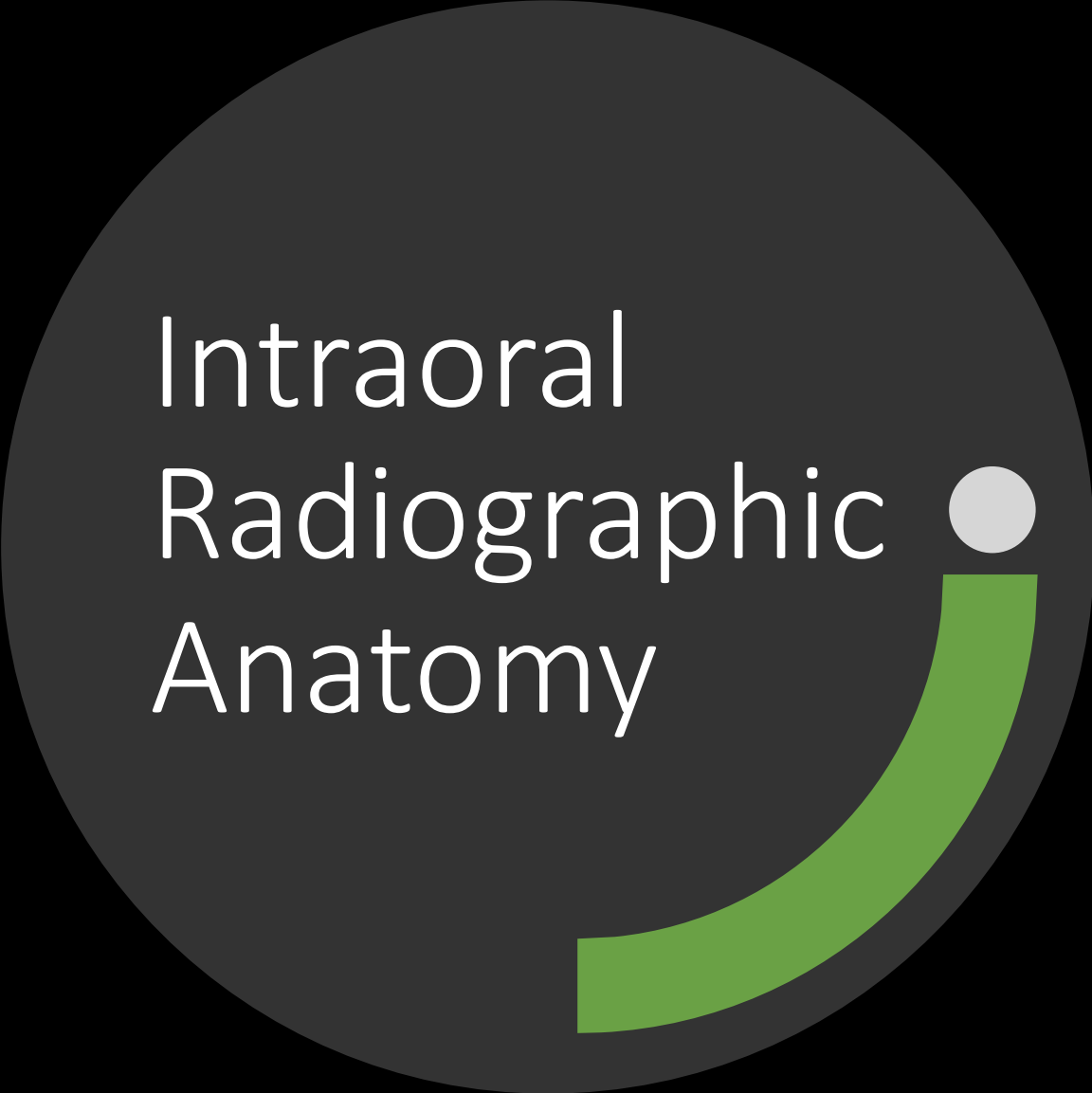




# Intraoral Radiographic Anatomy

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OMF Radiologist

# Contents

- BW, PA & Occlusograph Anatomy
  - Dental structures
  - Osseous structures
  - Canals and foramina
  - Artefacts

# References & Recommended Textbooks

Essentials of dental radiography and radiology 5<sup>th</sup> edition

by Whaites, Eric; Drage, Nicholas

Churchill Livingstone 2013

Pocket atlas of dental radiology

by Pasler, Friedrich A; Visser, Heiko

Flexibook, 2007

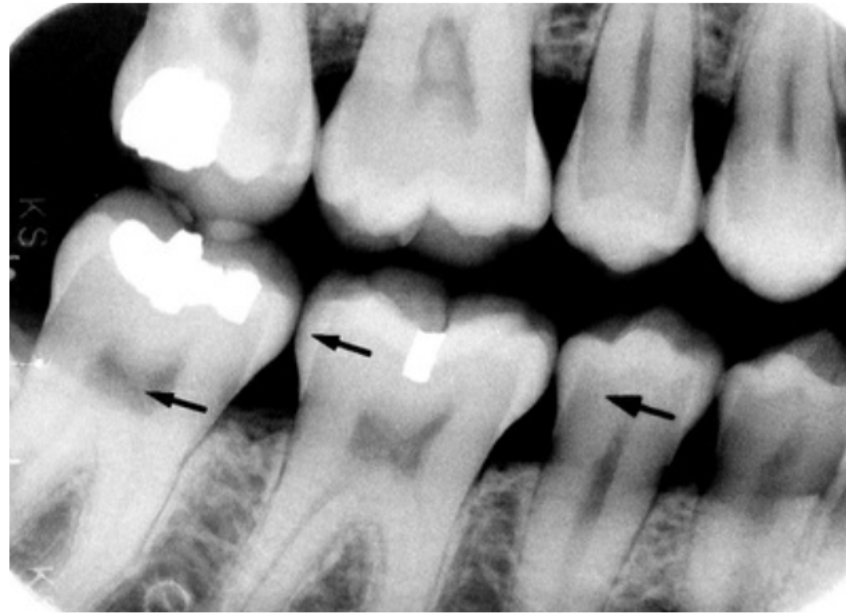
Oral radiology: principles and interpretation 7<sup>th</sup> edition

by White, Stuart C; Pharoah, M. J

Permalink 2014

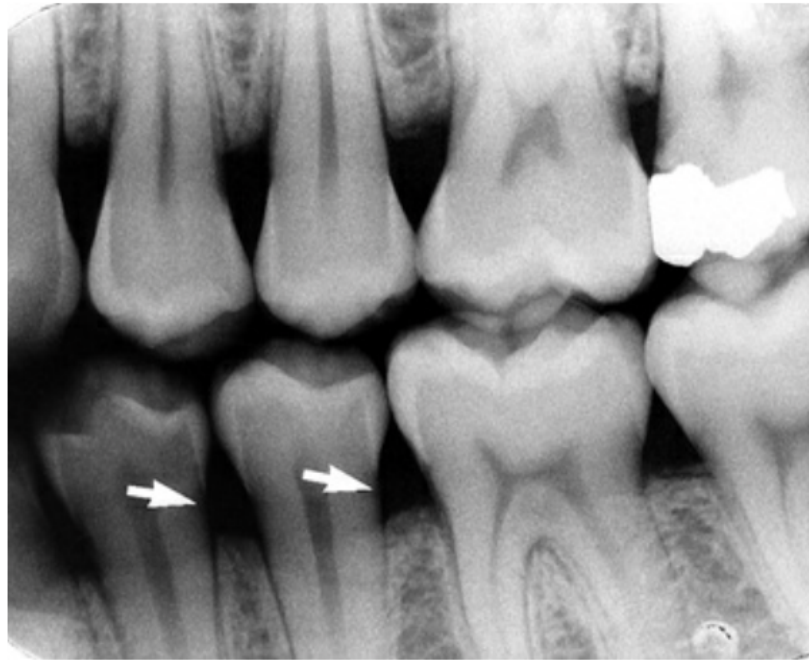
- 8<sup>th</sup> edition available now

# Teeth



**FIG. 12.1** Teeth are composed of pulp (*arrow* on the second molar), enamel (*arrow* on the first molar), dentin (*arrow* on the second premolar), and cementum (usually not visible radiographically).

# Cervical Burnout



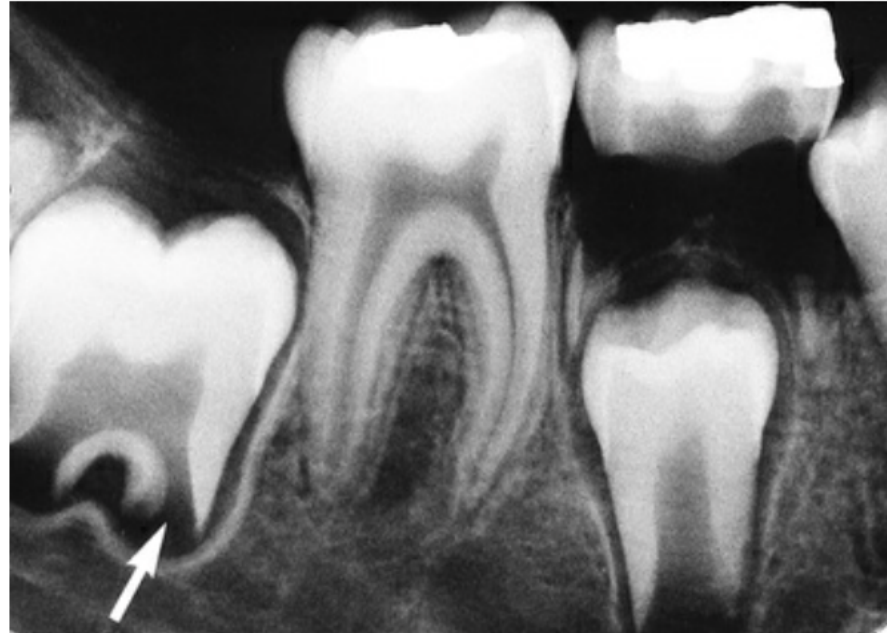
**FIG. 12.2** Cervical burnout is caused by overexposure of the lateral portion of roots between the enamel and the alveolar crest and results in an ill-defined radiolucent zone (*arrows*).

