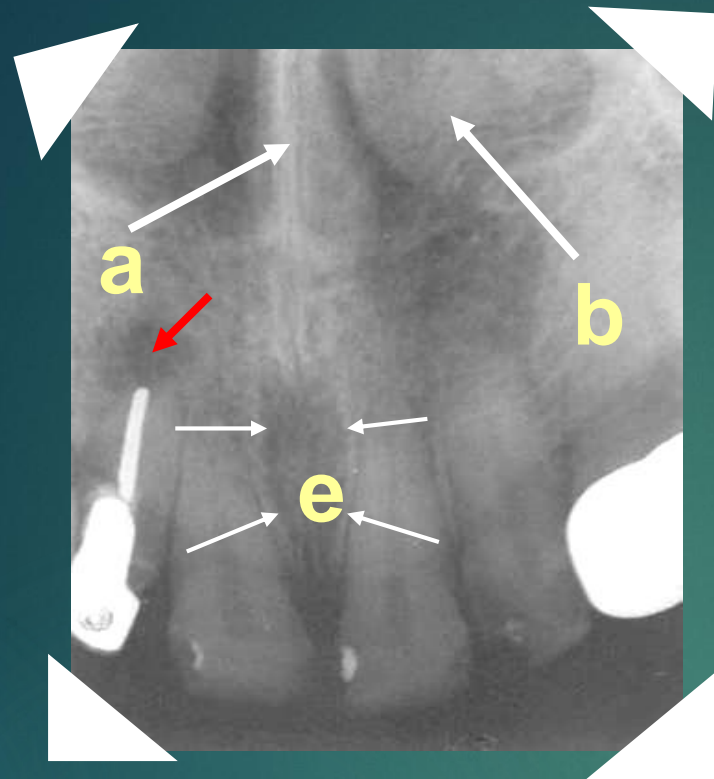
12



Median palatal suture

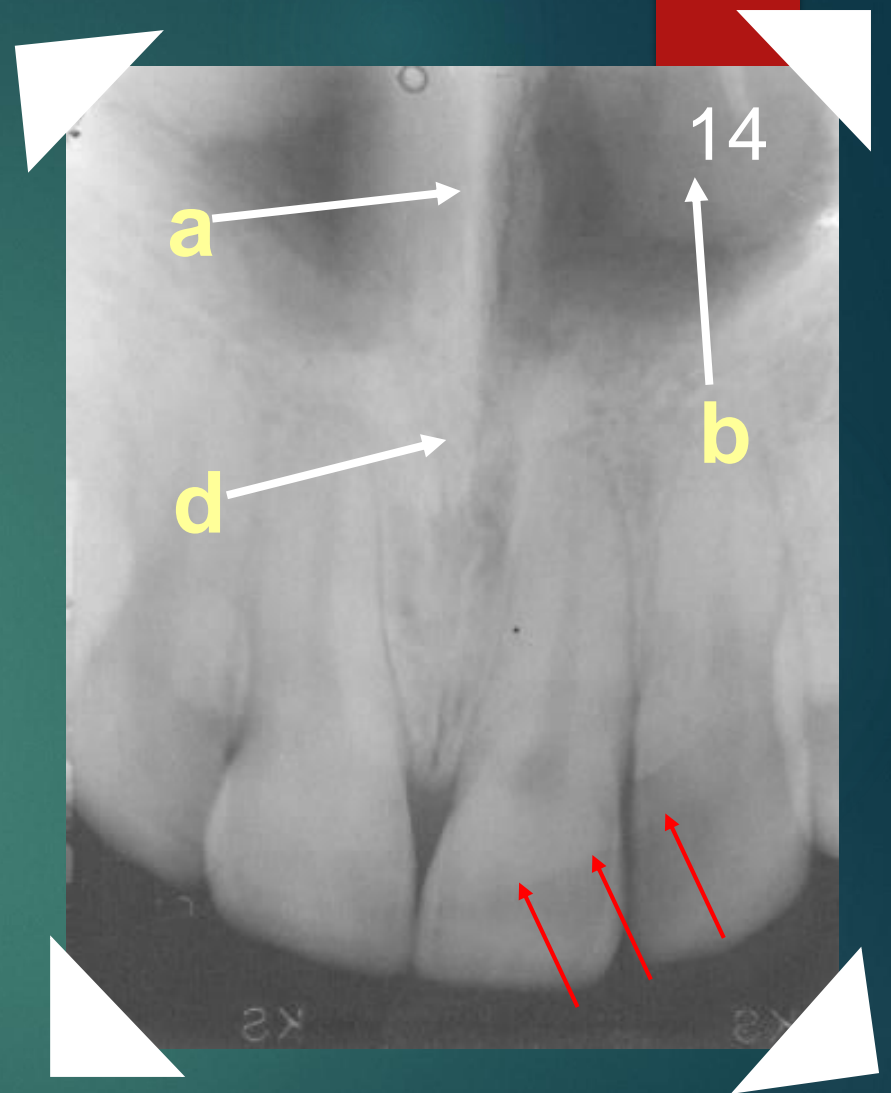


Soft tissue of the nose



a = nasal septum
b = inferior concha
e = incisive foramen
d = anterior nasal spine

Red arrow points to periapical lesion (post-endo).

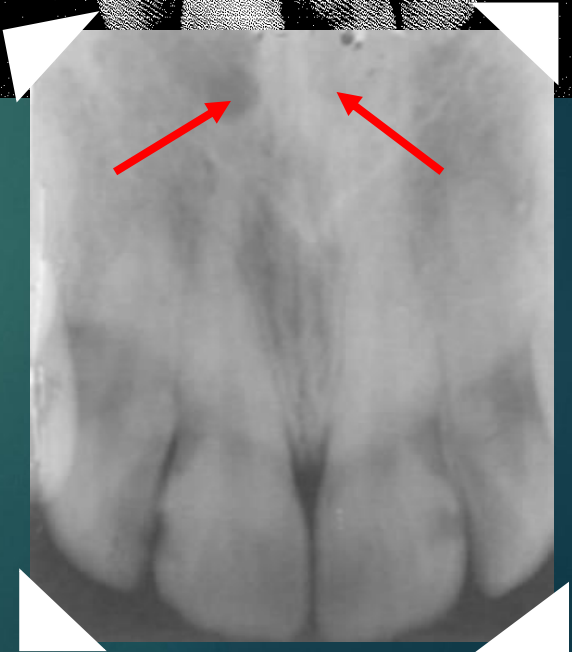
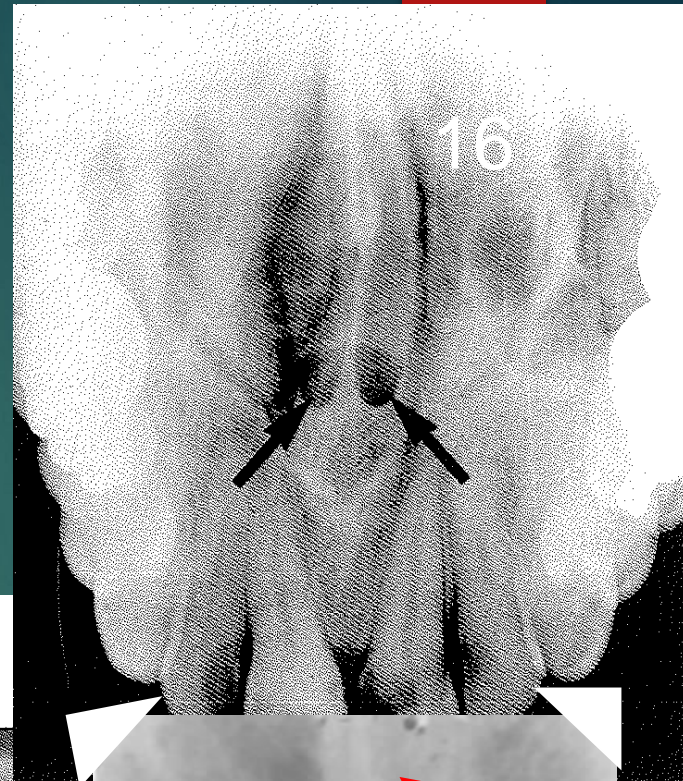
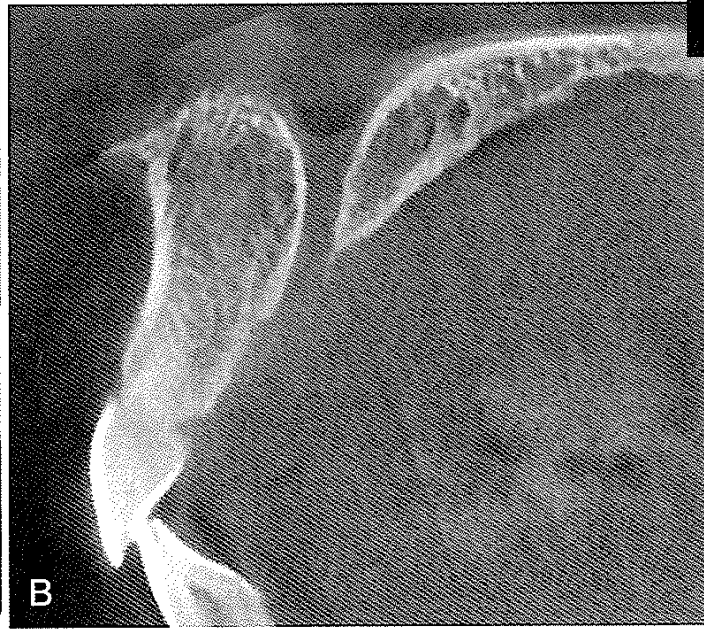
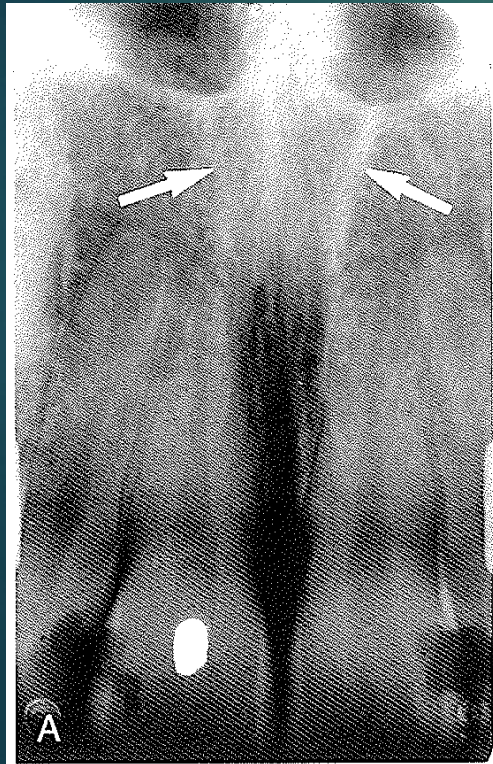


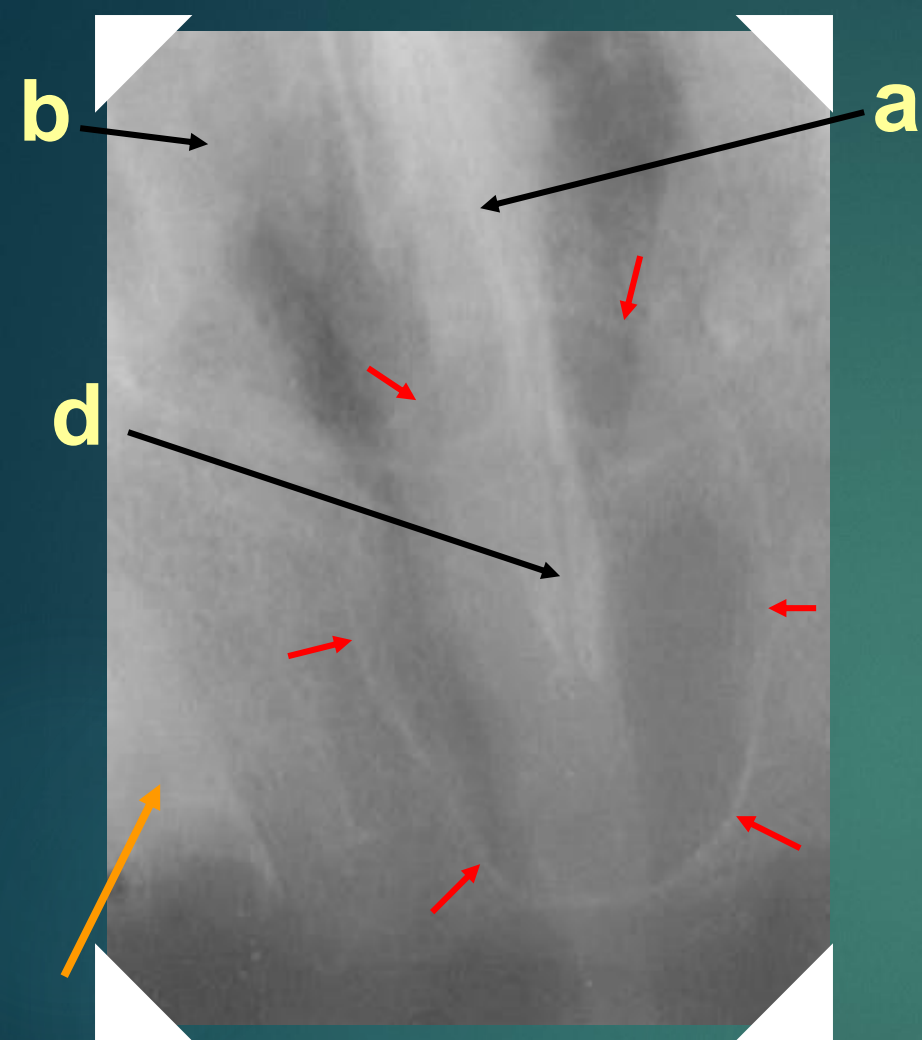
Red arrows = lip line



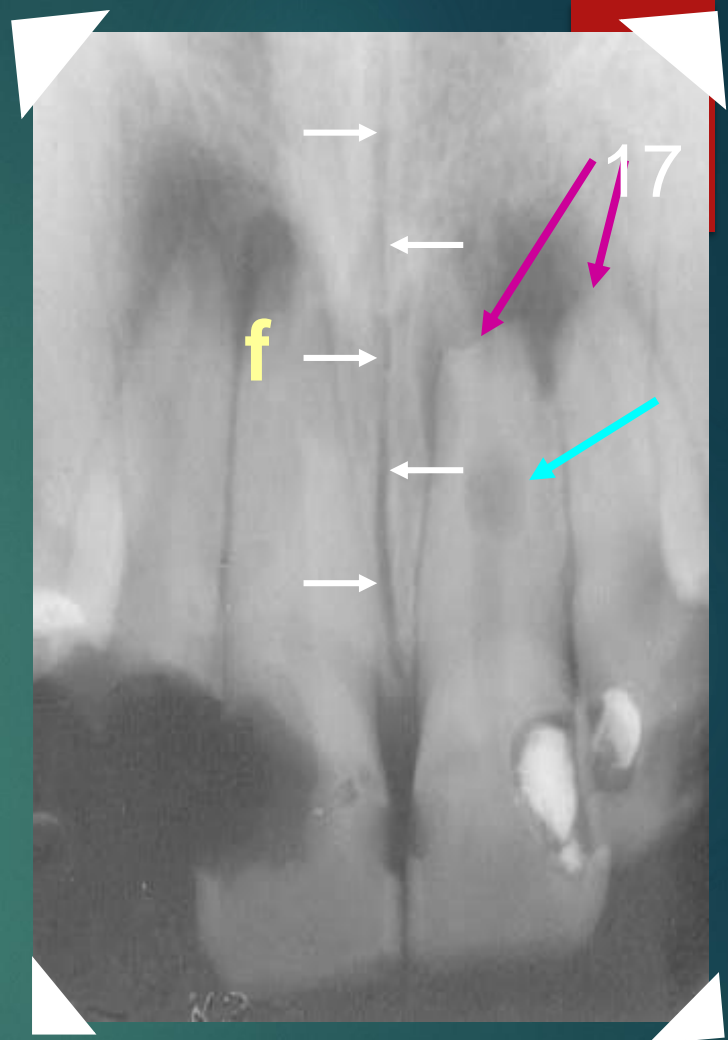
Superior foramina of the nasopalatine canals (red arrows). These foramina lie in the floor of the nasal fossa. The nasopalatine canals travel downward to join in the incisive foramen.

Nasopalatin Canal

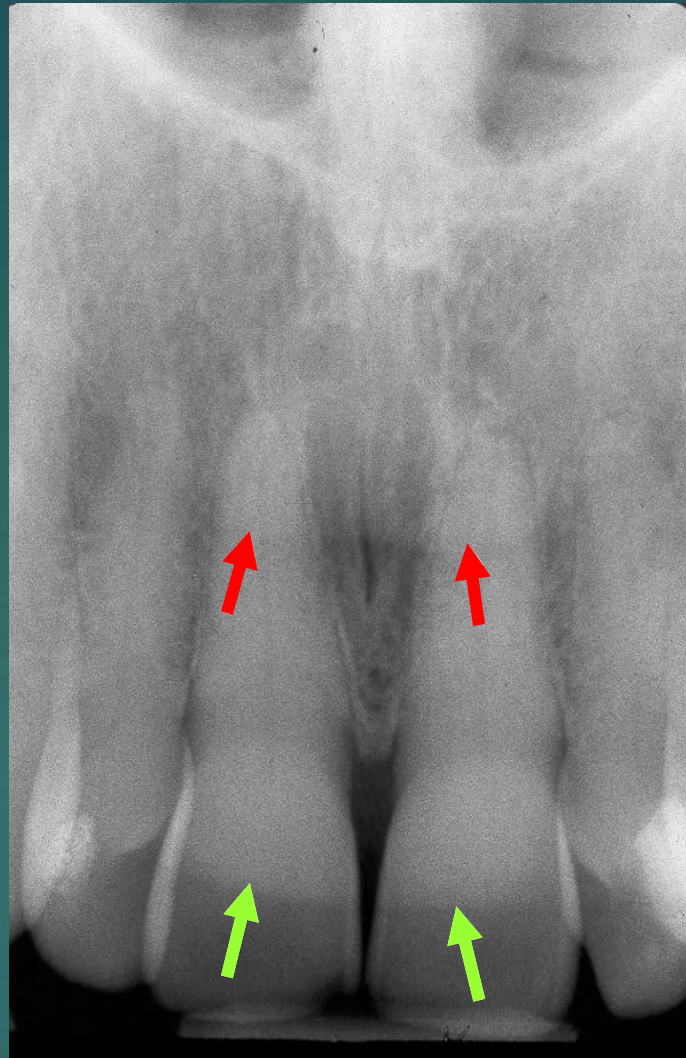




The red arrows point to an incisive canal cyst; the orange arrow identifies the root of tooth # 7.



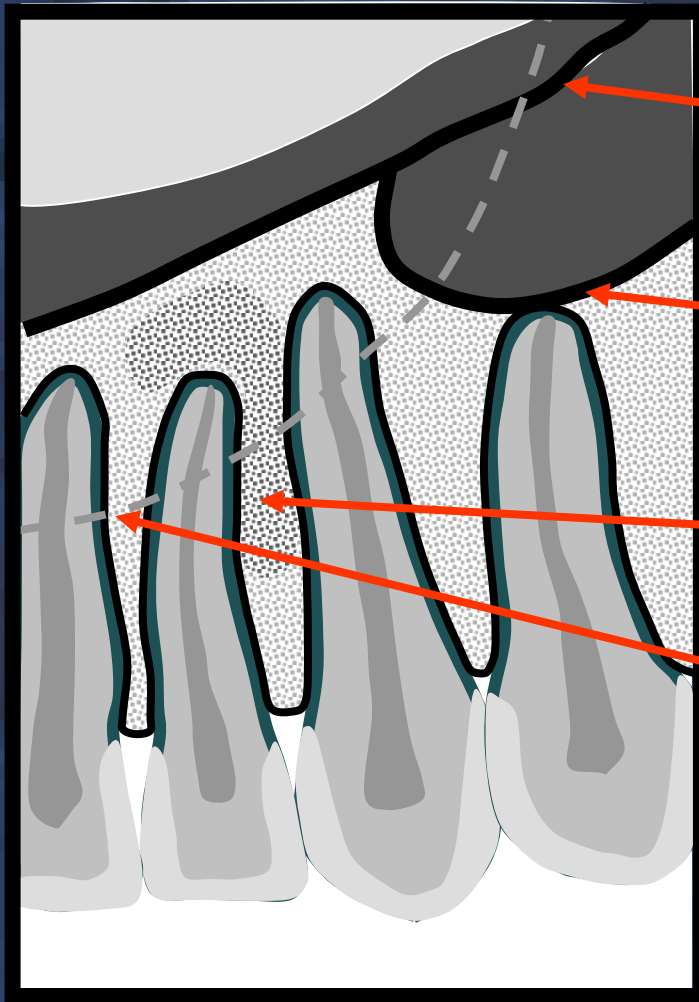
All the incisors are non-vital and have periapical lesions. The purple arrows point to external resorption; the blue arrow identifies internal resorption.



