

10 Radiologic Diagnoses Every Dentist Should Know

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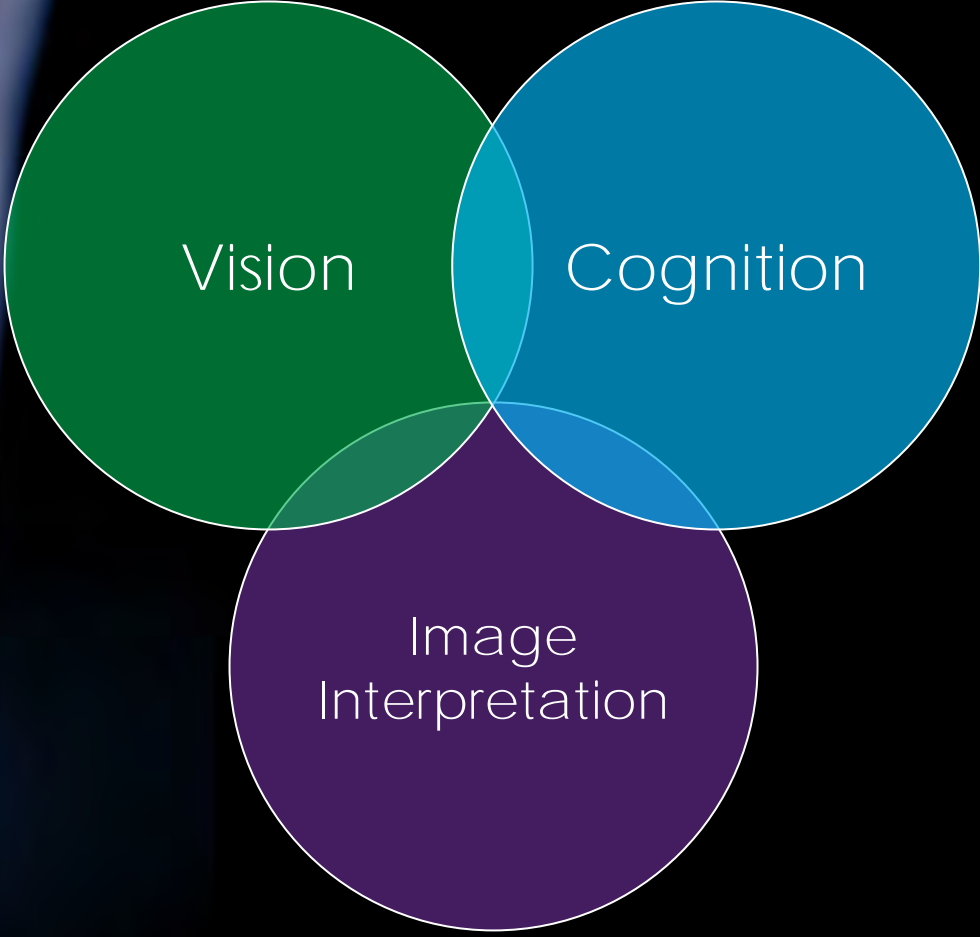
UNIVERSITY OF TORONTO
FACULTY OF DENTISTRY

A close-up, high-contrast photograph of a person's eye, looking directly at the camera. The eye is light-colored, possibly hazel or green, and is the central focus. The surrounding skin and hair are in soft focus. The overall lighting is cool and blue-toned. The text "Interpretation vs. Diagnosis" is overlaid in white, sans-serif font on the right side of the image.

Interpretation vs. Diagnosis



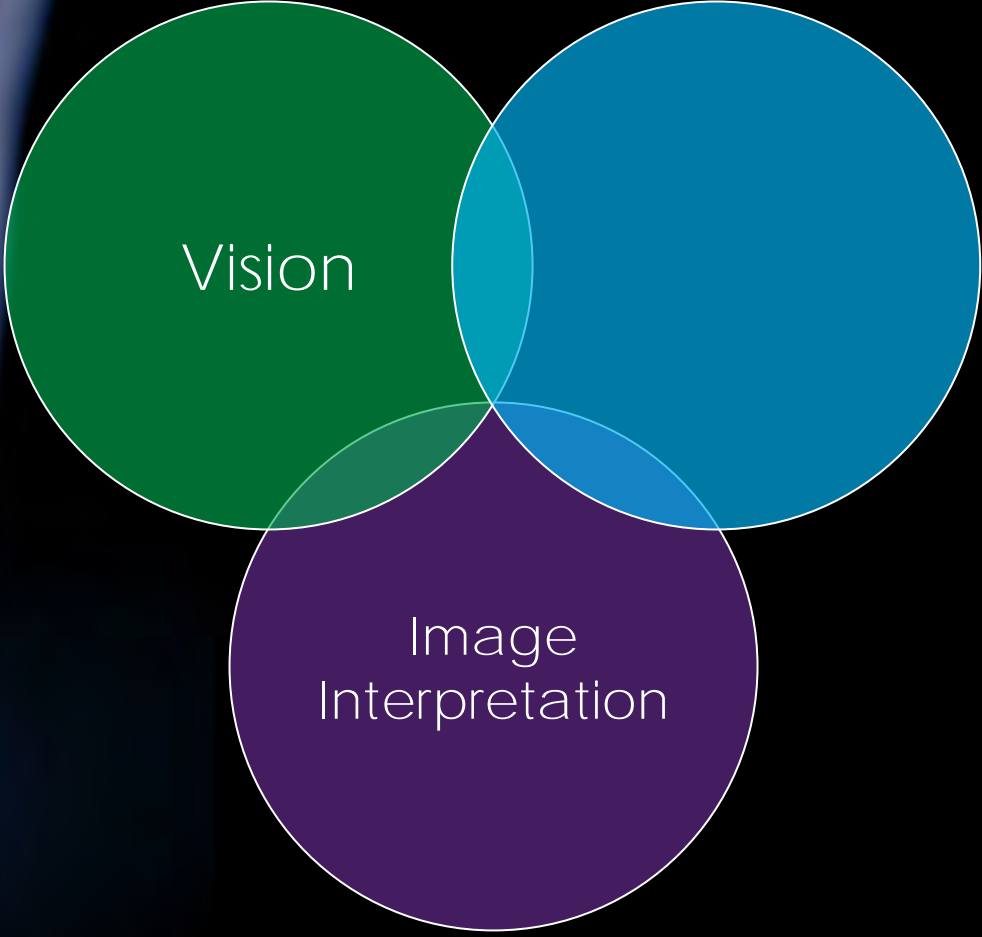
Science or Art?



Vision

Cognition

Image
Interpretation

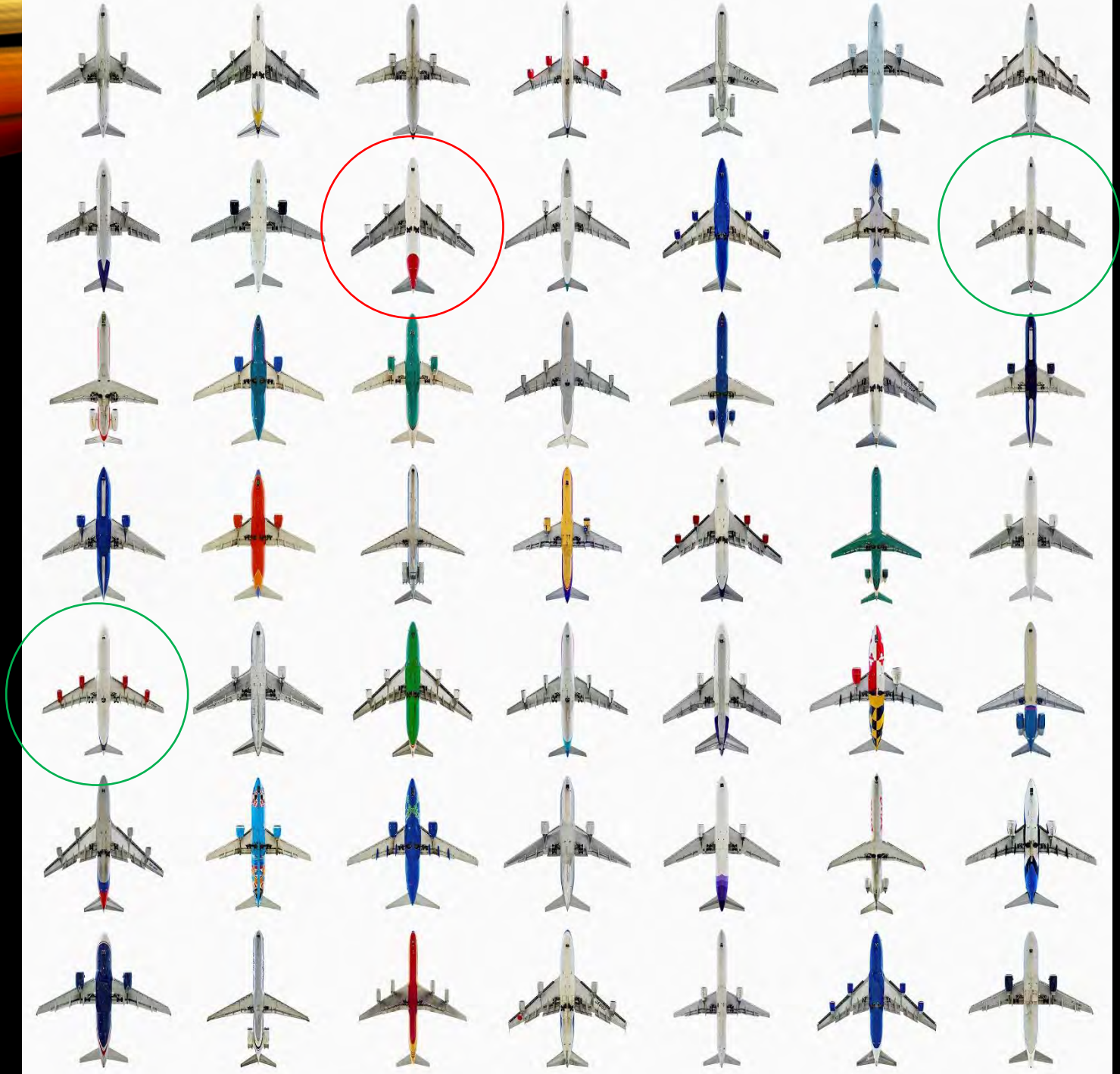


Vision

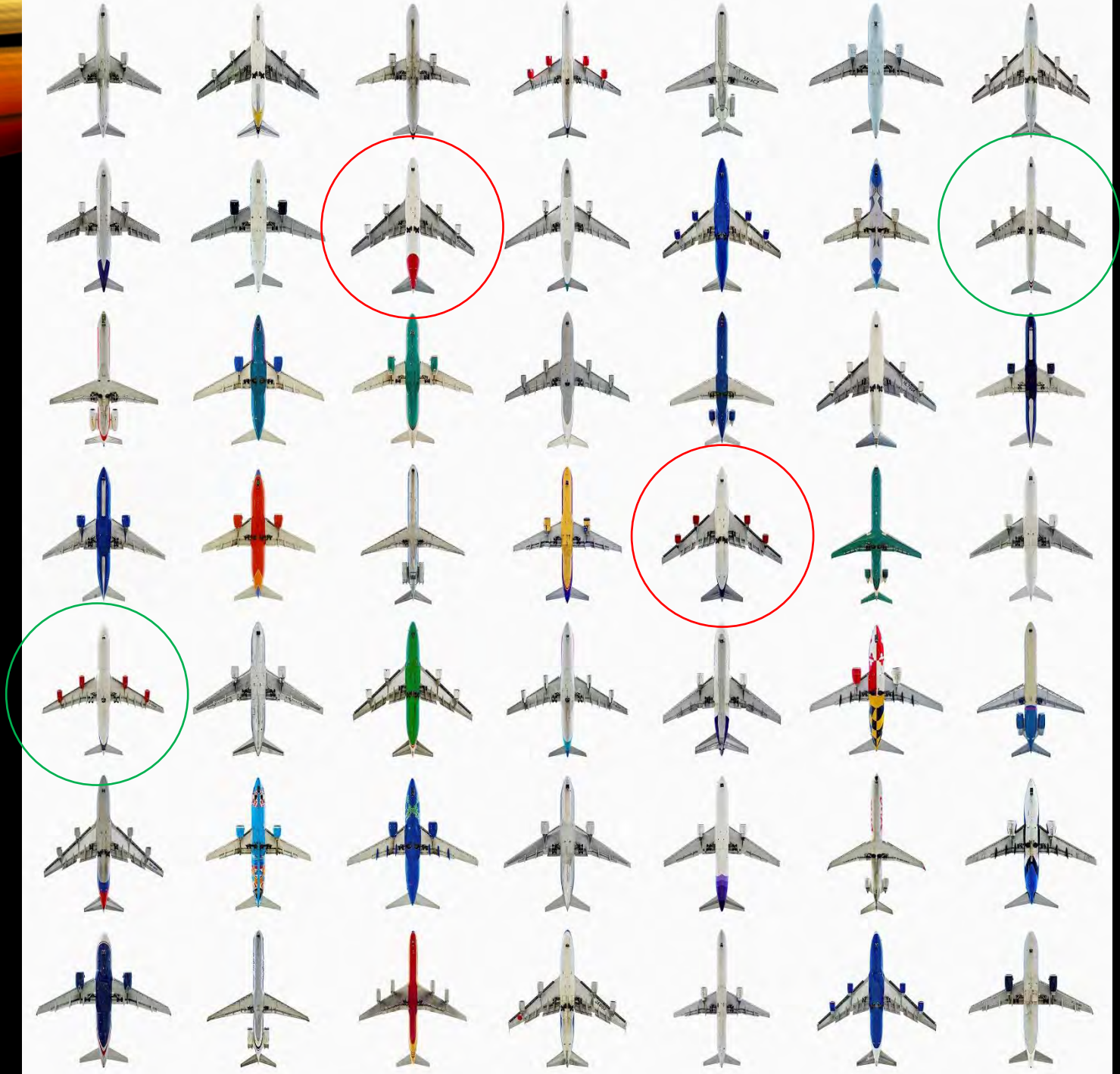
Image
Interpretation



Milstein, Aircraft The Jet as Art, 2007



Milstein, AirCrafft The Jet as Art, 2007



Milstein, AirCraFt The Jet as Art, 2007






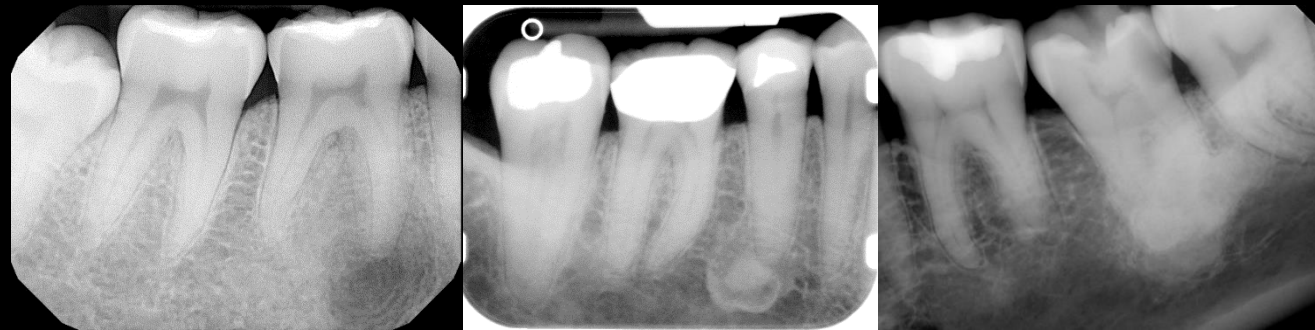
Image Investigation




What do you see?

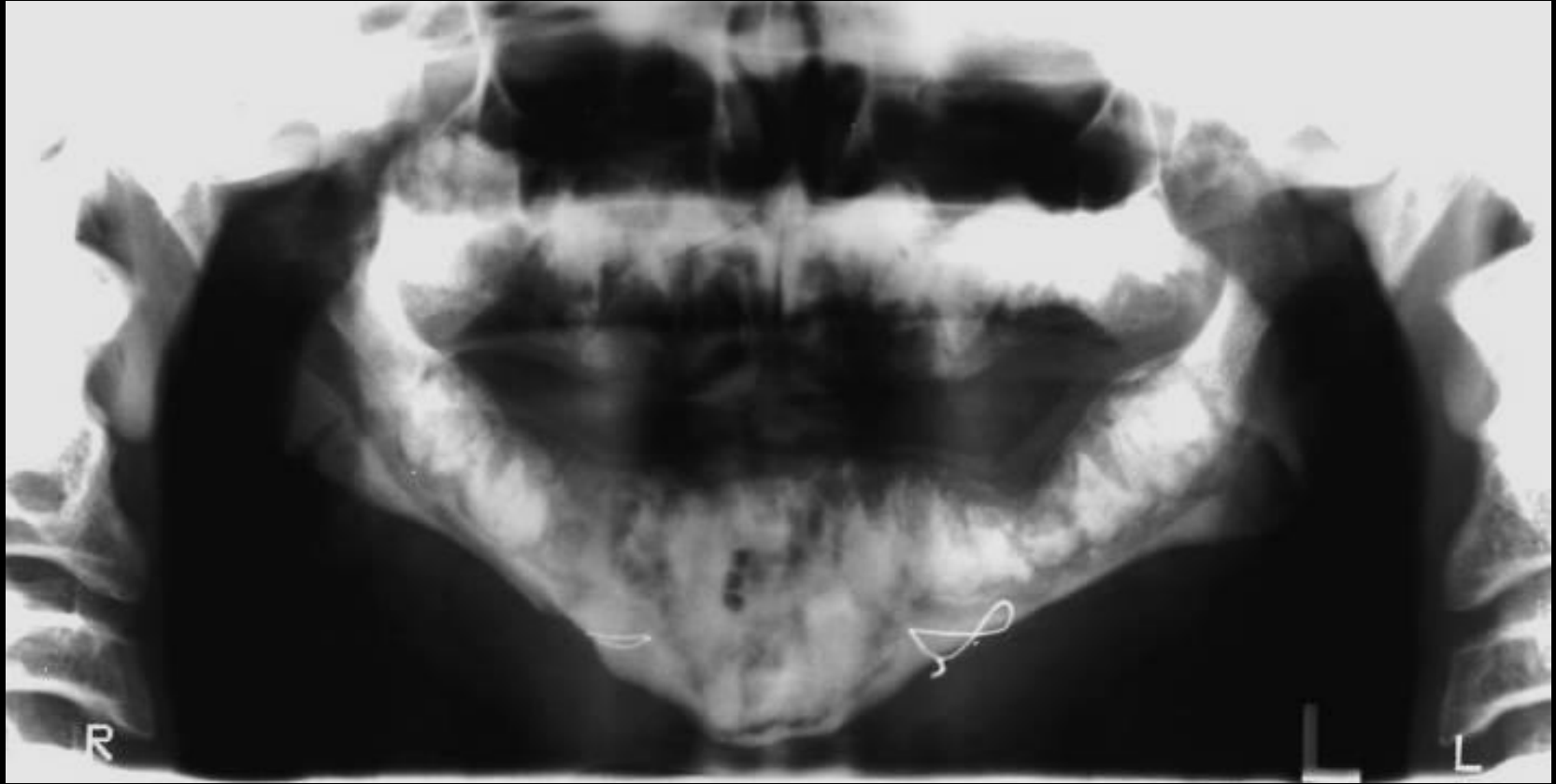
- 
- The cemento-osseous dysplasias are a group of non-neoplastic processes usually confined to the tooth-bearing areas of the jaws or edentulous alveolar processes.