# Root Canal – Apical third



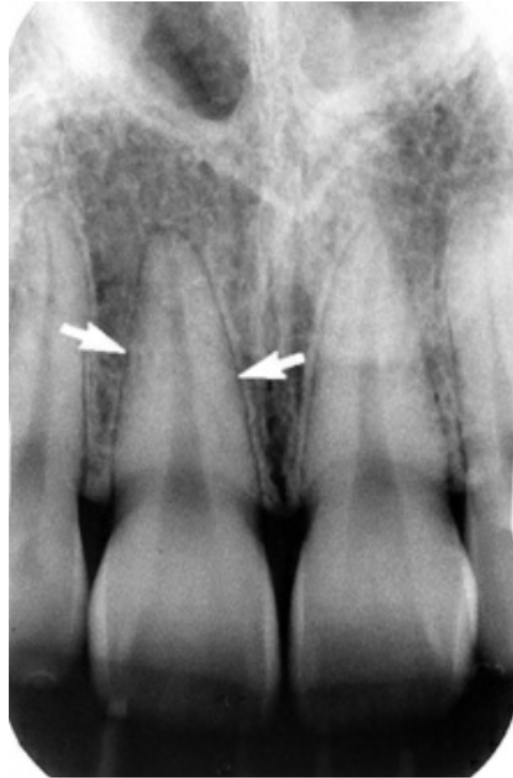
**FIG. 12.6** Although the root canal is typically not radiographically visible in the apical 2 mm of a tooth, anatomically it is present and contains the vascular and neural supply to the pulp (*arrow*).

# Mixed Dentition – Developing Roots



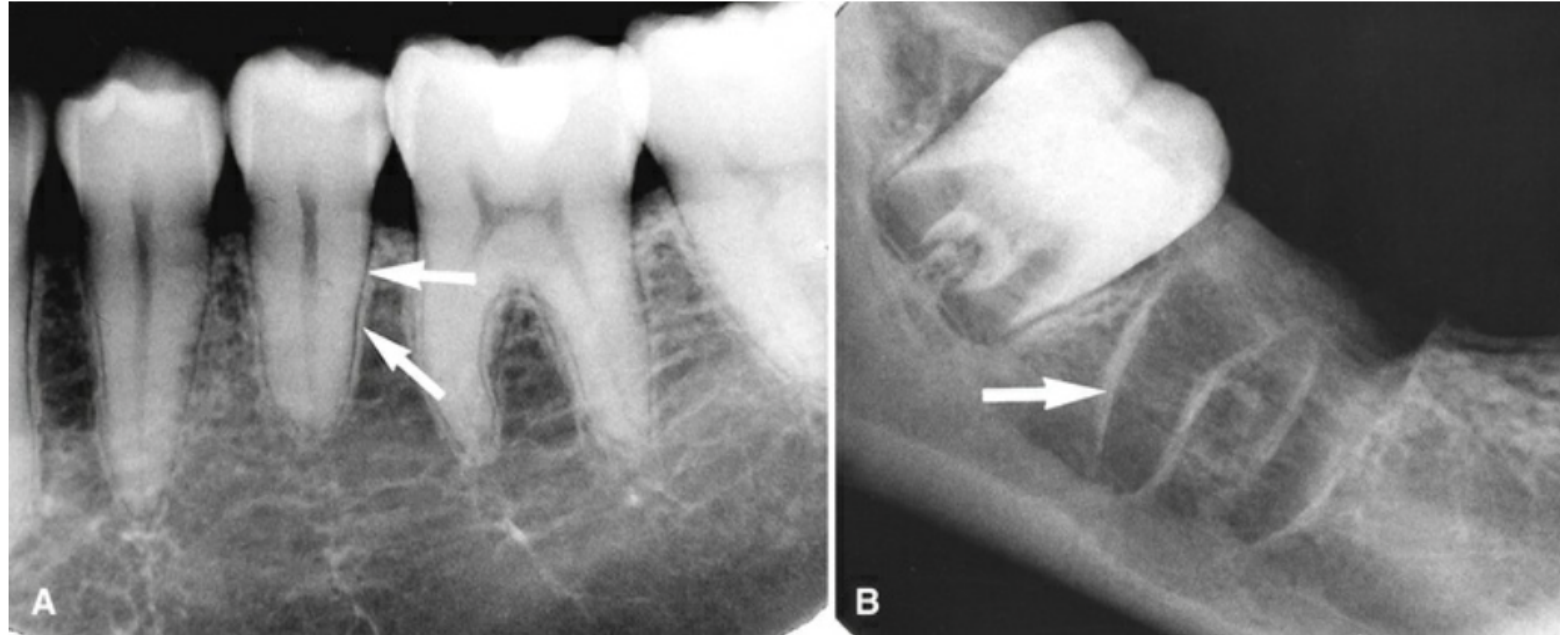
**FIG. 12.8** A developing root shown by a divergent apex around the dental papilla (*arrow*), which is enclosed by an opaque bony crypt. The apices of the first molar are still open but nearing closure.

# Periodontal Ligament Space



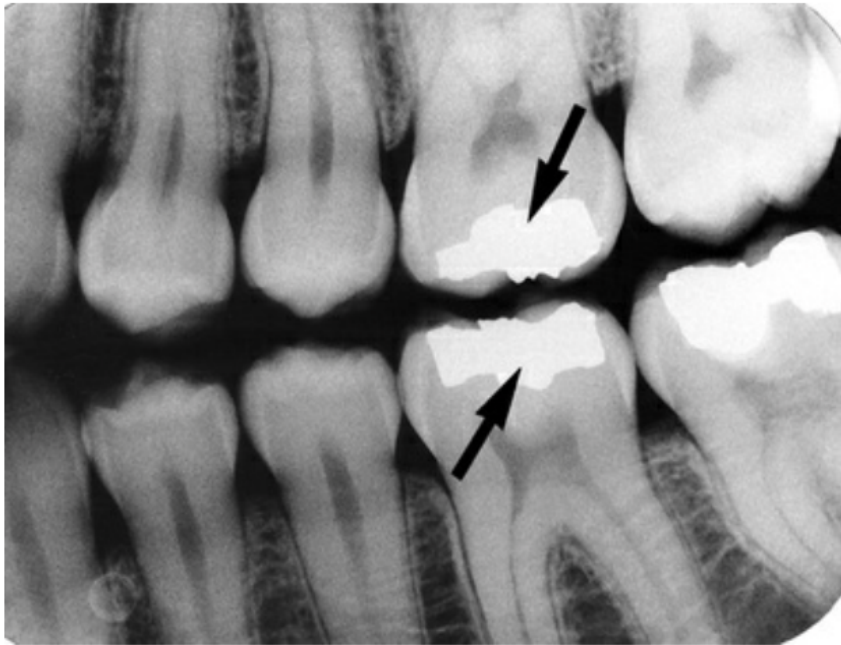
**FIG. 12.12** The periodontal ligament space (*arrows*) is seen as a narrow radiolucency between the tooth root and the lamina dura.

# Lamina Dura



**FIG. 12.9** The lamina dura (*arrows*) appears as a thin opaque layer of bone around teeth (A) and around a recent extraction socket (B).