**The red arrows point to the soft tissue of the nose.
The green arrows identify the lip line.**

Maxillary Canine

19



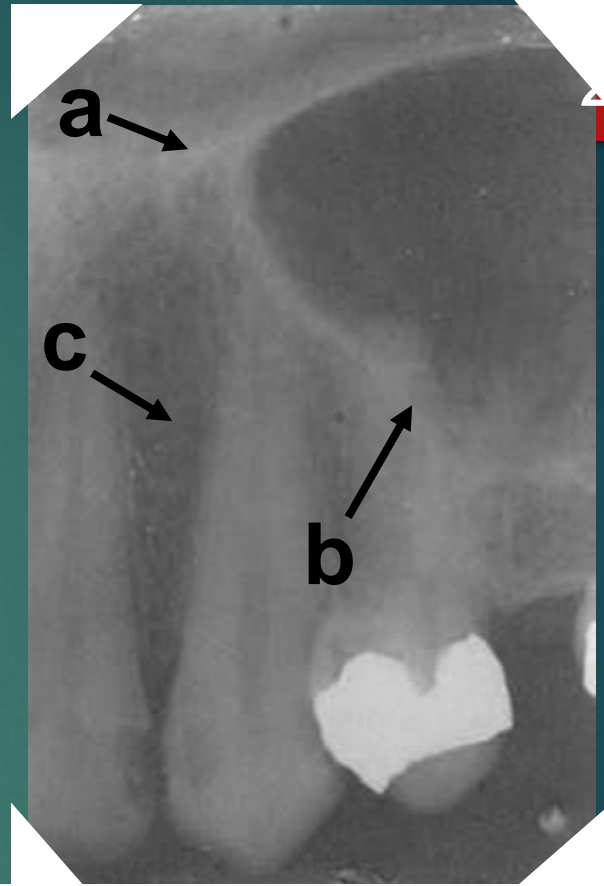
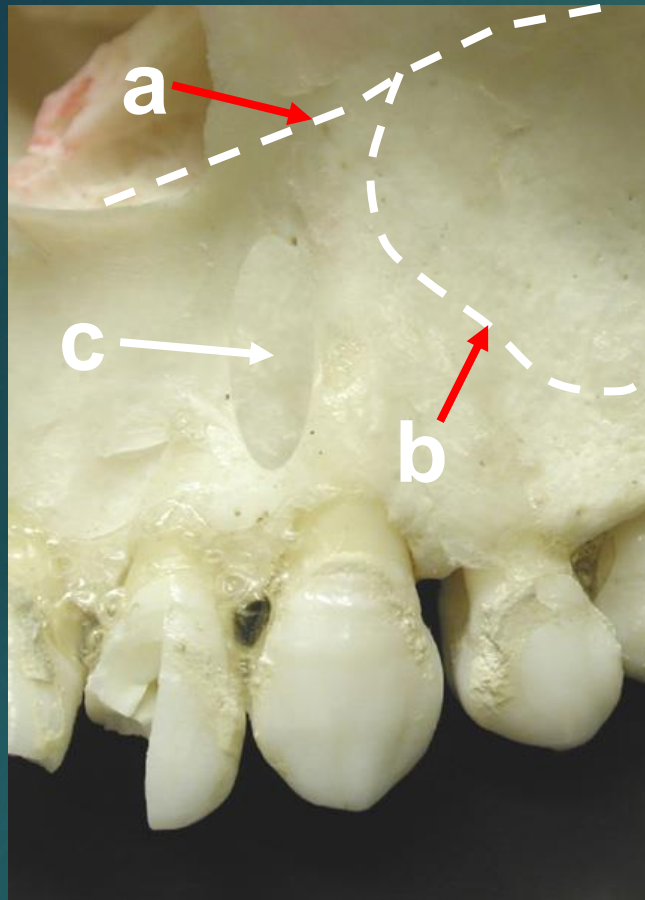
Floor of nasal fossa

Maxillary sinus

Lateral fossa

Nose

facial view



20

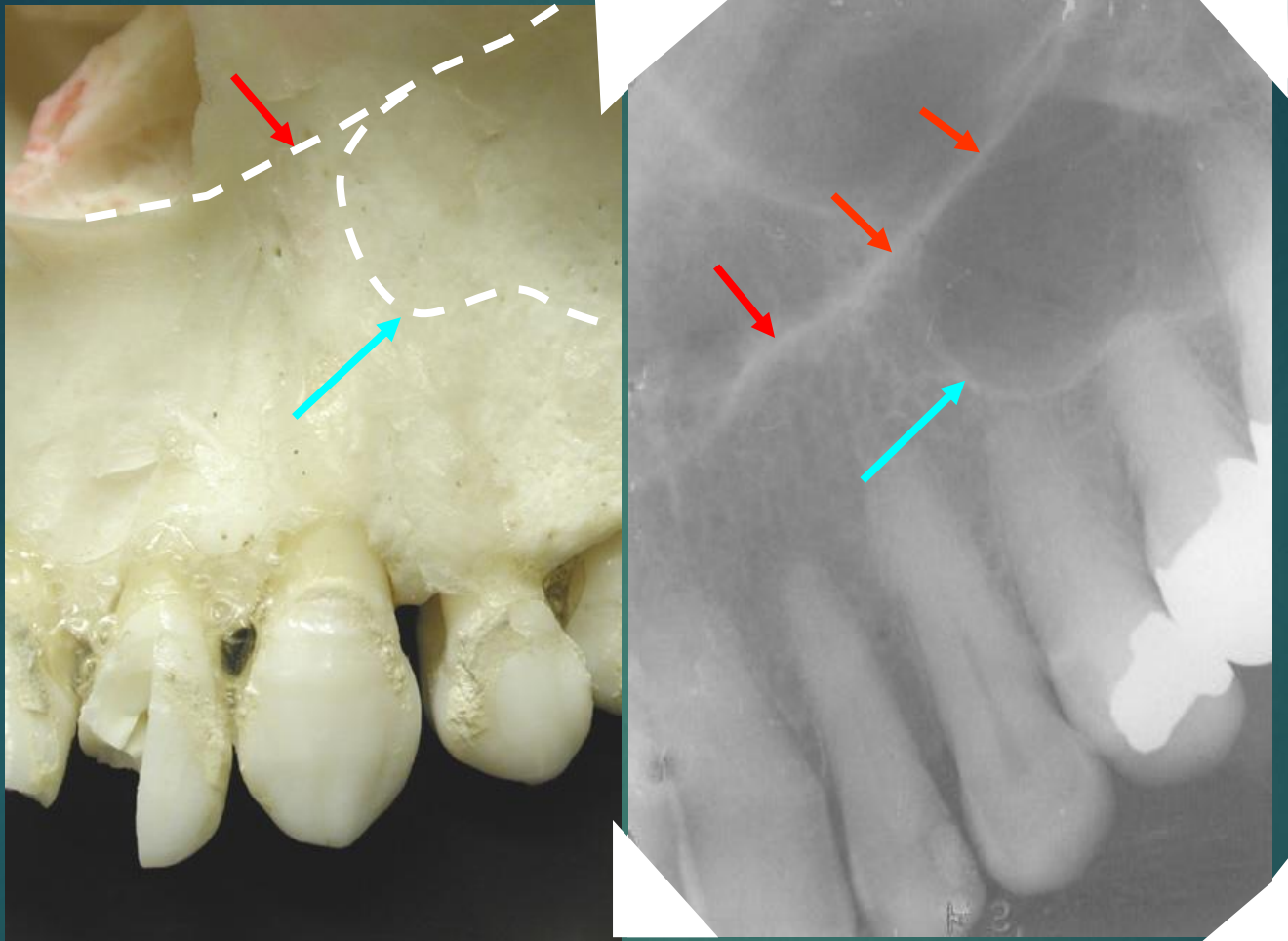
a = floor of nasal fossa


b = maxillary sinus

c = lateral fossa

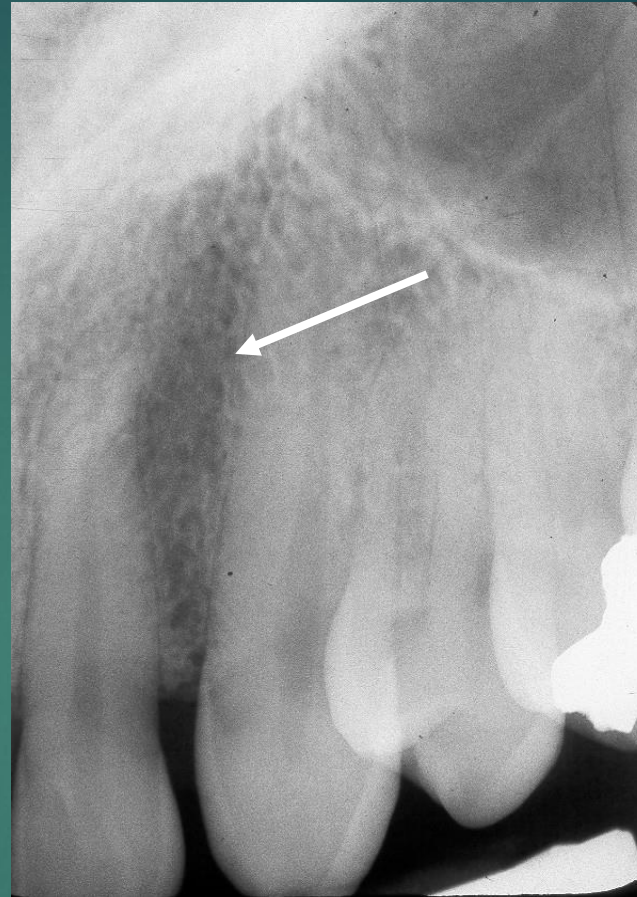
(a & b form inverted Y)

facial view



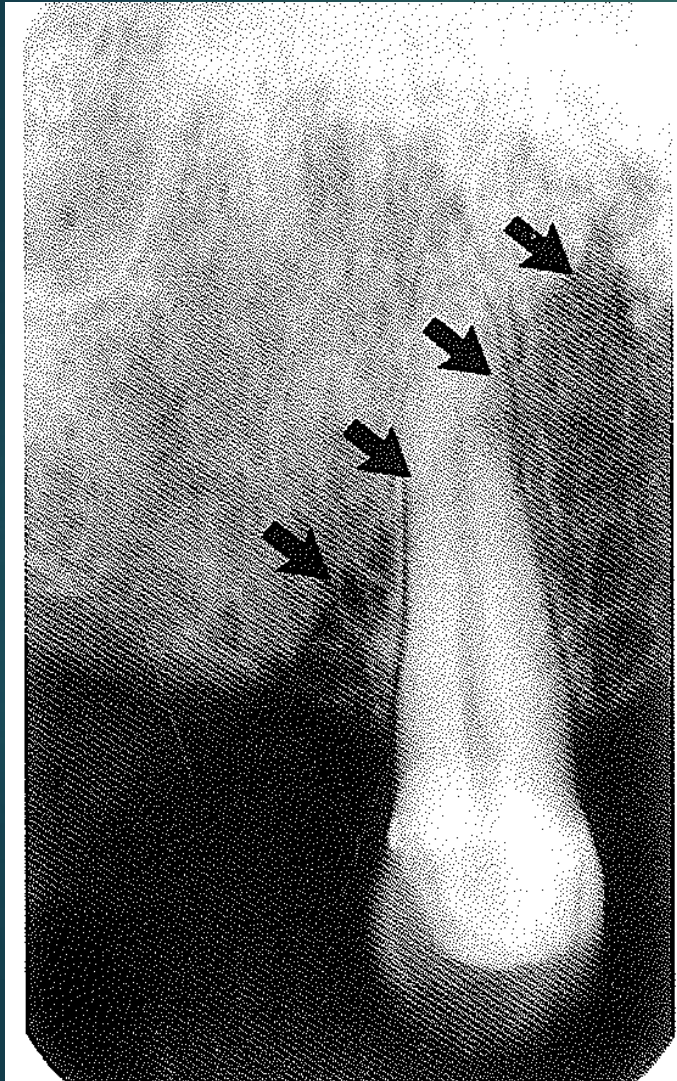
Floor of nasal fossa (red arrows) and anterior border of maxillary sinus (blue arrows), forming the inverted (upside down) Y. 

facial view

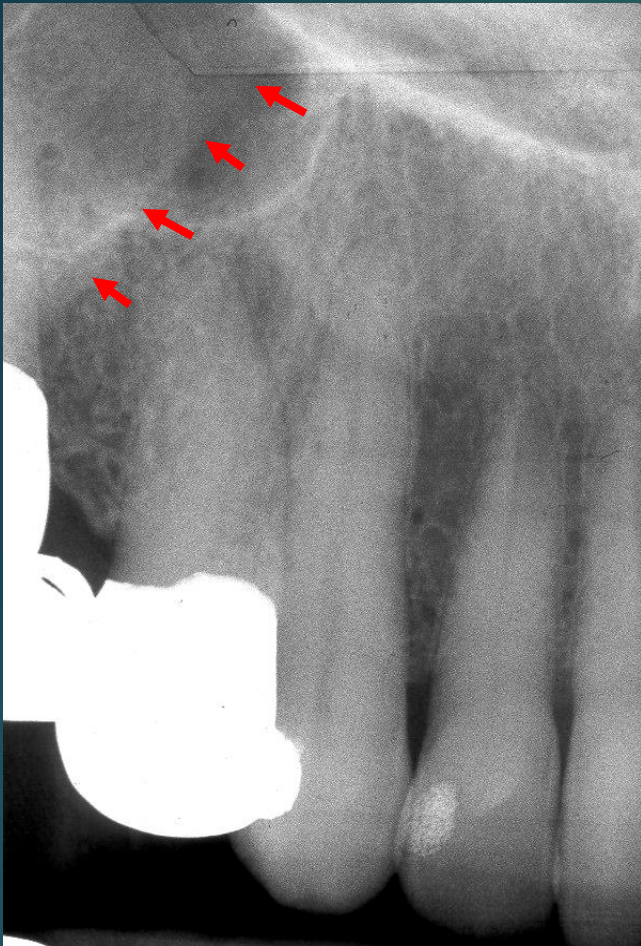


22

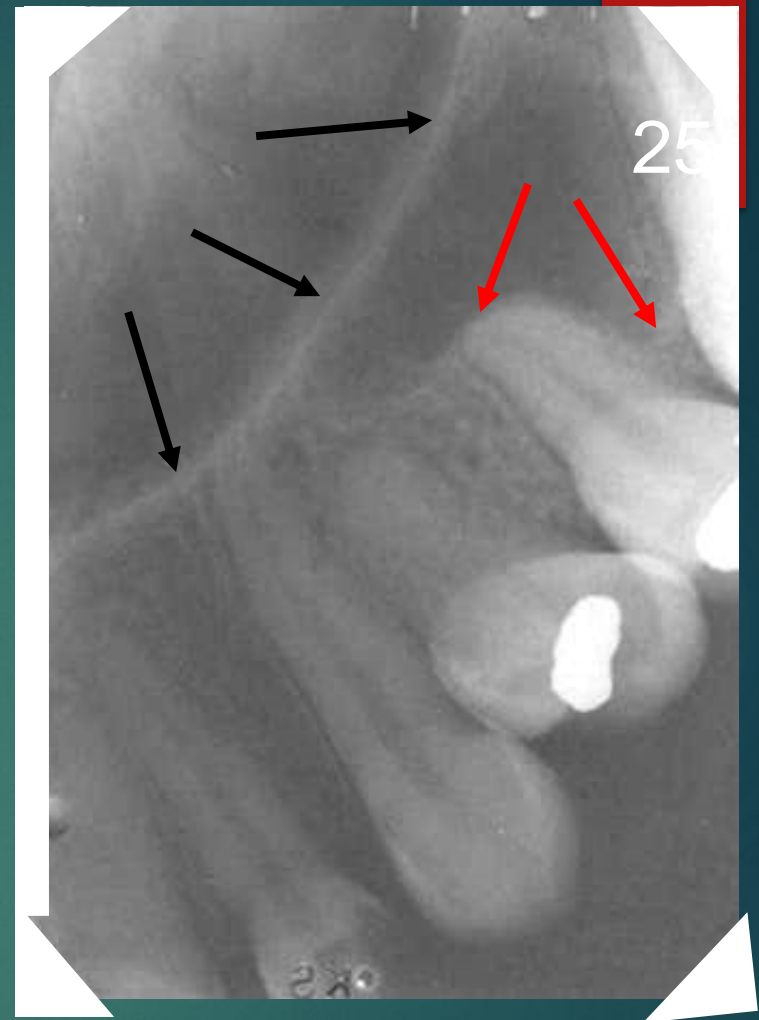
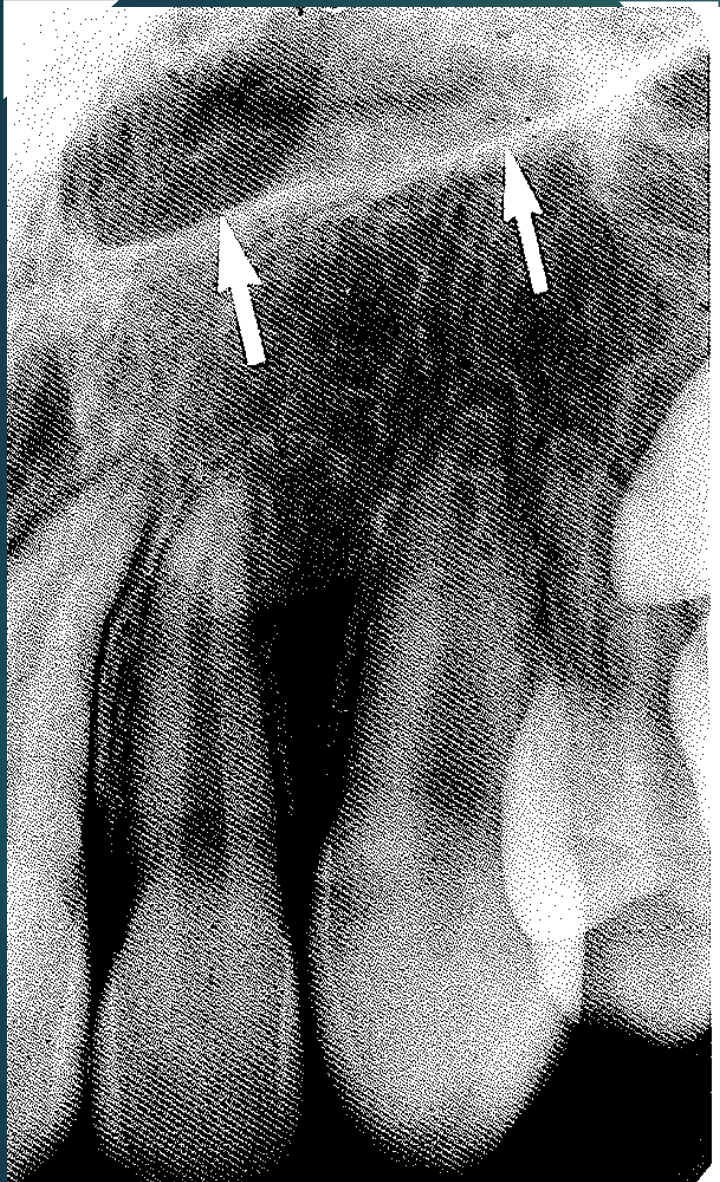
Lateral fossa. The radiolucency results from a depression above and posterior to the lateral incisor. To help rule out pathology, look for an intact lamina dura surrounding the adjacent teeth.



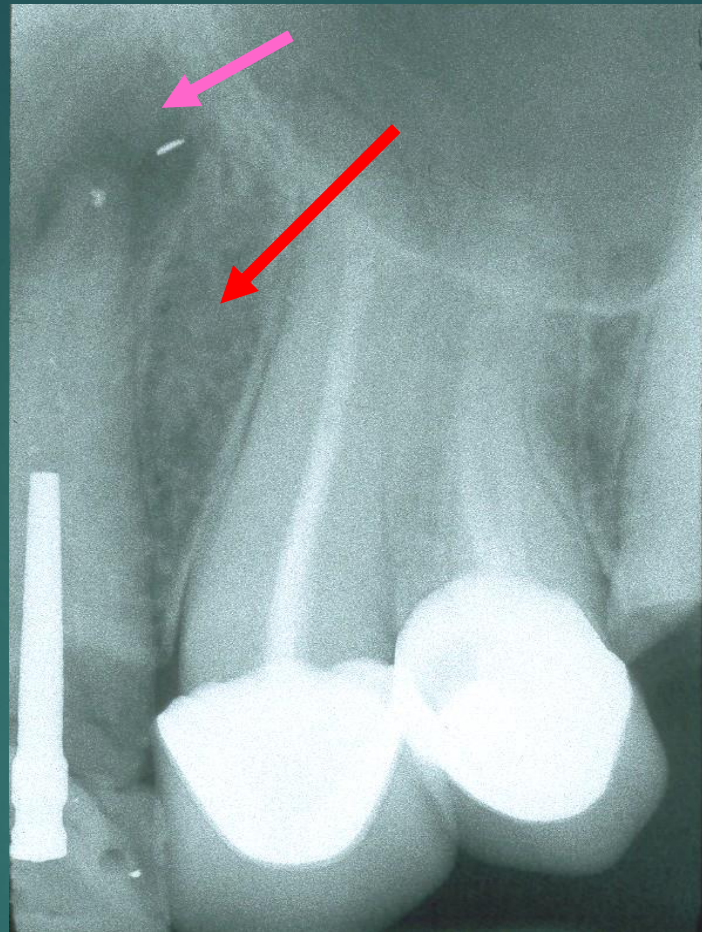
nasolabial fold



**Red arrows point to nasolabial fold.
Also note the inverted Y.**



The white arrows indicate the floor of the nasal fossa. The maxillary sinus (red arrows) has pneumatized between the 2nd premolar and first molar



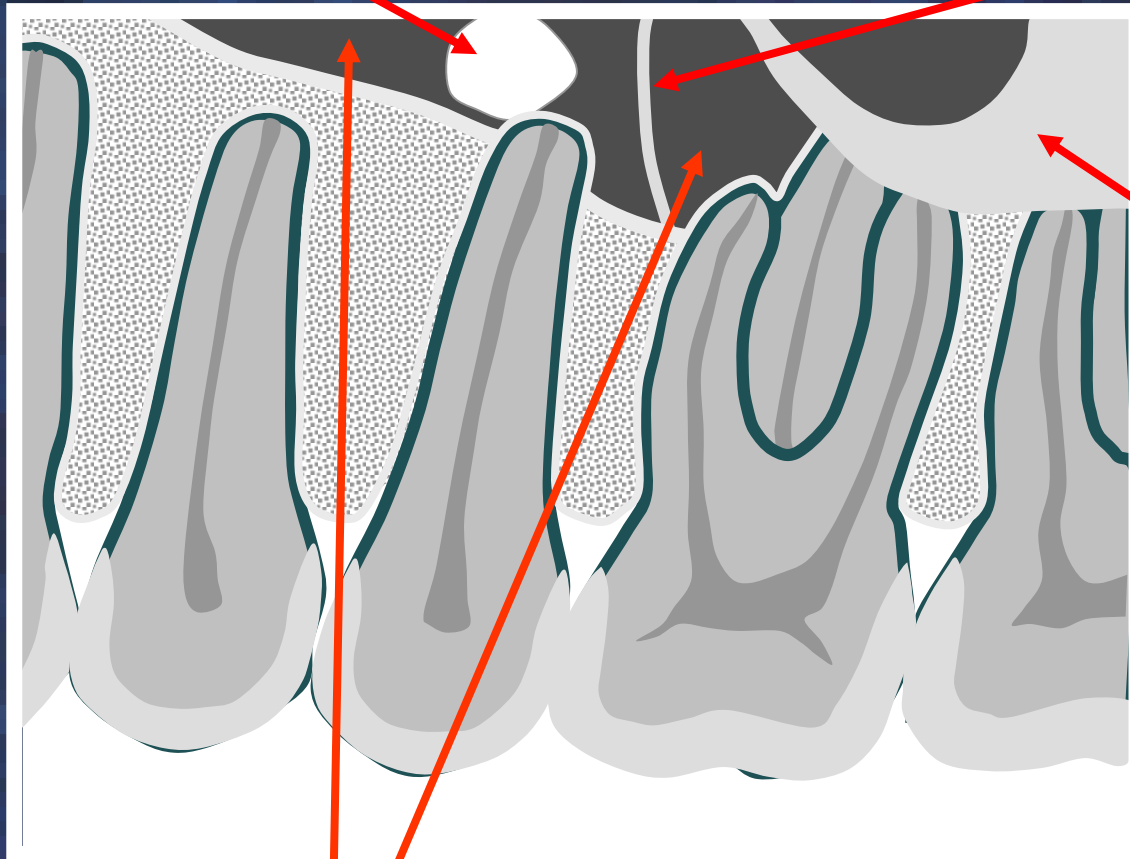
The red arrow identifies the lateral fossa. The pink arrow points to CPP (chronic periapical periodontitis = abscess, granuloma, etc.).