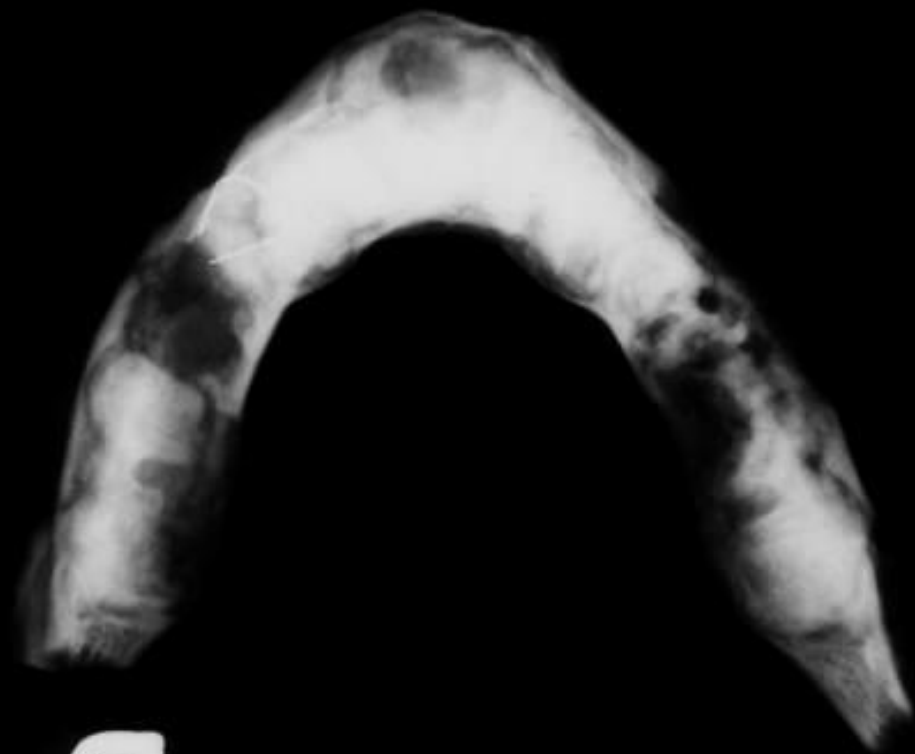
- 
- Three stages have been described:
 - An early stage, in which the changes are primarily radiolucent, mimicking lesions of rarefying osteitis.
 - A mixed stage where a radiopaque focus may be seen at or near the centre of a larger radiolucent area.
 - A mature stage, where the changes are primarily radiopaque, although with a thin peripheral radiolucent rim.



- 
- Given the large number of published case reports or series over the years, it is clear that this abnormality is not well-understood by clinicians, and as a result, there is mismanagement.

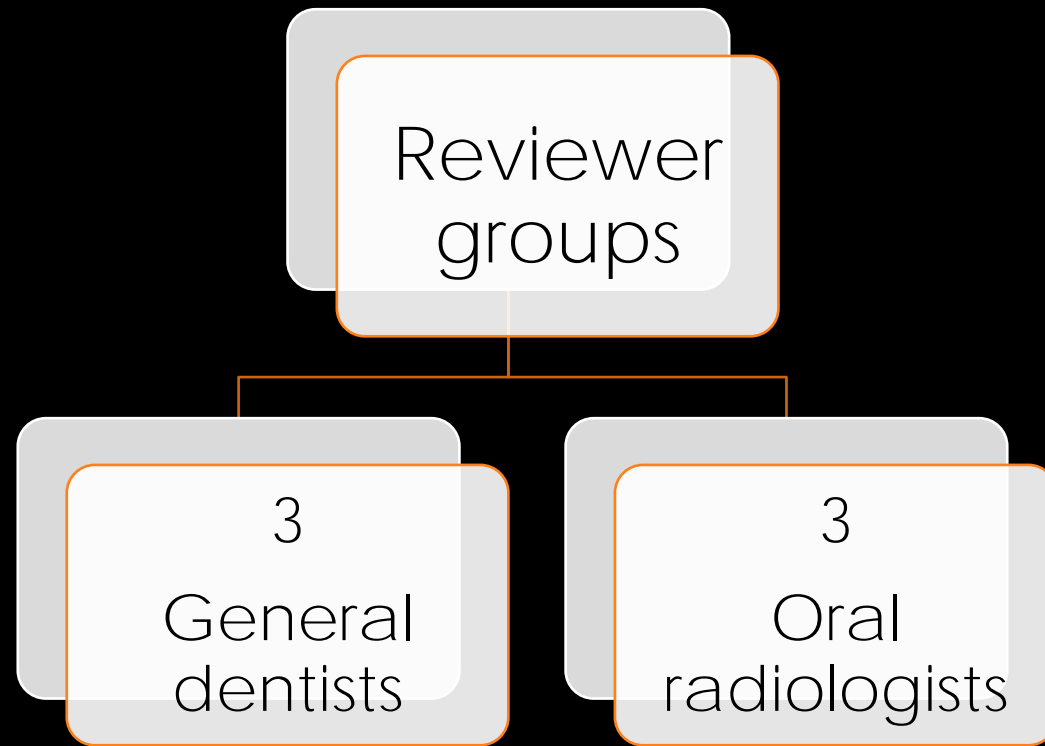






R

- 
- What radiologic features support a correct interpretation of cemento- osseous dysplasia?



- 37 Cemento-osseous dysplasia cases and 13 additional image sets consisting of other similarly-appearing entities:
 - cementoblastoma
 - ossifying fibroma
 - complex odontoma
 - dense bone island
 - fibrous dysplasia

Interpretation	General dentists	Oral radiologists	<i>p</i> ^a
Correct	38.7%	79.3%	<0.001
Incorrect	61.3%	20.7%	

^a chi-square value = 37.711 df = 1

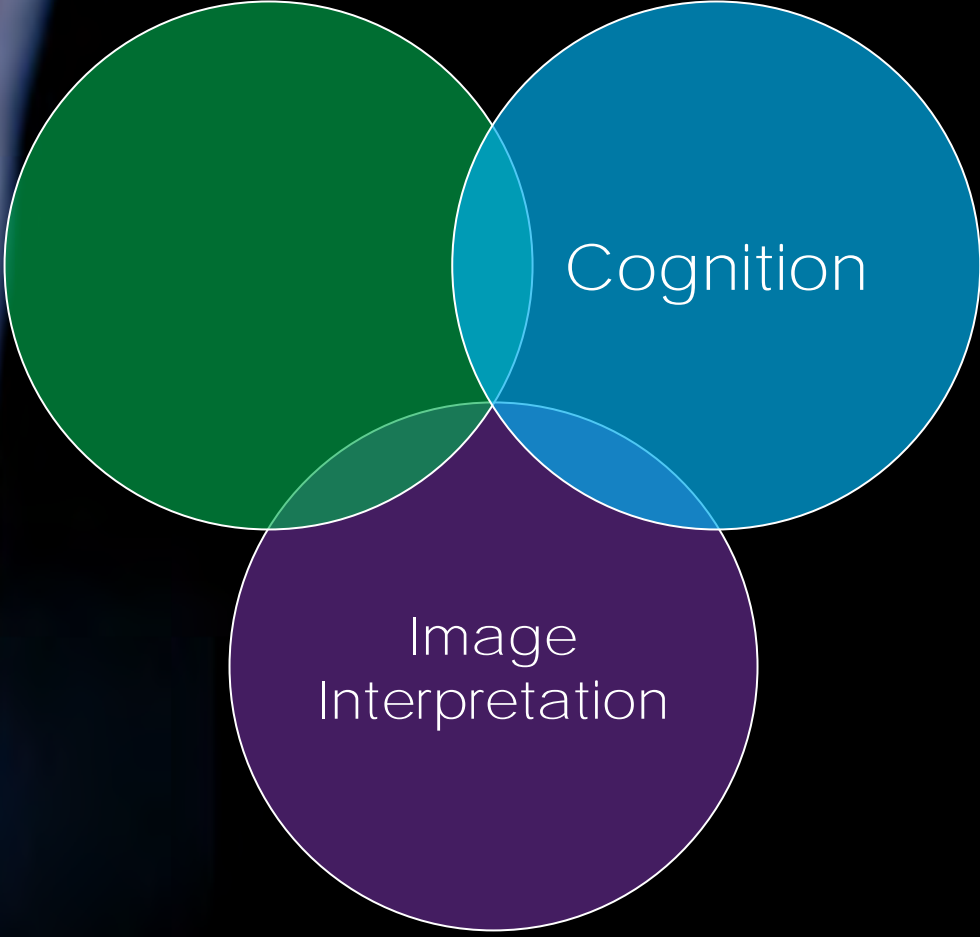
Logistic Regression Model for General Dentists

Radiographic feature	Adjusted OR	95.0% CI for exp (β)		p
		lower	upper	
No root resorption	4.52	1.18	17.30	0.03
Ant. & post. teeth	3.22	1.42	7.52	0.01
constant	3.45			0.05

Logistic Regression Model for Oral & Maxillofacial Radiologists

Radiographic feature	Adjusted OR	95.0% CI for exp (β)		p
		lower	upper	
Mixed radiolucent/radiopaque	10.53	2.06	52.63	0.01
Bilateral	10.23	2.00	52.56	0.01
Internal radiolucent periphery	8.28	2.14	32.56	<0.001
No cortical expansion	7.63	1.46	40.00	0.02
Well-defined periphery	6.67	1.50	28.57	0.01
Anterior & posterior teeth	4.34	1.11	17.54	0.04
constant	14.81			0.01

- 
- While the identification of one or more imaging features may be important in image interpretation, is there anything else that may be important?



Cognition

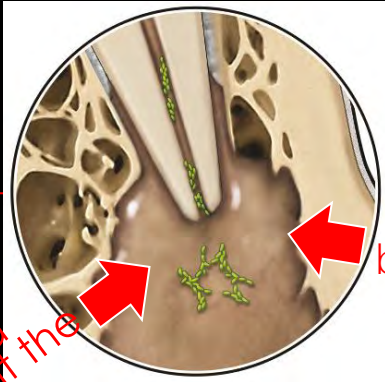
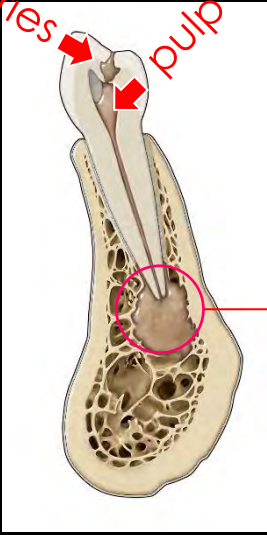
Image
Interpretation





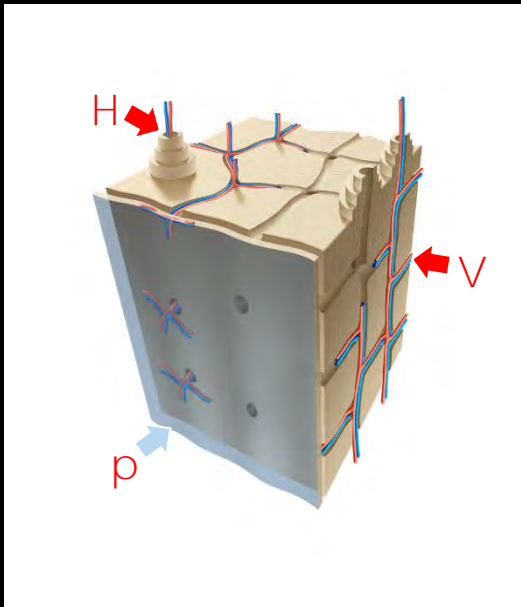
How did this happen?

caries
pulp necrosis

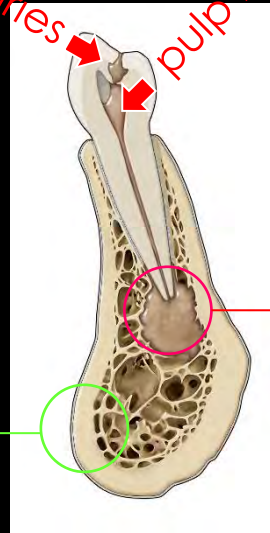


bacteria and
metabolites exit the
root apex

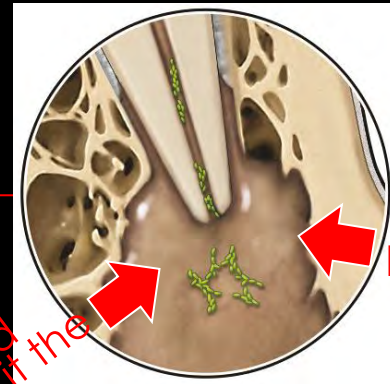
bone resorption



normal bone surface



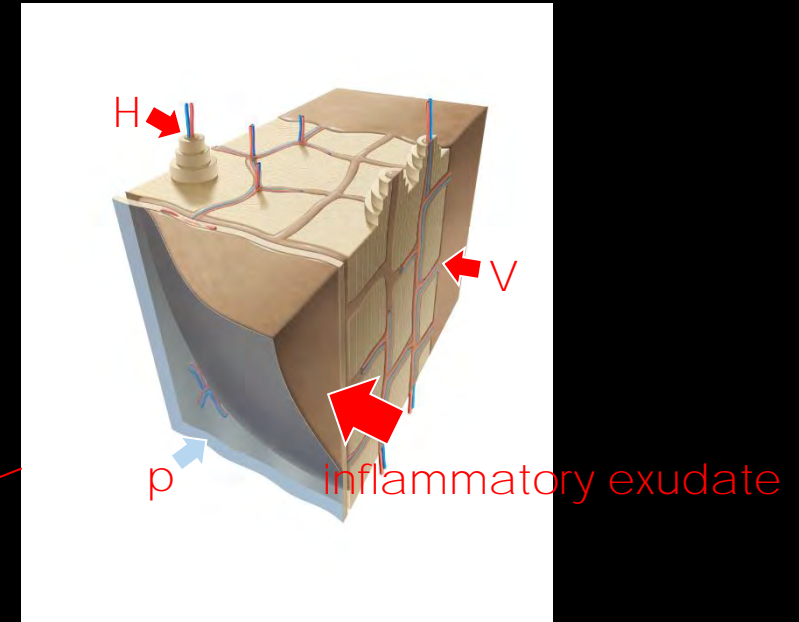
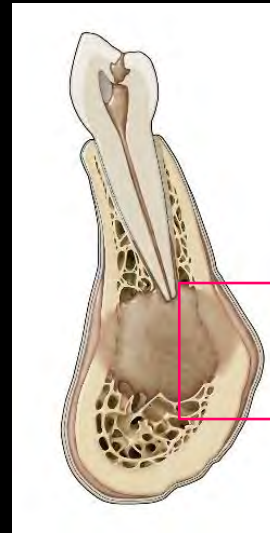
caries
pulp necrosis