# Restorative Therapy

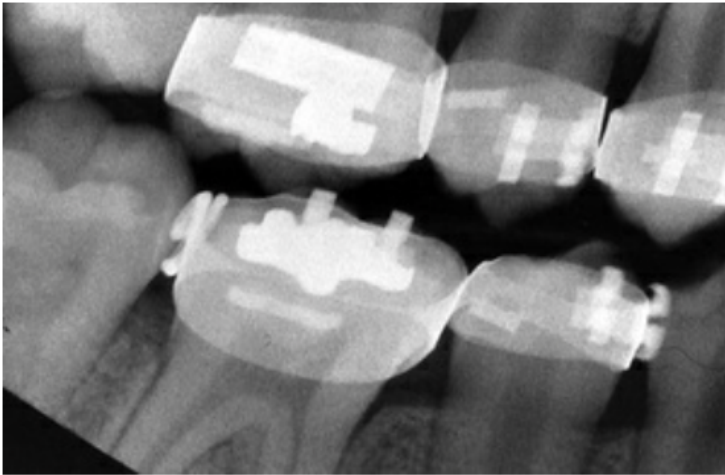


**FIG. 12.72** Amalgam restorations appear completely radiopaque (*arrows*).



**FIG. 12.77** Gutta-percha (*arrows*) is a radiopaque rubber-like material used in endodontic therapy.

# Orthodontic therapy & Crowns

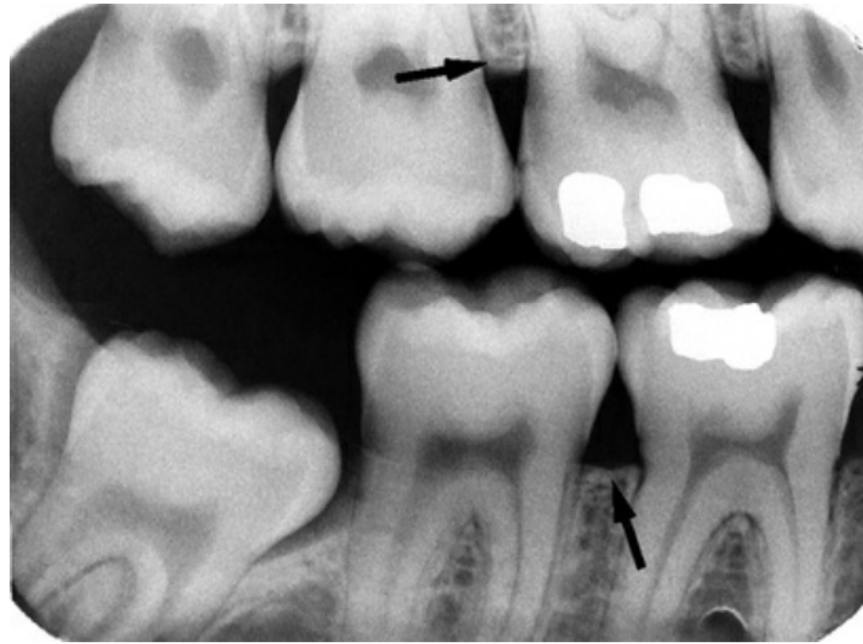


**FIG. 12.80** Orthodontic appliances have a characteristic radiopaque appearance.



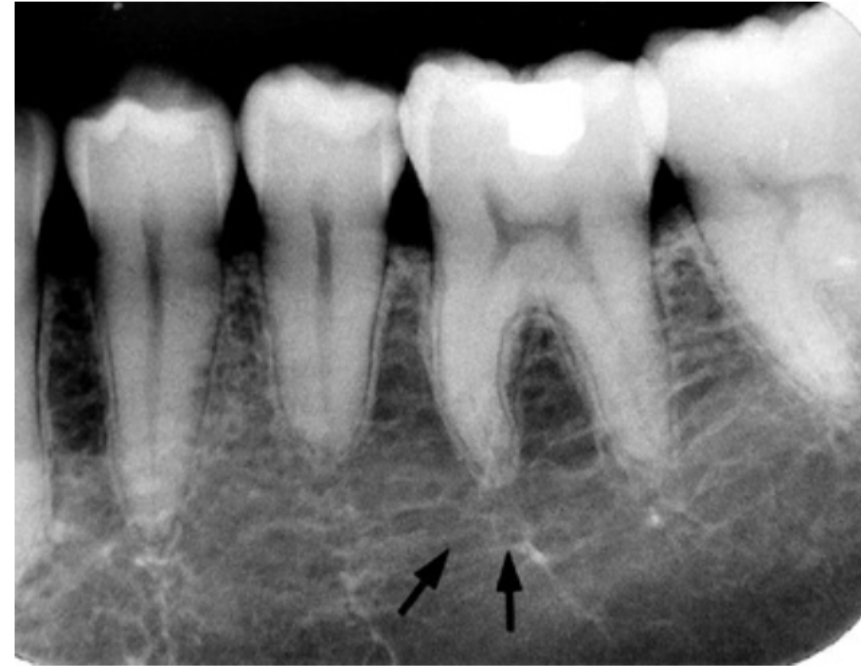
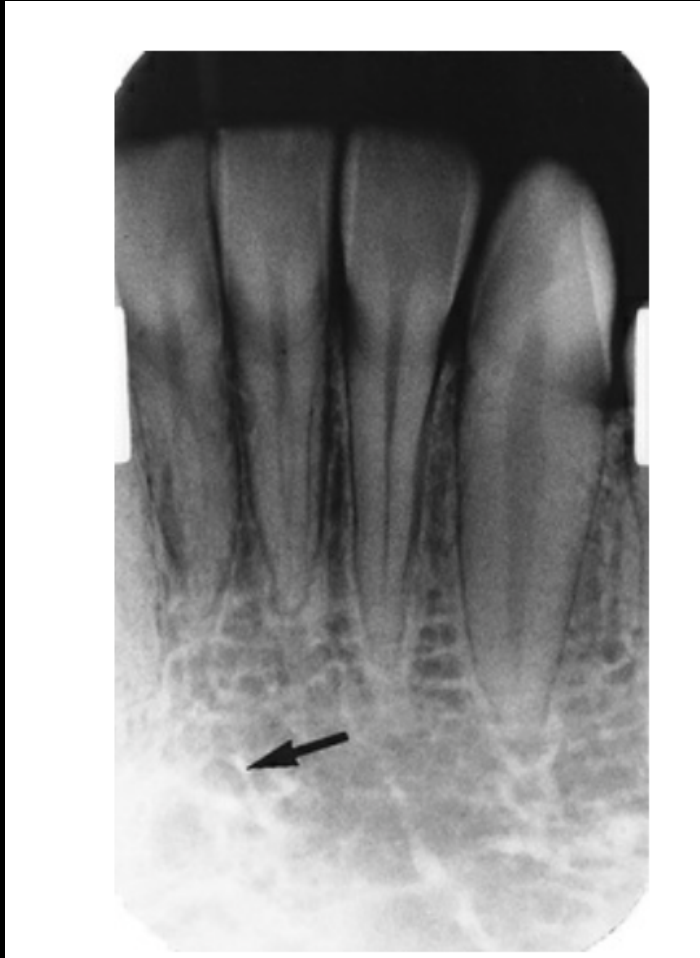
**FIG. 12.79** Porcelain appears radiolucent (*arrow*) over a metal coping.

# Alveolar Crest



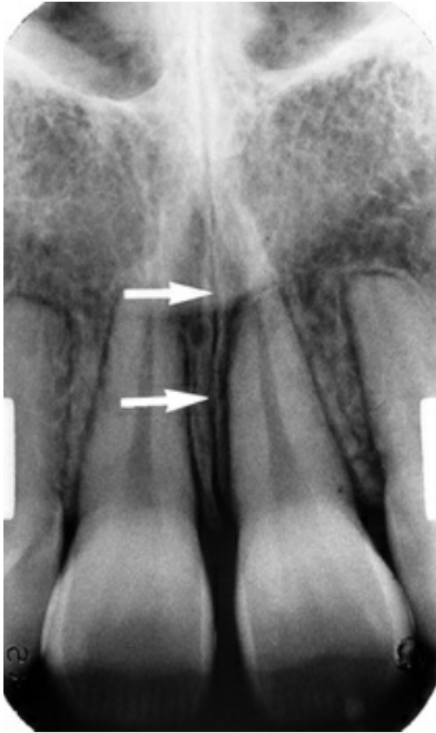
**FIG. 12.11** The alveolar crests (*arrows*) are seen as cortical borders of the alveolar bone. The alveolar crest is continuous with the lamina dura.

# Trabecular Pattern

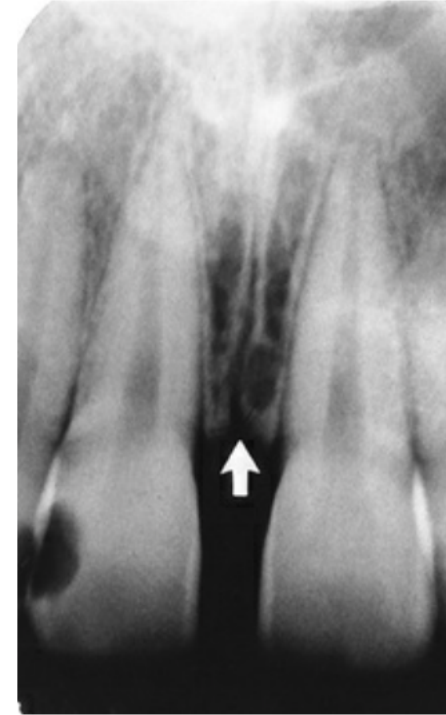


**FIG. 12.17** The trabecular pattern in the posterior mandible is quite variable, generally showing large marrow spaces and sparse trabeculation, especially inferiorly (*arrows*).

# Intermaxillary Suture

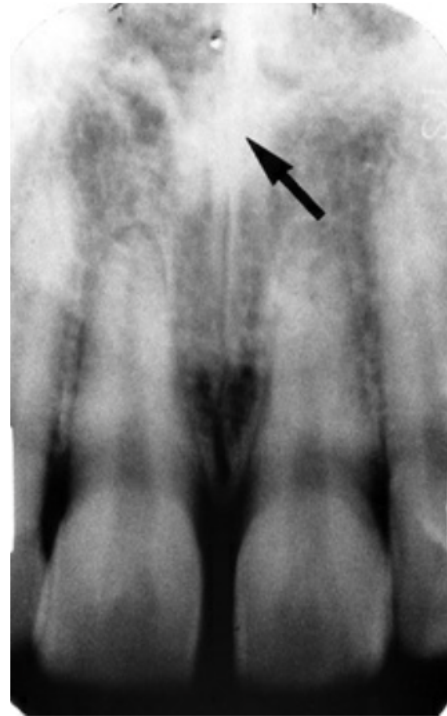


**FIG. 12.19** The intermaxillary suture (*arrows*) appears as a curved radiolucency in the midline of the maxilla.



**FIG. 12.20** The intermaxillary suture may terminate in a V-shaped widening (*arrow*) at the alveolar crest. This is a normal variation and should not be confused with alveolar bone loss associated with periodontal disease.

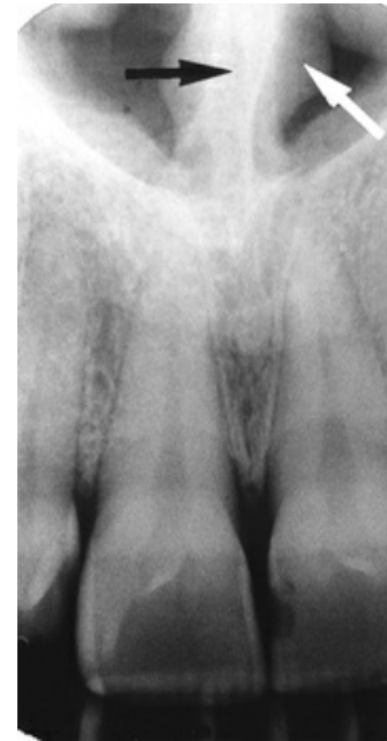
# Anterior Nasal Spine



**FIG. 12.21** The anterior nasal spine is seen as an opaque, irregular, or V-shaped projection from the floor of the nasal aperture in the midline (*arrow*).