Maxillary Premolar

27

Sinus recess

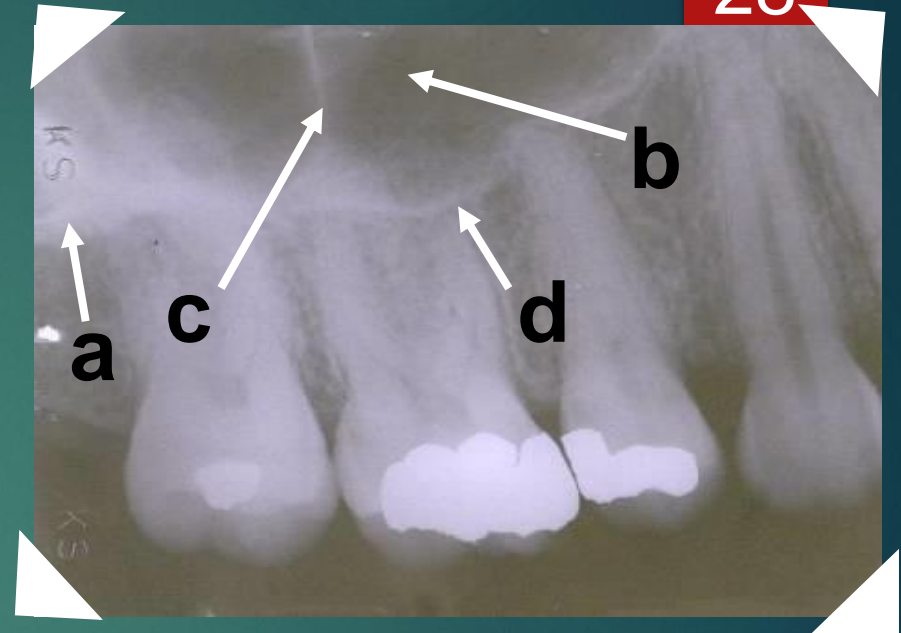
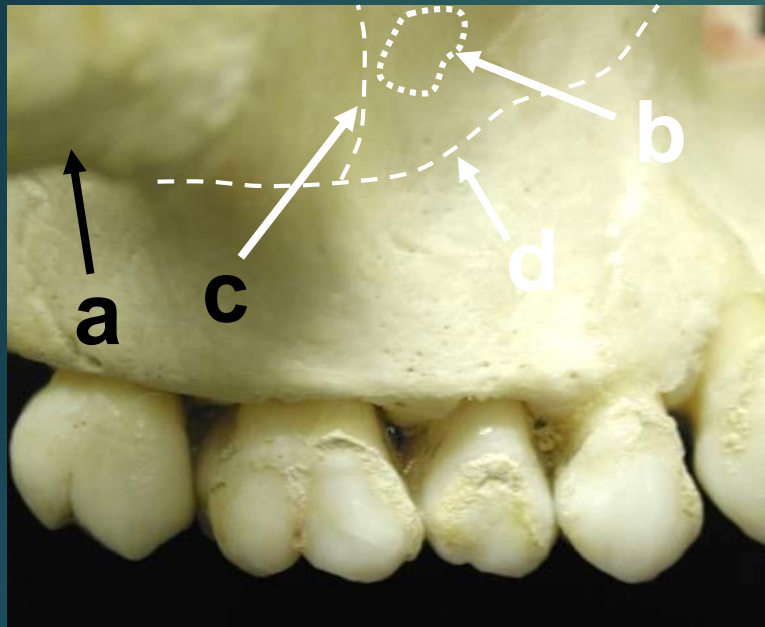
Sinus septum



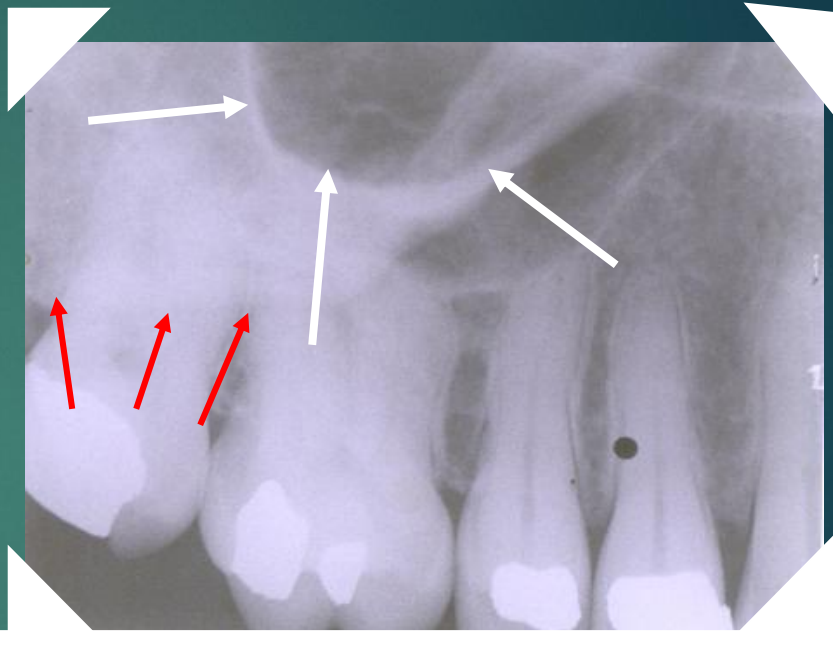
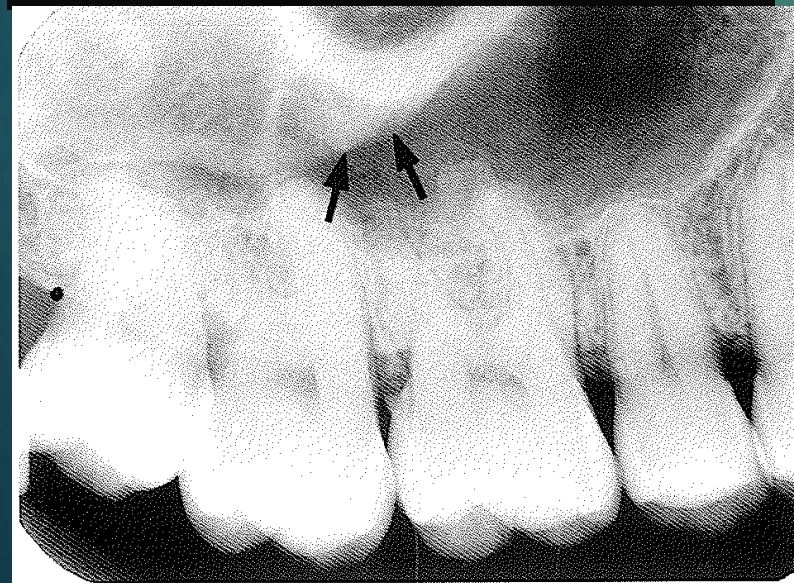
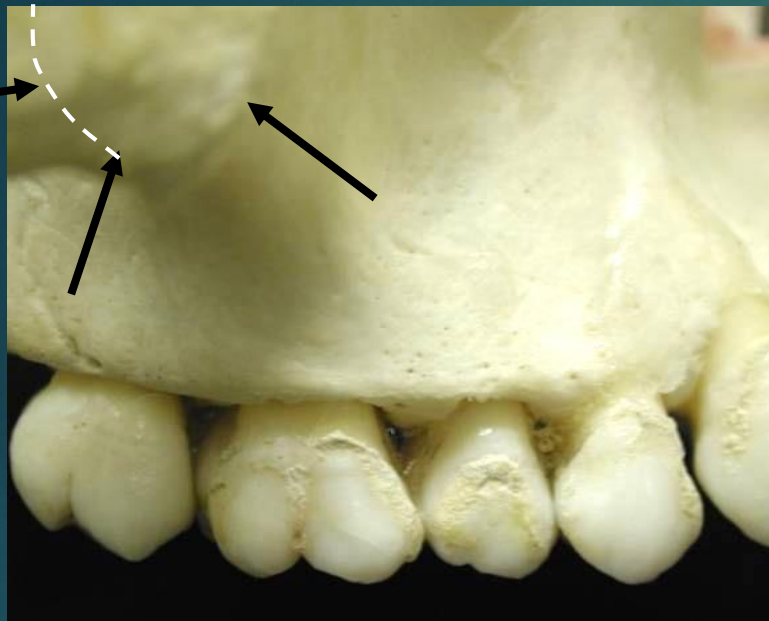
Zygomatic process

Maxillary sinus

facial view



a = malar process
b = sinus recess
c = sinus septum
d = maxillary sinus

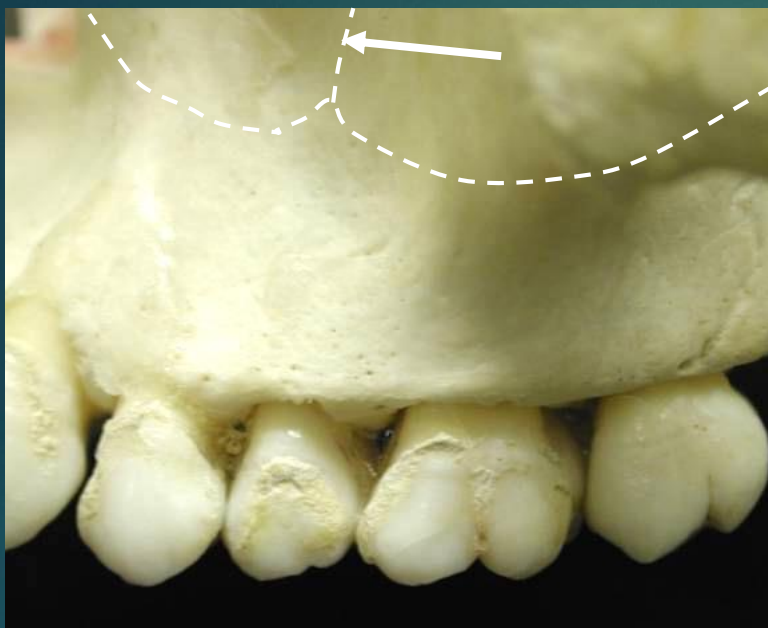


facial view

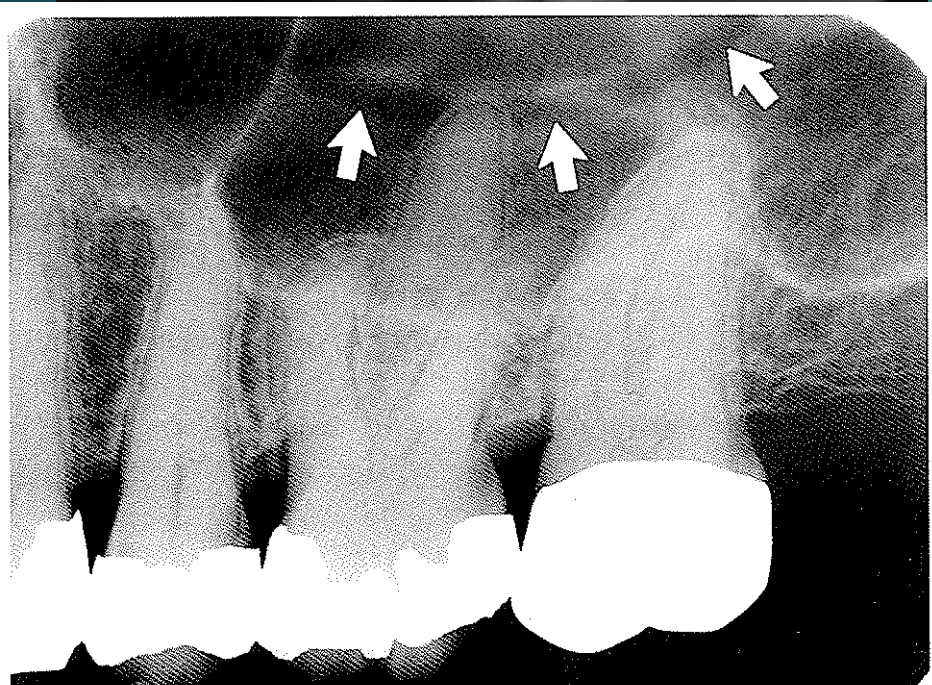
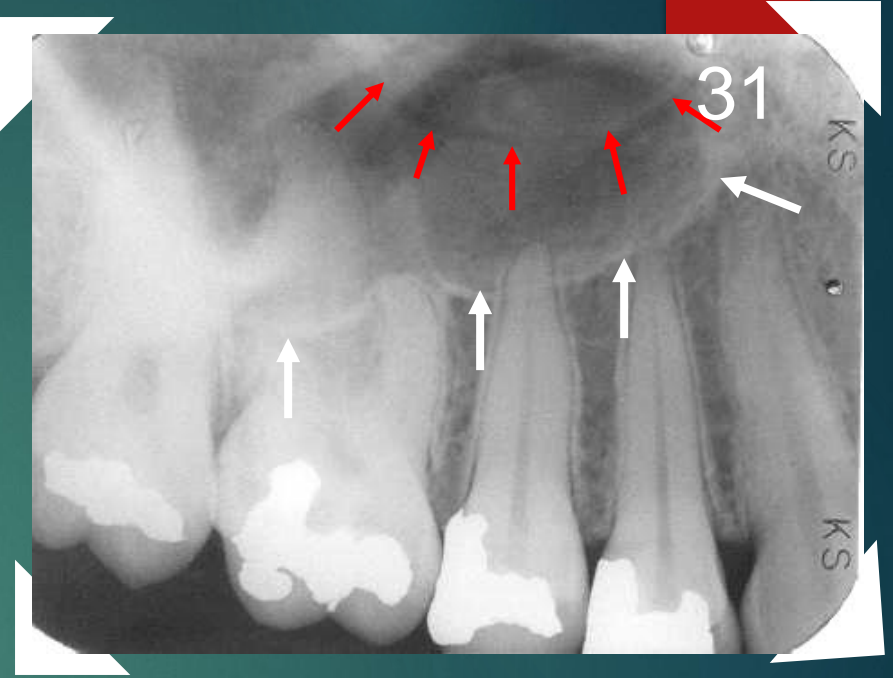
White arrow:zygomatic process

Red&short black arrow:zygomatic bone

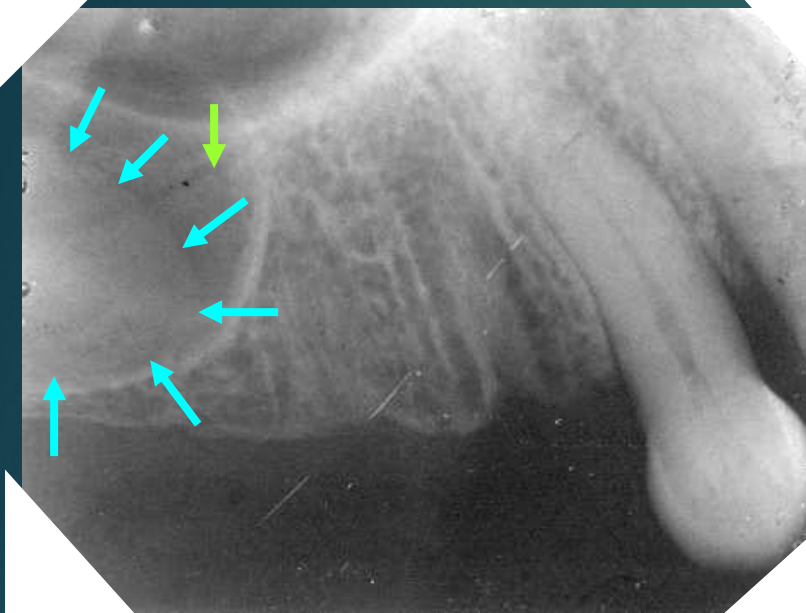
facial view



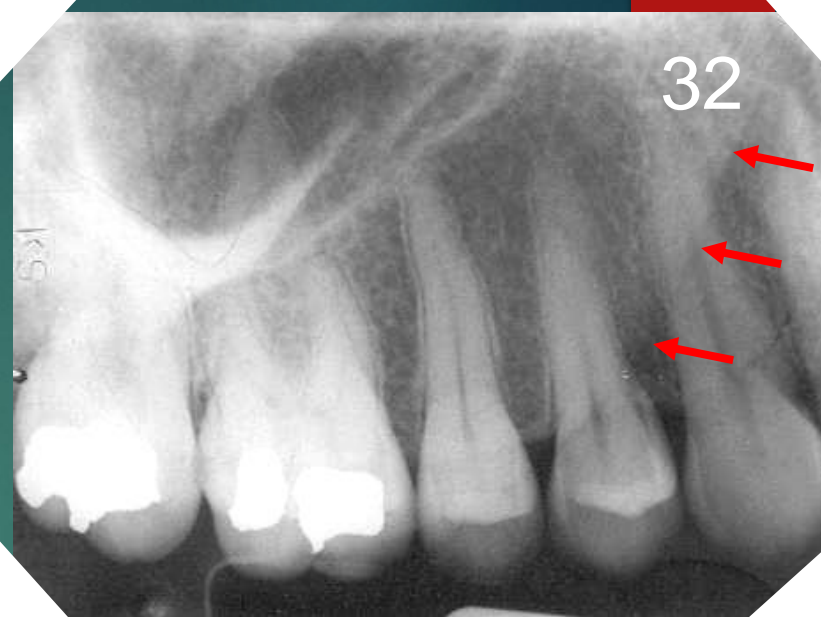
Sinus septum. This septum is composed of folds of cortical bone that arise from the floor and walls of the maxillary sinus, extending several millimeters into the sinus. In rare cases, the septum completely divides the sinus into separate compartments.



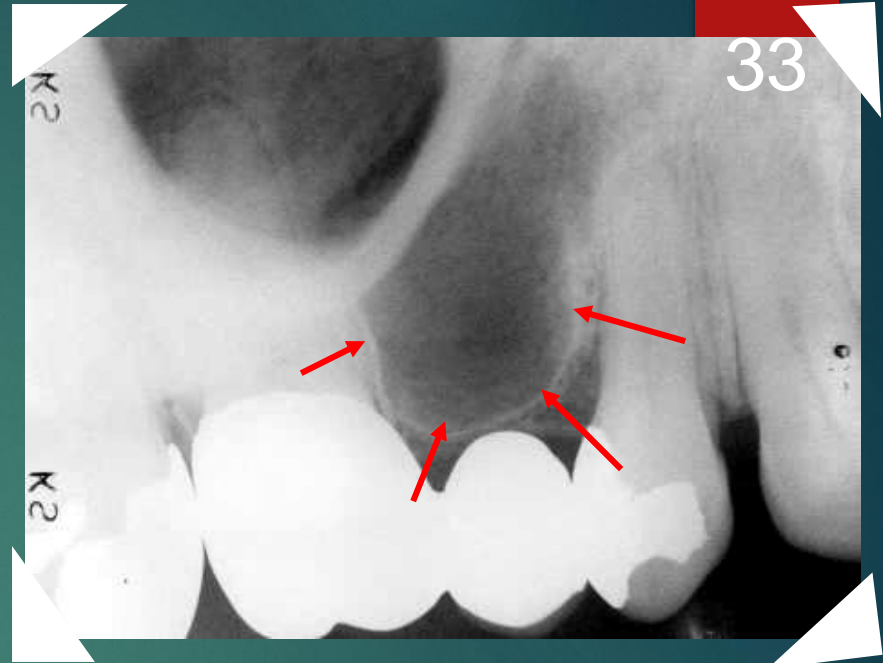
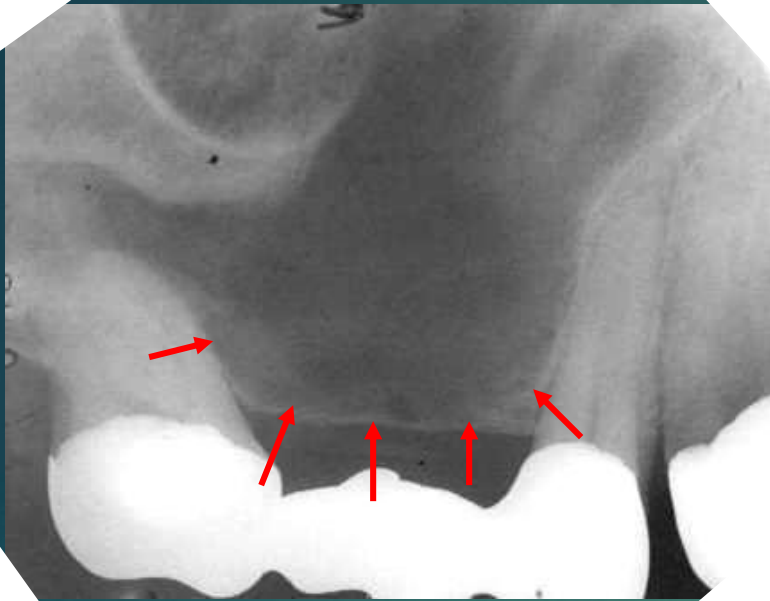
Neurovascular canal



Blue arrows identify radiopacity which is a mucous retention cyst. Note relatively recent premolar extraction sites. Green arrow points to neurovascular canal.



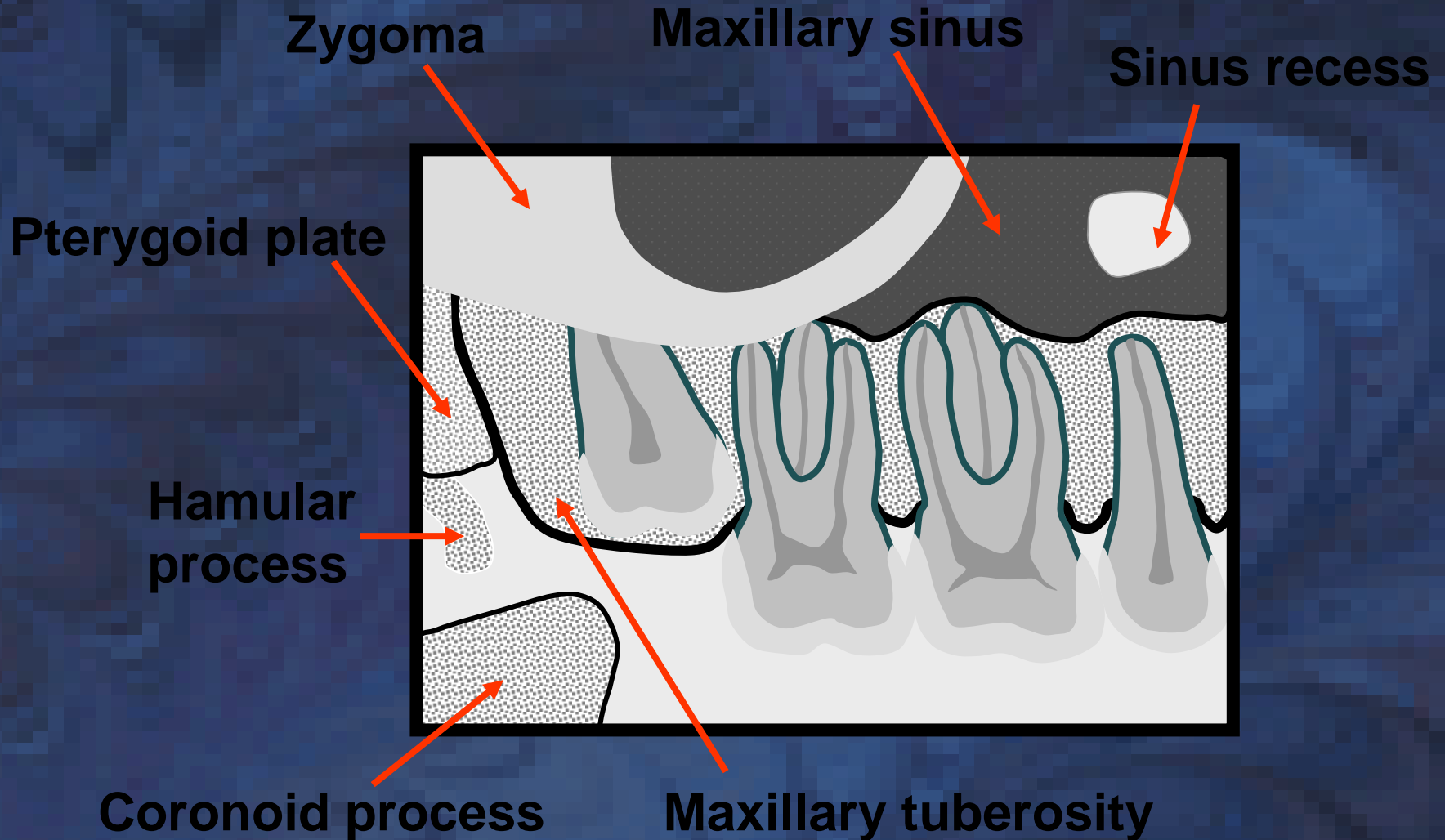
The red arrows point to the nasolabial fold. The thicker cheek tissue makes the area more radiopaque posterior to the line.



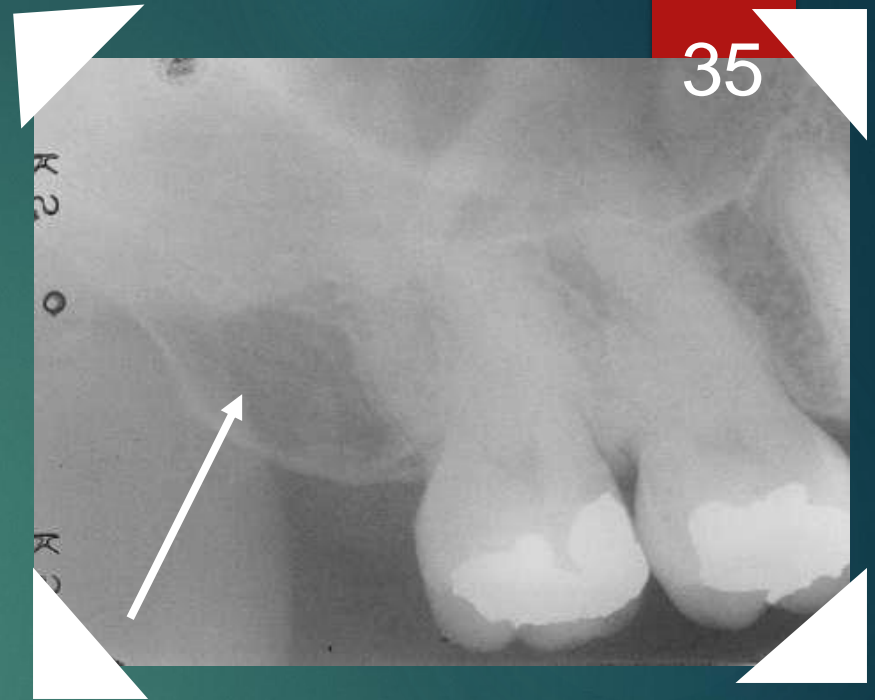
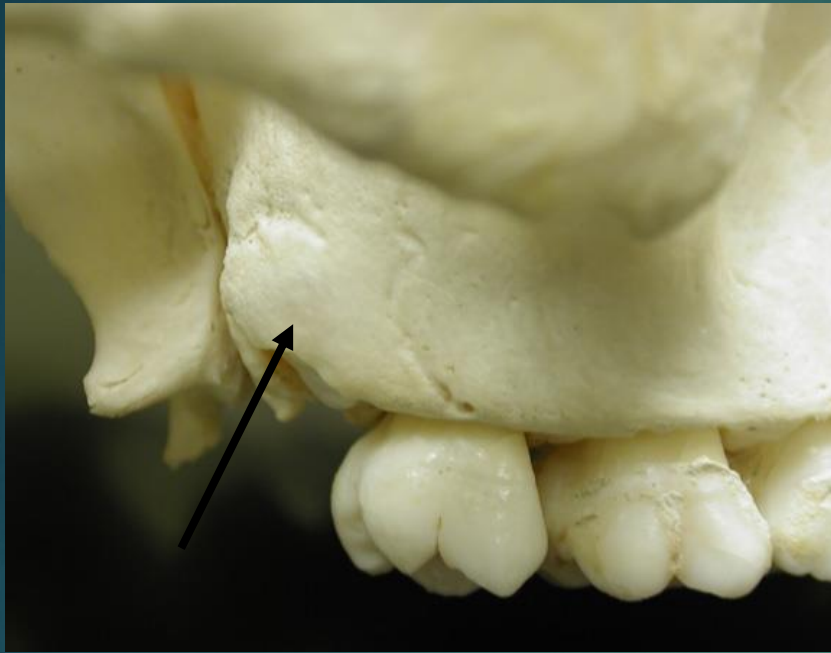
Pneumatization. Expansion of sinus wall into surrounding bone, usually in areas where teeth have been lost prematurely. Increases with age.