bacteria and
metabolites exit the
root apex

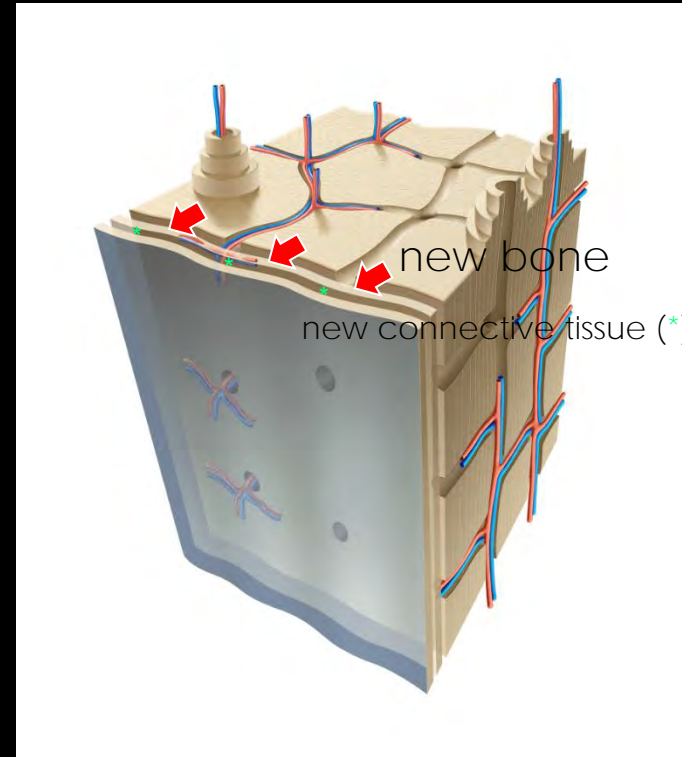
bone resorption

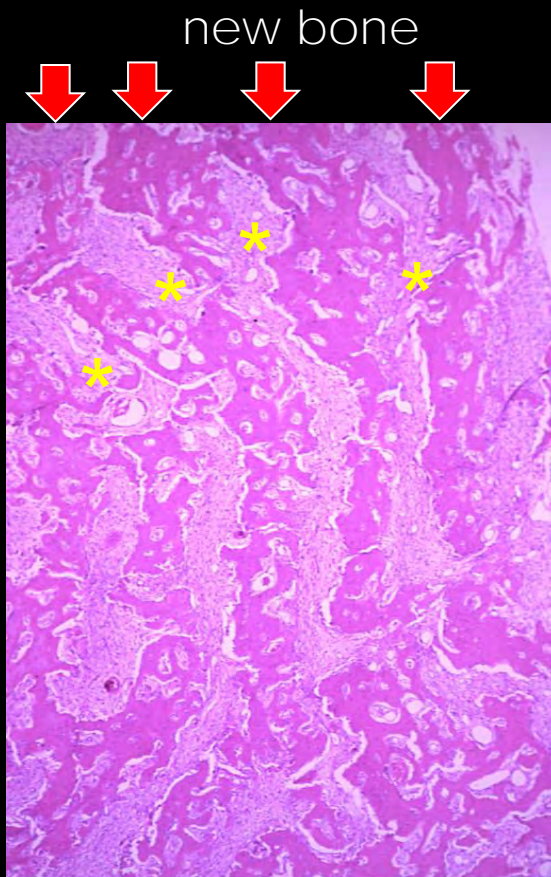
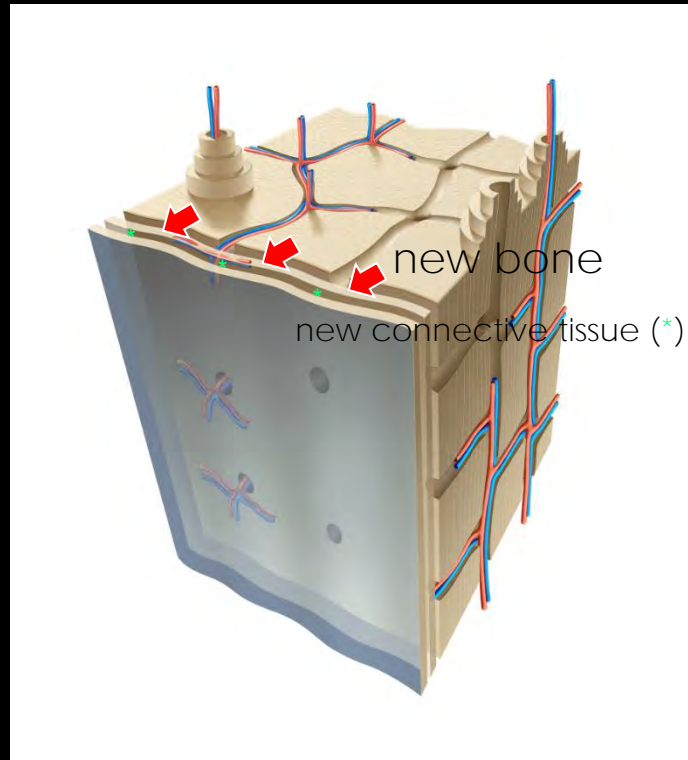
- Widespread dissemination of the inflammatory response may extend to nearby cortical borders through the Haversian system and Volkmann's canals, and this may result in a physical lifting of the periosteum from the cortical surface of the bone.

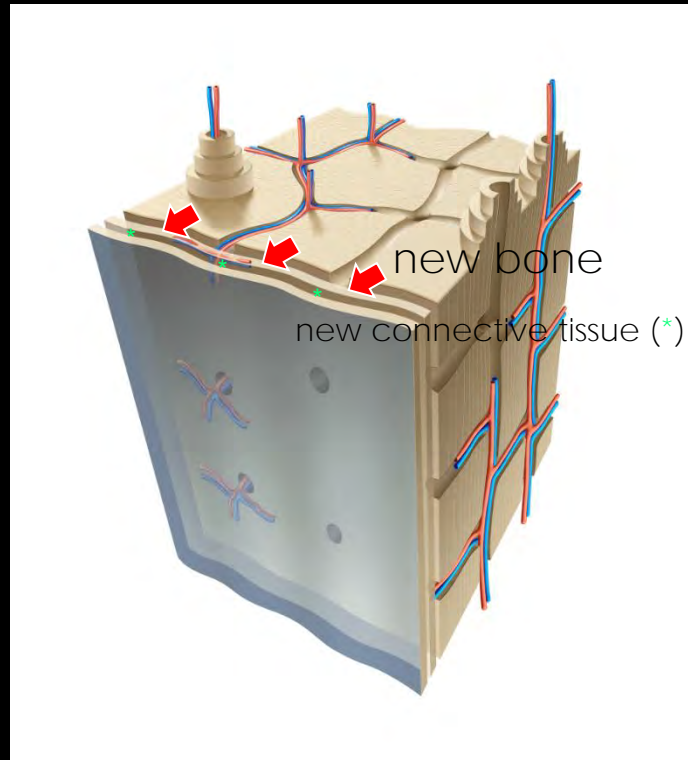


- 
- This process also results in the stimulation of bone surface osteoblasts, and the recruitment and differentiation of pluripotential mesenchymal stem cells in the periosteum into osteoblasts and fibroblasts.

- The stimulated osteoblasts lay down a layer of new bone parallel to the cortical surface that is radiopaque, and proliferating connective tissue is radiolucent.







- 
- Can an understanding of these basic principles of disease development improve students' diagnostic accuracy?

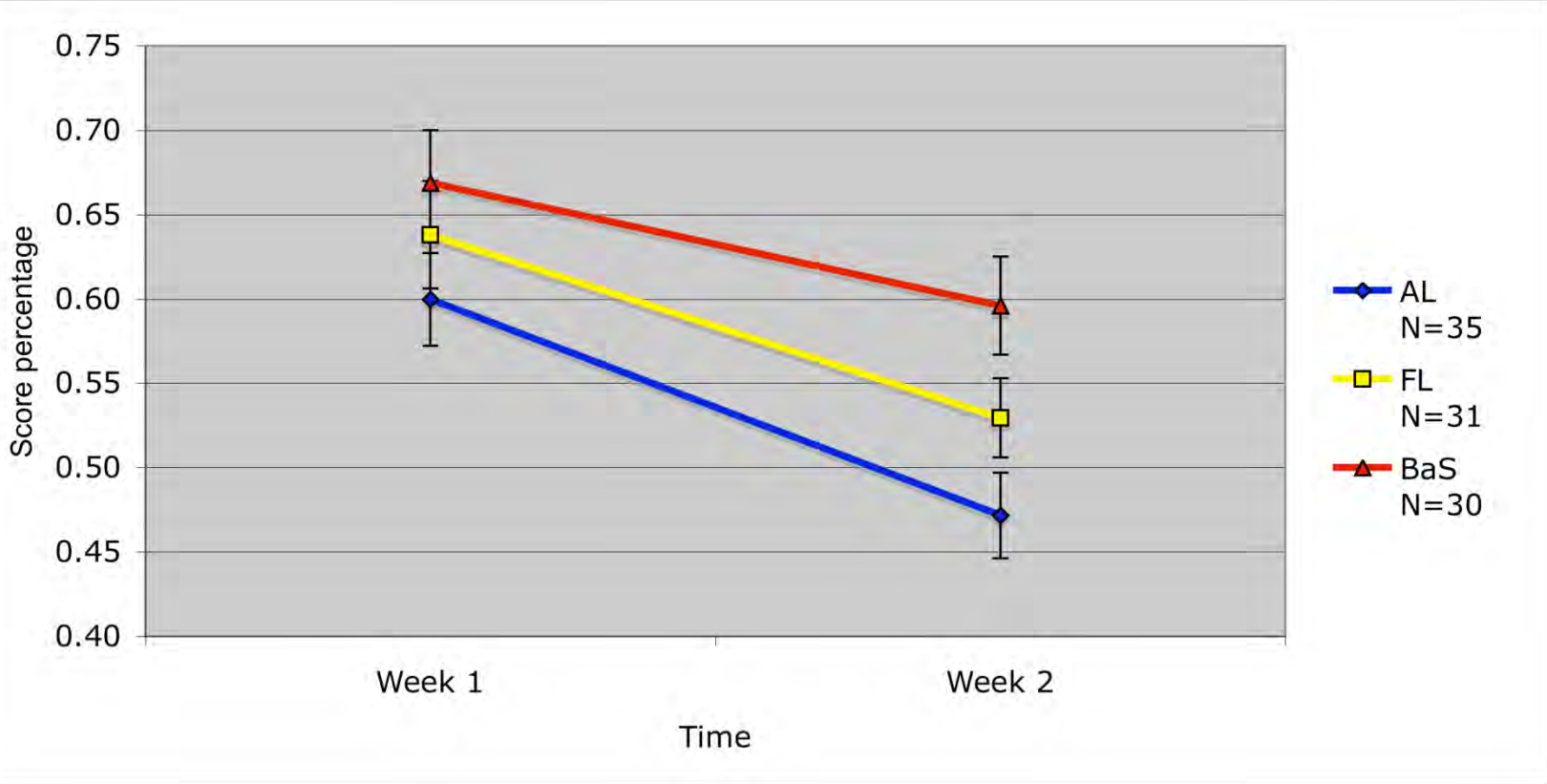
- 96 undergraduate dentistry and dental hygiene students, randomly divided into 3 learning conditions.
 - feature list (unstructured algorithm)
 - structured algorithm
 - basic science



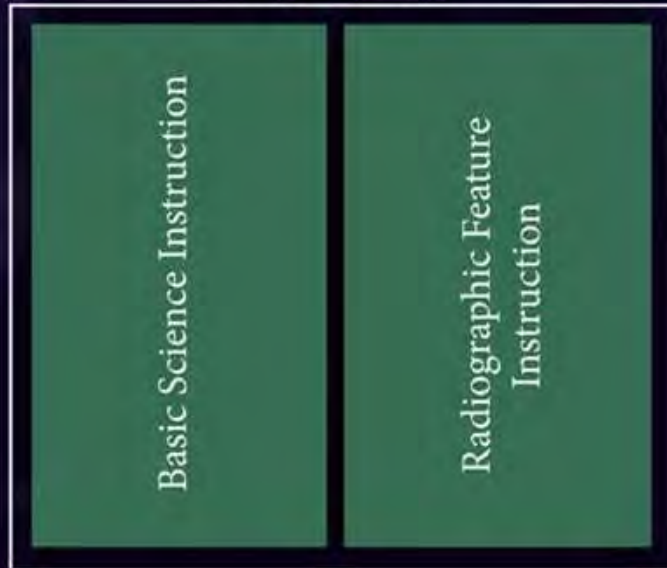
a: periapical cemento-osseous dysplasia
b: complex odontome
c: dense bone island
d: sclerosing osteitis

BASIC SCIENCE

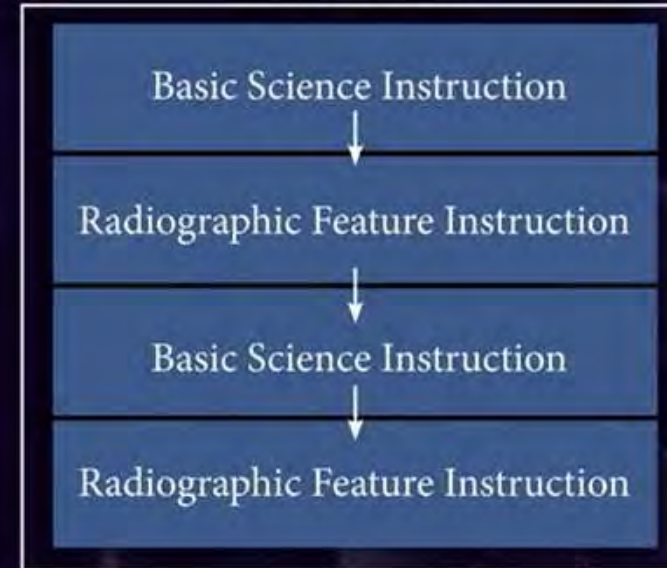
- Odontomas are benign tumours that originate from **remnants of the dental lamina** in the jaws. The **histological appearance** is characterized by the production of mature enamel, dentin, cementum, and pulp tissue. In complex odontomas the tumor forms nondescript masses of dental tissue. This is manifested radiographically as an irregular radiopaque mass. The degree of radiopacity is equivalent to adjacent tooth structure.
- Radiographically, odontomas are well defined with a corticated border, which represents **reactive bone**. Corticated borders are typically seen in **slow growing lesions** (i.e. cysts and benign slow growing tumours). Immediately inside and adjacent to the cortical border there is a smooth uniform radiolucent space, which represents **the soft tissue fibrous capsule**, surrounding the tumor.
- Odontomas develop and mature while the related teeth are forming and cease development when the associated teeth complete development. Because of the **slow and space-occupying nature** of the growth of this tumour, frequently it displaces nearby teeth and obstructs the normal eruption of adjacent teeth.

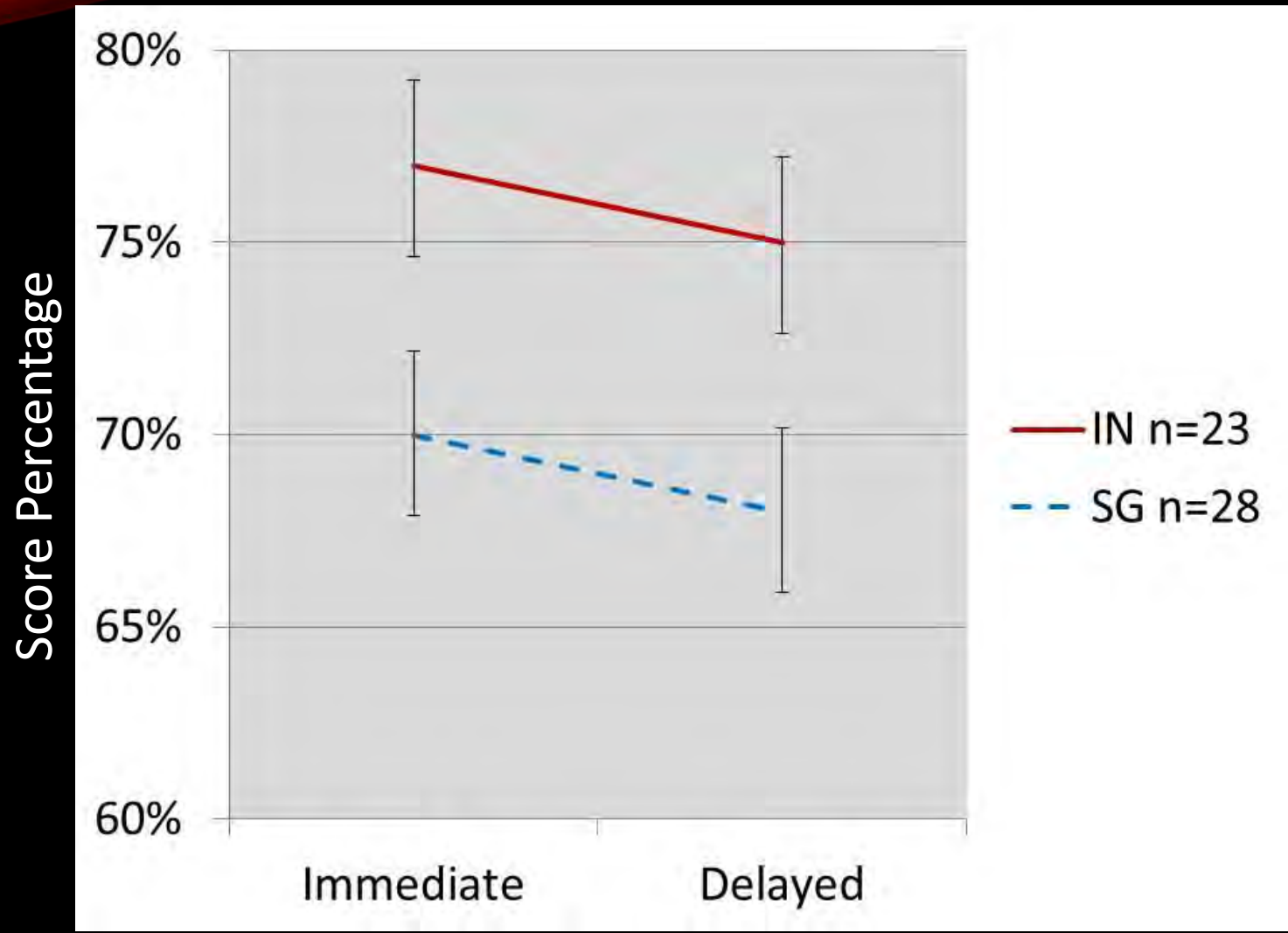


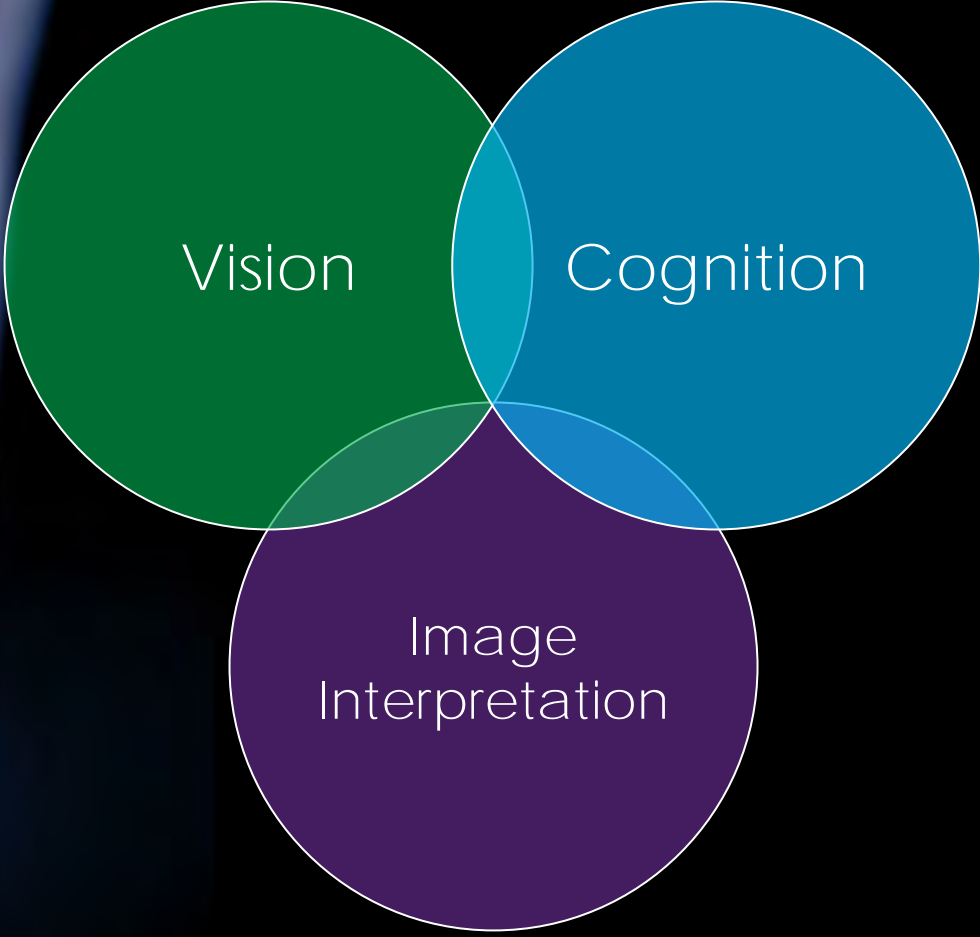
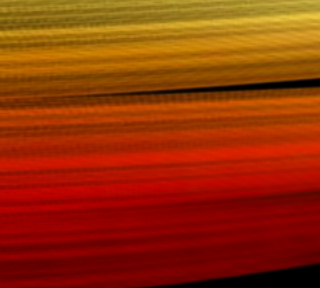
Segregated (SG)
Single Disease



Integrated (IN)
Single Disease







A close-up photograph of a person's eye, heavily tinted with a blue color. The eye is looking directly at the camera. The background is dark, with a vertical strip of orange and red on the left side and a curved cyan and blue shape in the top right corner. The text "A systematic approach" is overlaid in white on the right side of the image.