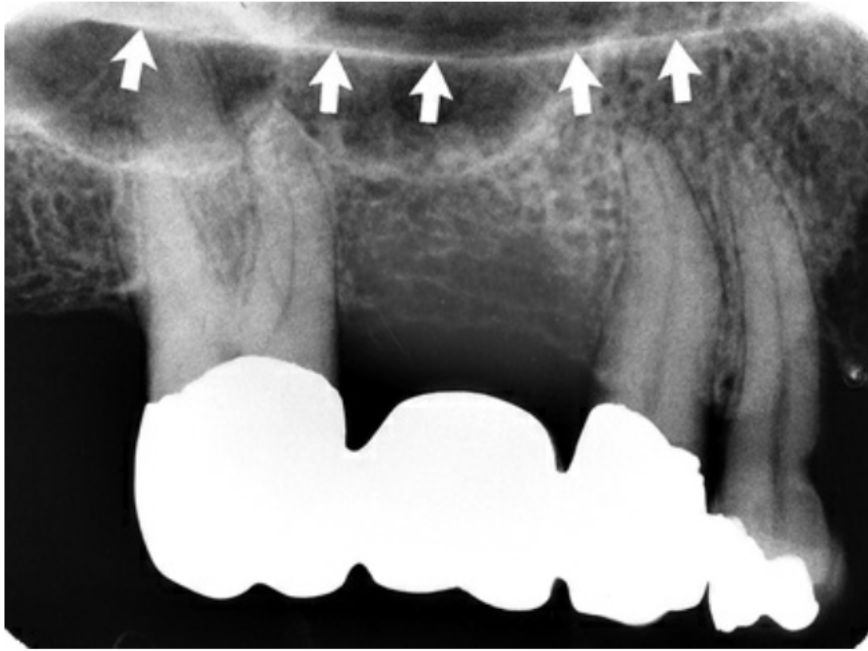


**FIG. 12.22** The anterior floor of the nasal aperture (*arrows*) appears as opaque lines extending laterally from the anterior nasal spine.

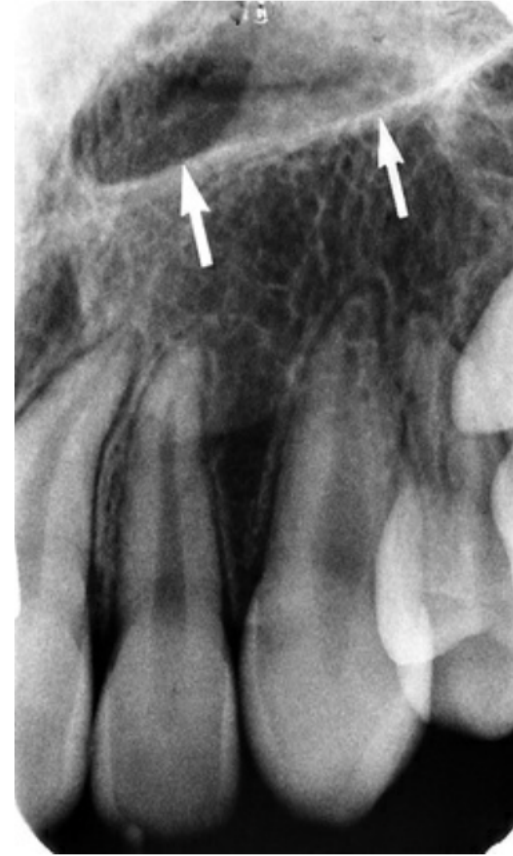


**FIG. 12.23** The nasal septum (*black arrow*) arises directly above the anterior nasal spine and is covered on each side by mucosa (*white arrow*).

# Nasal Floor

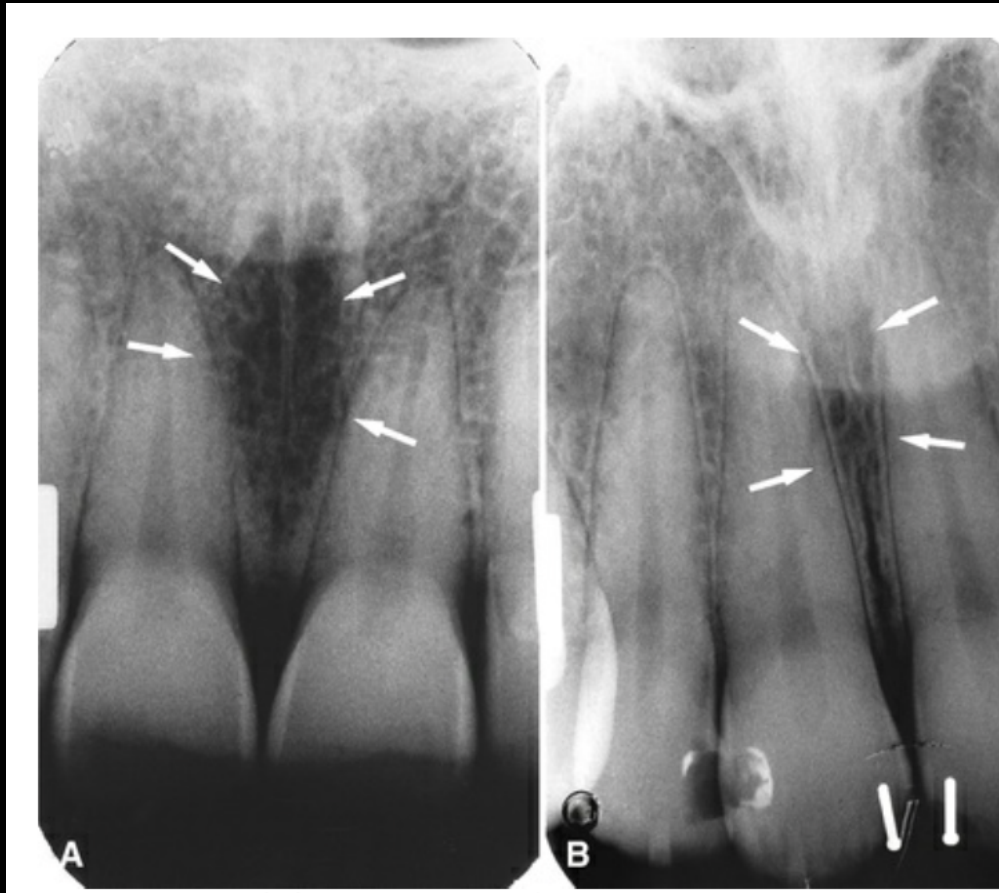


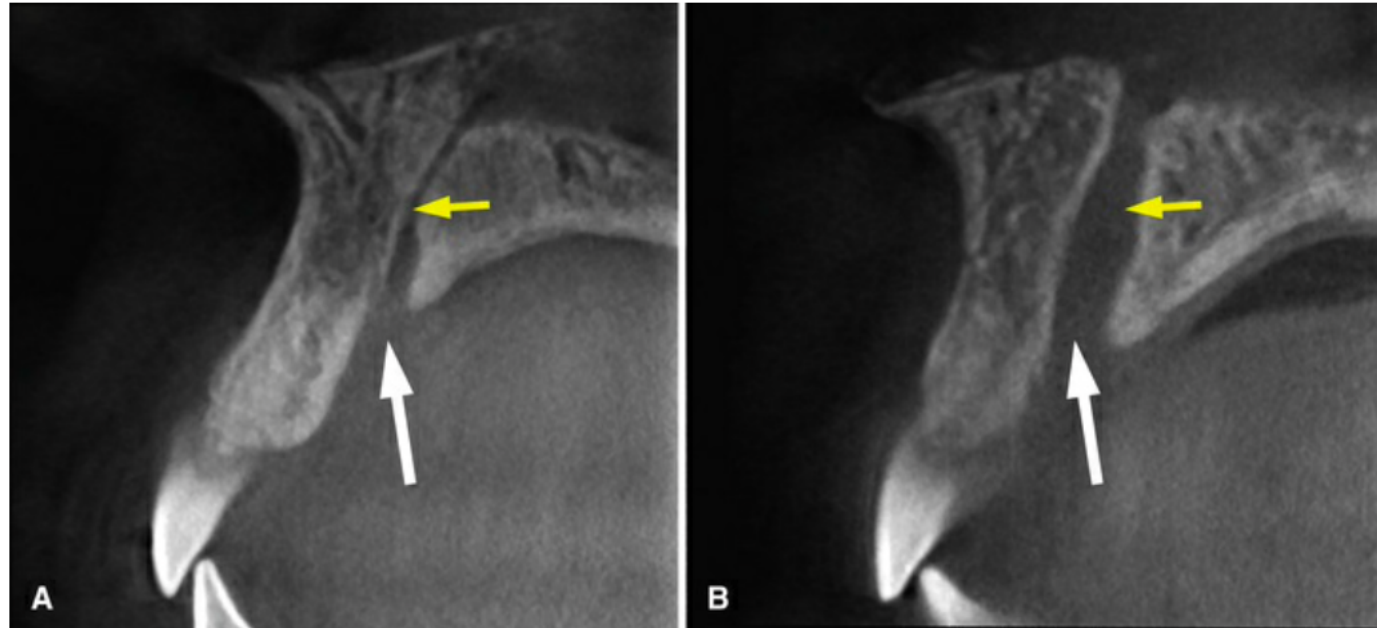
**FIG. 12.27** The floor of the nasal cavity, or hard palate (*arrows*), extends posteriorly, superimposed over the maxillary sinus.