Maxillary Molar

34



facial view



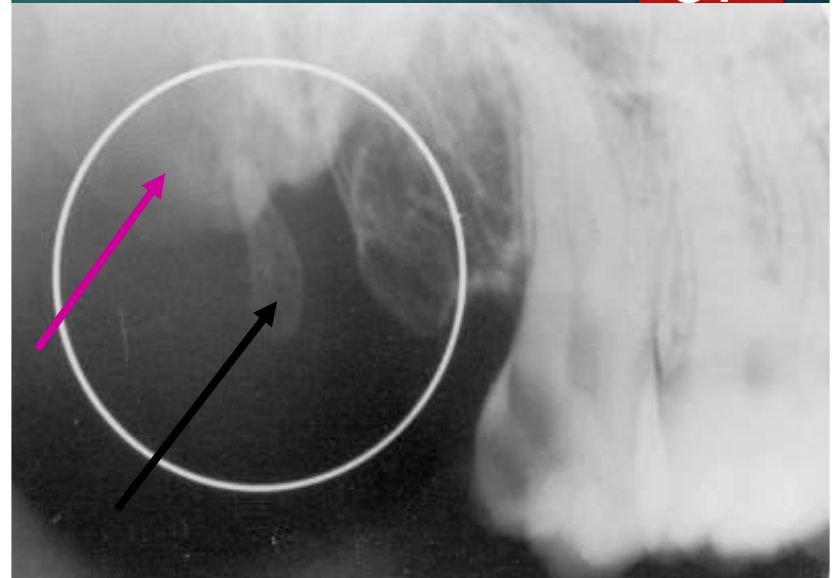
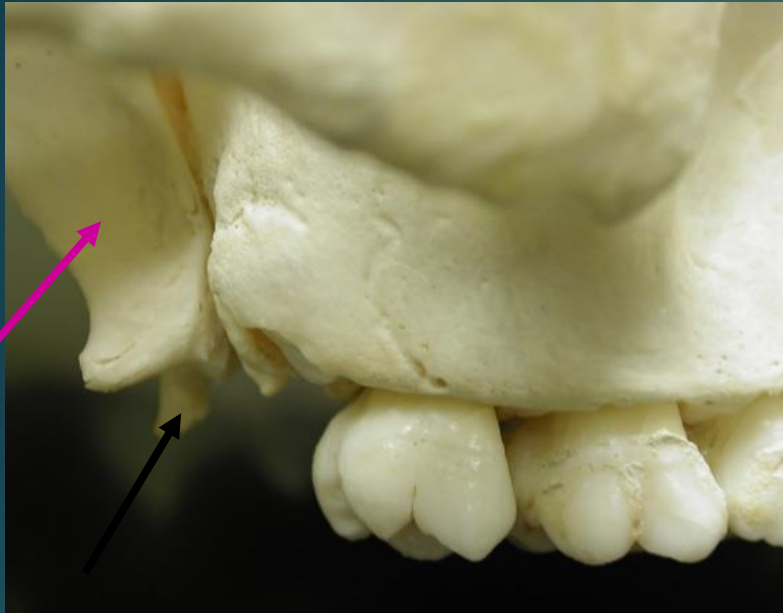
Maxillary Tuberosity. The rounded elevation located at the posterior aspect of both sides of the maxilla. Aids in the retention of dentures.

facial view



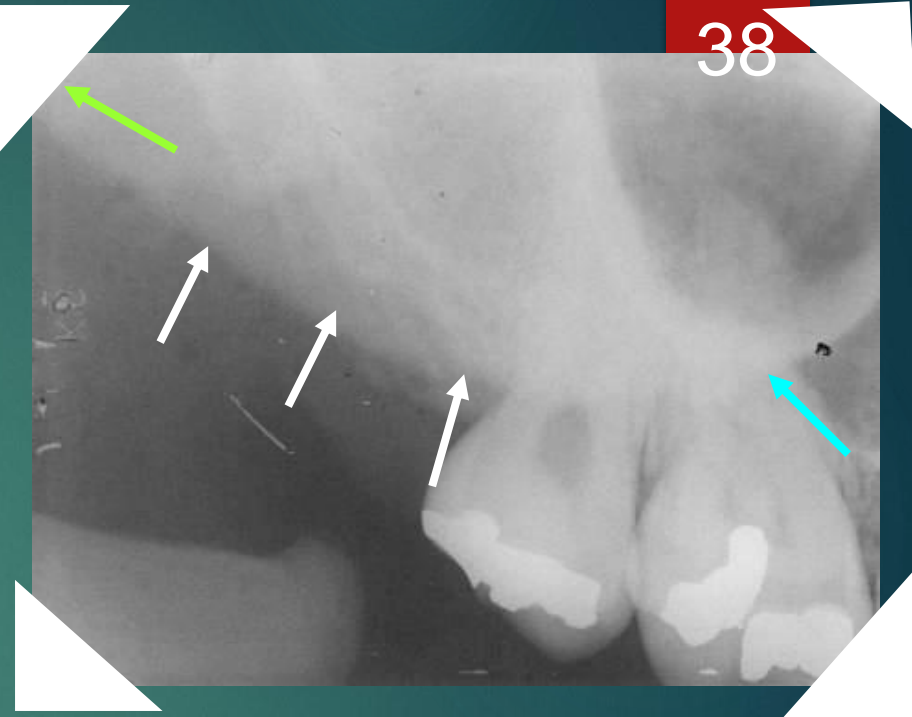
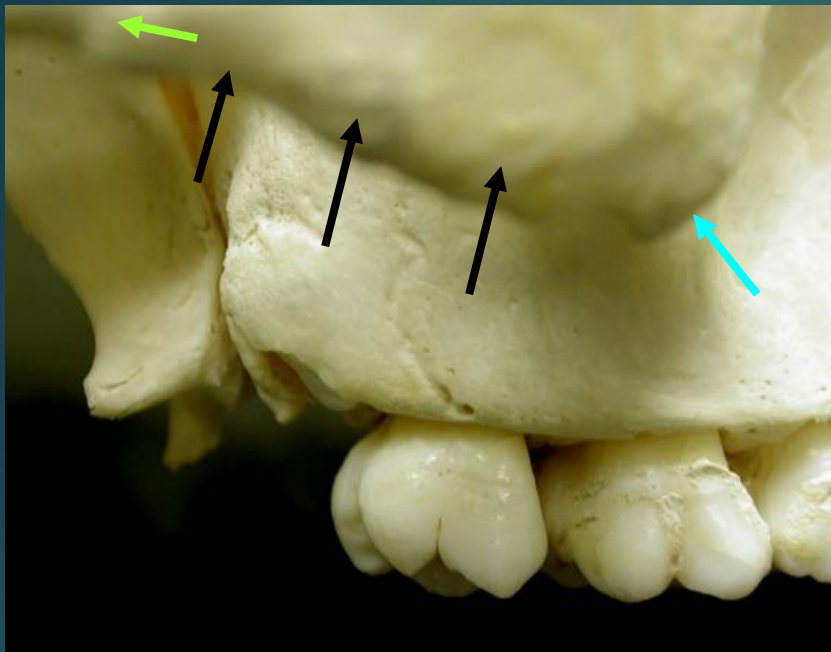
Coronoid process. A mandibular structure sometimes seen on the maxillary molar periapical film when using the bisecting angle technique with finger retention (The mouth is opened wide, moving the coronoid down and forward). Note the supernumerary molar.

facial view



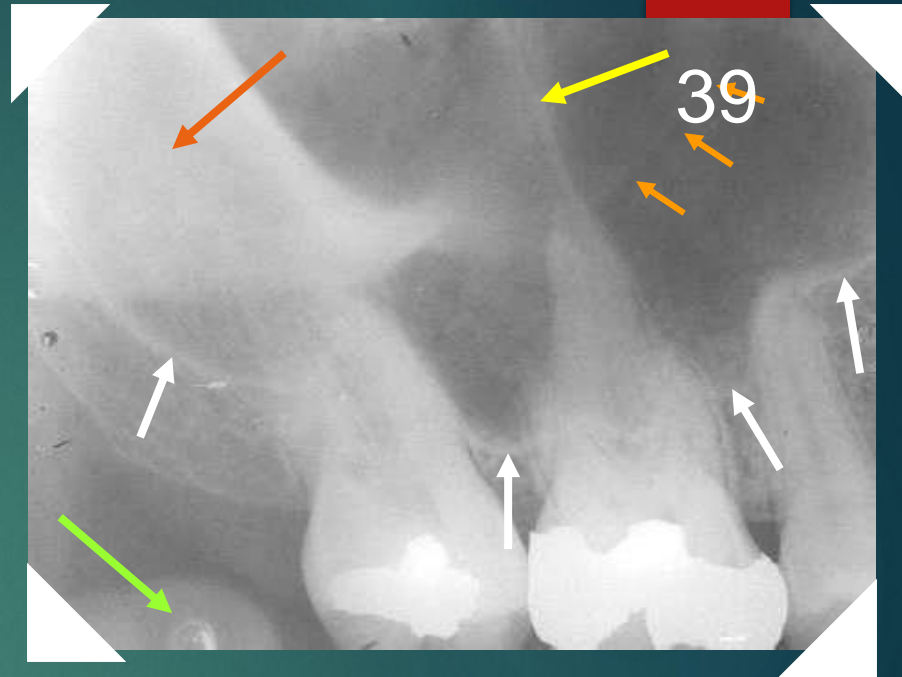
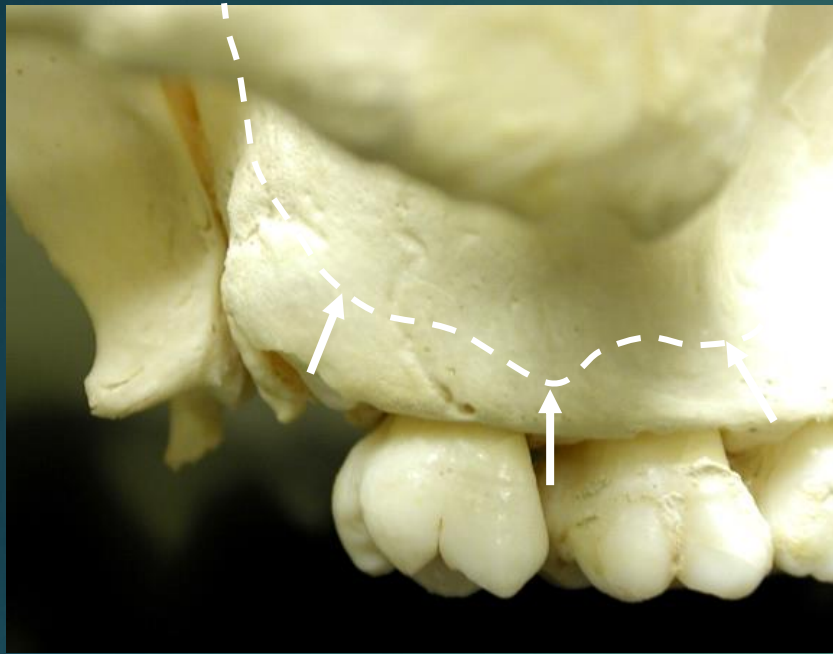
Hamular process (black arrows) and pterygoid plates (purple arrows). The hamular process is an extension of the medial pterygoid plate of the sphenoid bone, positioned just posterior to the maxillary tuberosity.

facial view

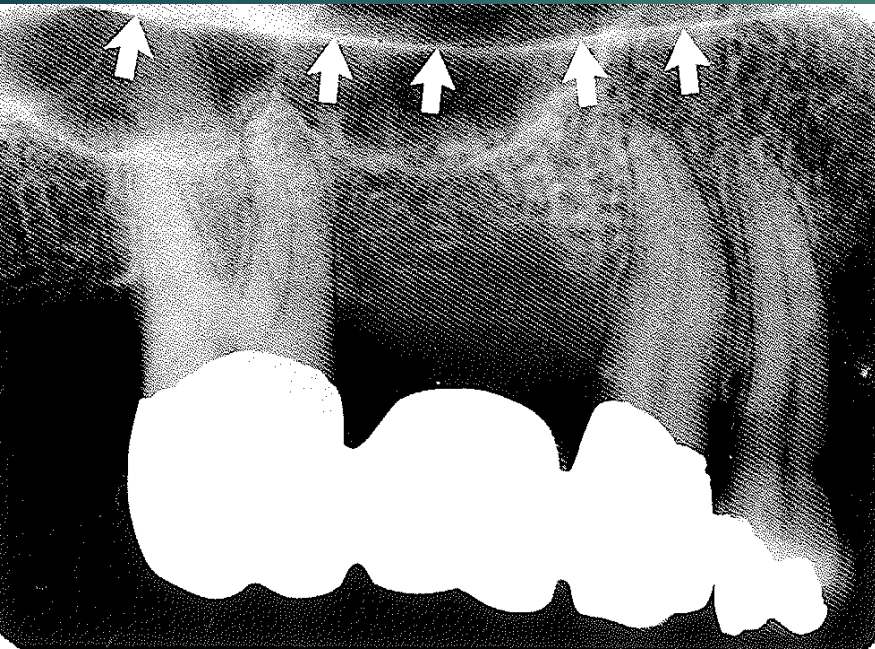
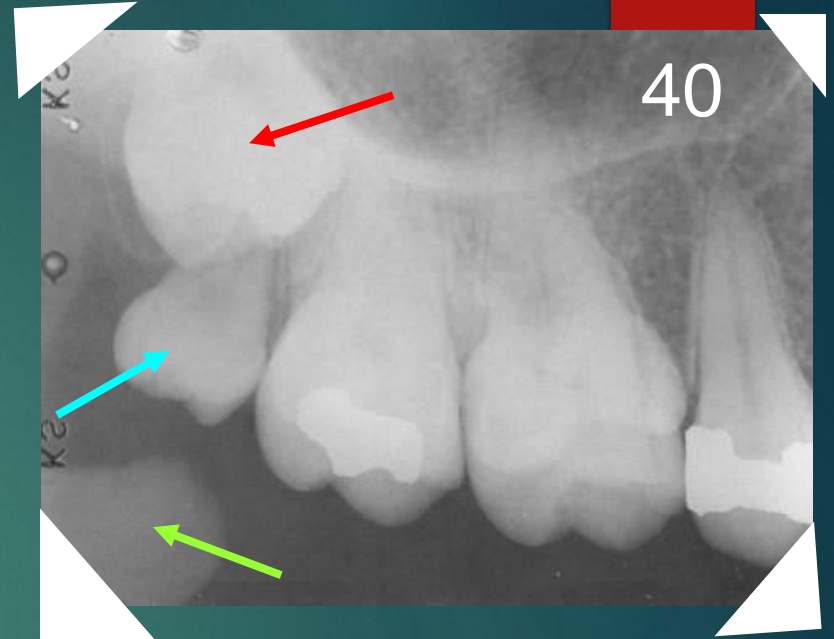
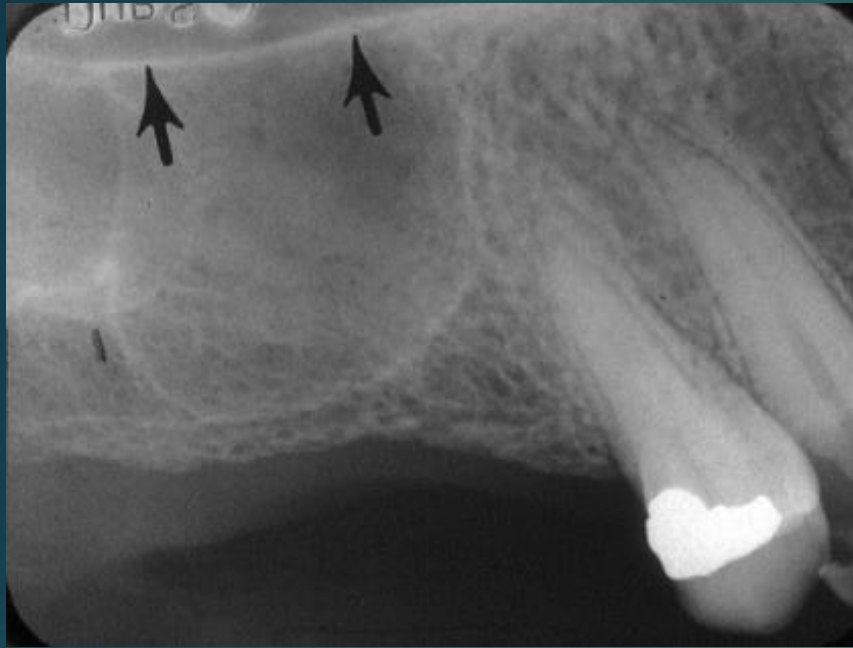


Zygomatic (malar) bone/process/arch. The zygomatic bone (white/black arrows) starts in the anterior aspect with the zygomatic process (blue arrow), which has a U-shape. The zygomatic bone extends posteriorly into the zygomatic arch (green arrow).

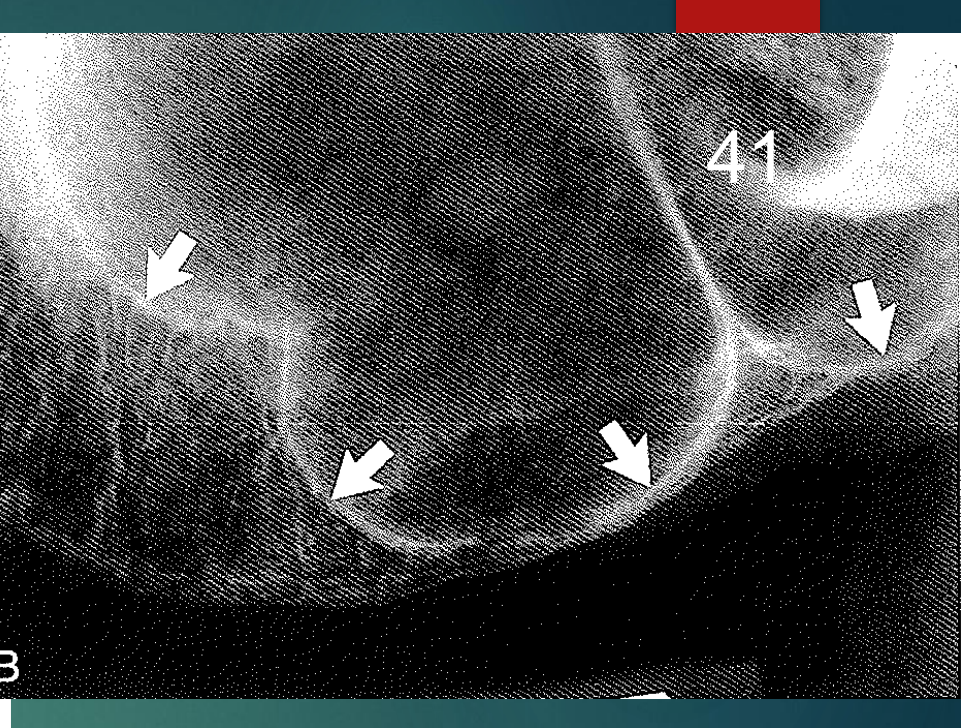
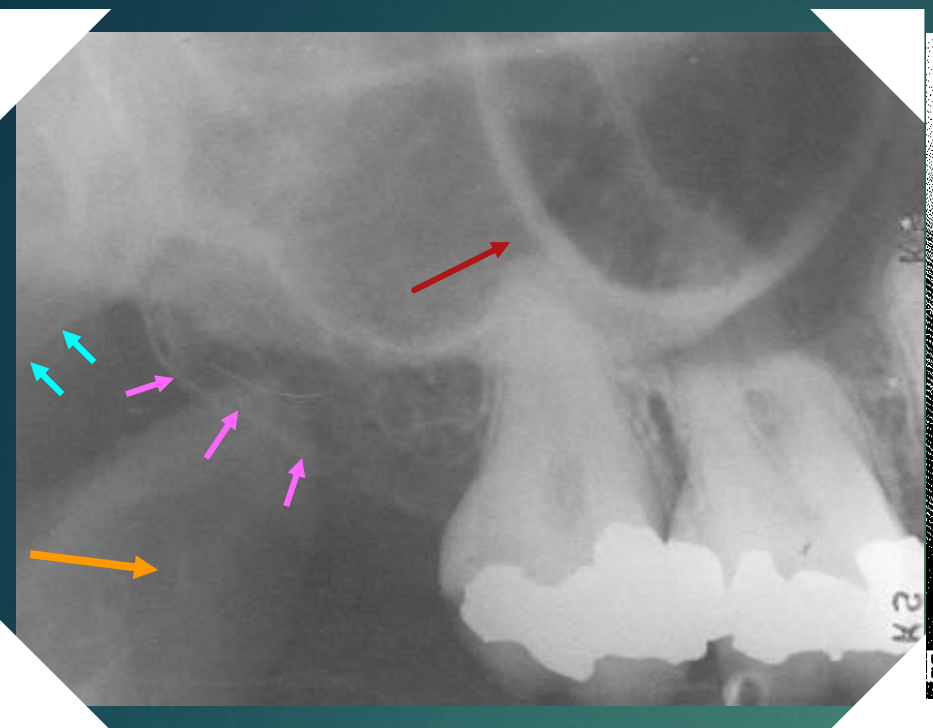
facial view



Maxillary sinus. As seen in the above film, the floor of the maxillary sinus flows around the roots of the maxillary molars and premolars. The walls of the sinus may become very thin. As a result, sinusitis may put pressure on the superior alveolar nerves resulting in apparent tooth pain, even though the tooth is perfectly healthy. Note coronoid process (green arrow), zygomatic bone (red arrow), sinus septum (yellow arrow) and neurovascular canal (orange arrows).