A systematic approach

abnormal

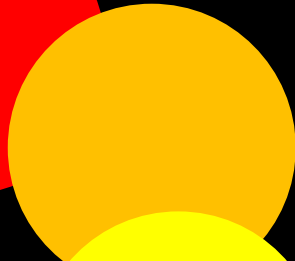


number

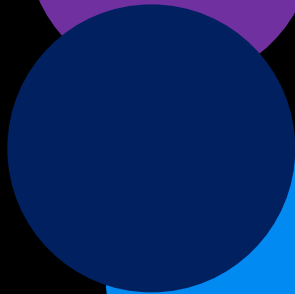
associations
with
teeth



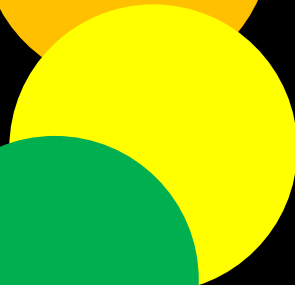
location



effects on
adjacent
structures



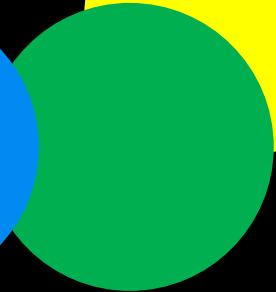
borders



internal
structure



density

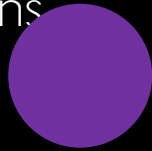


abnormal

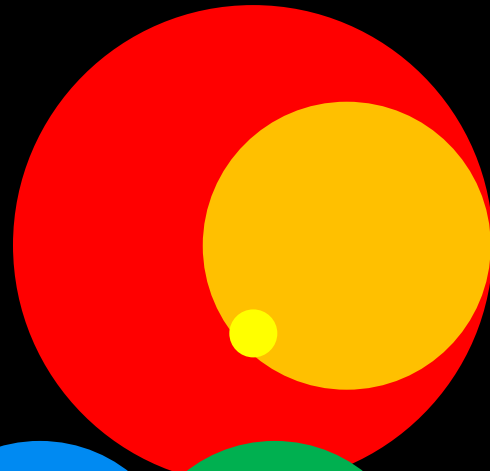


number

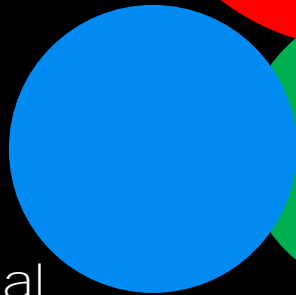
associations
with
teeth



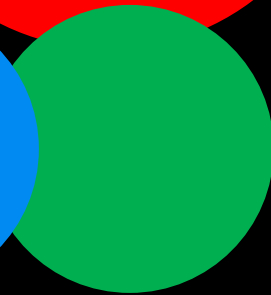
effects on
adjacent
structures



location



internal
structure



density

borders



Normal

Abnormal

Dental anomaly

Inflammation

Cyst

Benign neoplasia

Malignant neoplasia

Bone dysplasia

Metabolic disease

Vascular anomaly

Trauma

Choose the most likely disease category.

- a. Normal/variation of normal.
- b. Soft tissue calcification/ossification.
- c. Healing.
- d. Developmental dental anomaly.
- e. Cyst/pseudocyst.
- f. Benign neoplasm.
- g. Malignant neoplasm.
- h. Inflammation.
- i. Bone dysplasia.
- j. Vascular anomaly.
- k. Metabolic disease.
- l. Trauma.
- m. Temporomandibular joint abnormality.

Choose the most likely disease category.

- a. Normal/variation of normal.
- b. Soft tissue calcification/ossification.
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- d. Developmental dental anomaly.
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- f. Benign neoplasm.
- g. Malignant neoplasm.
- h. Inflammation.
- i. Bone dysplasia.
- j. Vascular anomaly.
- k. Metabolic disease.
- l. Trauma.
- m. Temporomandibular joint abnormality.

FYI. The answer is never "caries" or "periodontal disease"



- There is a well-defined, corticated, **radiolucent** area located adjacent to the distal root surface of the maxillary right second premolar. The entity scallops coronally between the roots of the premolar and first molar, but the **periodontal ligament spaces and lamina dura** along these root surfaces are intact.



Choose the most likely disease category for Case 1.

- a. Normal anatomy/variation of normal.
- b. Cyst/pseudocyst.
- c. Benign neoplasm.
- d. Malignant neoplasm.

RADIOPAQUE



metal (restorations, sutures, bullet fragments)
radiopaque white restorations and cements
enamel
dentin
cementum
cortical bone
trabecular bone
calculus



RADIOLUCENT

soft tissues (including normal cartilage)
body fluids
radiolucent white restorations and cements
fat
air



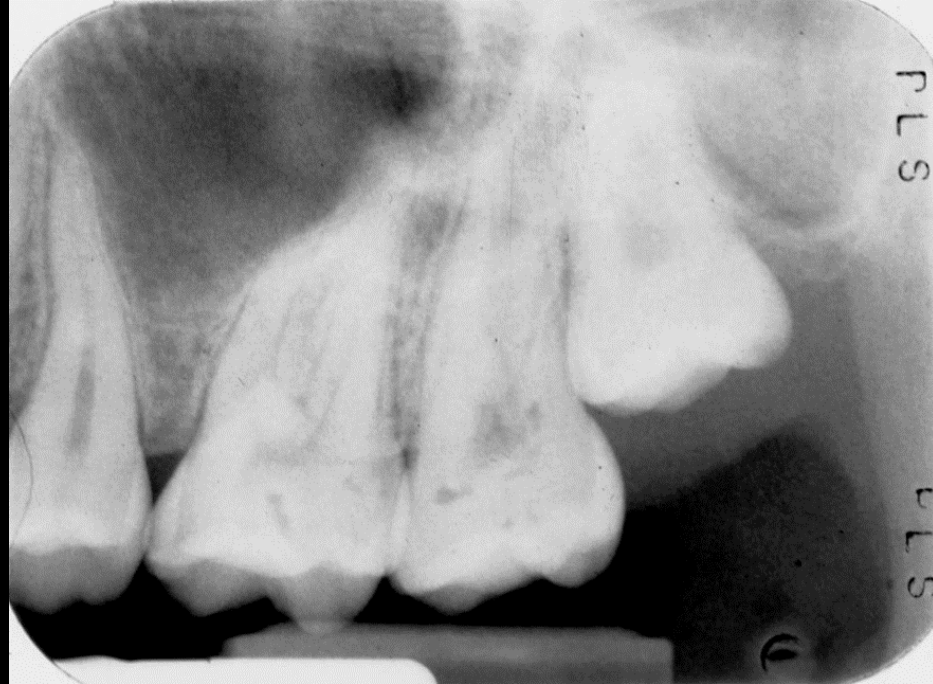
▫ Pneumatization is the development of air cells or cavities.



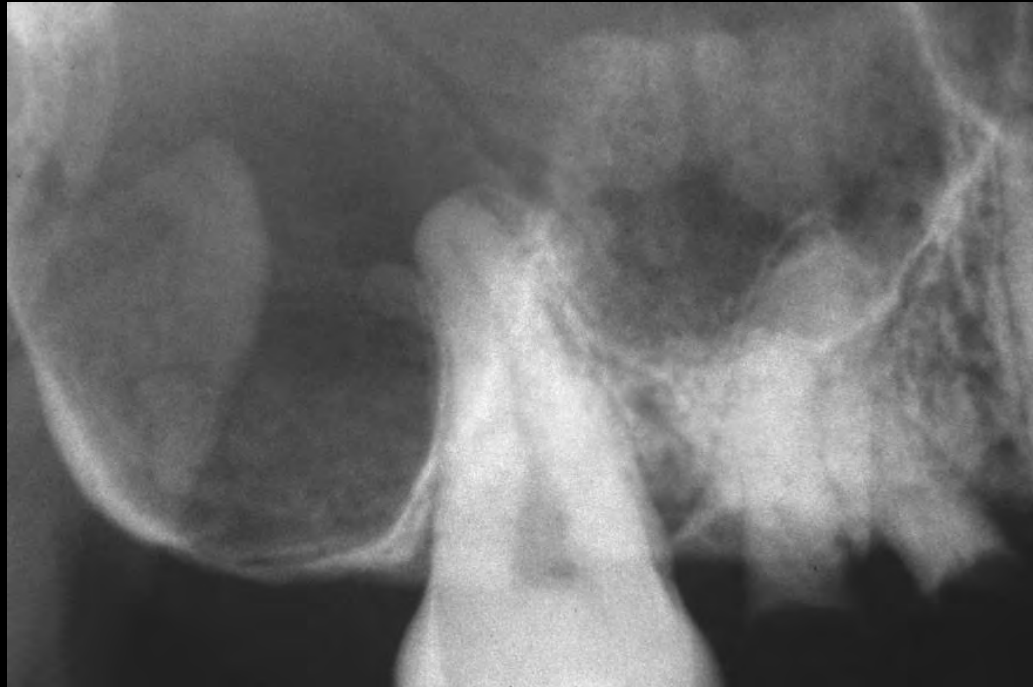
Variations in the position of the maxillary sinus floor relative to the teeth



SIEMENS ORTHODONT



An intra-oral image may be useful in this situation



Pneumatization of the maxillary tuberosity



Endodontic treatment of the maxillary sinus

- 
- No further imaging or follow-up is required for pneumatization of the maxilla.

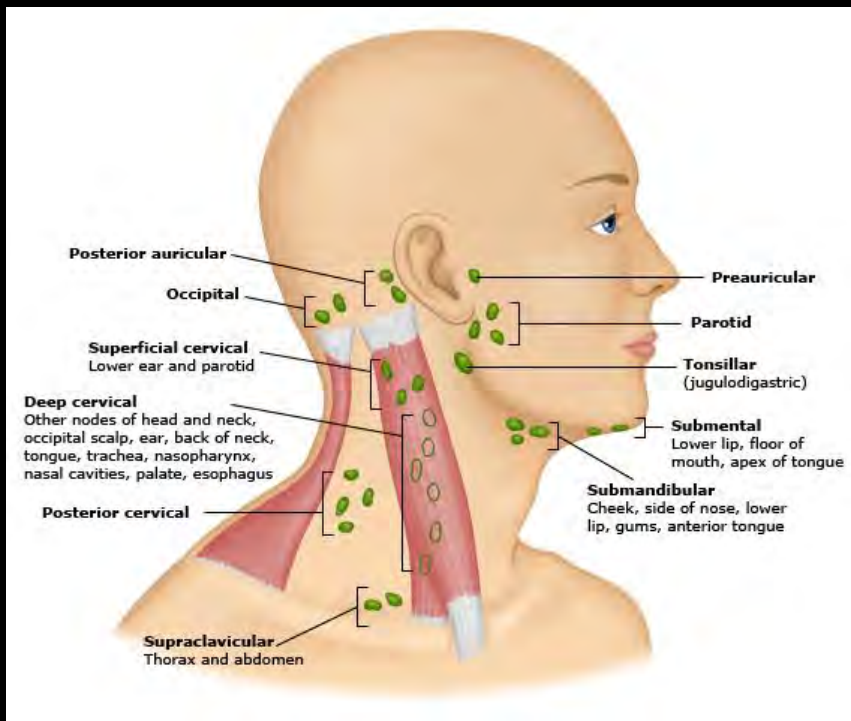


- There are multiple well-defined, non-corticated, radiopaque entities superimposed over the ramus without any effects on the adjacent anatomical structures or teeth.

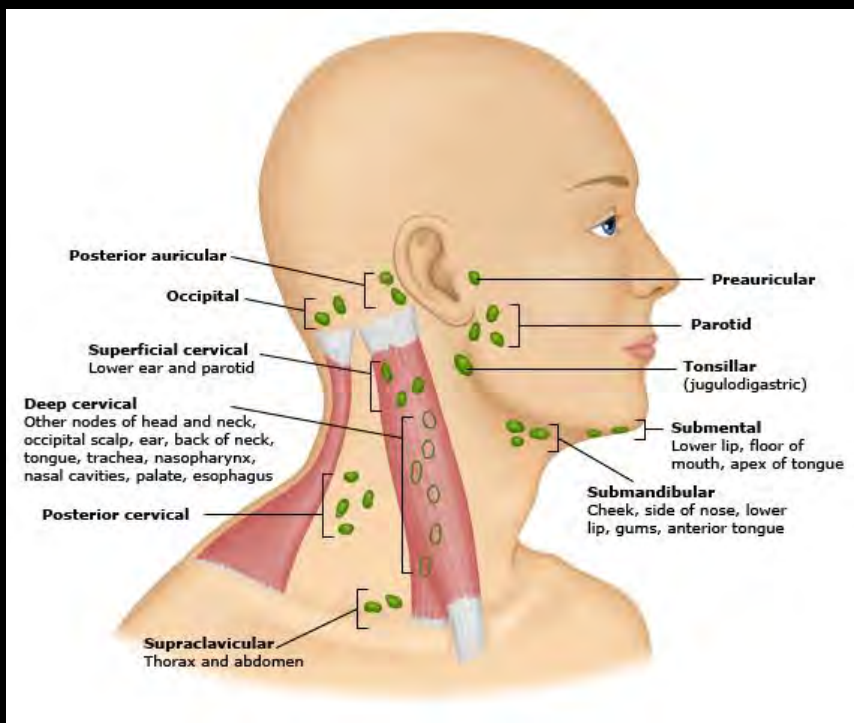


Choose the most likely disease category for Case 2.

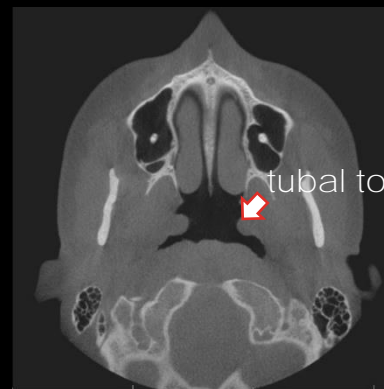
- a. Soft tissue calcification/ossification.
- b. Healing.
- c. Developmental dental anomaly.
- d. Bone dysplasia.



Head & neck lymph nodes



Head & neck lymph nodes



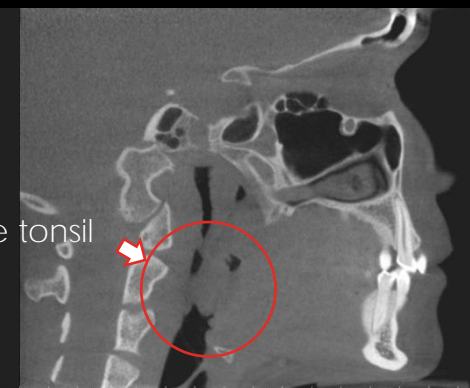
tubal tonsil



adenoid




palatine tonsil




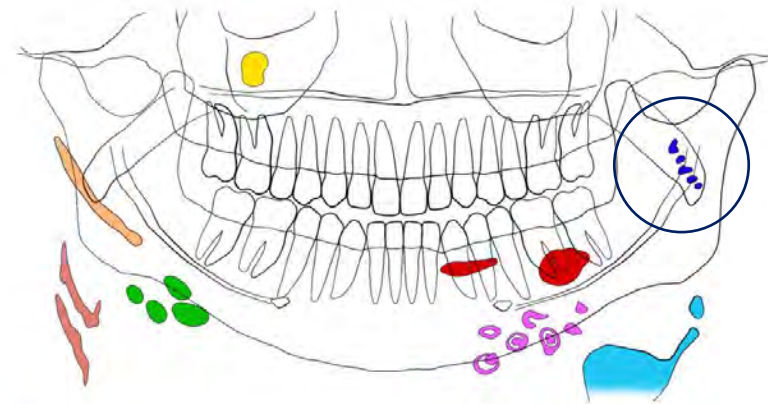
lingual tonsil



Waldeyer's ring

- 
- Dystrophic calcification in the tonsils
 - Tonsilliths arise from the calcification of organic debris in lymphoid tissue in the head and neck as a result of multiple rounds of inflammation, resolution, and scarring.

- 
- Tonsilliths are becoming more and more common as fewer adults had their tonsils removed as children.