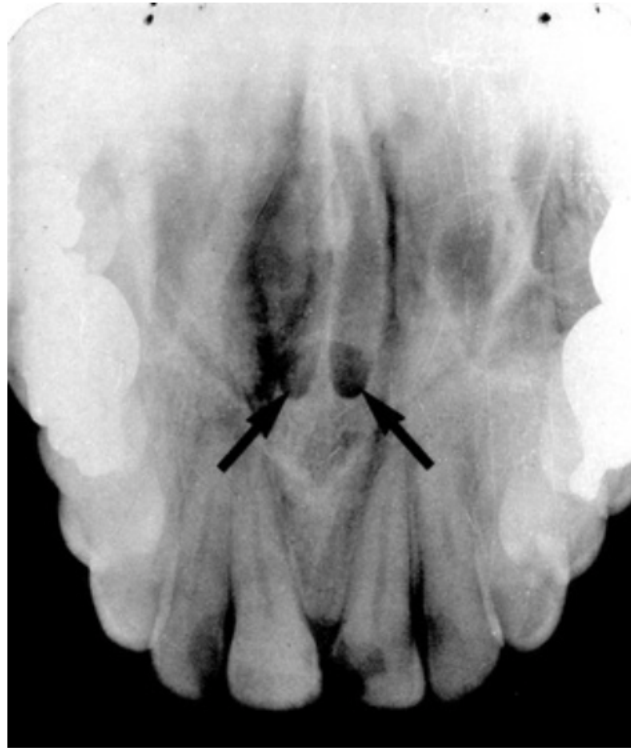
**FIG. 12.26** The floor of the nasal aperture (*arrows*) often may be seen extending posteriorly from the anterior nasal spine above the maxillary lateral incisor and canine.

# Incisive Canal



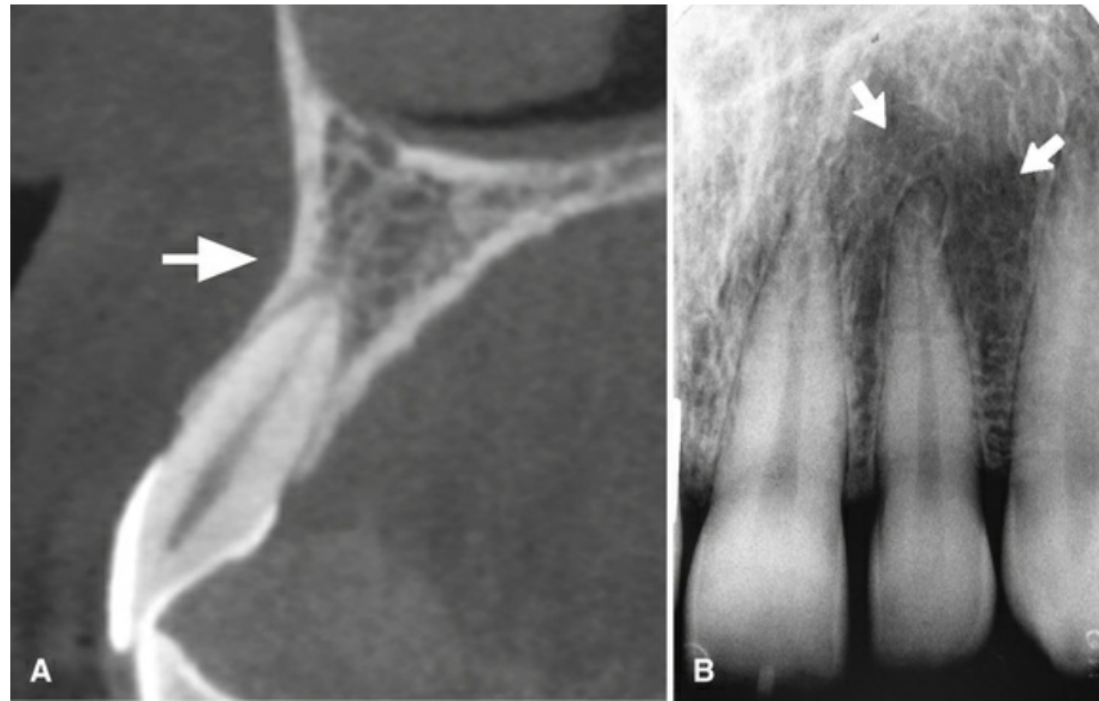


**FIG. 12.31** (A) and (B) Sagittal cone beam computed tomography sections through the midsagittal plane showing the course of the nasopalatine canal (*yellow arrow*) and the opening of the incisive foramen (*white arrow*). Note the range of normal variation in the size of these structures.



**FIG. 12.30** The superior foramina of the nasopalatine canal (*arrows*) appear just lateral to the nasal septum and posterior to the anterior nasal spine.

# Lateral Fossa



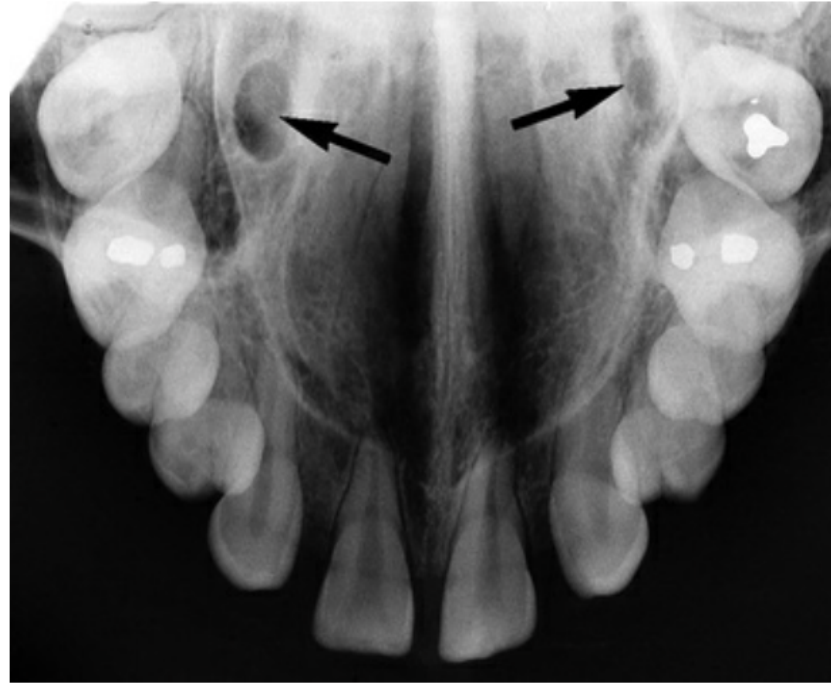
**FIG. 12.32** (A) Cone beam computed tomography section through the long axis of a maxillary lateral incisor showing the lateral fossa as a depression on the buccal surface (*arrow*). (B) The lateral fossa is a diffuse radiolucency (*arrows*) in the region of the apex of the lateral incisor.

# Soft Tissue of the Nose



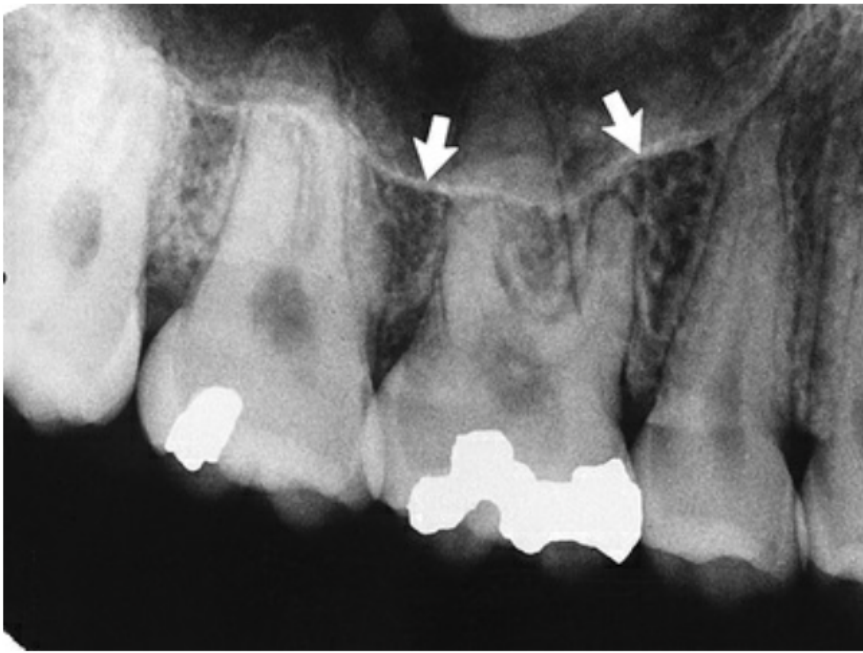
**FIG. 12.33** The soft tissue outline of the nose (*arrows*) is superimposed on the anterior maxilla.

# Nasolacrimal Canals

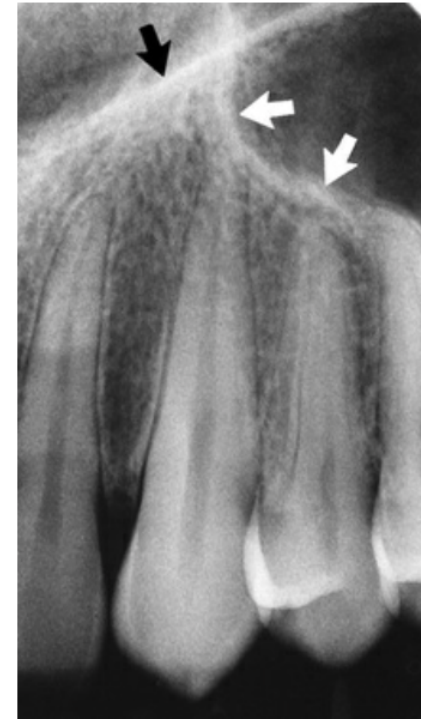


**FIG. 12.35** The nasolacrimal canals are commonly seen as ovoid radiolucencies (*arrows*) on maxillary occlusal projections. They should not be confused with the greater palatine foramina, which are not apparent on maxillary occlusal projections.