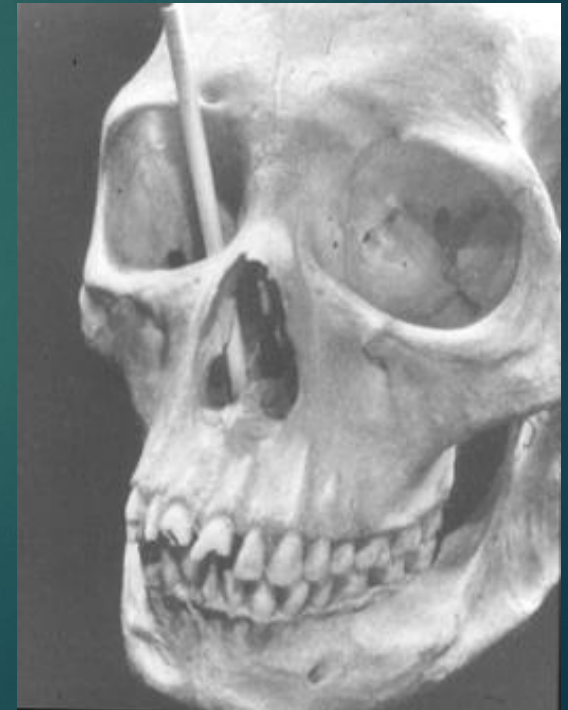
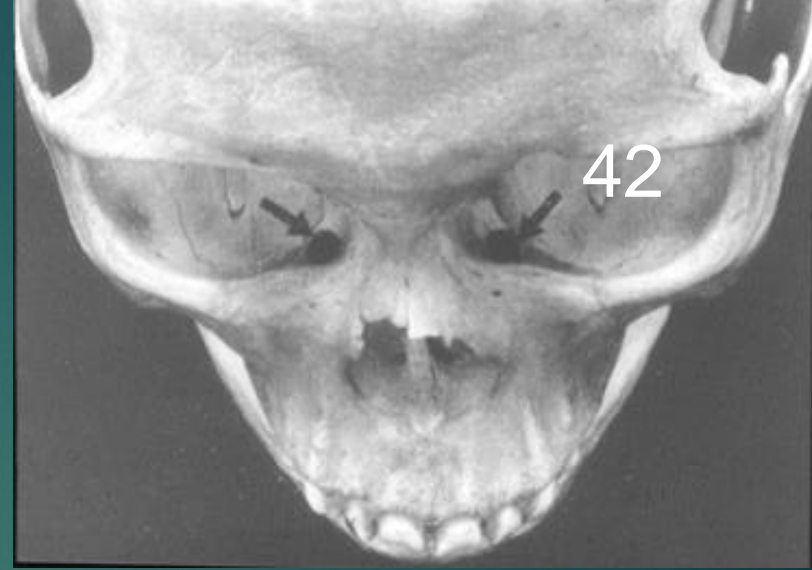
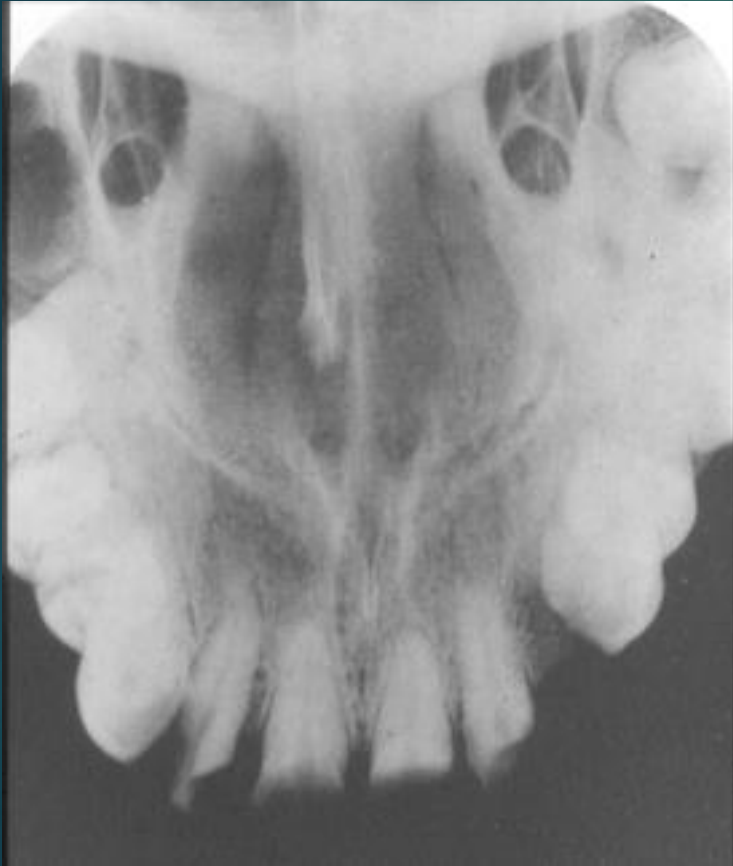


This film shows the coronoid process (green arrow) and a distomolar (blue arrow) that has erupted ahead of the third molar (red arrow). A distomolar is a supernumerary tooth that erupts distal (posterior) to the other molars.



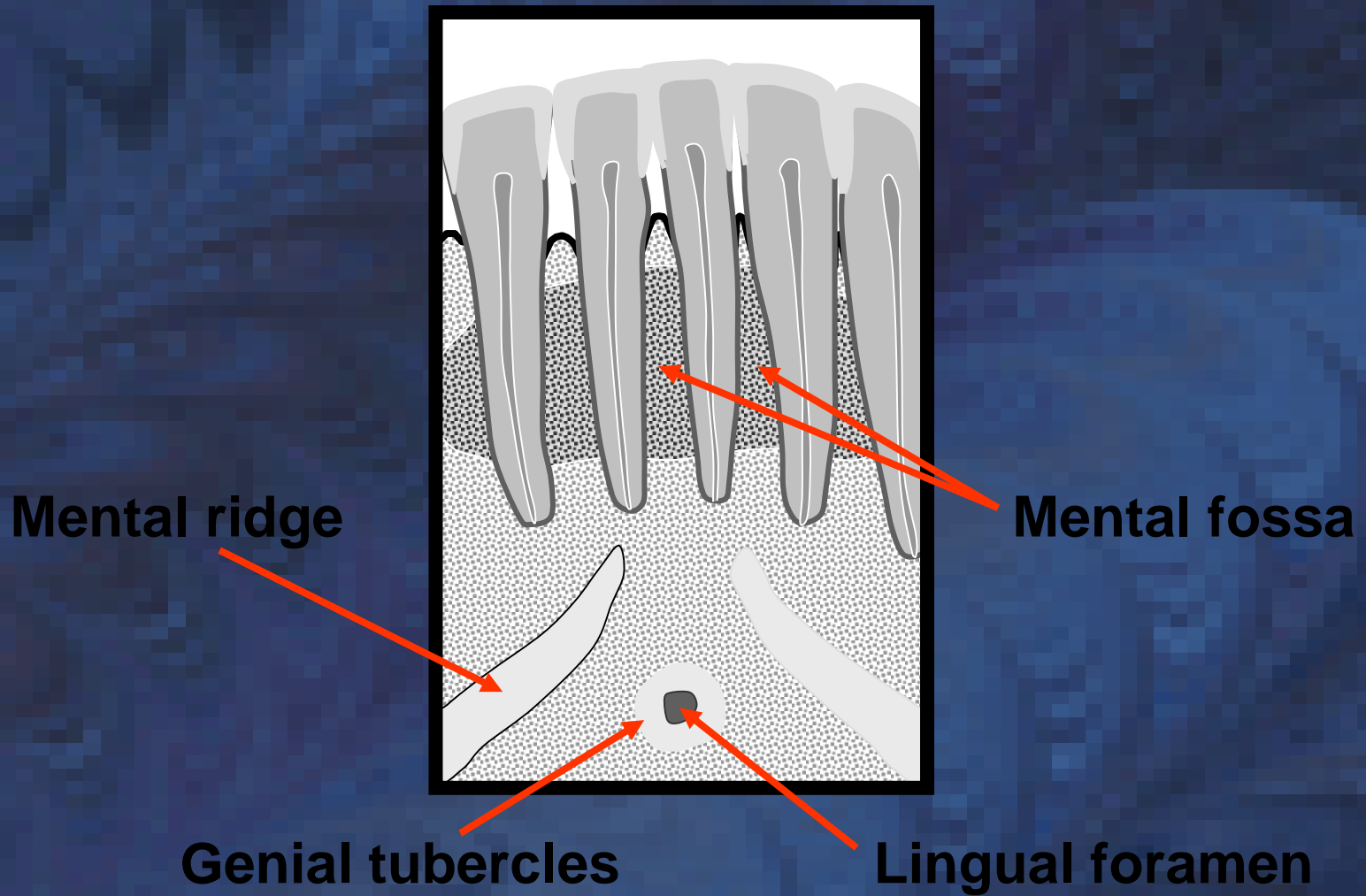
The zygomatic process (red arrows) is a prominent U-shaped radiopacity. Normally the zygomatic bone posterior to this is very dense and radiopaque. In this patient, however, the maxillary sinus has expanded into the zygomatic bone and makes the area more radiolucent. The coronoid process (orange arrow), the pterygoid plates (blue arrows) and the maxillary tuberosity (pink arrows) are also identified.

Orbital Entrance of Naso-lachrymal Canal

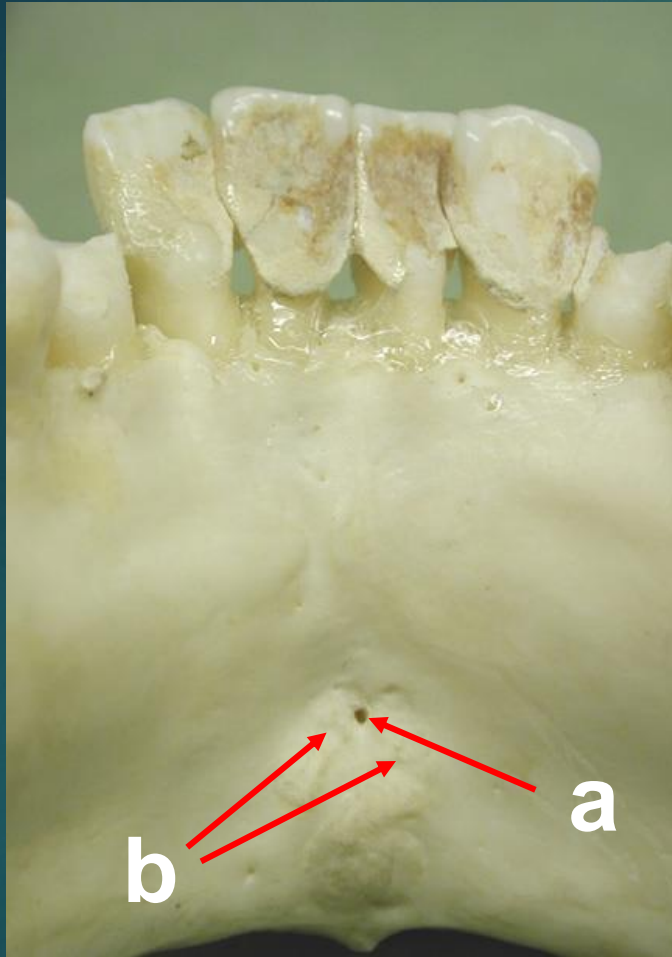


Mandibular Incisor

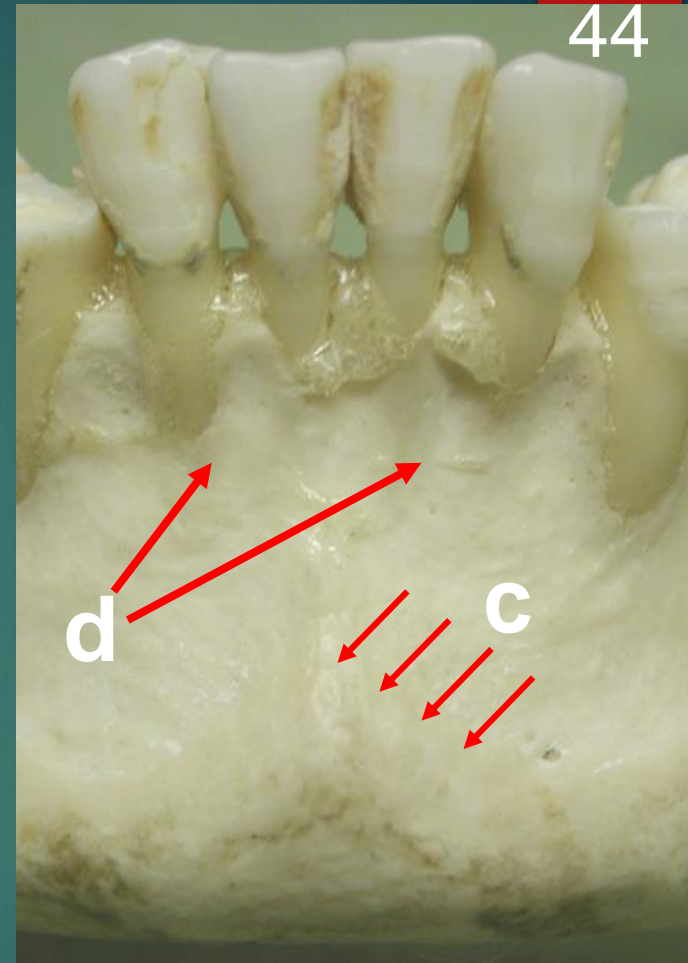
43



lingual view



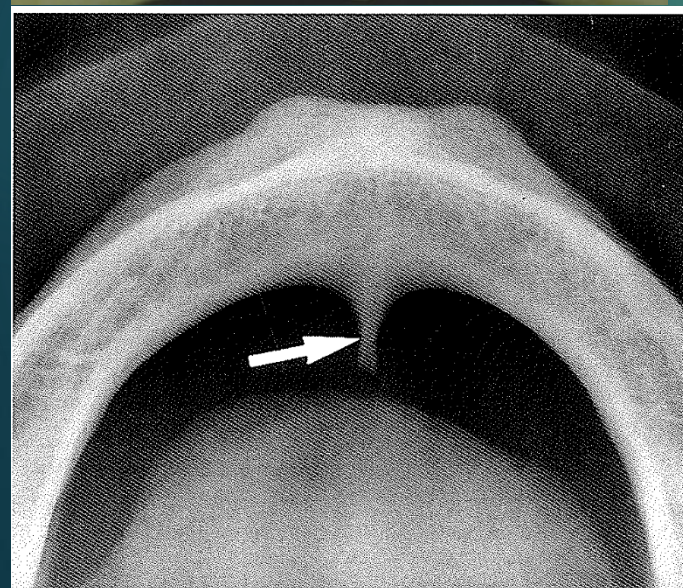
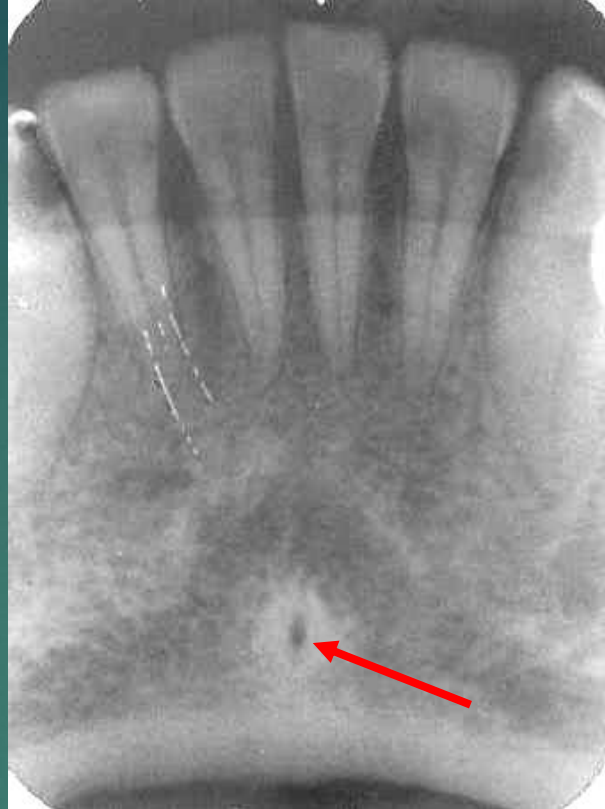
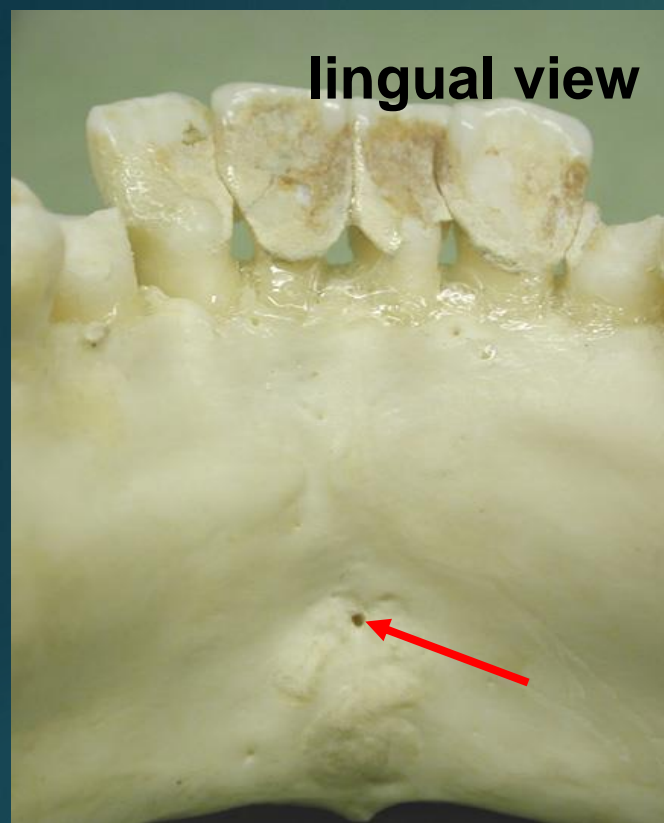
facial view



a = lingual foramen
b = genial tubercles

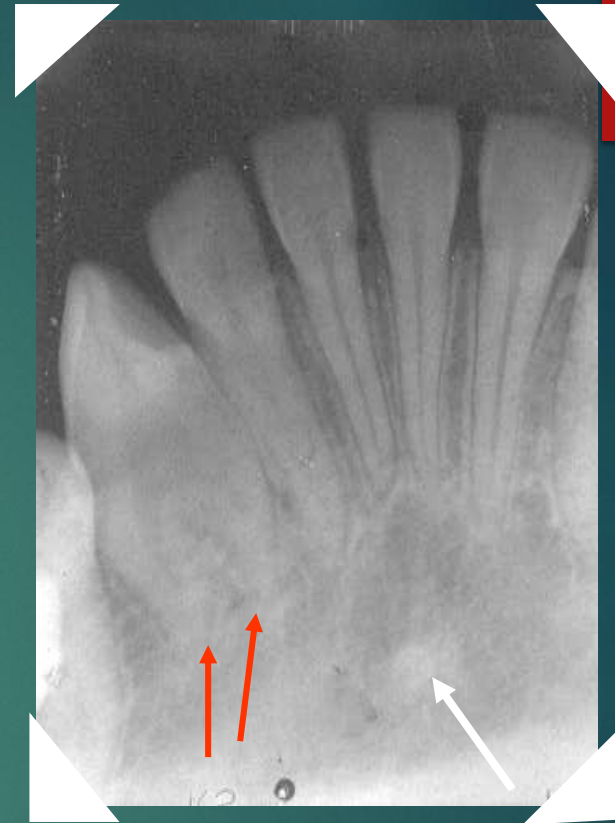
c = mental ridge
d = mental fossa

lingual view



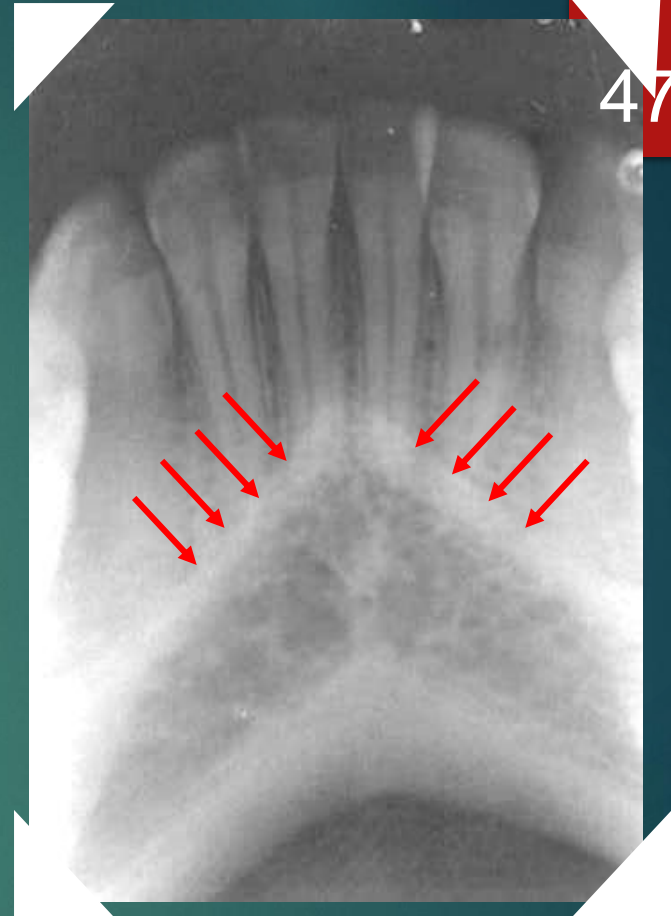
Lingual foramen. Radiolucent “hole” in center of genial tubercles. Lingual nutrient vessels pass through this foramen.

lingual view



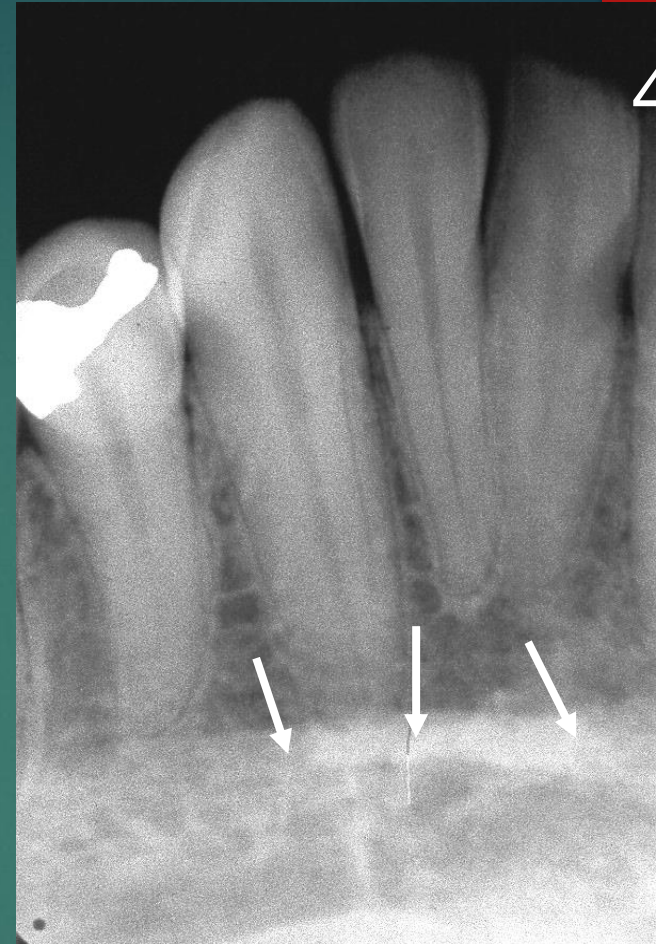
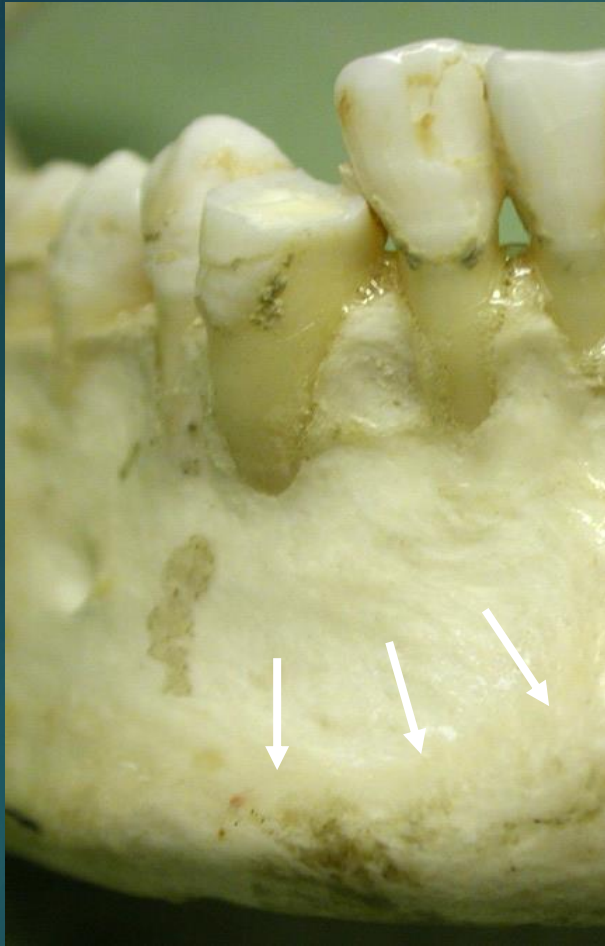
Genial tubercles. Radiopaque area in the midline, midway between the inferior border of the mandible and the apices of the incisors. Serve as attachments for the genioglossus and geniohyoid muscles. May have radiolucent hole in center (lingual foramen), but not on this film. Note double rooted canine (red arrows).