- | | |
|--|--|
|  Antrolith |  Phleboliths |
|  Calcified atheromatous plaque |  Sialoliths |
|  Calcified lymph nodes |  Tonsilloliths |
|  Ossified stylohyoid ligament |  Triticeous cartilage and thyroid cartilage |

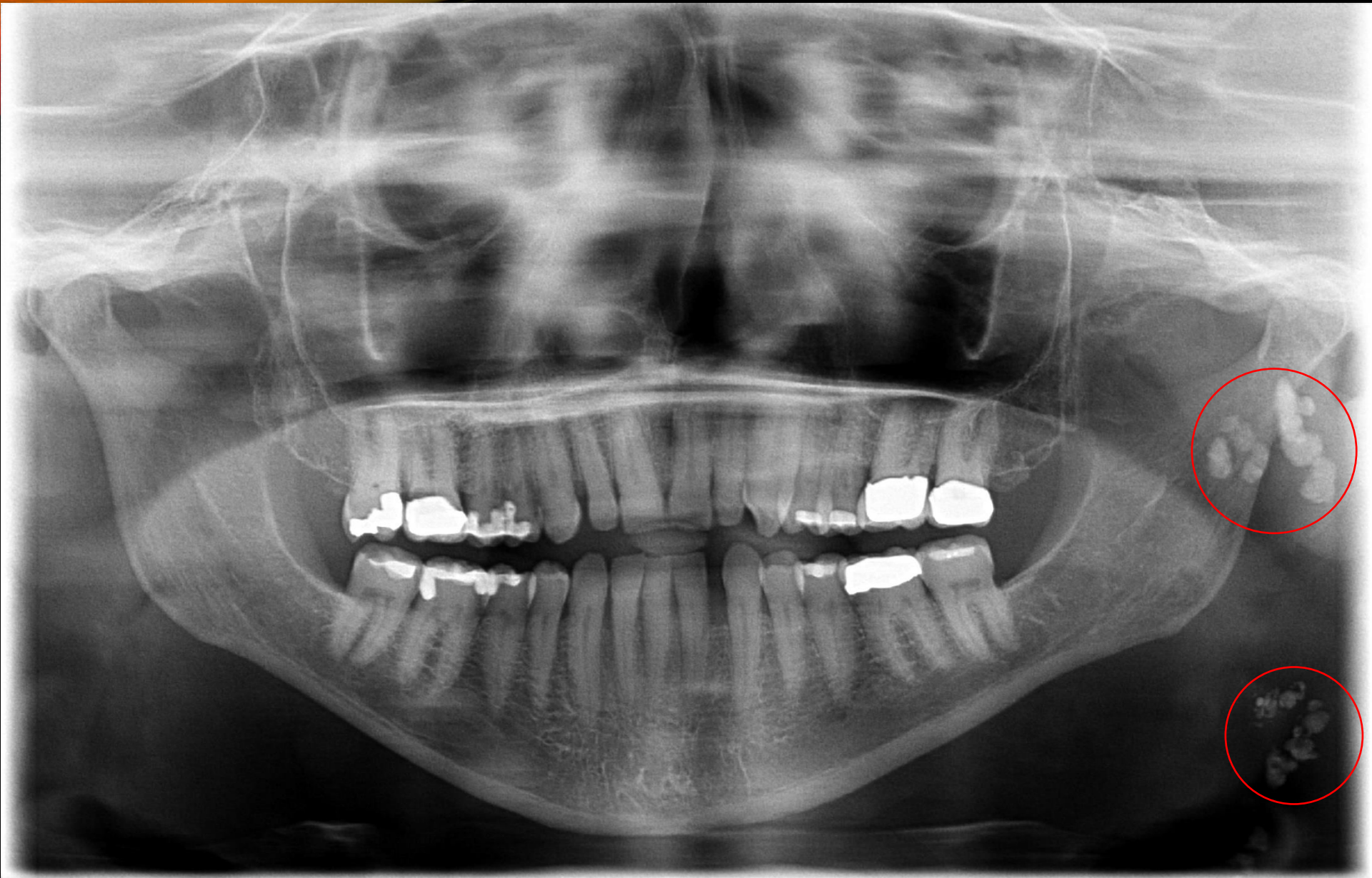


R

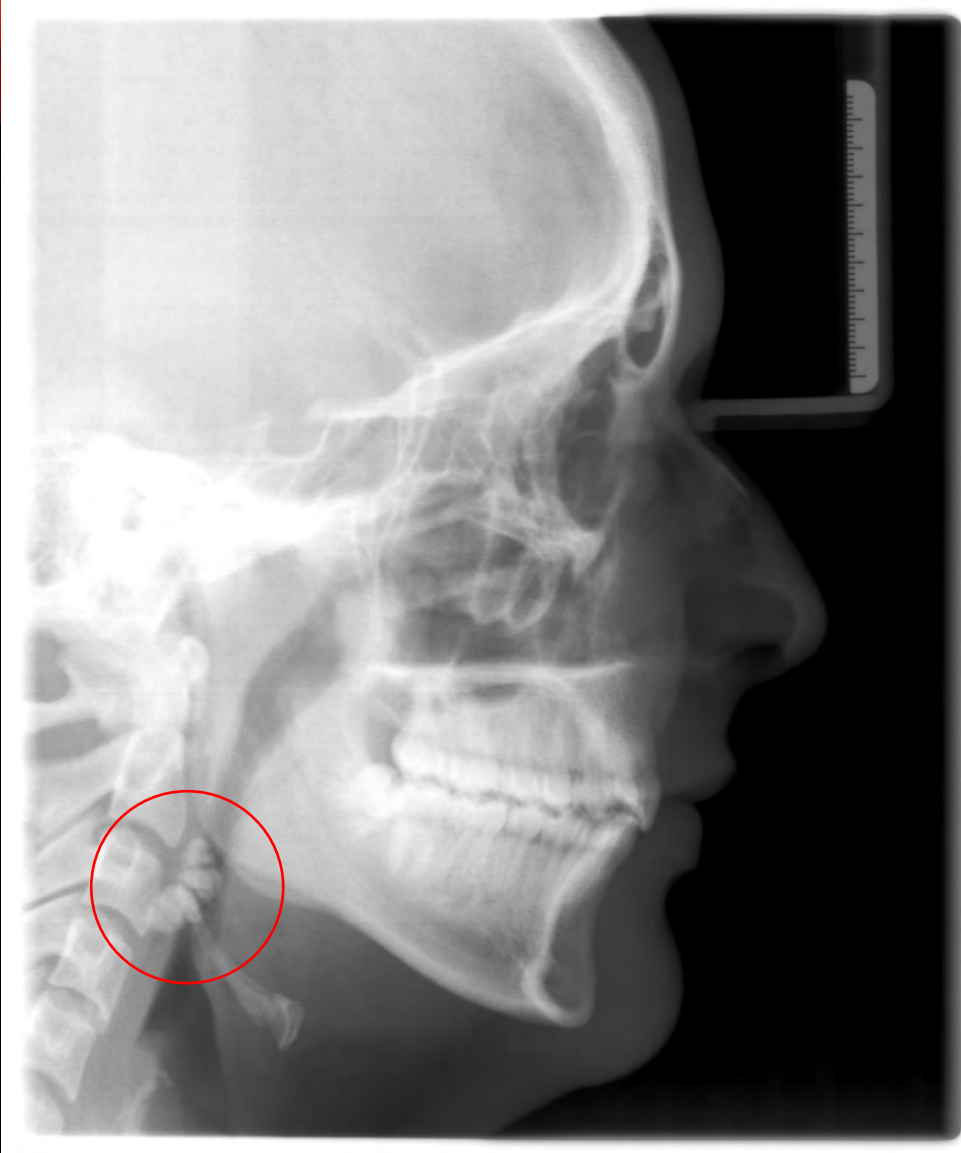
L

KODAK 8000 System


phleboliths

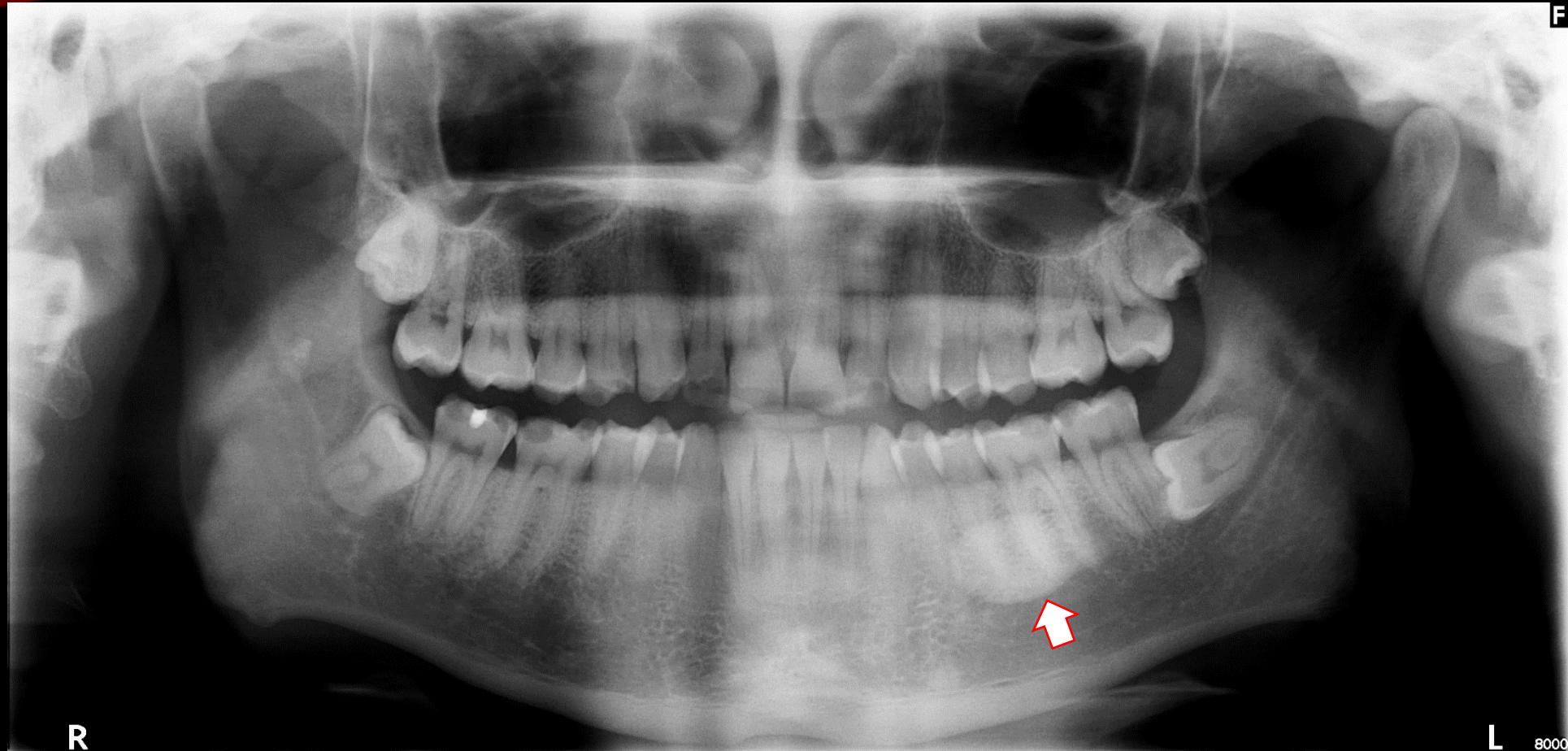


calcified lymph nodes

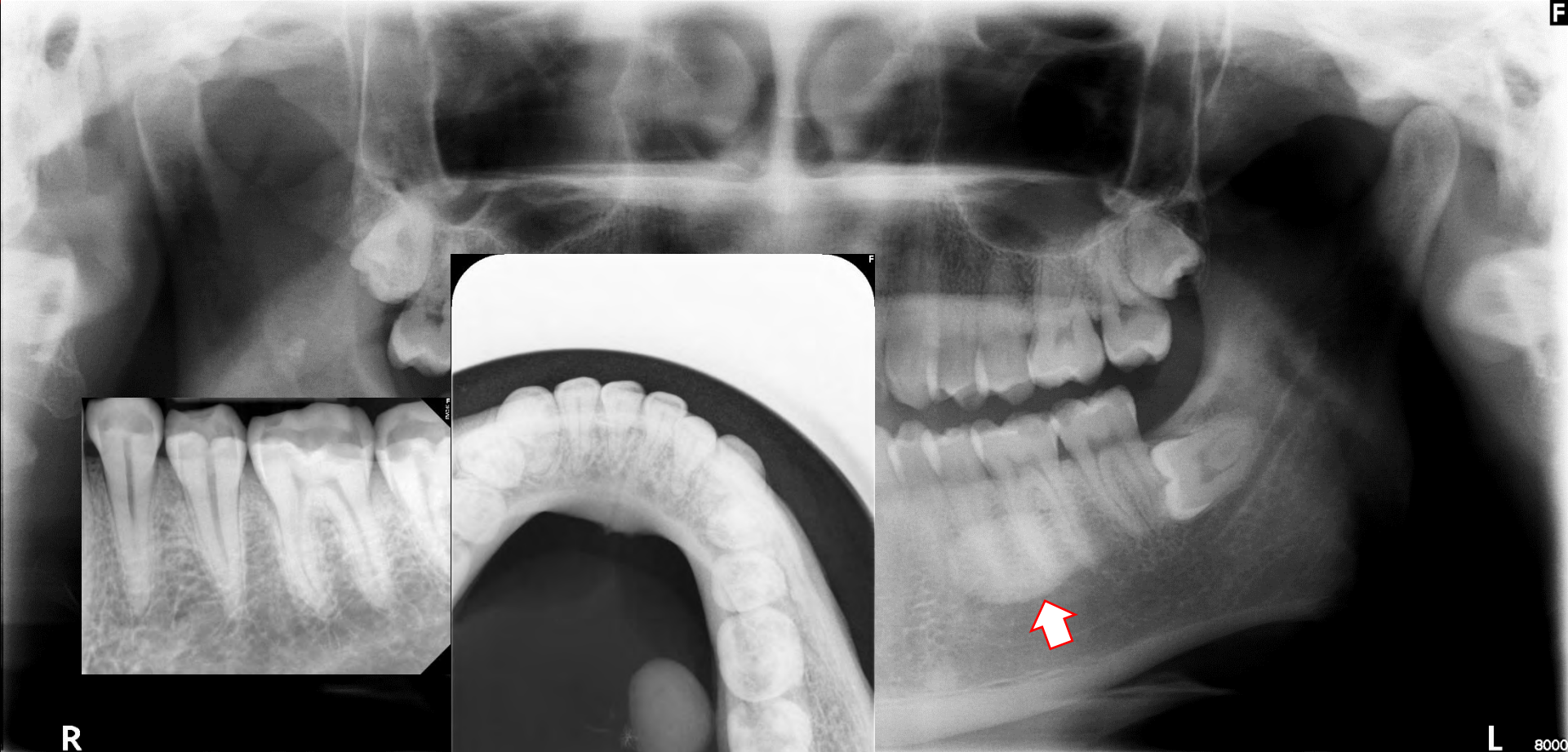


calcified lymph nodes

- 
- Tonsilliths are located more anteriorly than the parenchyma of the parotid gland and more superiorly than the submandibular salivary gland, so these calcifications should not be confused with sialoliths.
 - Parotid sialoliths are rare.



sialolith



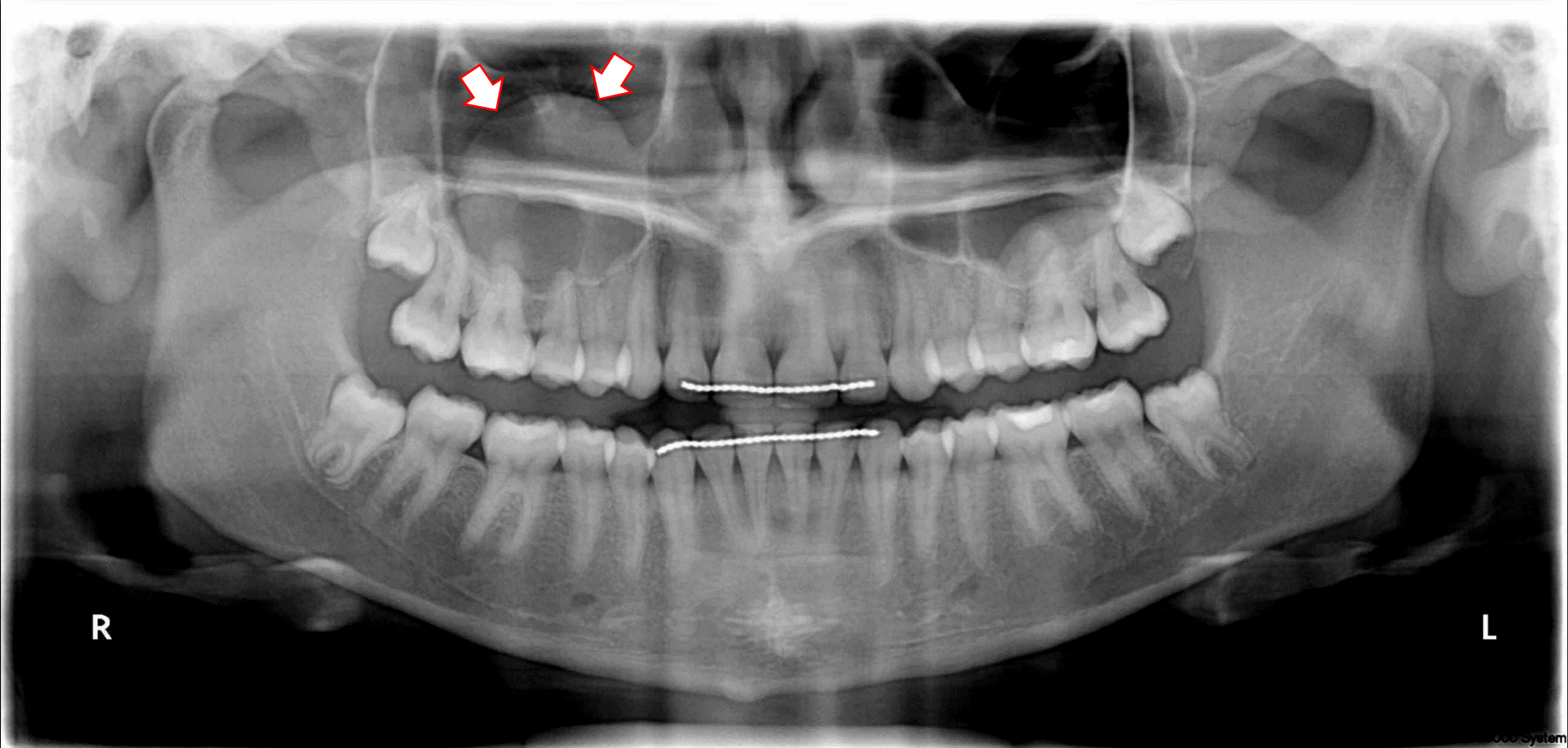
R

L

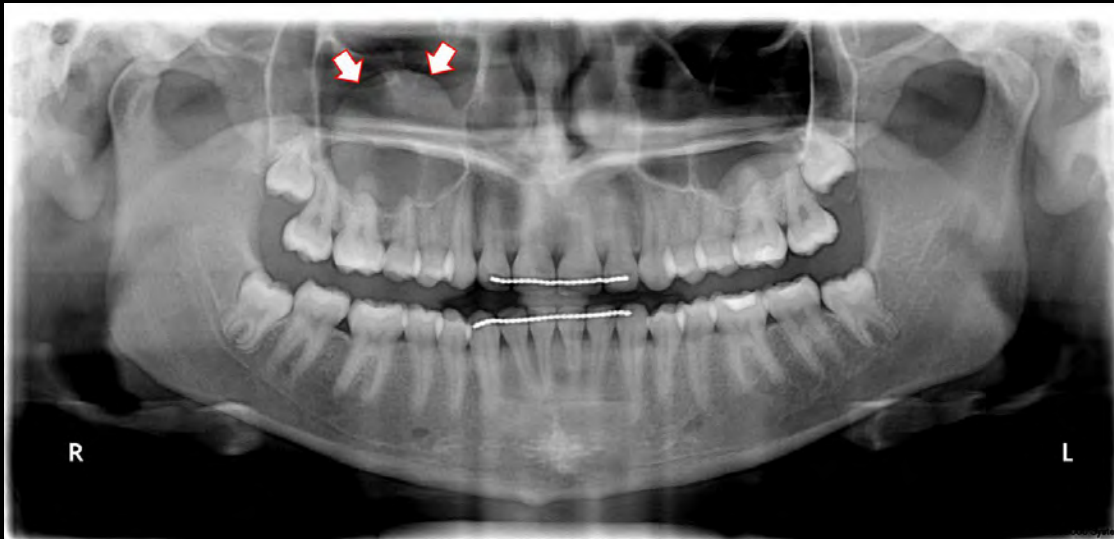
8000

sialolith

- 
- No further imaging or follow-up is required for tonsilliths.