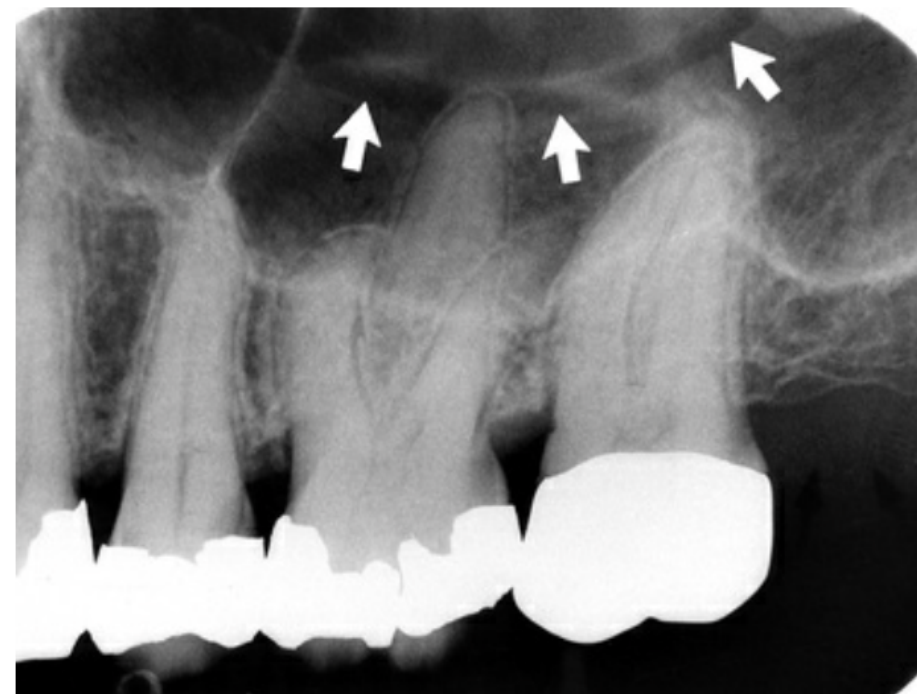
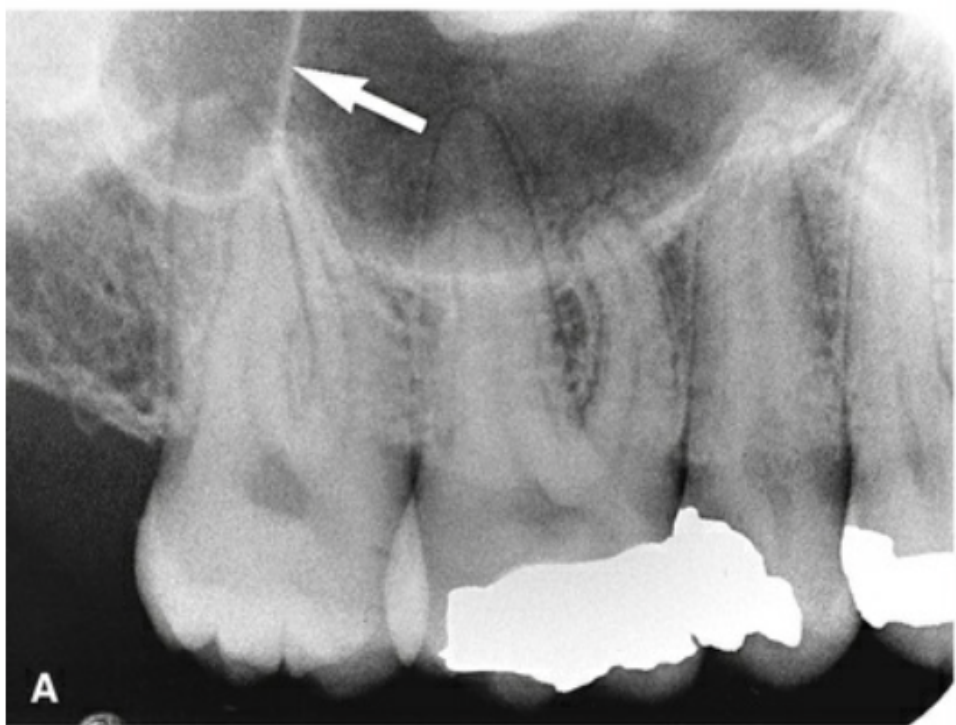
# Maxillary Sinus



**FIG. 12.36** The inferior border of the maxillary sinus (*arrows*) appears as a thin radiopaque line near the apices of the maxillary premolars and molars.

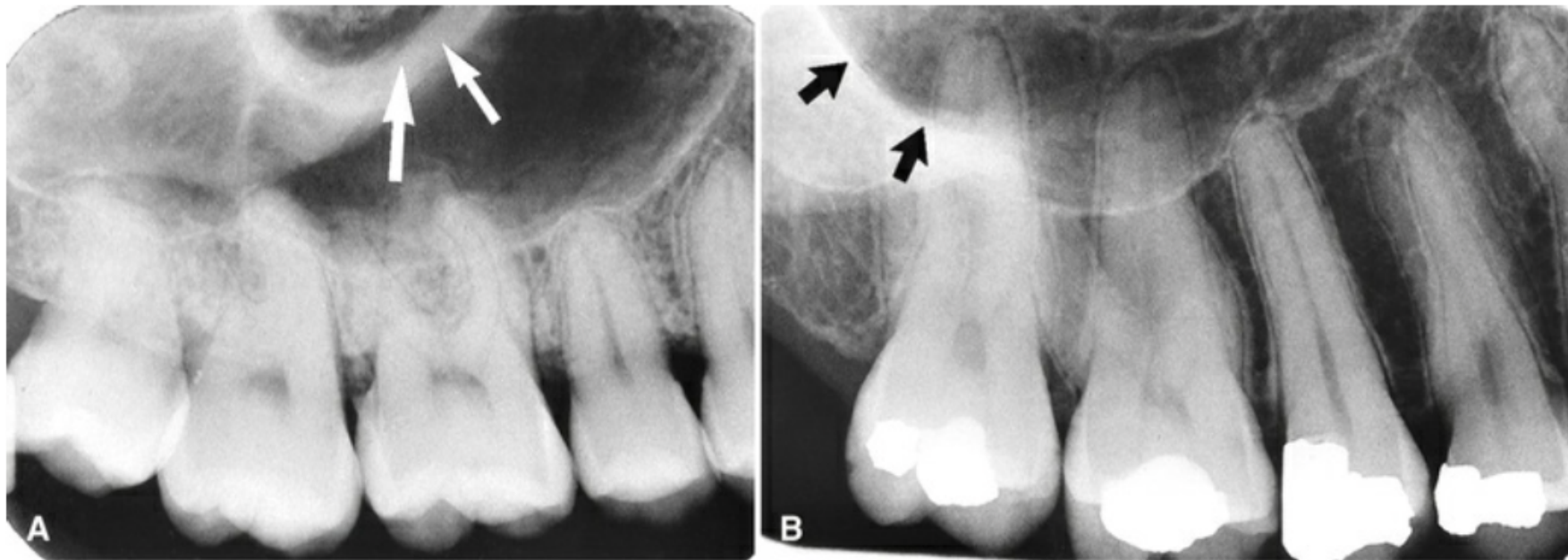


**FIG. 12.37** The anterior border of the maxillary sinus (*white arrows*) crosses the floor of the nasal fossa (*black arrow*).



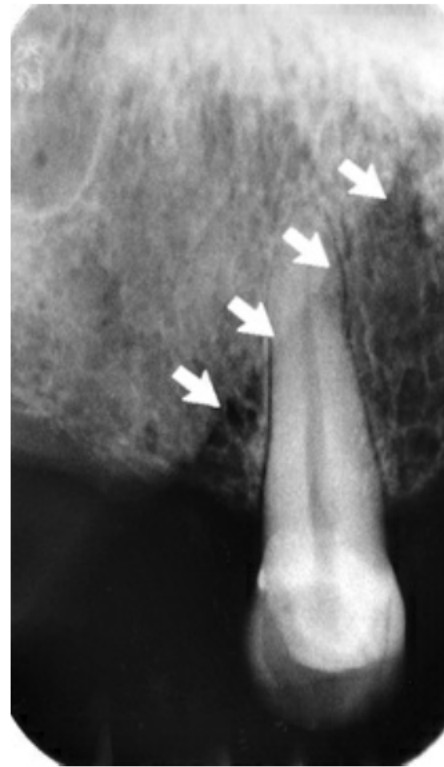
**FIG. 12.40** Neurovascular canals (*arrows*) in the lateral wall of the maxillary sinus. Such vascular canals, although typically less prominent, are commonly seen in the walls of the normal maxillary sinus.

# Zygomatic Process



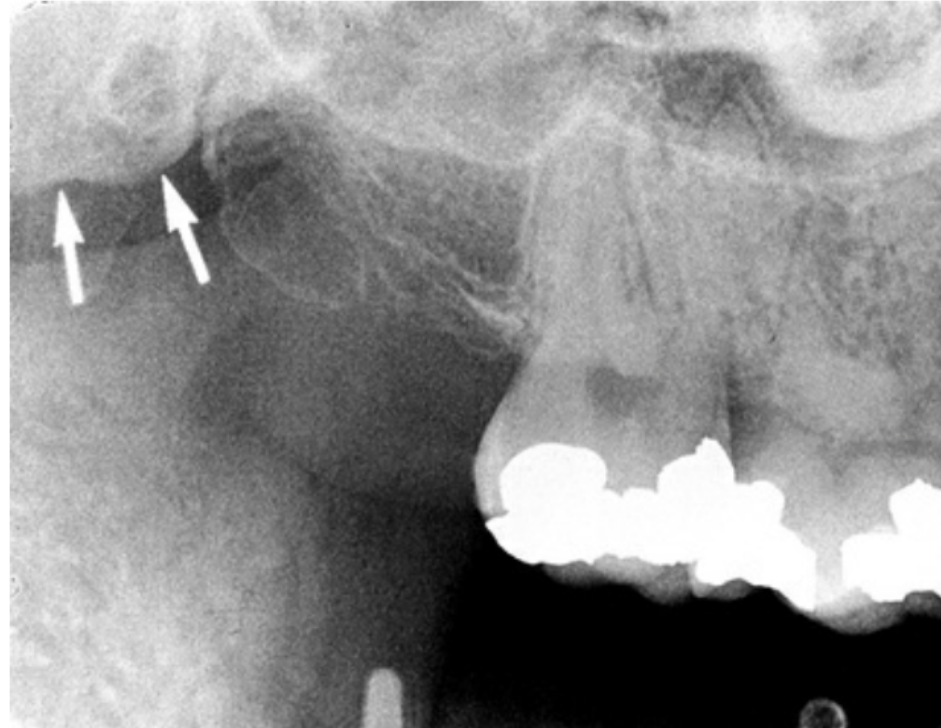
**FIG. 12.43** The zygomatic process of the maxilla (*arrows*) protrudes laterally from the maxillary wall. Its size may be quite variable: small with thick borders (A) or large with thin borders (B).