facial view



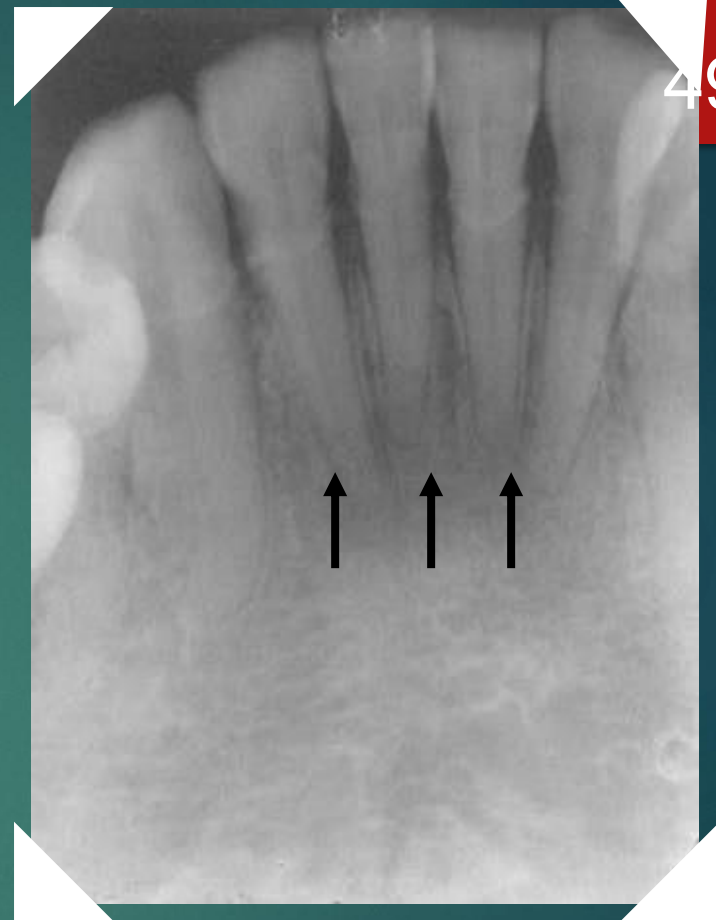
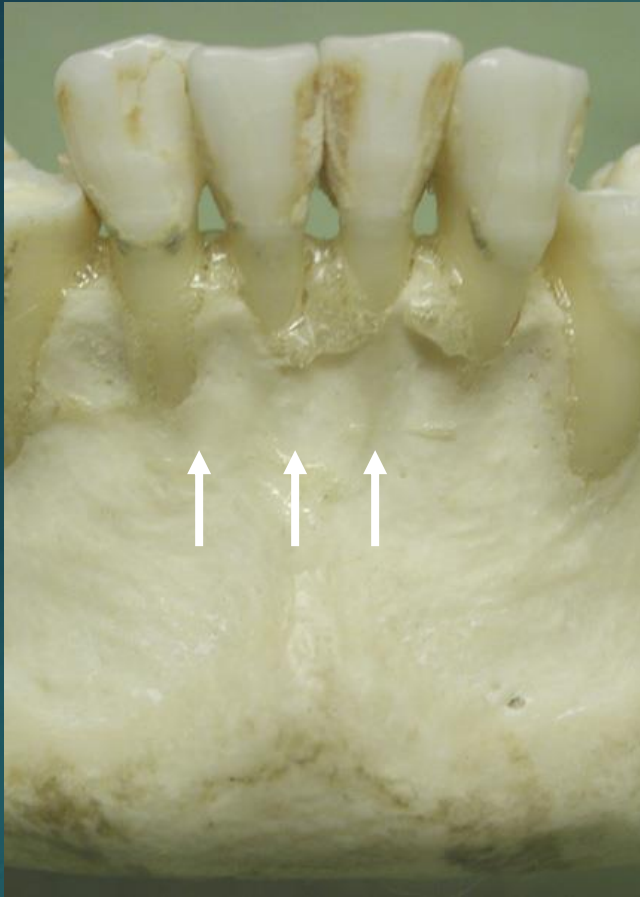
Mental ridge. These represent the raised portions of the mental protuberance on either side of the midline. More commonly seen when using the bisecting angle technique, when the x-ray beam is directed at an upward angle through the ridges.

facial view

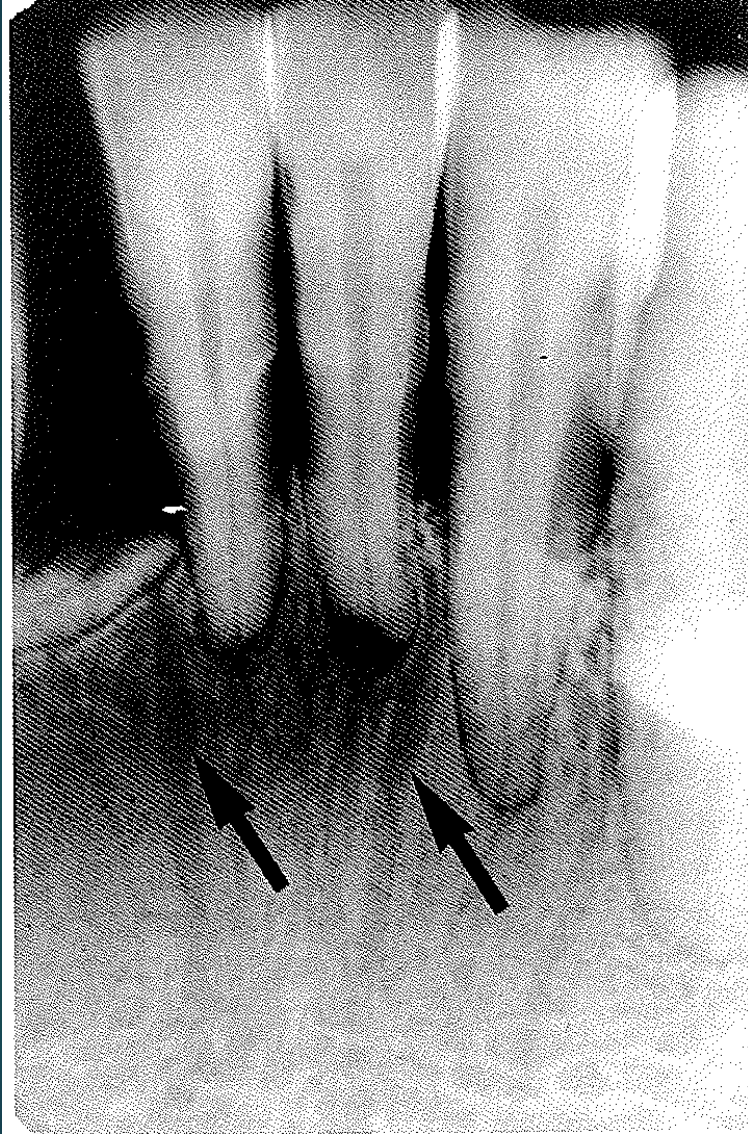


Mental ridge. The raised portions of the mental protuberance, sloping downward and backward from the midline.

facial view



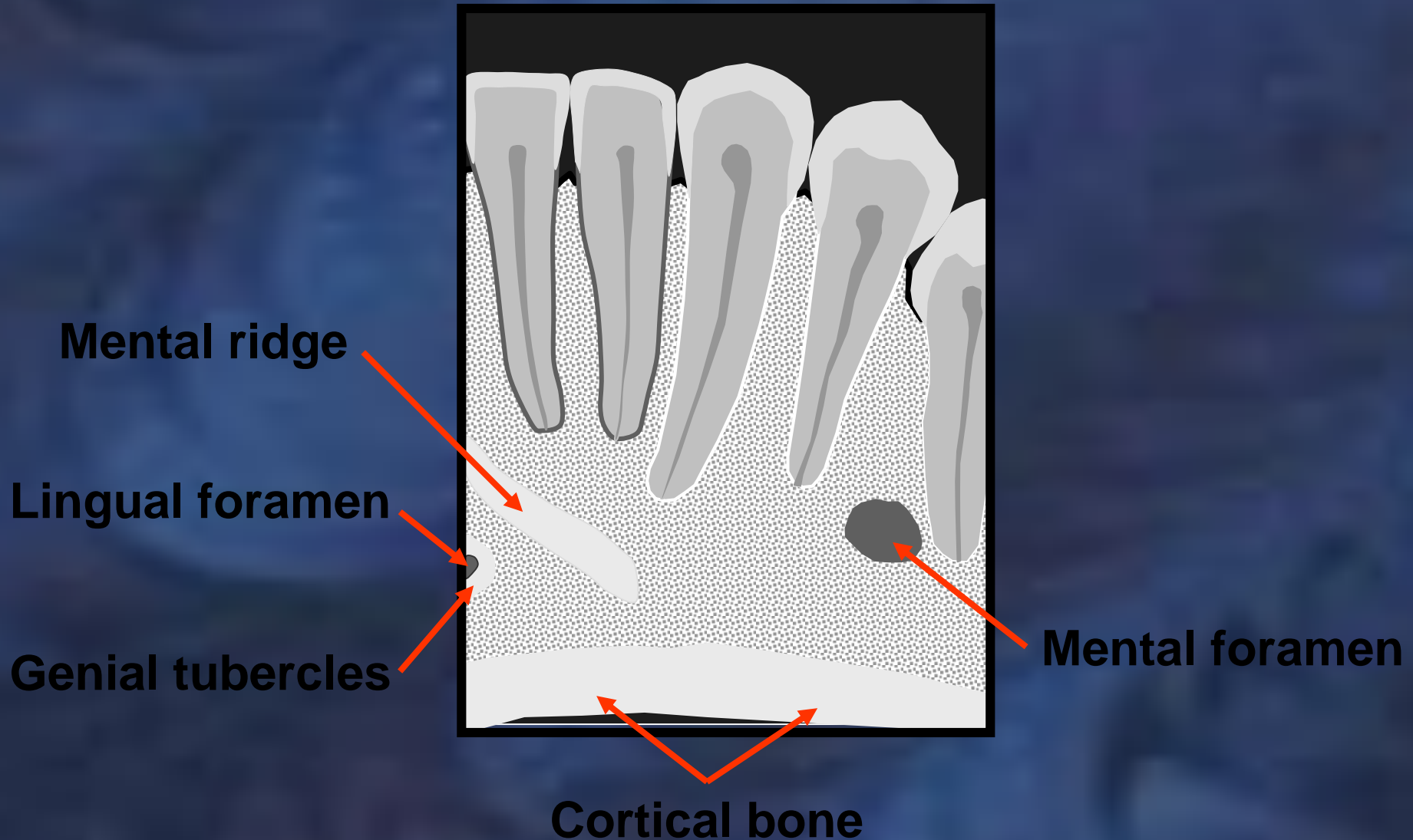
Mental fossa. This represents a depression on the labial aspect of the mandible overlying the roots of the incisors. The resulting radiolucency may be mistaken for pathology.



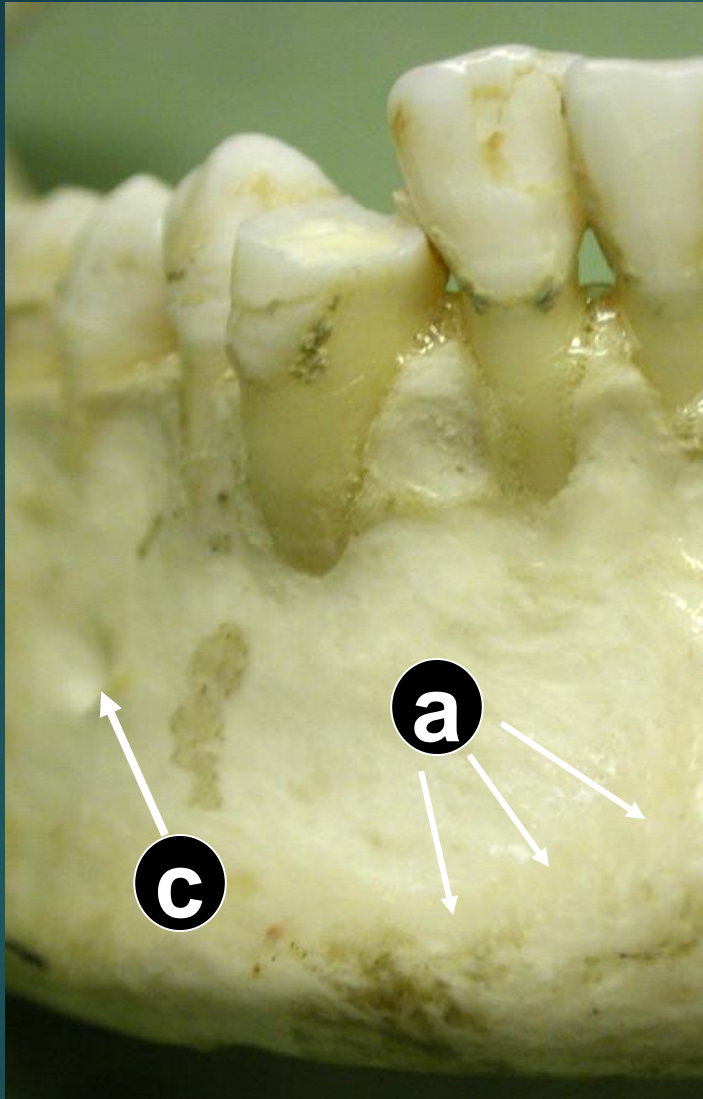
The orange arrows above identify nutrient canals. They are most often seen in older persons with thin bone, and in those with high blood pressure or advanced periodontitis.

Mandibular Canine

51

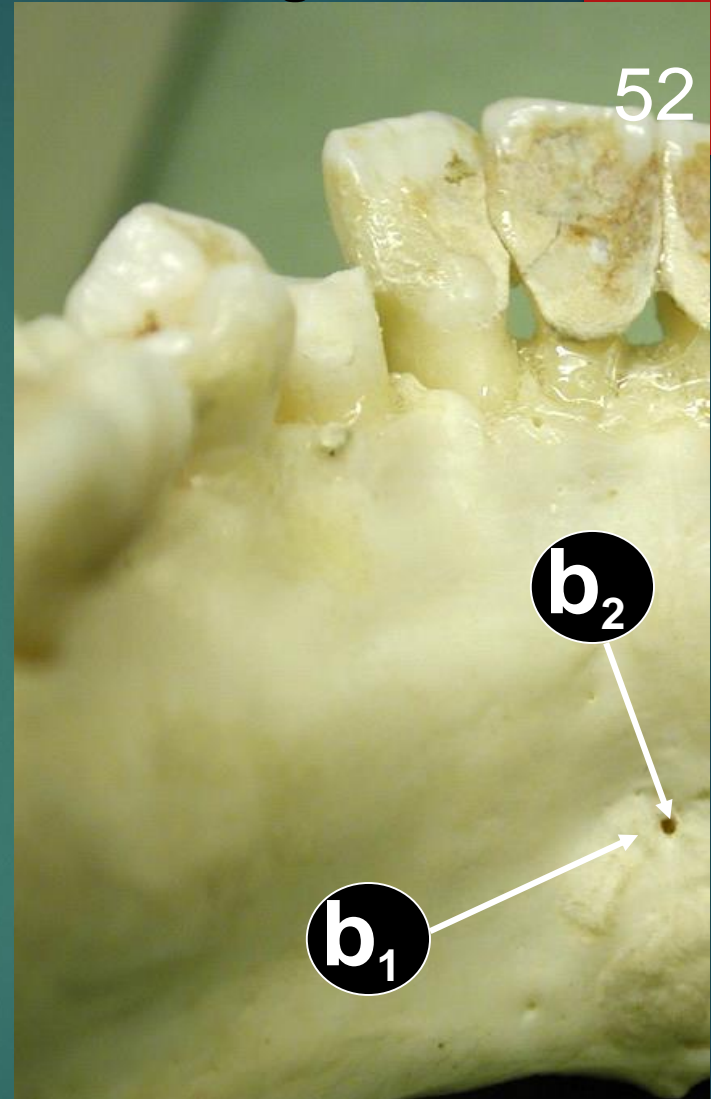


facial view



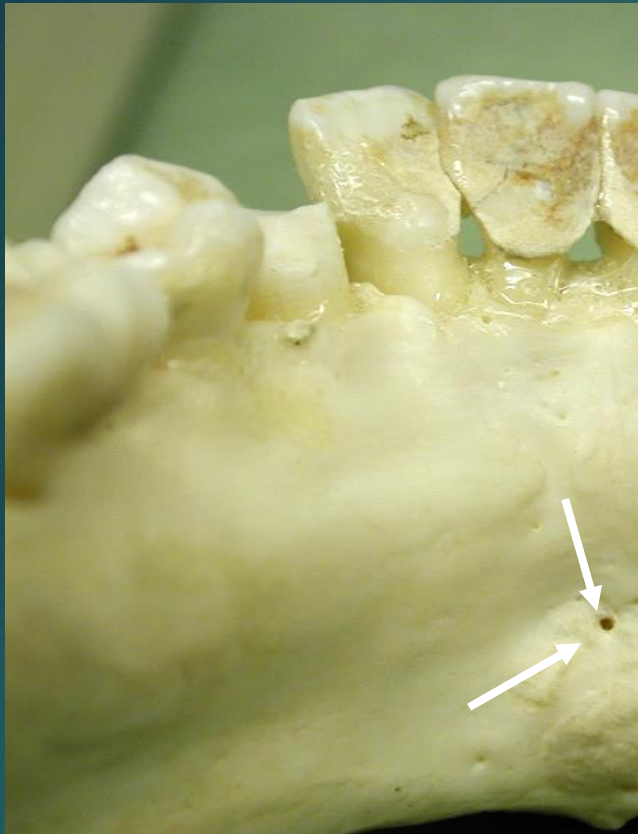
a = mental ridge
c = mental foramen

lingual view



b₁ = genial tubercles
b₂ = lingual foramen

lingual view

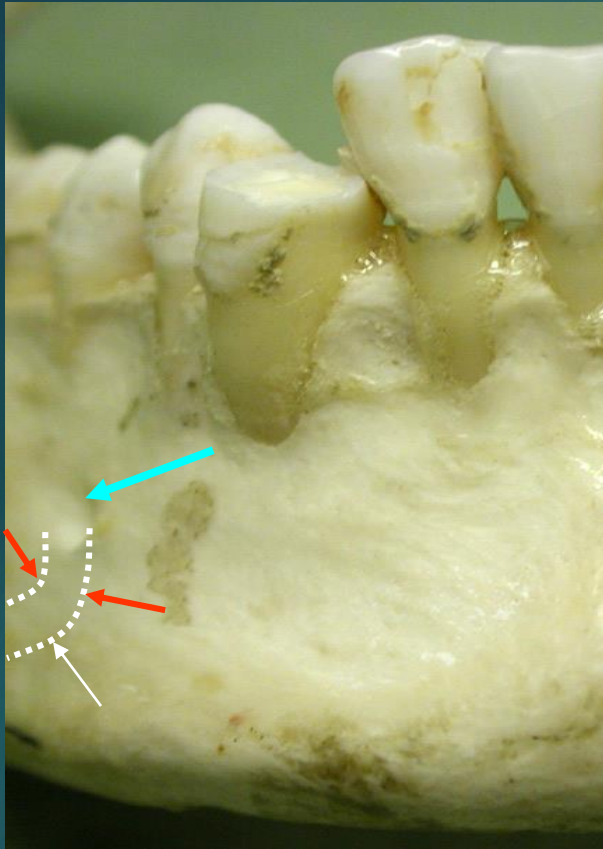


53

Lingual foramen/genial tubercles. (See description under mandibular incisor above).

facial view

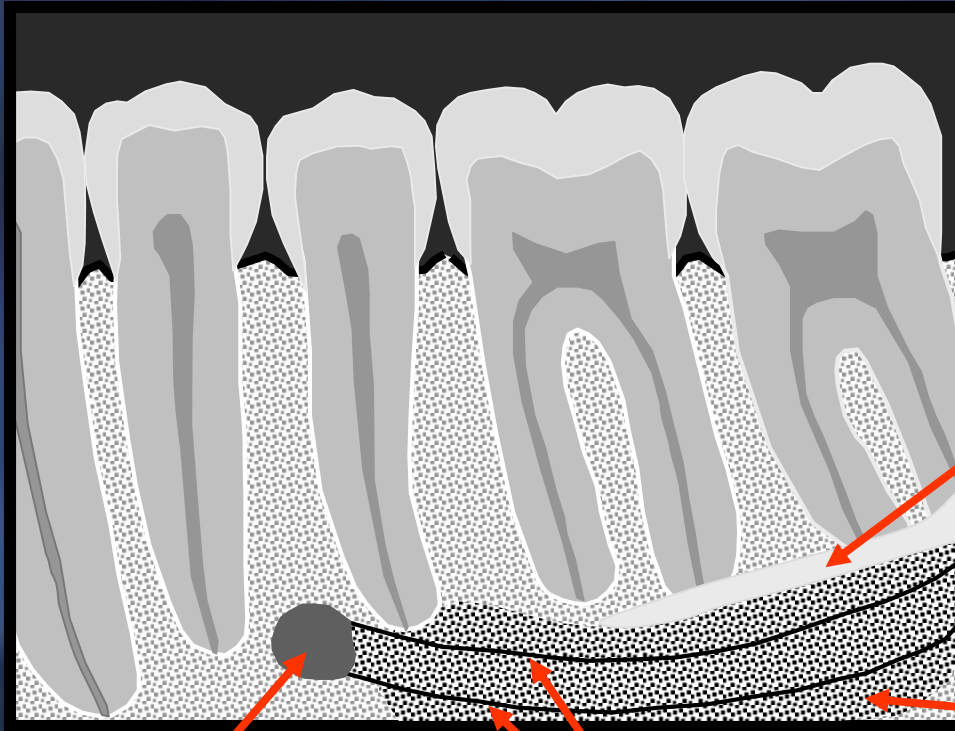
54



The red arrows identify the mandibular canal and the blue arrow points to the mental foramen.