- There is a well-defined, non-corticated, radiopaque (relative to the maxillary sinus) entity with a hydraulic border, situated along the floor of the maxillary sinus without an effect on the adjacent anatomical structures, teeth or peri-dental structures.



Choose the most likely disease category for Case 3.

- a. Soft tissue calcification/ossification.
- b. Cyst/pseudocyst.
- c. Benign neoplasm.
- d. Inflammation.

- 
- A true cyst is a pathologic cavity in bone that is lined by epithelium.
 - Odontogenic cysts have an epithelium that is odontogenic in origin and non-odontogenic cysts have an epithelium that is non-odontogenic in origin.
 - Pseudocysts have some of the radiologic features of a cyst, but they lack either an epithelial lining or they are not cavities in bone, or both.

- 
- The retention pseudocyst arises from the mucosal lining of the sinus, and is believed to develop from either a blockage of seromucous secretory glands in the sinus mucosa resulting in submucosal serous accumulations or cystic degeneration within an inflamed sinus lining.

RADIOPAQUE




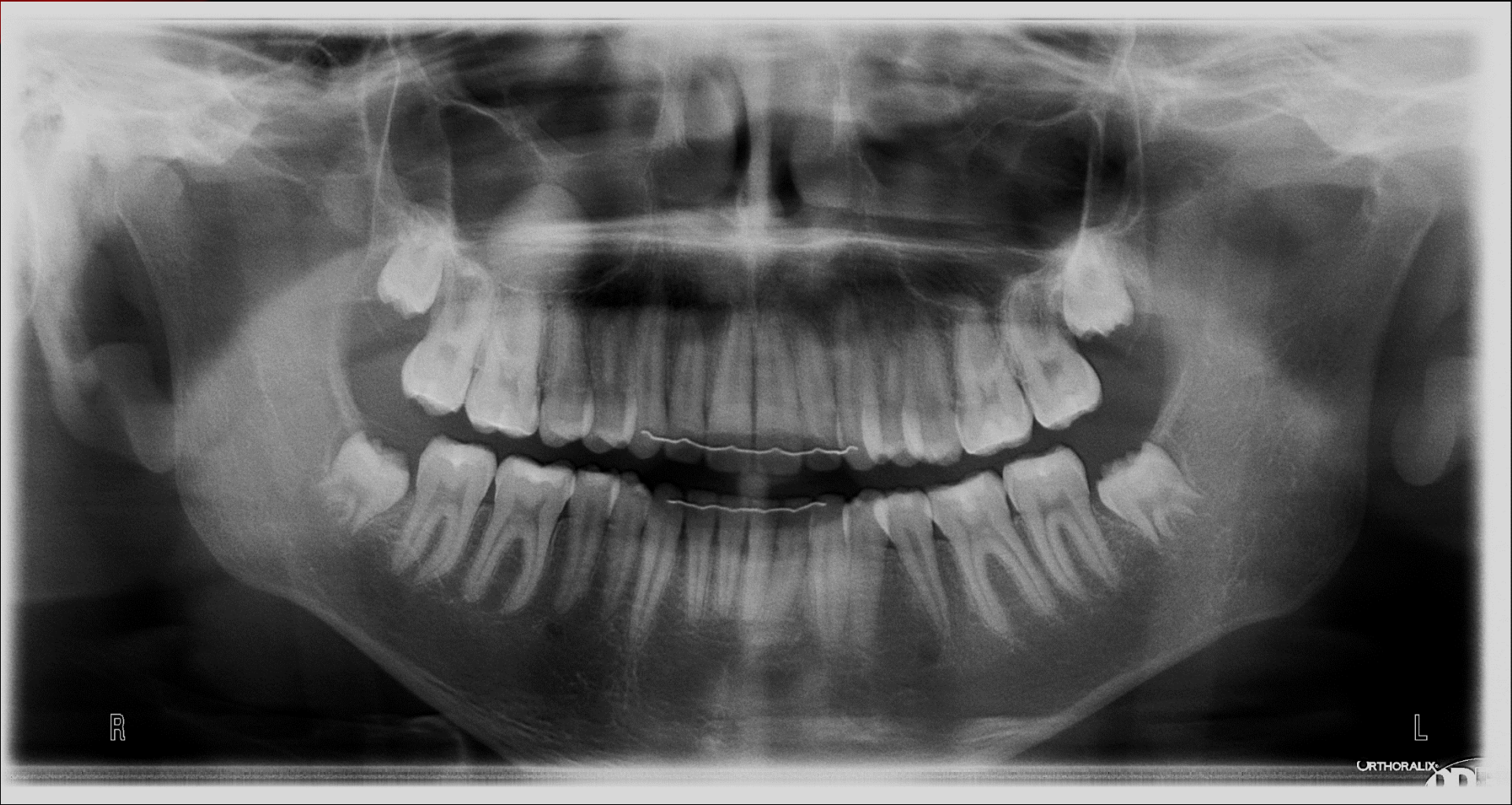
metal (restorations, sutures, bullet fragments)
radiopaque white restorations and cements
enamel
dentin
cementum
cortical bone
trabecular bone
calculus

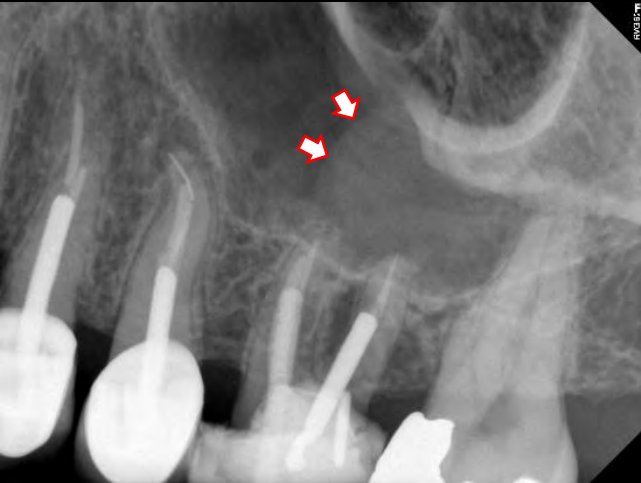


RADIOLUCENT

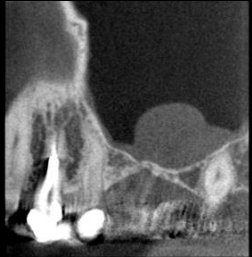
soft tissues (including normal cartilage)
body fluids
radiolucent white restorations and cements
fat
air

- 
- Retention pseudocysts are well-defined, non-corticated, and relatively radiopaque compared with the airspace within the maxillary sinus.
 - They also have a similar curved or “hydraulic” periphery or shape as a true cyst, however, they are not cavities within bone or epithelially lined.



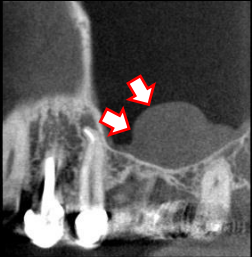


9.21



10.21

11.21



11.21

12.21



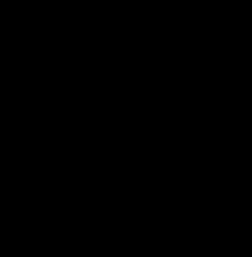
12.21

13.21



13.21

14.21



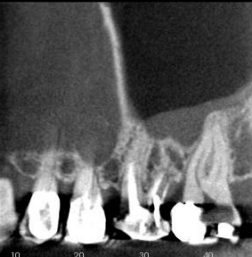
14.21



9.21



10.21



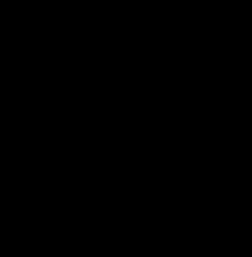
11.21



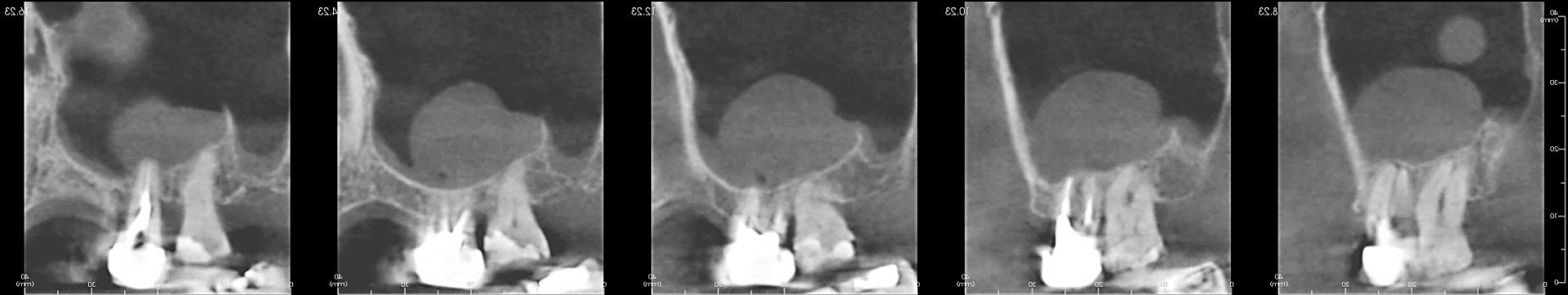
12.21



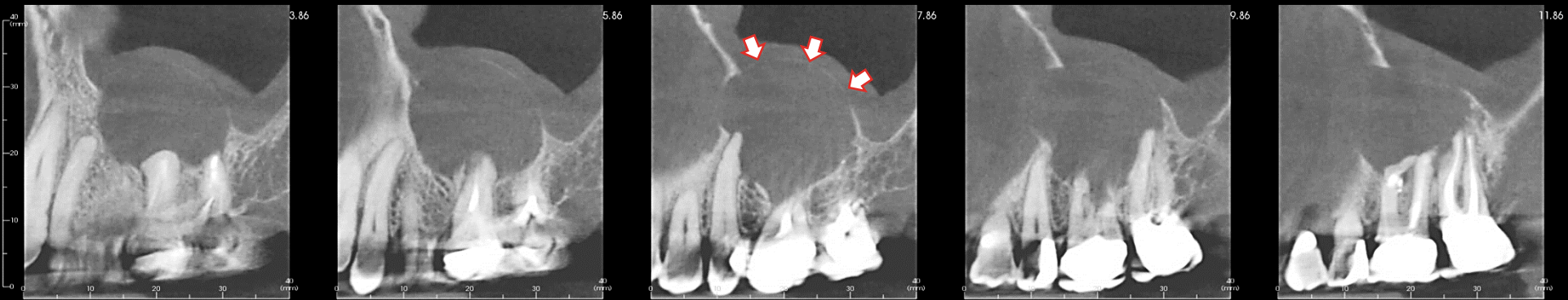
13.21



14.21




retention pseudocyst

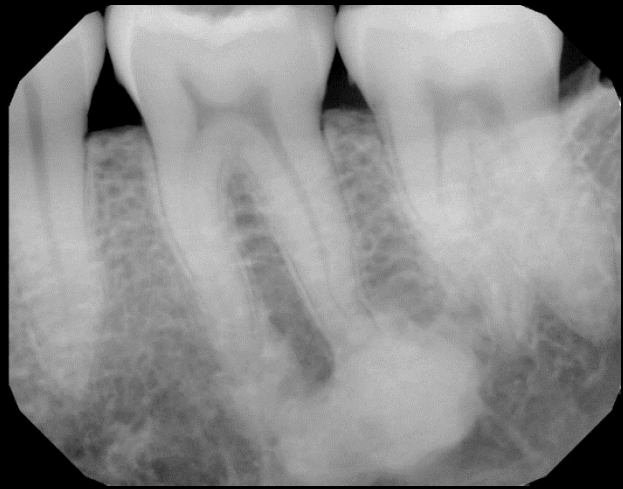


rarefying osteitis

- 
- Retention pseudocysts are often more commonly seen in the spring and fall when seasonal allergies are at their peak.

- 
- The term retention pseudocyst is NOT synonymous with mucocoele.

- 
- No further imaging or follow-up is required for retention pseudocysts.




- There is a well-defined, non-corticated, radiopaque entity situated at the root apices of the molar tooth. The periodontal ligament spaces are intact, and there has been no effect on the tooth itself.



Choose the most likely disease category for Case 4.

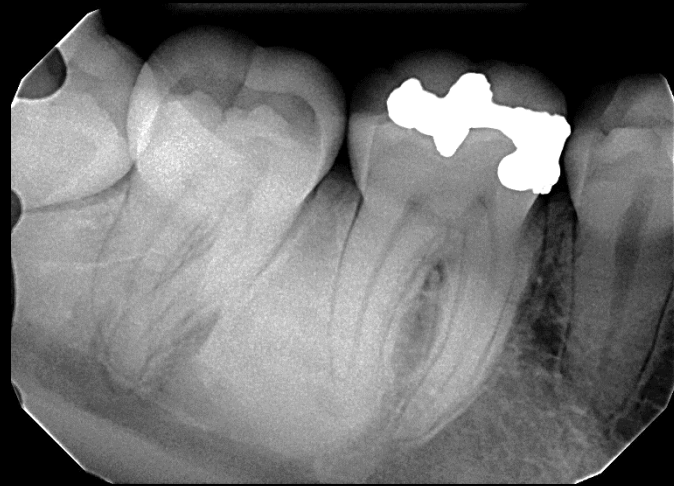
- a. Normal anatomy/variation of normal.
- b. Healing.
- c. Inflammation.
- d. Bone dysplasia.

- 
- An asymptomatic, non-inflammatory hamartoma that may or may not have an apparent association with teeth.
 - If there is an association, the tooth pulp is vital.

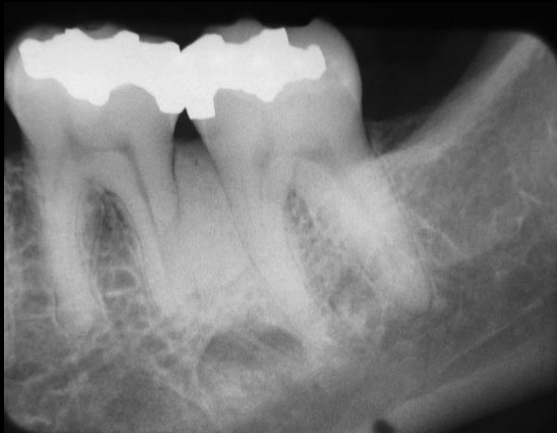


- Hamartoma (*def.*)

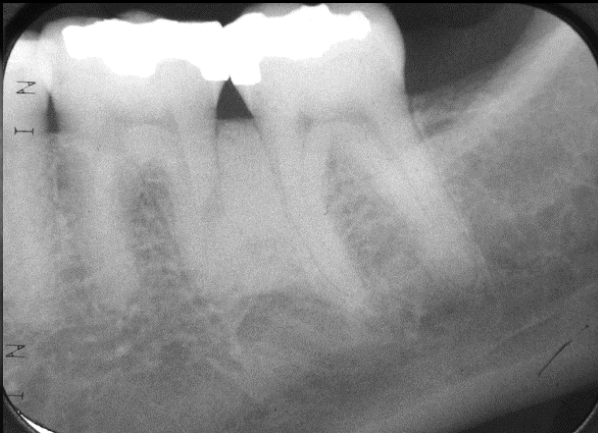
- A mass resembling a tumour that represents anomalous development of tissue natural to a part or organ rather than a true tumour.



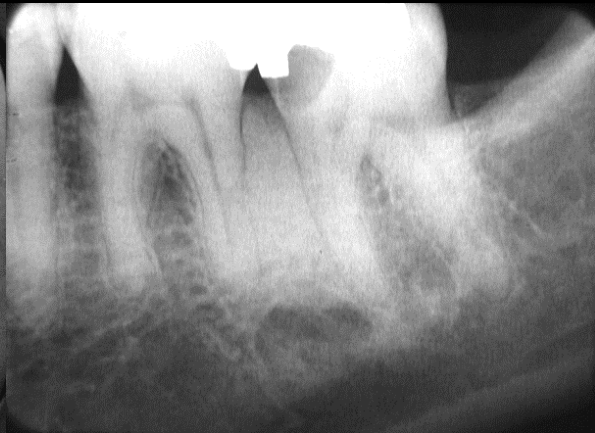
Note the continuity with the lamina dura
and the intact periodontal ligament space.