# Nasolabial Fold



**FIG. 12.45** The nasolabial soft tissue fold (*arrows*) extends across the canine-premolar region.

# Pterygoid Plates



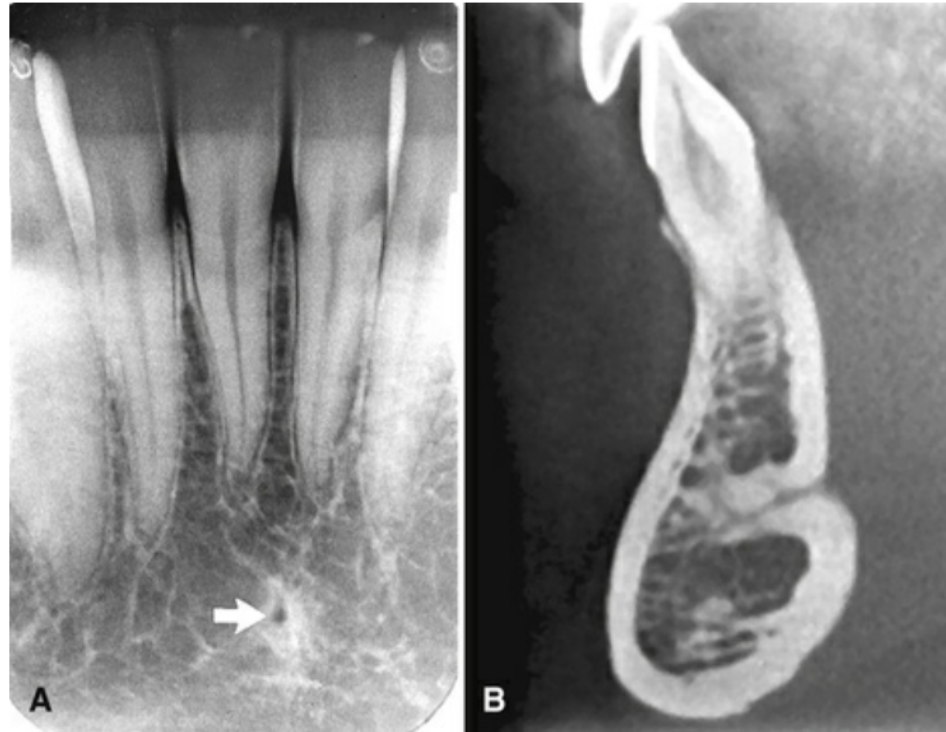
**FIG. 12.46** Pterygoid plates (*arrows*) located posterior to the maxillary tuberosity.

# Genial Tubercles



**FIG. 12.50** The genial tubercles (*arrow*) appear as a radiopaque mass, in this case without evidence of the lingual foramen.

# Lingual Foramen & Canal



**FIG. 12.51** Lingual foramen. (A) Lingual foramen on a periapical view (*arrow*), with a sclerotic border, in the symphyseal region of the mandible. (B) Cone beam sagittal section through mandibular midline shows superior lingual foramen extending deep into the mandible from the lingual surface.

# Mental Fossa

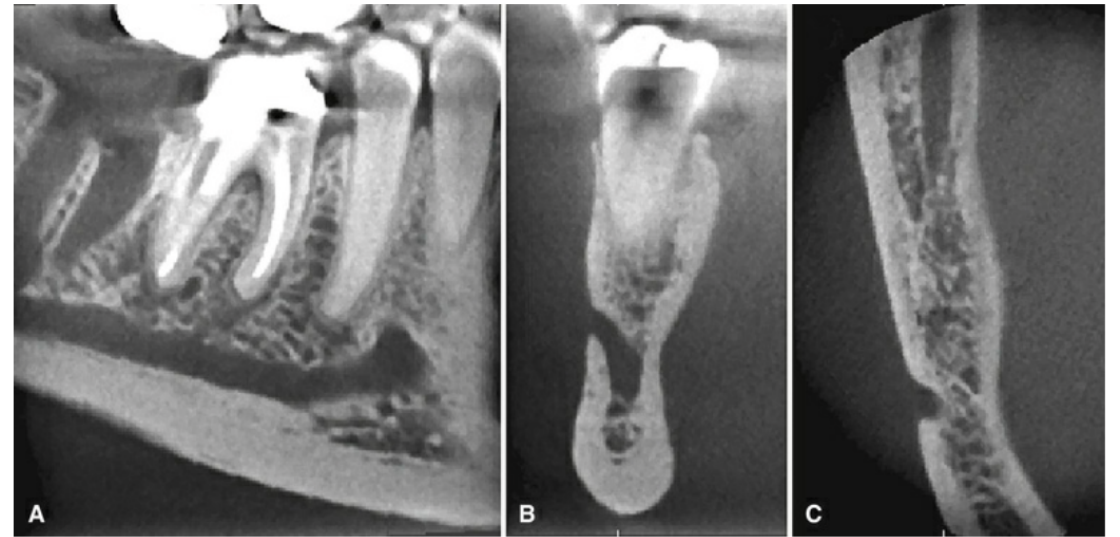


**FIG. 12.53** The mental fossa is a depression on the anterior surface of the mandible and is seen as a radiolucent area with ill-defined borders (*arrows*) in the region of the incisor roots.

# Mental Foramen

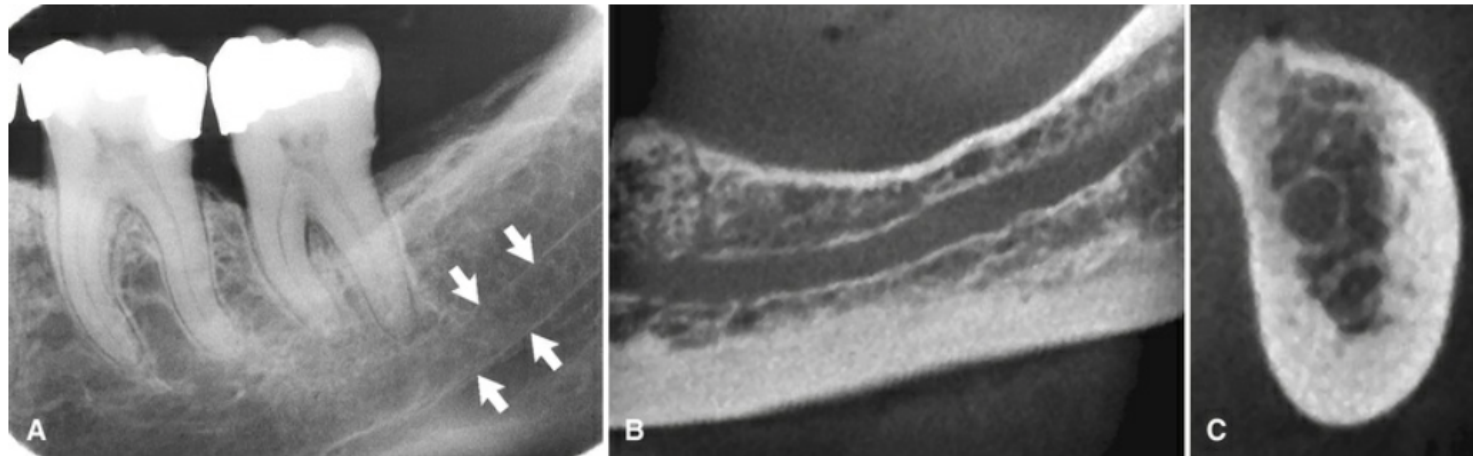


**FIG. 12.54** The mental foramen (*arrow*) appears as an oval radiolucency typically near the apex of the second premolar.

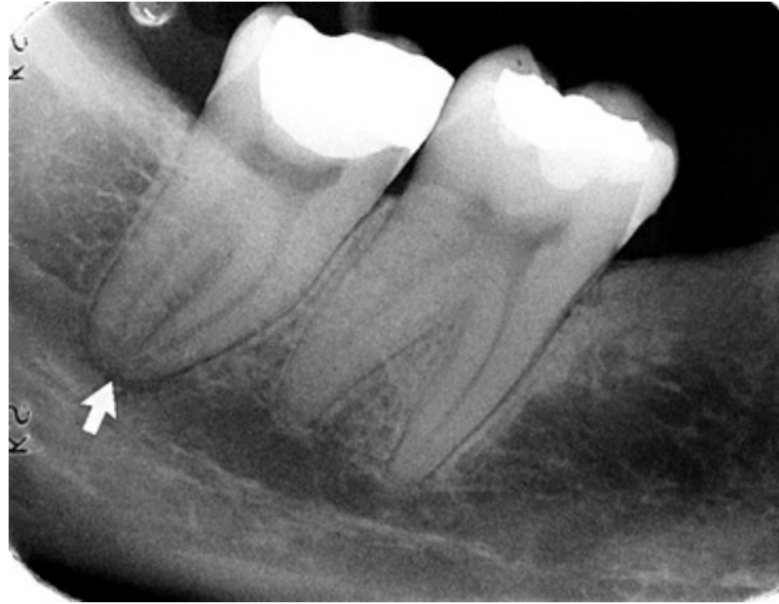


**FIG. 12.56** The mental foramen (*arrow*) (over the apex of the second premolar) may simulate periapical disease. However, continuity of the lamina dura around the apex indicates the absence of periapical abnormality.