Mandibular Premolar

55



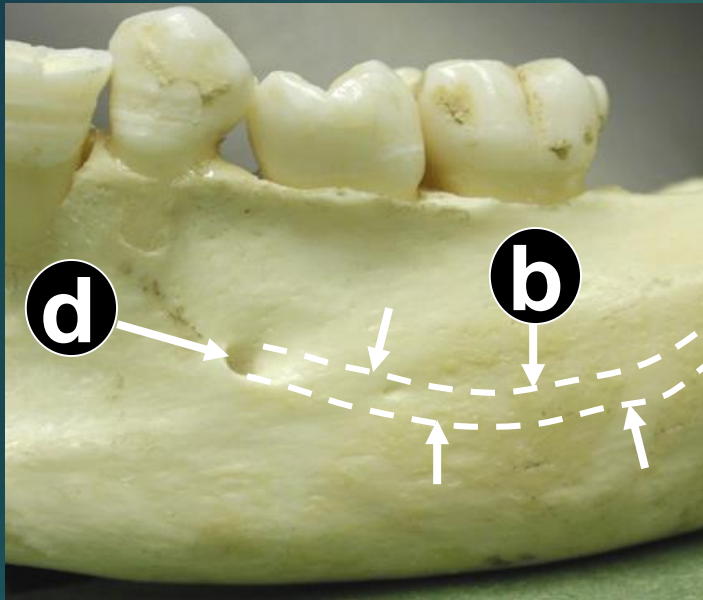
Mylohyoid ridge

Submandibular
gland fossa

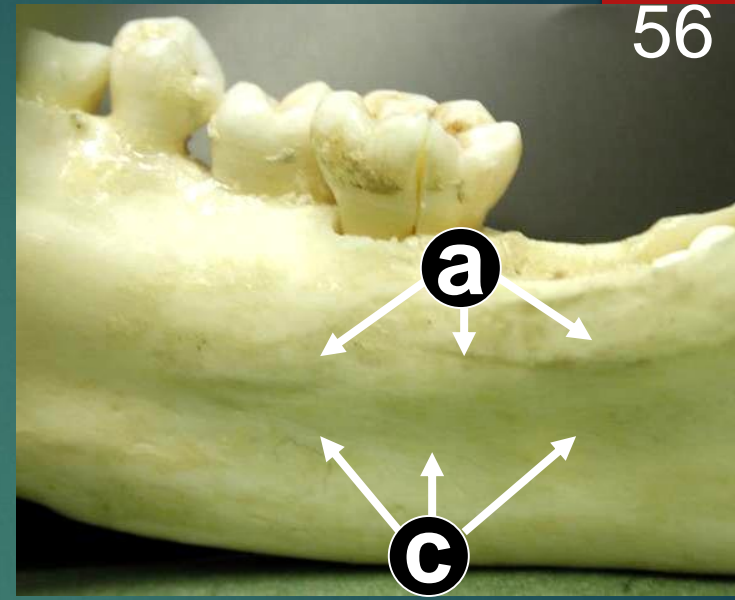
Mental foramen

Mandibular canal

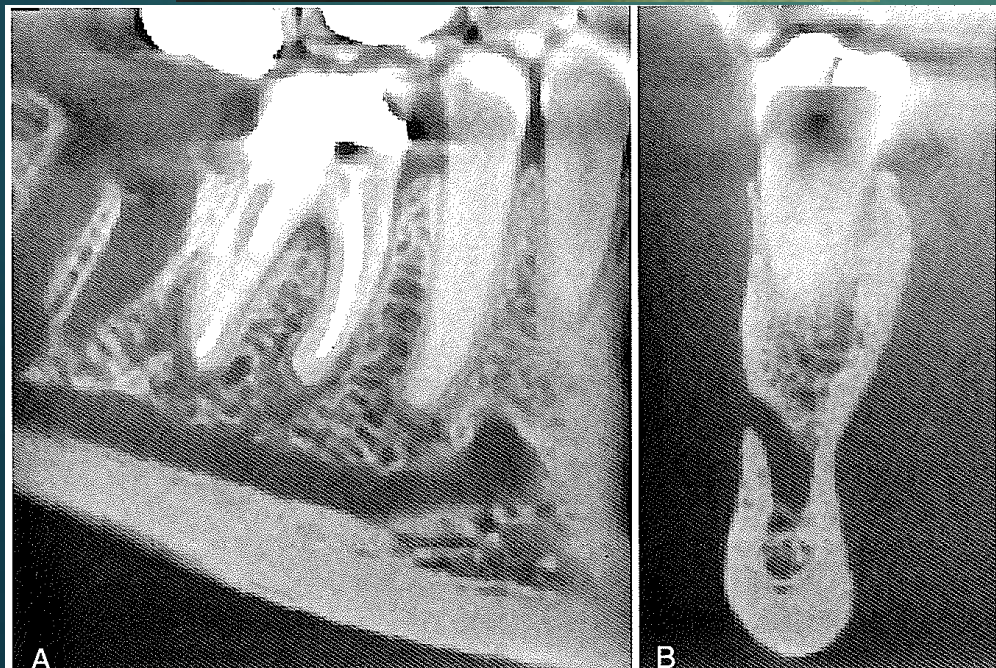
facial view



lingual view

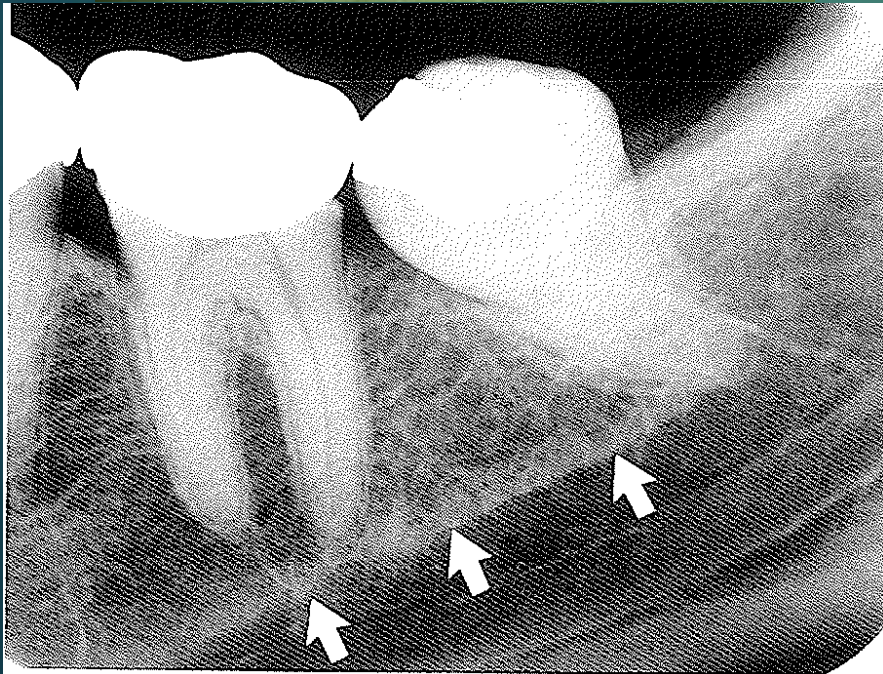
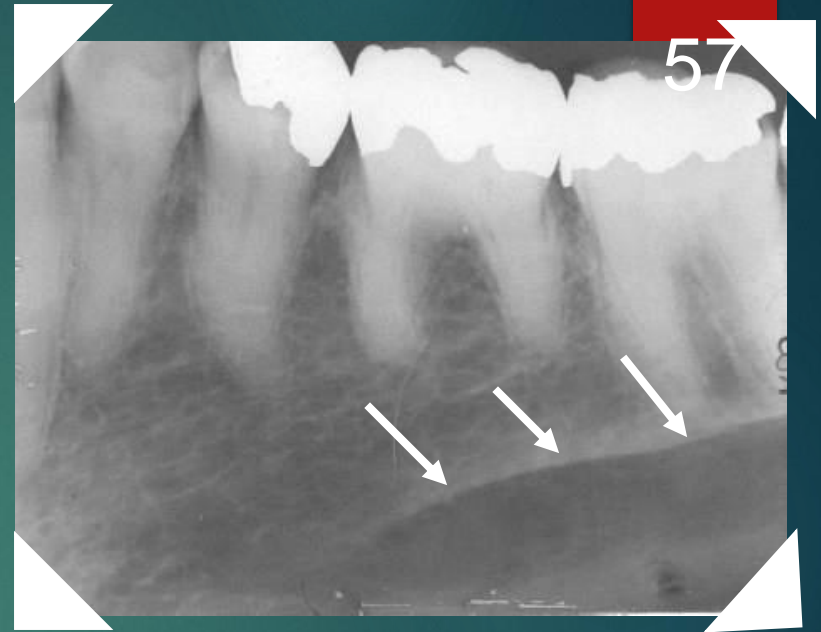
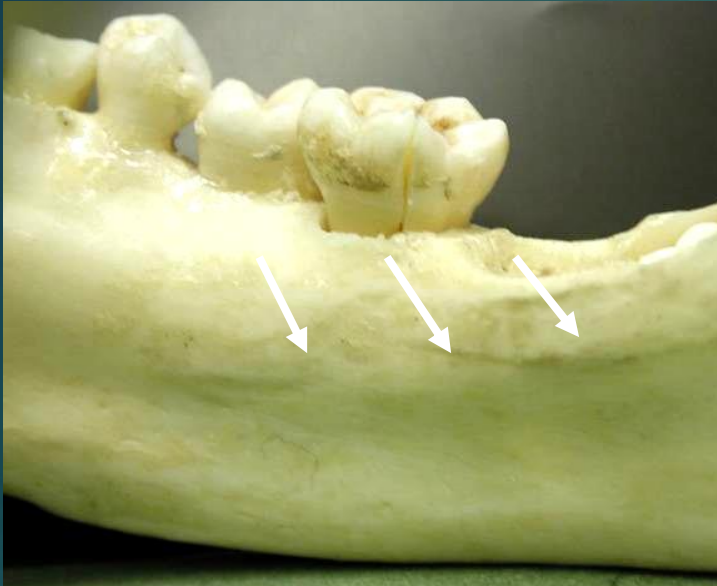


56



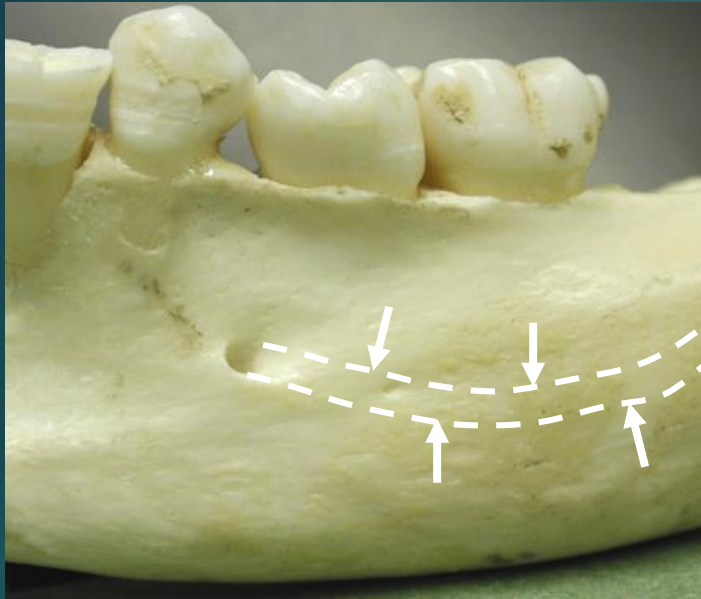
**a = mylohyoid ridge
(internal oblique)**
**c = submandibular gland
fossa**

lingual view



**mylohyoid ridge
(internal oblique)**

facial view



58

Mandibular canal. (Inferior alveolar canal). Runs downward from the mandibular foramen to the mental foramen, passing close to the roots of the molars. More easily seen in the molar periapical.



Superimposition of the inferior alveolar canal over the apex of a molar causes the image of the periodontal ligament space to appear wider (*arrow*). However, the presence of an intact lamina dura indicates that there is no periapical disease.

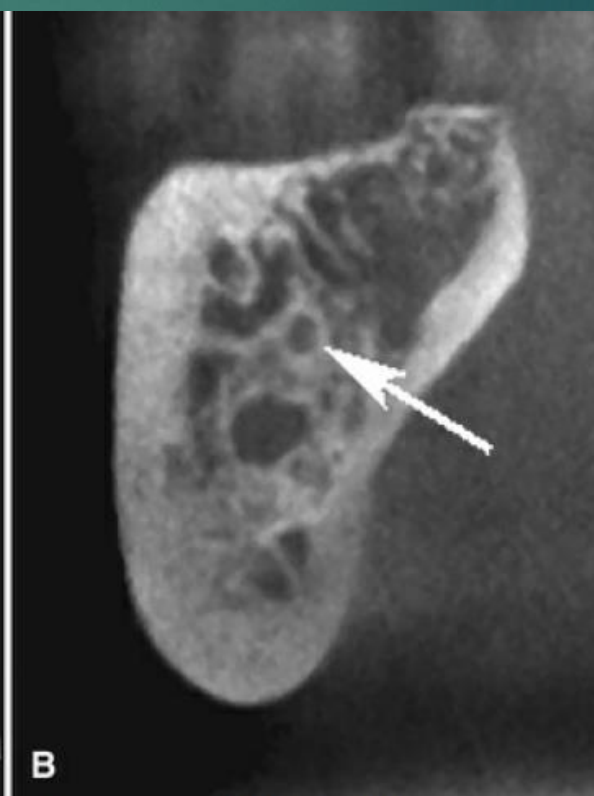
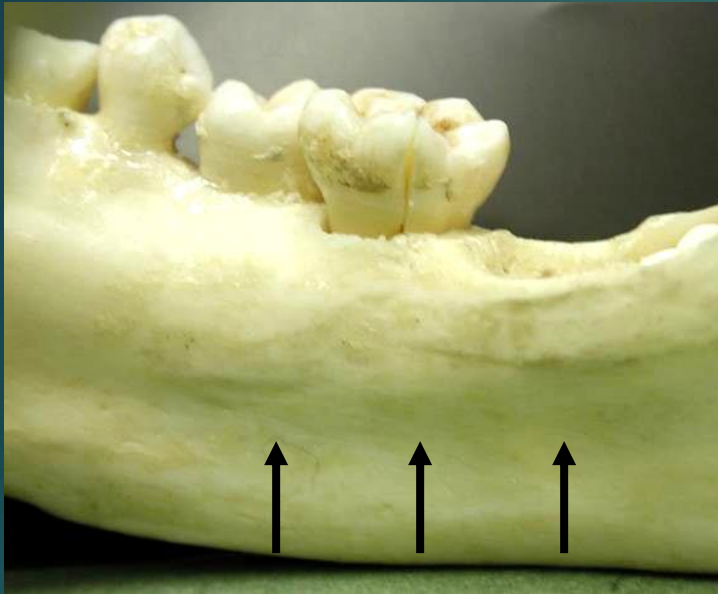
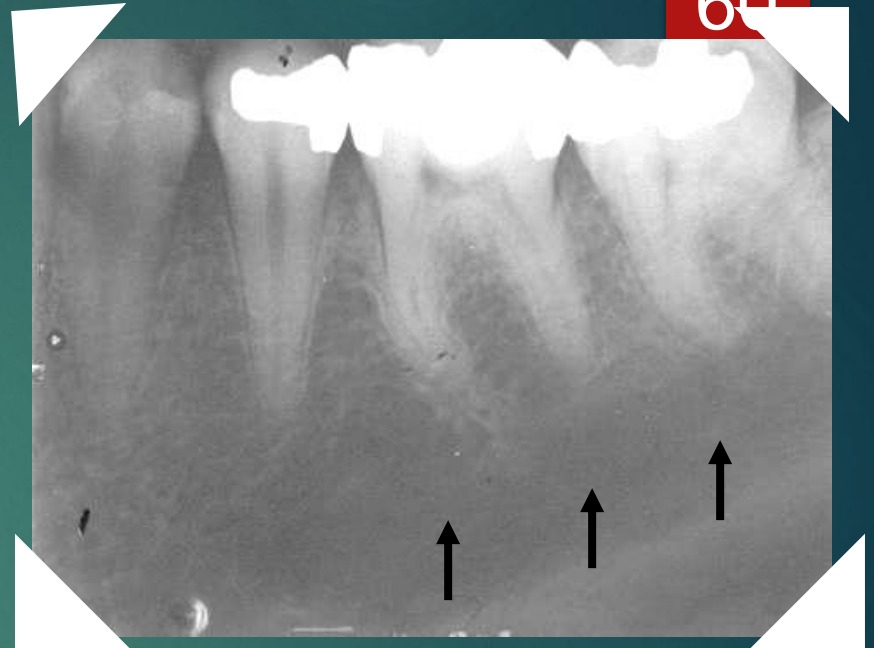


FIG. 12.59 Bifid inferior alveolar canal. (A) Cone beam sagittal section

lingual view



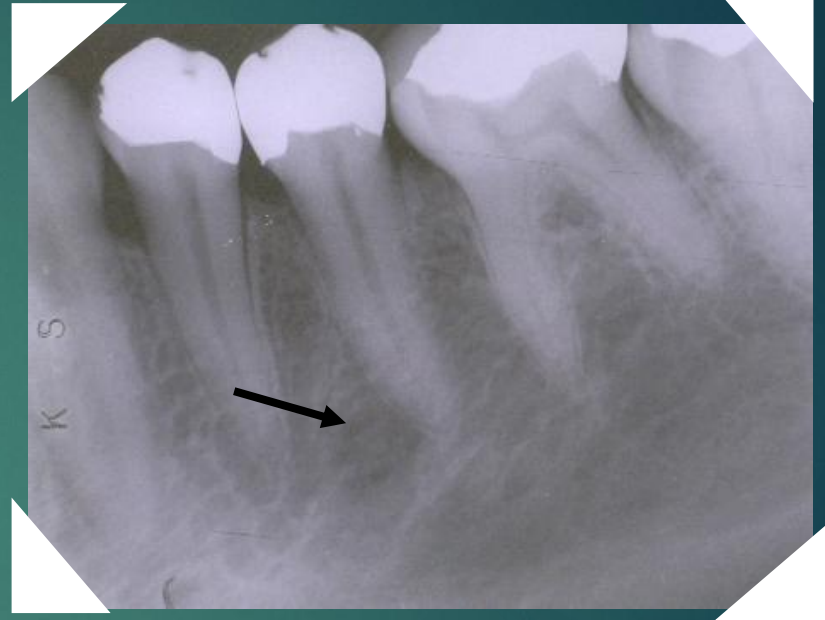
60



Submandibular gland fossa. The depression below the mylohyoid ridge where the submandibular gland is located. More obvious in the molar periapical film.

facial view

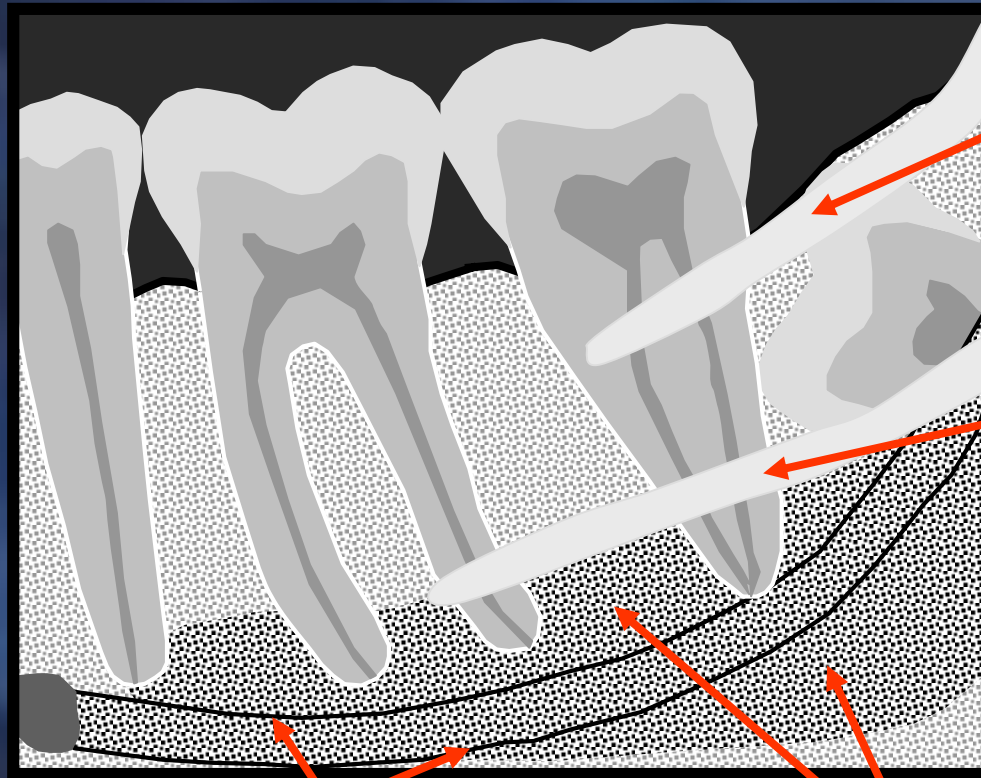
61



Mental foramen. Usually located midway between the upper and lower borders of the body of the mandible, in the area of the premolars. May mimic pathology if superimposed over the apex of one of the premolars.

Mandibular Molar

62



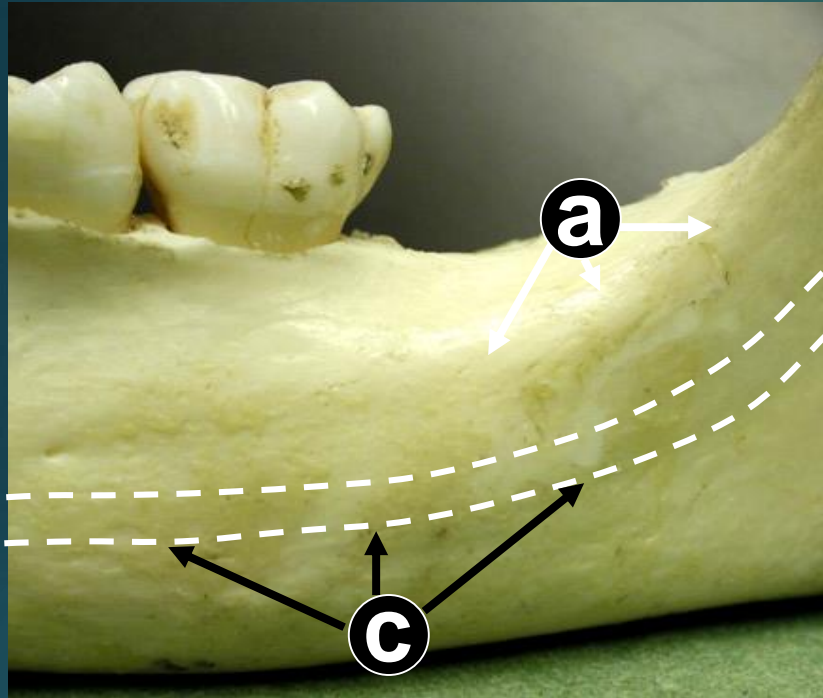
External oblique ridge

Mylohyoid ridge (internal oblique)