11/2002




03/2003

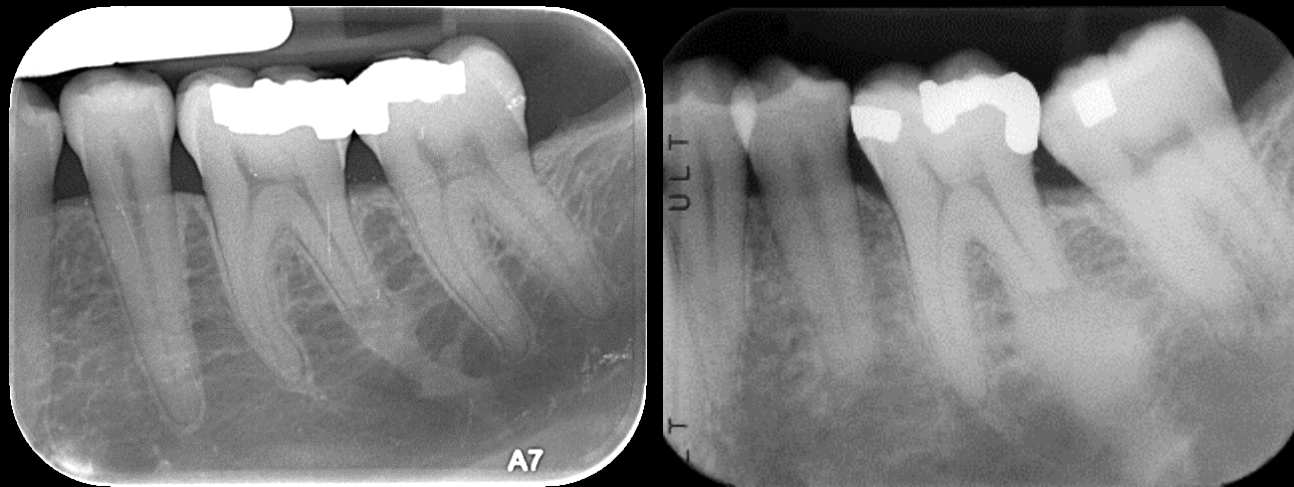


10/2004



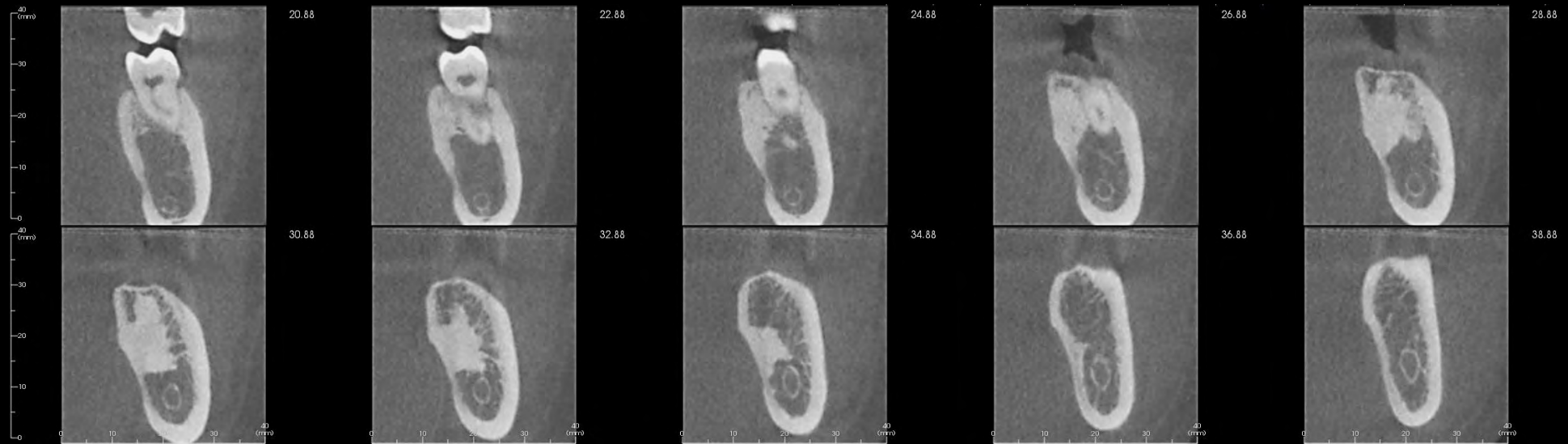
Some dense bone islands can take on an almost “ground glass” type of internal pattern.

- 
- In some instances when a dense bone island is intimately associated with a tooth root, the root can undergo external resorption.
 - Examples of this are most commonly seen in mandibular first molars.



Two dense bone islands demonstrating differing degrees of external root resorption.





- 
- No further imaging or follow-up is required for a dense bone island.





- There is a well-defined, corticated, mixed radiolucent and radiopaque entity situated at the root apices of the molar tooth. The entity contains multiple, centrally-located, radiopaque foci, and these are surrounded by a radiolucent rim of variable width. There has been elevation of the floor of the maxillary sinus, but no effects on the adjacent teeth.





Choose the most likely disease category for Case 5.

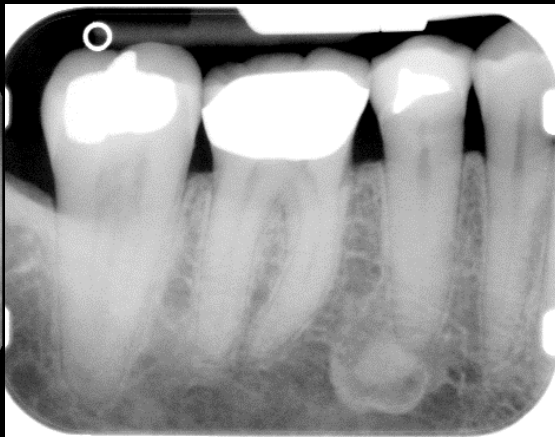
- a. Healing.
- b. Inflammation.
- c. Bone dysplasia.
- d. Metabolic disease.

- 
- Formerly the “cemental dysplasias”
 - Periapical cemento-osseous dysplasia
 - Florid cemento-osseous dysplasia

- 
- A group of dysplastic lesions of bone that result in the deposition of a fibrous connective tissue matrix with a matrix of immature bone material.
 - Depending on the relative mix of connective tissue and immature bone, the foci can appear radiolucent to mixed radiolucent and radiopaque.

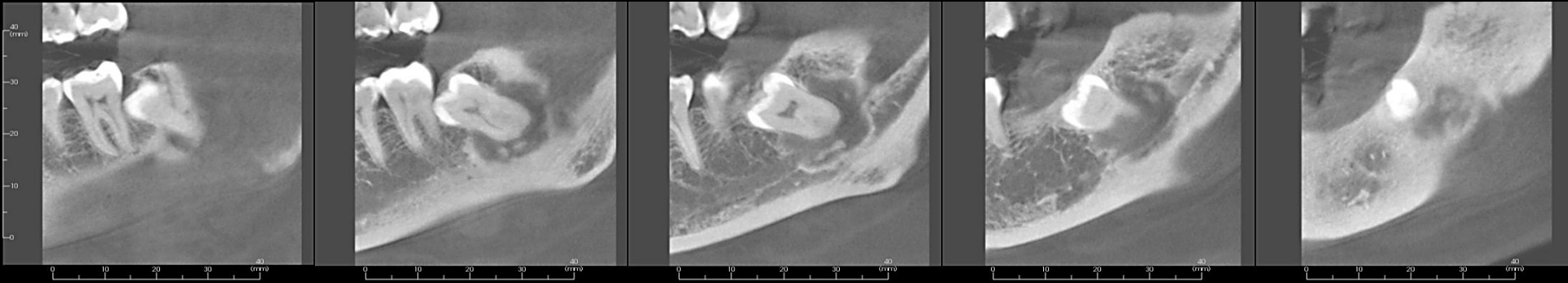
- 
- In the context of bone, the word “dysplasia” refers to a disorder affecting the normal function of osteoblast and osteocytes, and the cells that form the underlying connective tissue matrix.
 - Unlike an epithelial dysplasia that is pre-malignant, a bone dysplasia is not a pre-malignant condition.

- 
- Three stages have been described in the life of the cemento-osseous dysplasias.
 - An early stage, in which the lesions are primarily radiolucent.
 - A mixed radiolucent and radiopaque stage where a radiopaque focus may be seen within the radiolucent area.
 - A mature stage, where the lesion is primarily radiopaque with a radiolucent rim of varying width.



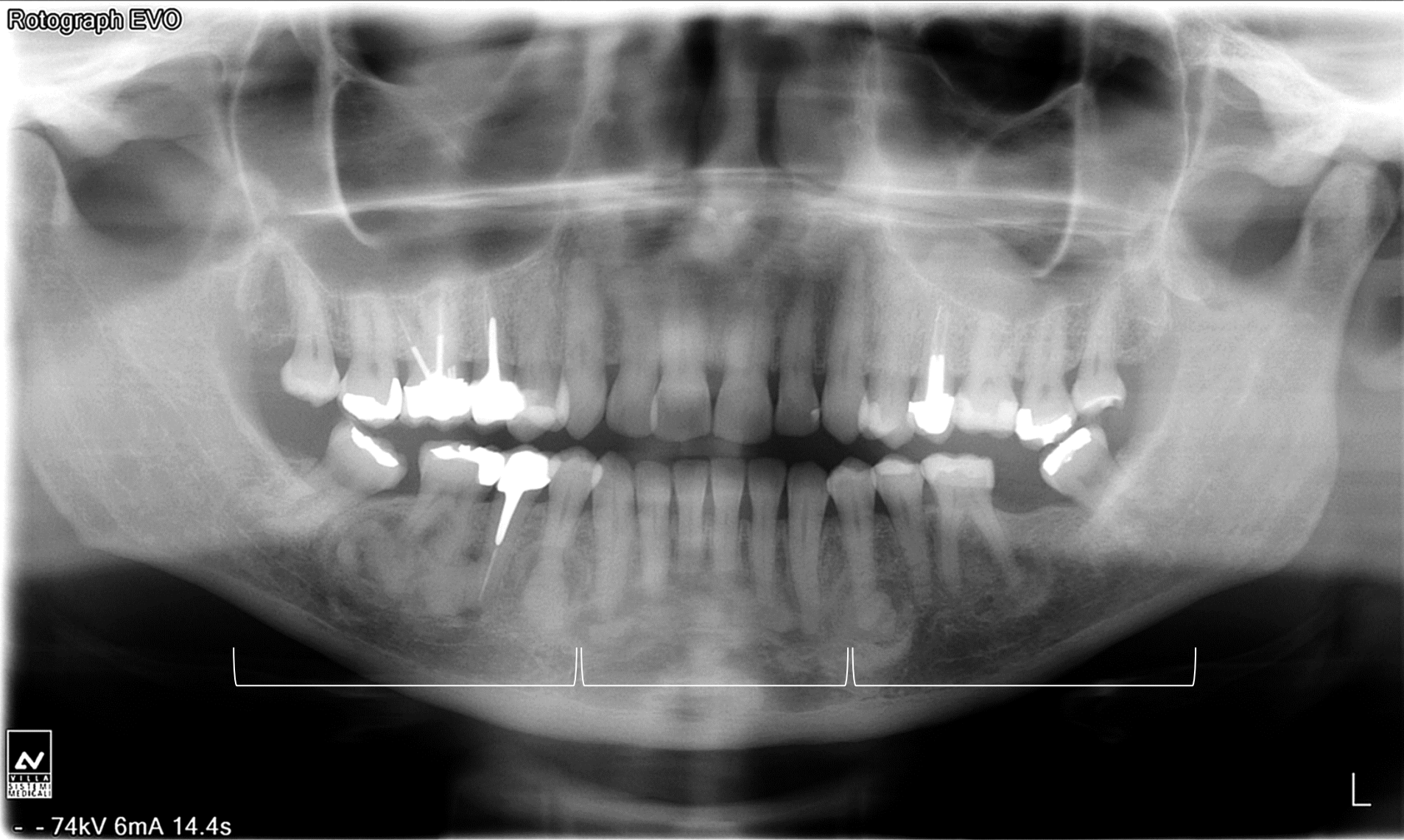






- 
- Periapical cemento-osseous dysplasia becomes “florid” when it affects 2 or more sextants.

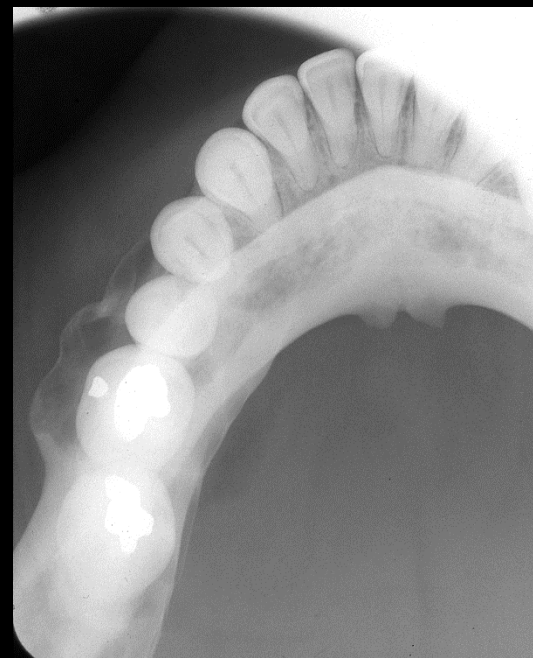
Rotograph EVO




- - 74kV 6mA 14.4s

- 
- Florid cemento-osseous dysplasia can also occur in conjunction with simple bone cysts.

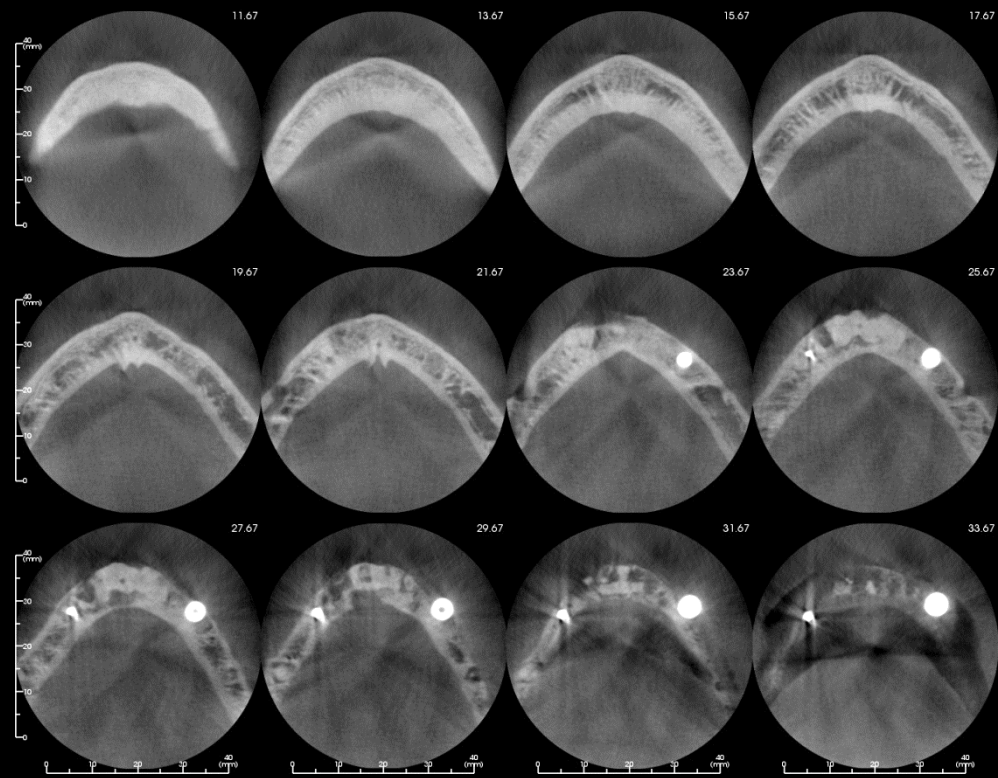




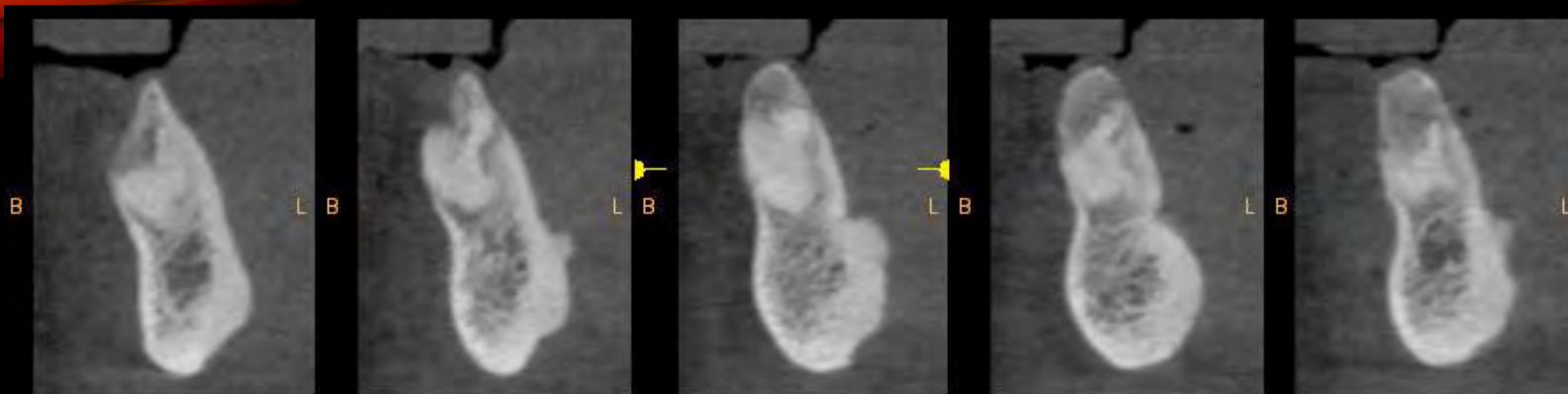
- 
- As the dysplastic bone lesions mature, the blood supply to the bone diminishes as the vascular spaces become increasingly reduced in both number and size by the deposition of dysplastic bone.