# Mandibular Canal

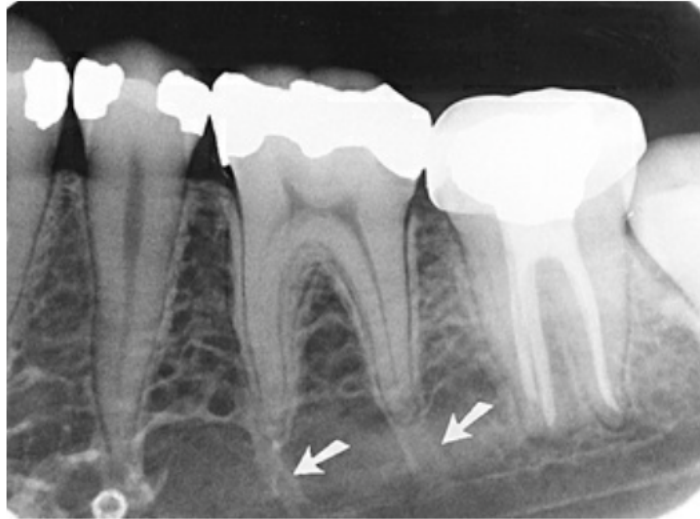


**FIG. 12.57** Inferior alveolar canal. (A) On periapical view, *arrows* denote radiopaque superior and inferior cortical borders. (B) Cone beam section through the body of the mandible (different patient) shows corticated borders of the inferior alveolar canal. (C) Cone beam cross-sectional view shows the circular inferior alveolar canal with corticated borders lying adjacent to the lingual plate.



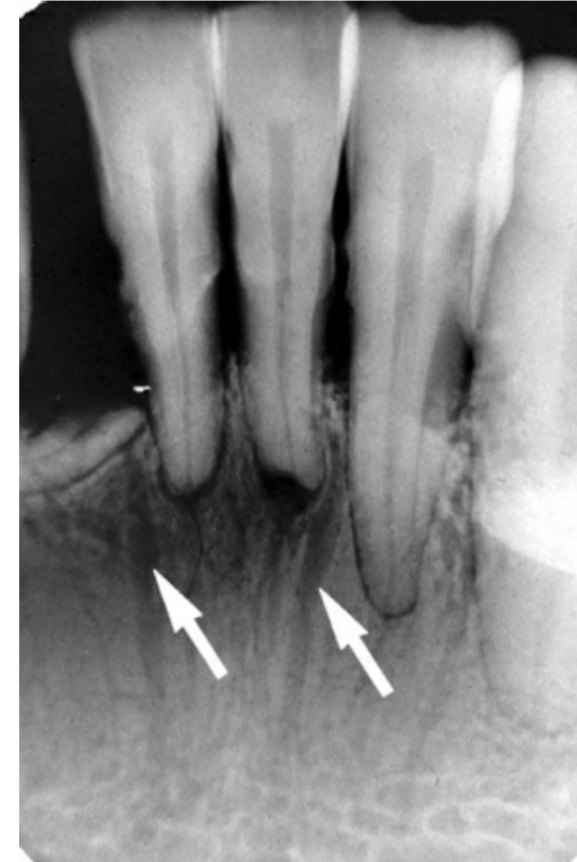
**FIG. 12.58** Superimposition of the inferior alveolar canal over the apex of a molar causes the image of the periodontal ligament space to appear wider (*arrow*). However, the presence of an intact lamina dura indicates that there is no periapical disease.

# Nutrient Canals



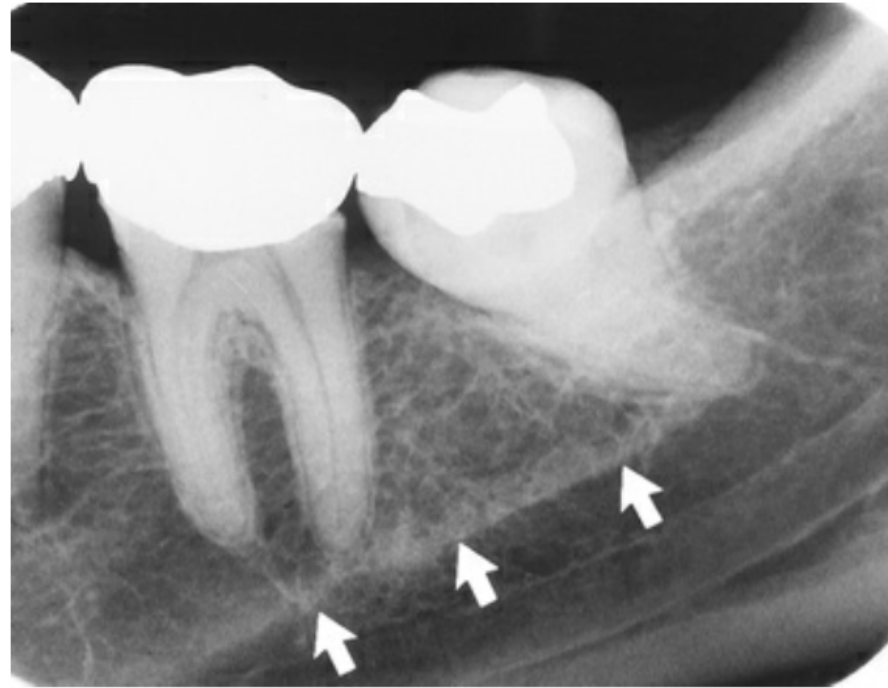
**FIG. 12.60** Nutrient canals (*arrows*), demonstrated by radiopaque cortical borders, descend from the mandibular first molar. Nutrient canals at this location are a common finding.

What are the irregular opacities on the roots?



**FIG. 12.61** Nutrient canals seen as vertical radiolucent structures (*arrows*) in the anterior mandible are often associated with periodontal disease as in this patient.

# Mylohyoid Ridge



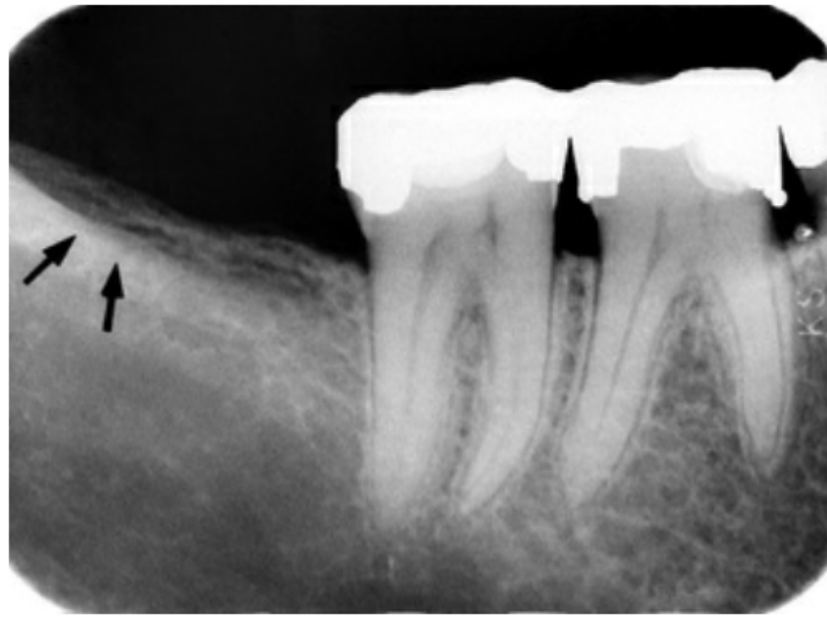
**FIG. 12.62** Mylohyoid ridge (*arrows*) running at the level of the molar apices and above the inferior alveolar canal.

# Submandibular Fossa / Concavity



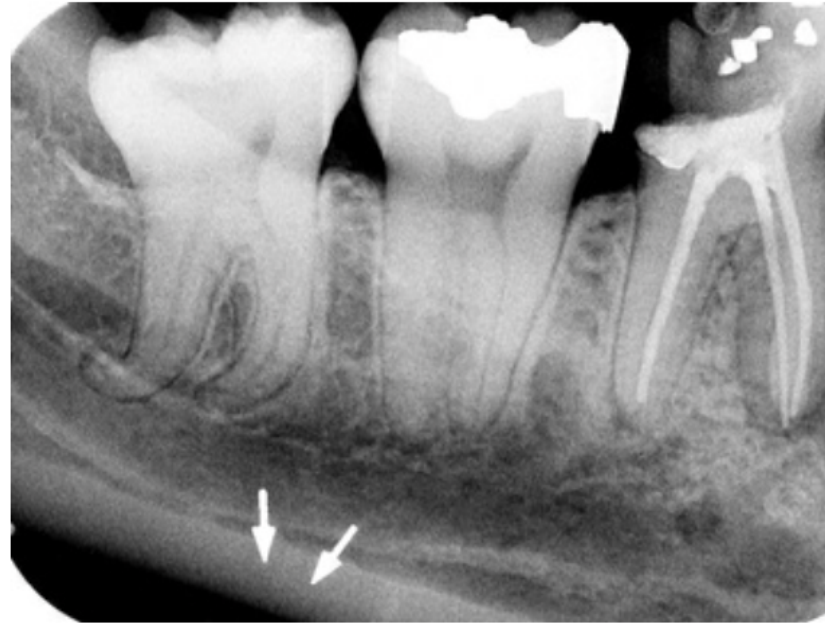
**FIG. 12.64** Submandibular gland fossa (*arrows*), indicated by a radiolucent region with ill-defined borders and sparse trabecular bone lying inferiorly to the mandibular molars.

# External Oblique Ridge



**FIG. 12.65** External oblique ridge (*arrows*) on the buccal surface of the mandible, seen as a radiopaque line near the alveolar crest in the mandibular third molar region.

# Inferior Cortical Border of the Mandible



**FIG. 12.66** The inferior border of the mandible (*arrows*) is seen as a dense, broad radiopaque band.

End.