Mandibular canal

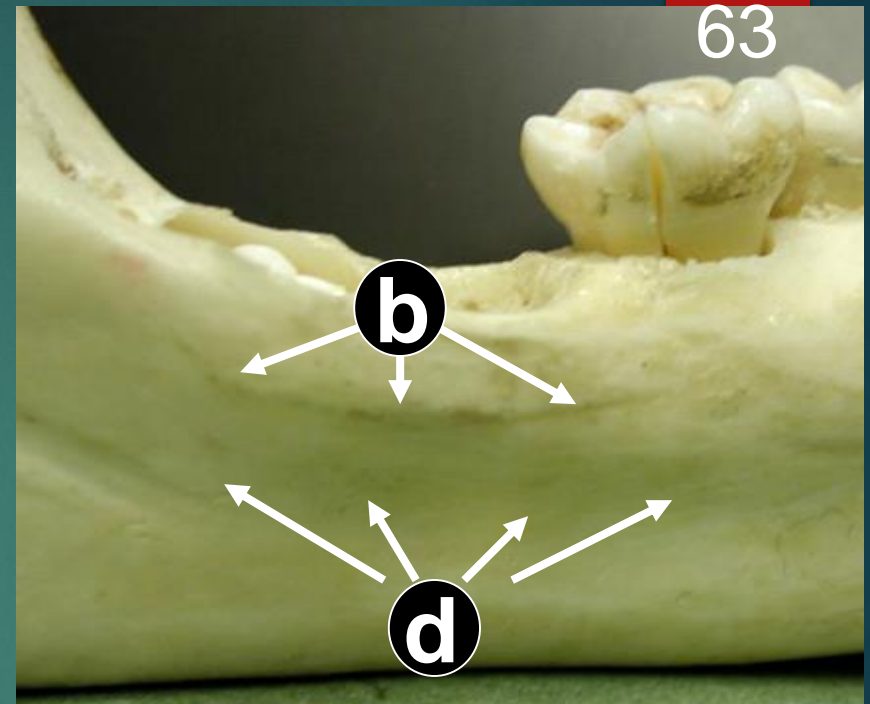
Submandibular gland fossa

facial view

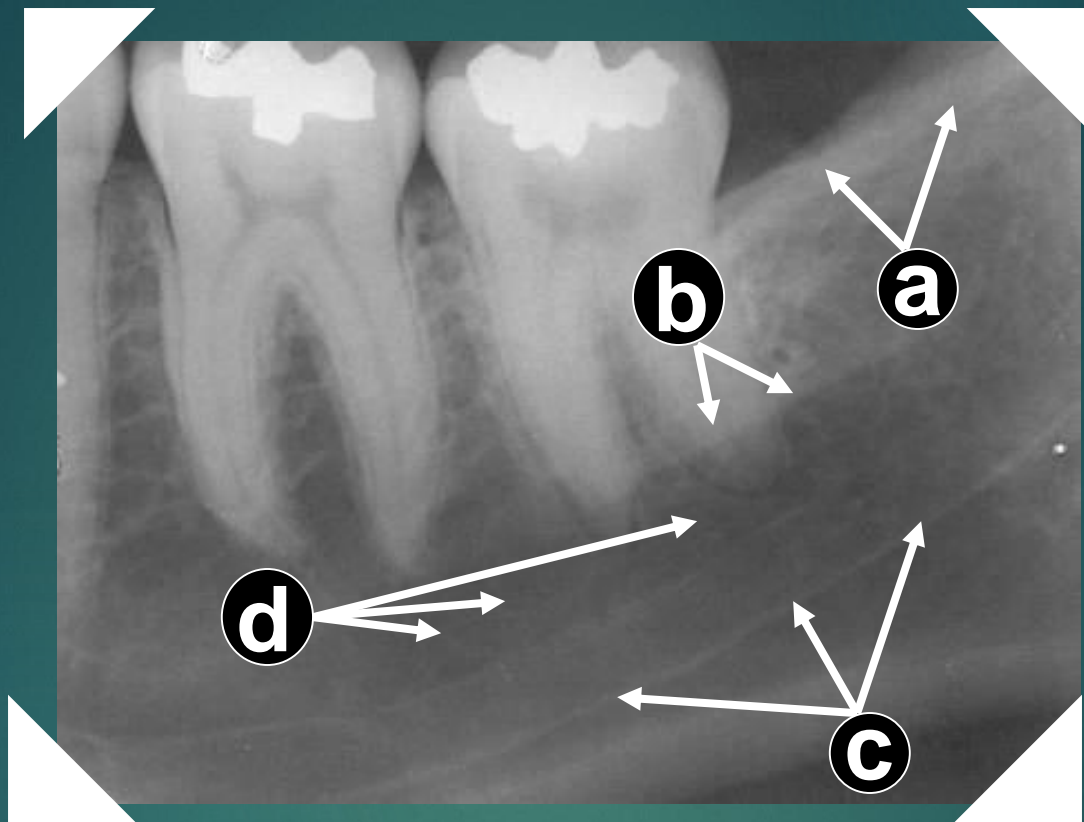


a = external oblique ridge
c = mandibular canal

lingual view



b = mylohyoid ridge
d = submandibular gland fossa



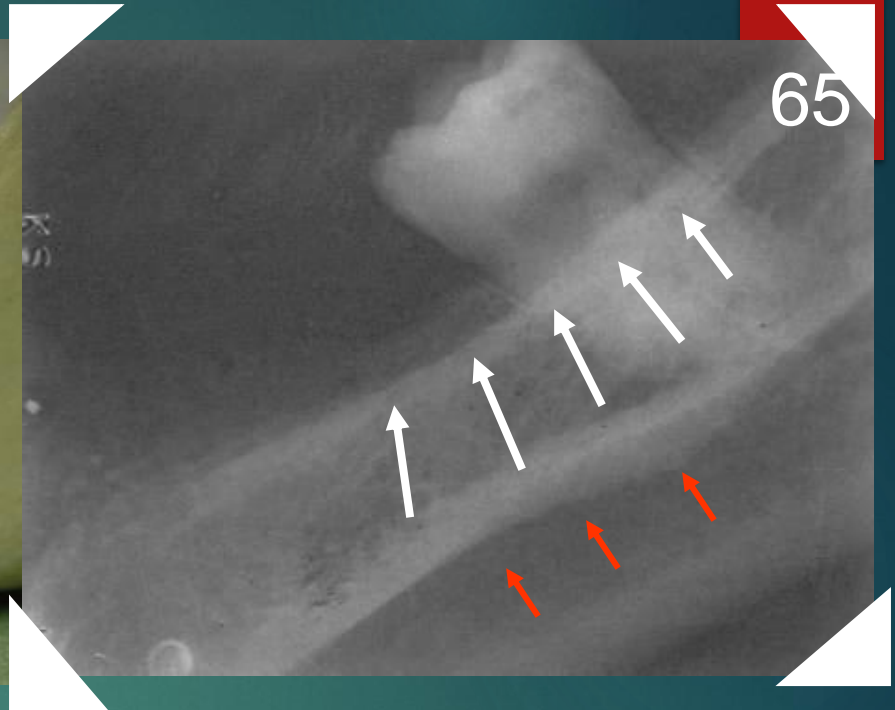
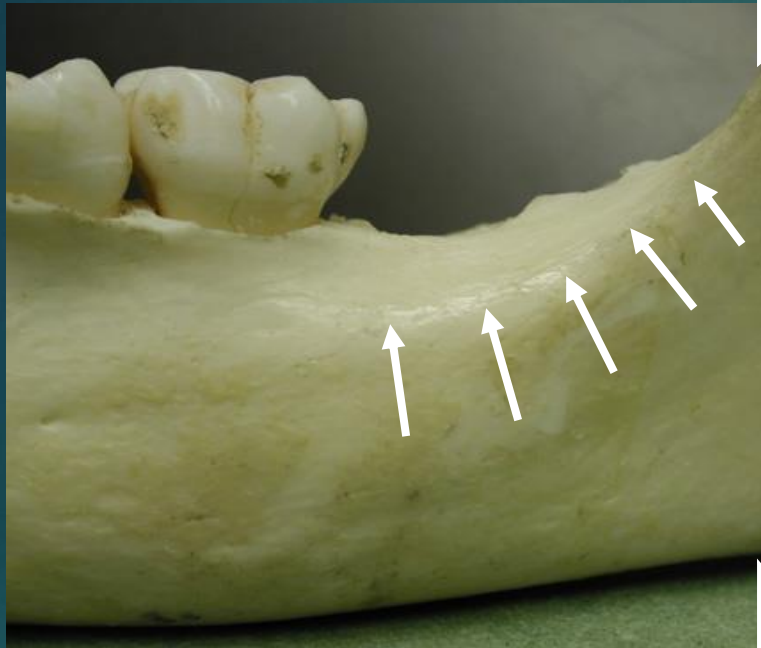
a = external oblique ridge

b = mylohyoid ridge

c = mandibular canal

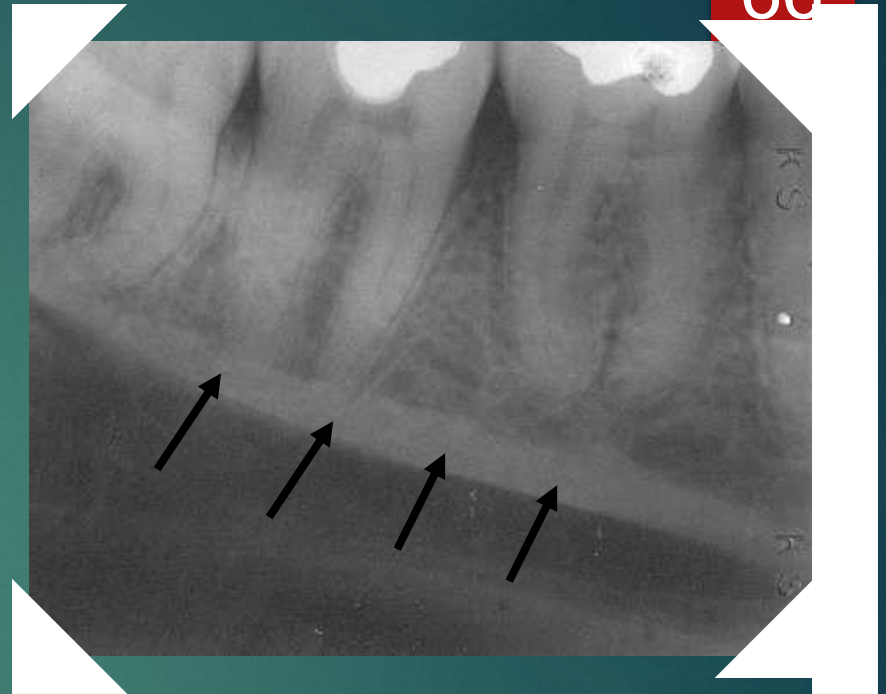
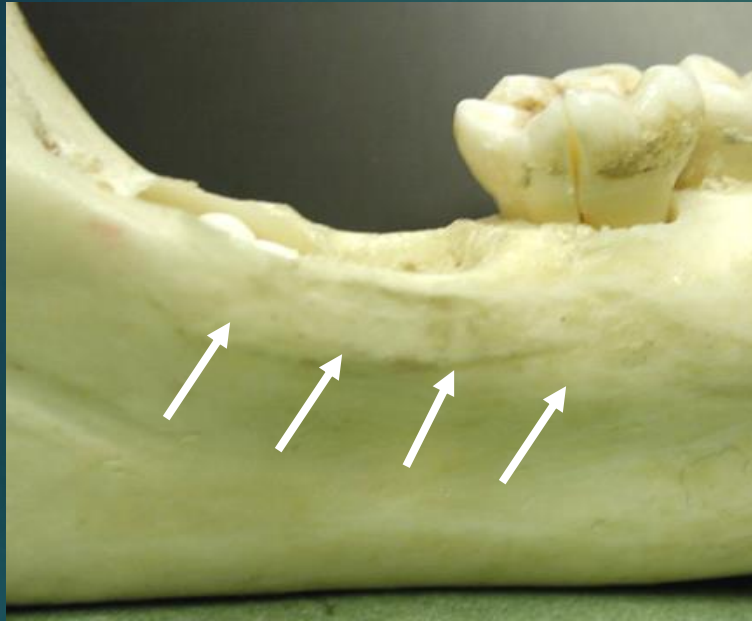
d = submandibular gland fossa

facial view



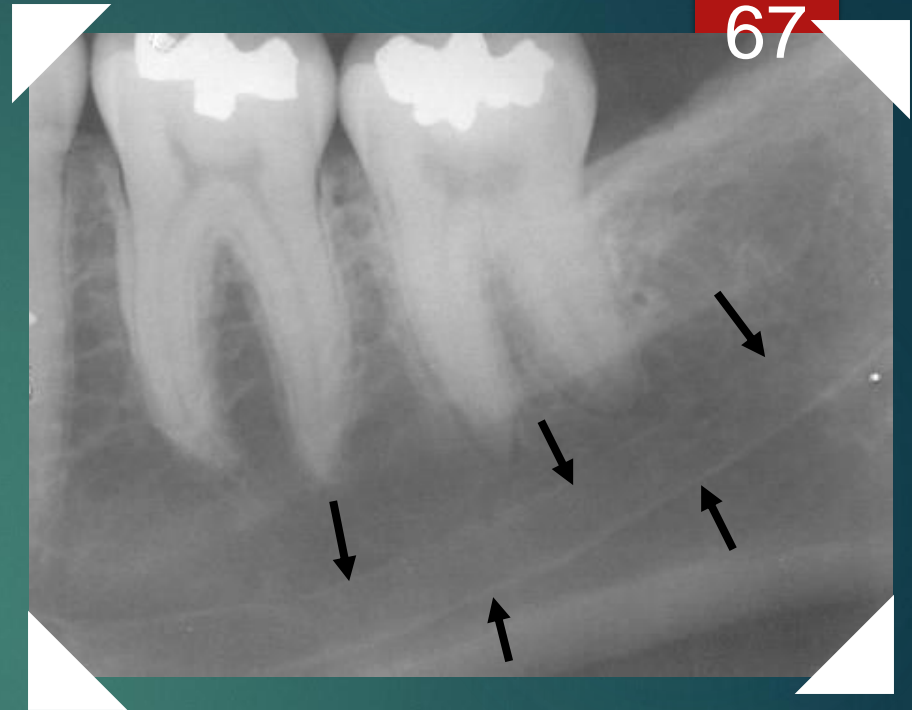
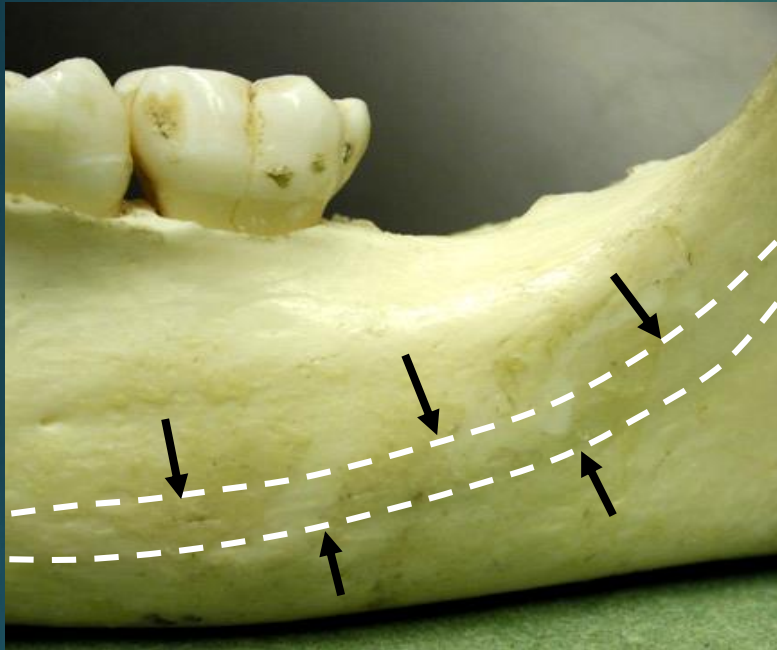
External oblique ridge. A continuation of the anterior border of the ramus, passing downward and forward on the buccal side of the mandible. It appears as a distinct radiopaque line which usually ends anteriorly in the area of the first molar. Serves as an attachment of the buccinator muscle. (The red arrows point to the mylohyoid ridge).

lingual view



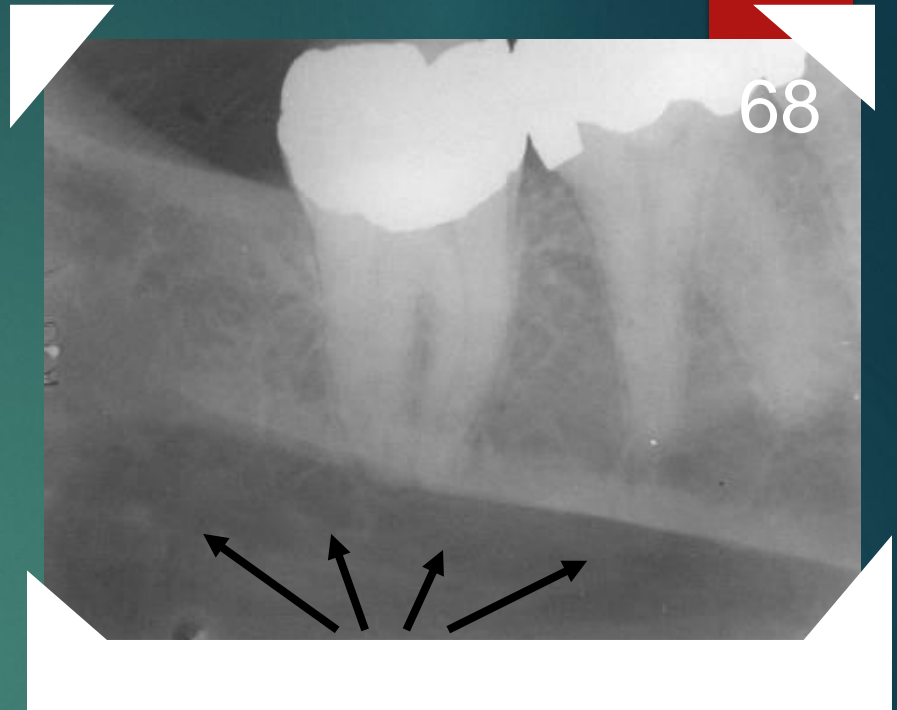
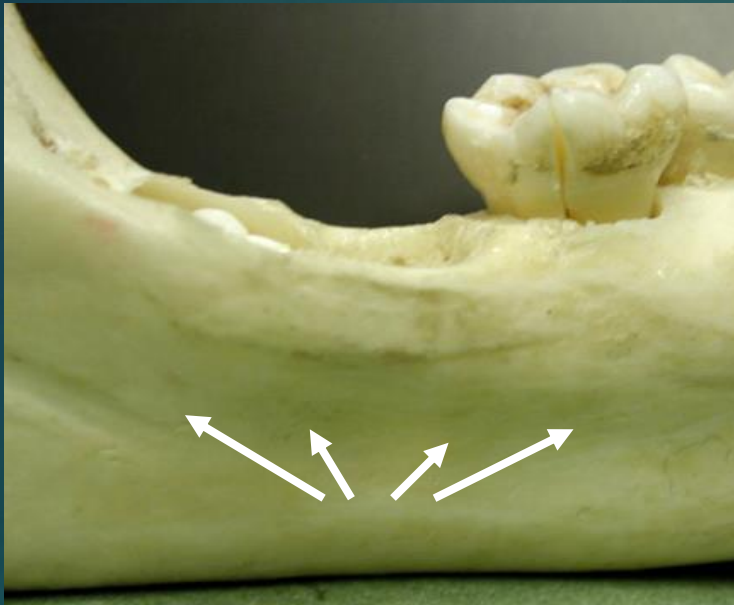
Mylohyoid ridge (internal oblique). Located on the lingual surface of the mandible, extending from the third molar area to the premolar region. Serves as the attachment of the mylohyoid muscle.

facial view

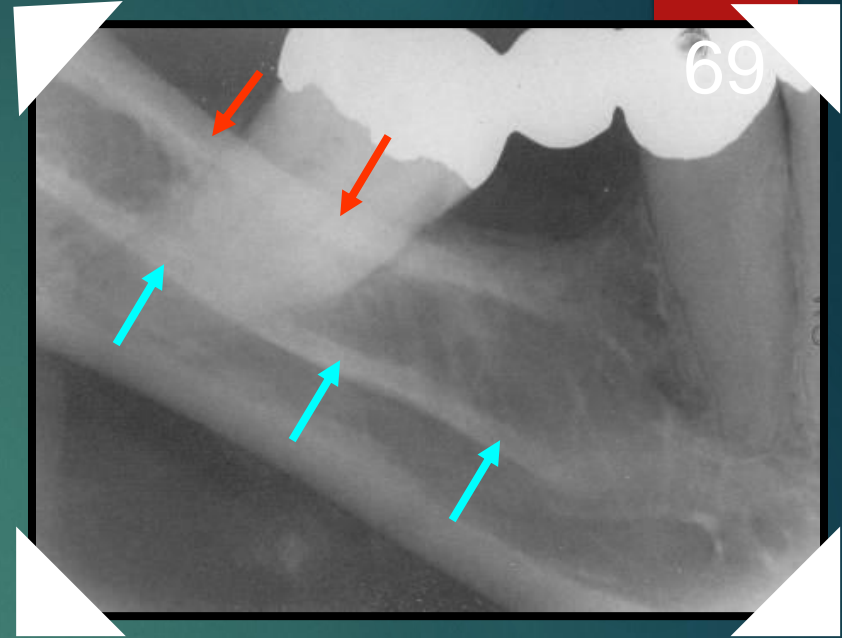
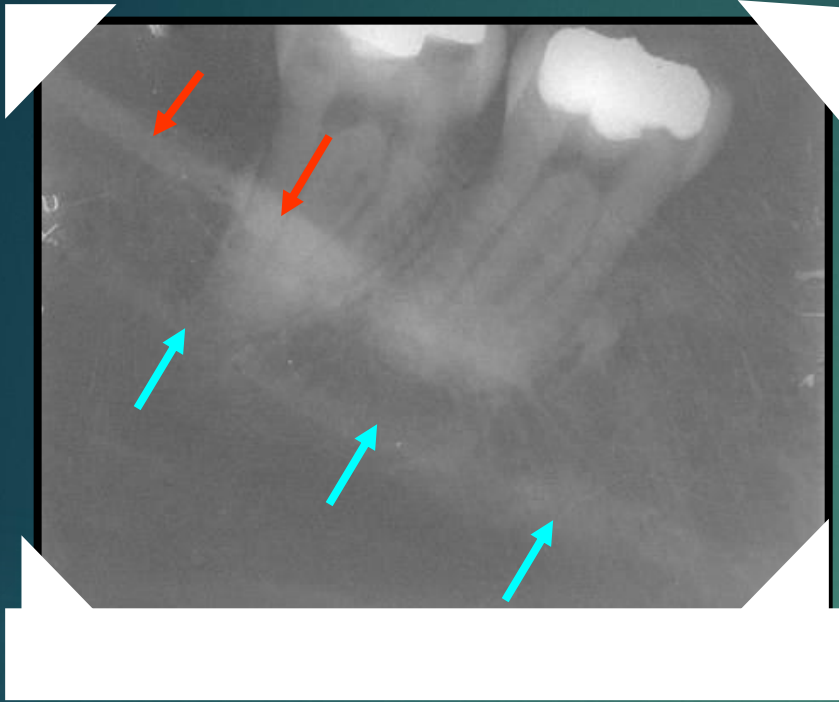


Mandibular (inferior alveolar) canal. Arises at the mandibular foramen on the lingual side of the ramus and passes downward and forward, moving from the lingual side of the mandible in the third molar region to the buccal side of the mandible in the premolar region. Contains the inferior alveolar nerve and vessels.

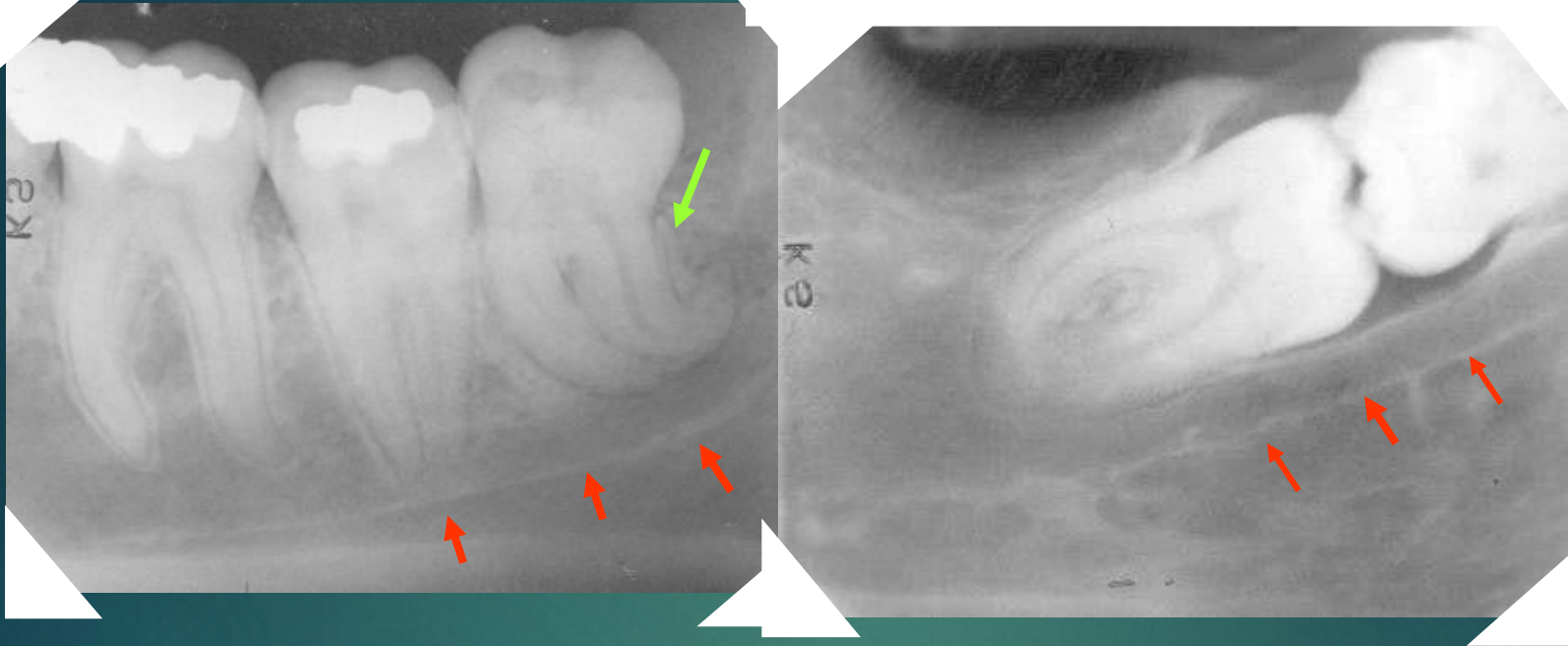
lingual view



Submandibular gland fossa. A depression on the lingual side of the mandible below the mylohyoid ridge. The submandibular gland is located in this region. Due to the thinness of bone, the trabecular pattern of the bone is very sparse and results in the area being very radiolucent. The fact that it occurs bilaterally helps to differentiate it from pathology.



The external oblique ridge (red arrows) and the mylohyoid ridge (blue arrows) usually run parallel with each other, with the external oblique ridge always being higher on the film.



The mandibular canal (red arrows identify inferior border of canal) usually runs very close to the roots of the molars, especially the third molar. This can be a problem when extracting these teeth. Note the extreme dilaceration (curving) of the roots of the third molar (green arrow) in the film at left. The film at right shows “kissing” impactions located at the superior border of the canal.

*Thanks for
Attention*