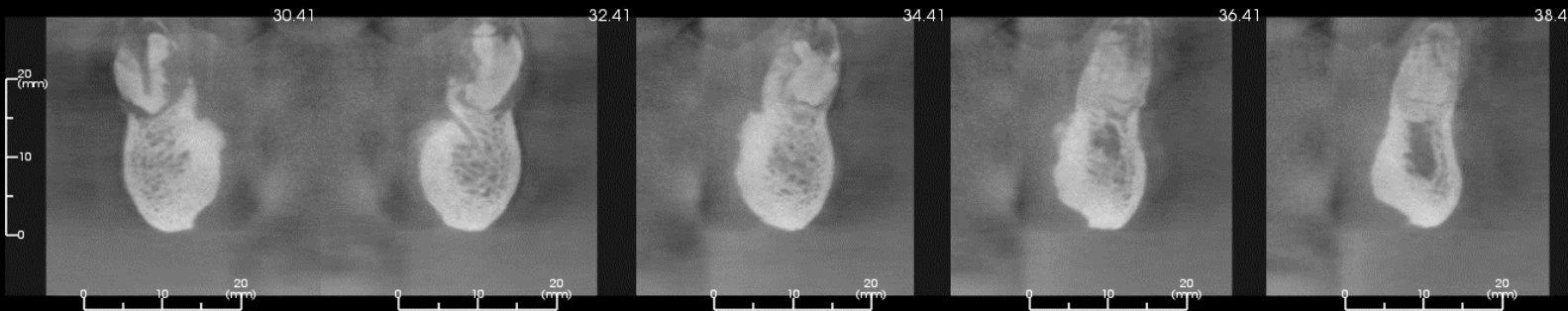
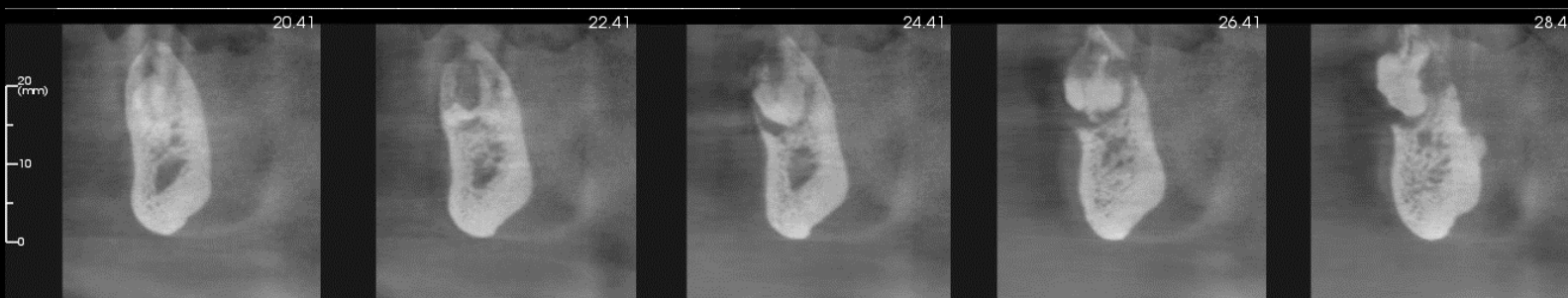
initial




after



initial

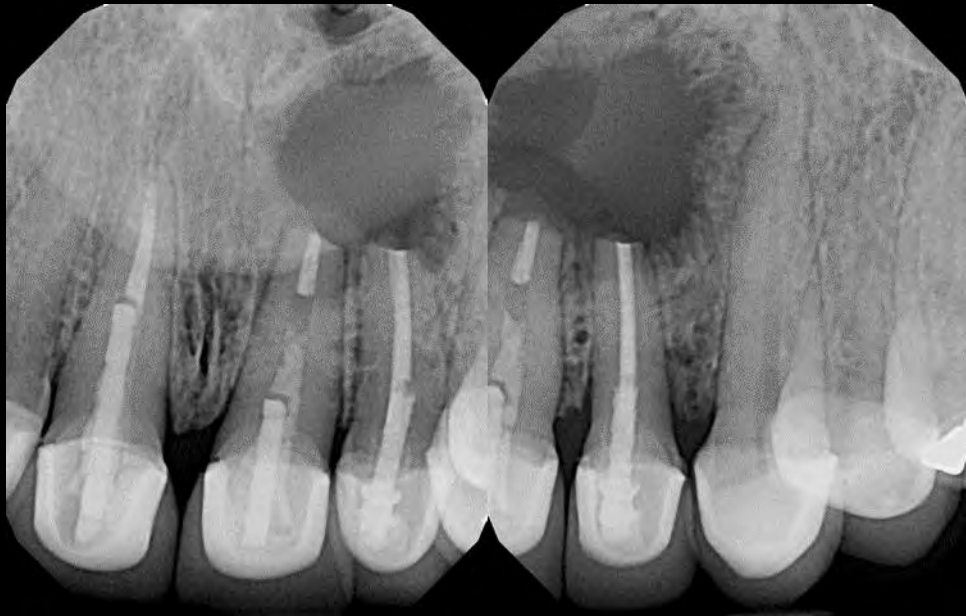


after (sequestered dysplastic bone)

- 
- 3D imaging may be required if 2D imaging cannot fully demonstrate the key features of the bone dysplasia.
 - No treatment, including surgical manipulation are required unless the lesions become secondarily infected.




- There is a well-defined, irregularly-shaped, non-corticated, mixed radiolucent and radiopaque entity situated at the root apices of the incisor teeth. The radiopaque portion of the entity is located peripherally with radiating bone extending from the edge, inwards toward the centre. At the centre, is the more radiolucent component. There have been no effects on the adjacent teeth.




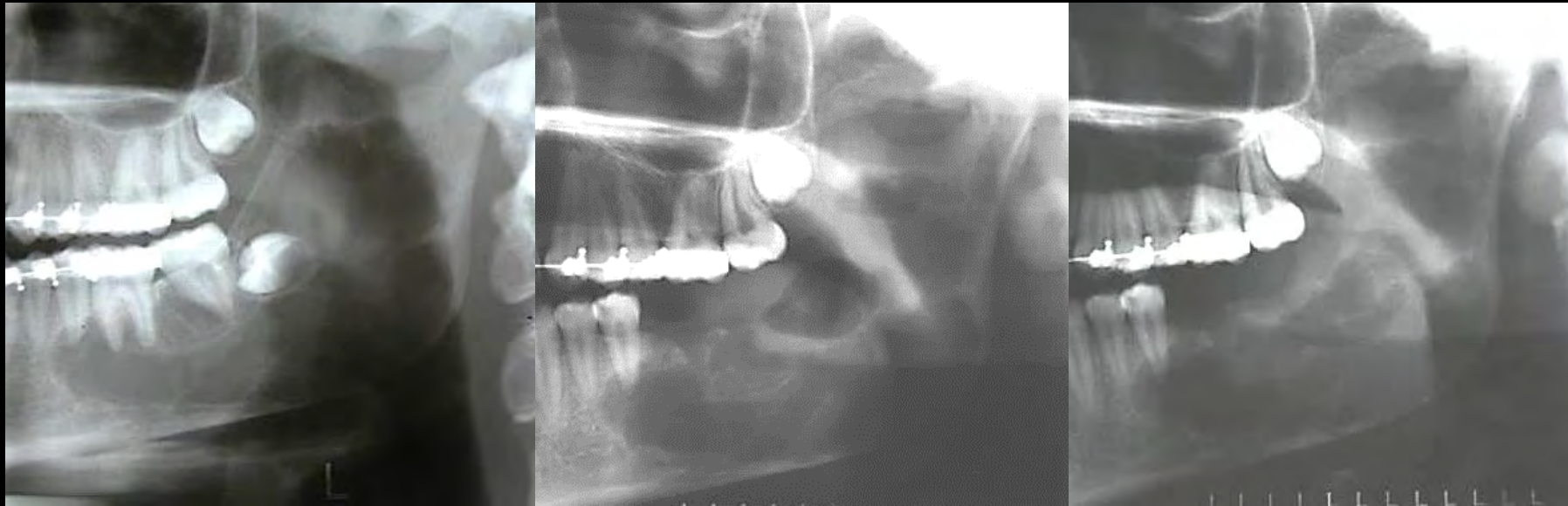
Choose the most likely disease category for Case 6.

- a. Healing.
- b. Cyst/pseudocyst.
- c. Benign neoplasm.
- d. Inflammation.

- 
- Healing within bone can take on a variety of appearances, depending on the size of the defect and the age of the patient because the “completeness” of the healing relies on the population of bone forming cells located within the bone and periosteum.

- 
- Following surgical manipulation, there is bleeding in the bone followed by clot formation.
 - Granulation tissue, which is a matrix of collagen formed by fibroblasts, immune cells and new blood vessels begins to grow into the wound from the periphery.

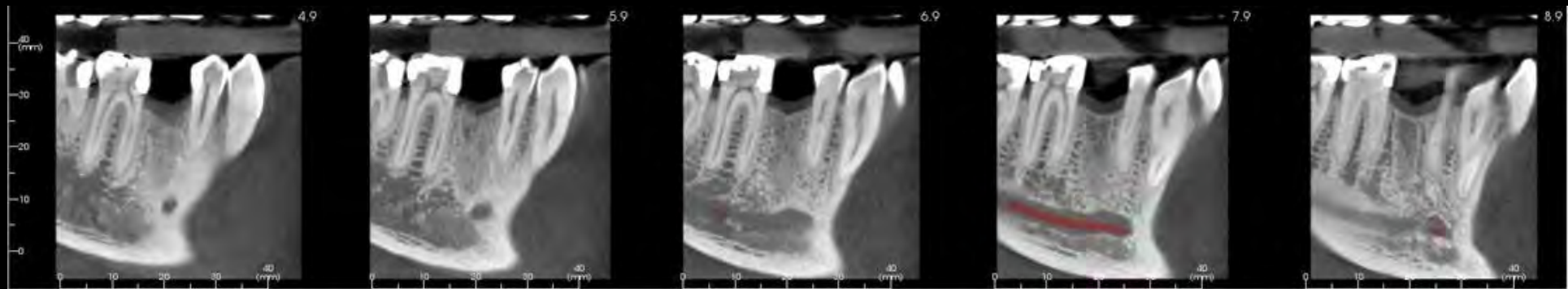
- 
- Osteoblasts are recruited from the defect's periphery, and begin to lay down a mineralized matrix from the periphery toward the centre of the defect.
 - If there are sufficient numbers of osteoblasts, the entire defect will fill in with bone (but if there are not, this where the fun begins).



Simple bone cyst




8 Months post-op.

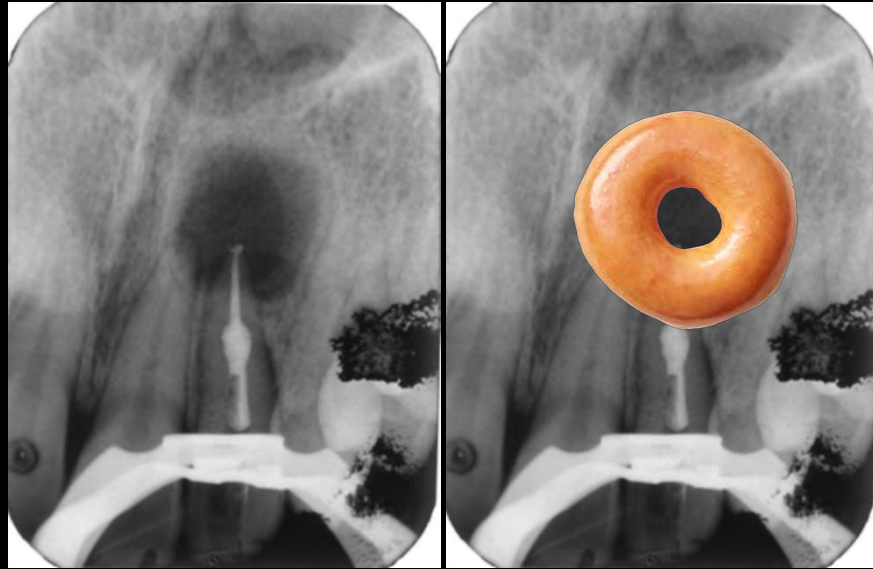


A more localized “ground glass” pattern



More "ground glass"


- 
- If the defect fails to fill completely, a “rolled” border of bone may be seen at the periphery, and a central radiolucent area may be appreciated.
 - This “doughnut”-shaped entity is referred to as a “fibrous scar”.



<https://www.krispykreme.com/menu/doughnuts>





- 
- No further imaging or follow-up is required to characterize healing.




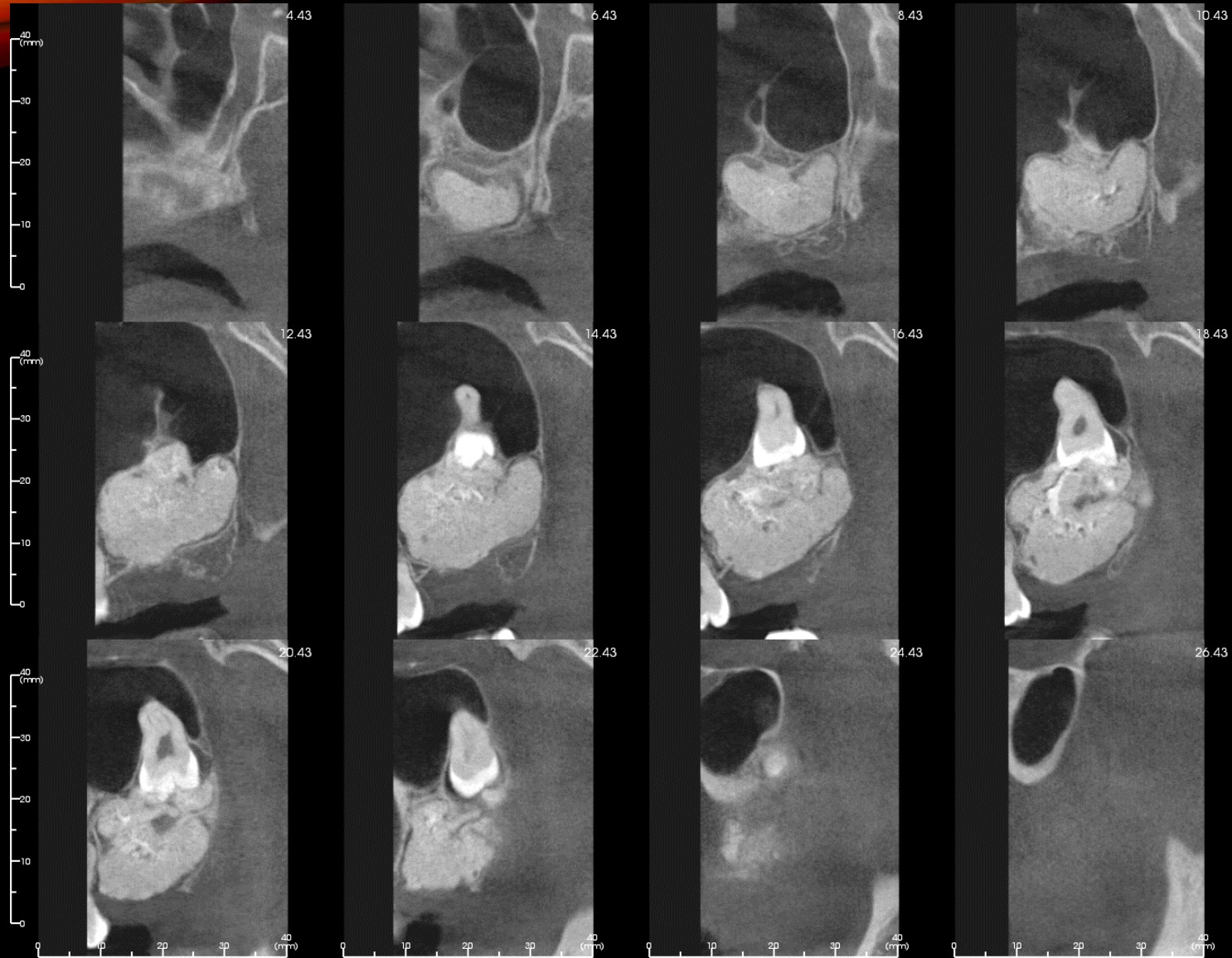
- There is a well-defined, corticated, mixed radiolucent and radiopaque entity with an epicentre located occlusal to the molar tooth. The radiopaque portion is surrounded by a thin, radiolucent rim of variable width. There has been elevation of the floor of the maxillary sinus, and superior displacement of the molar.




Choose the most likely disease category for Case 7.

- a. Healing.
- b. Cyst/pseudocyst.
- c. Benign neoplasm.
- d. Bone dysplasia.

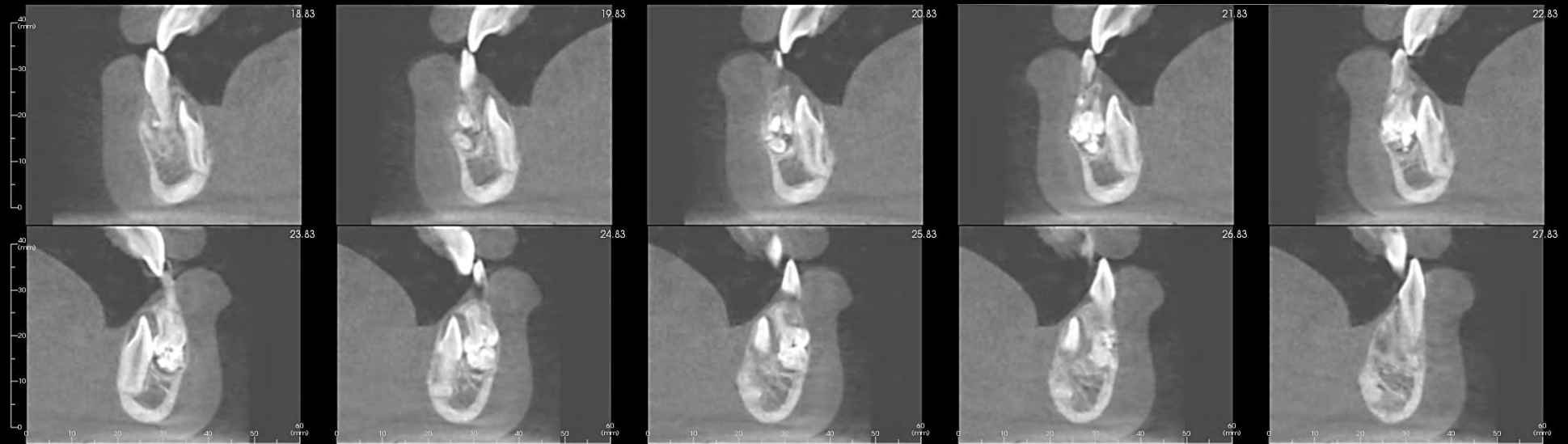
- 
- Complex odontomas (7ii) have the appearance of an amorphous conglomeration of the dental hard tissues with enamel having the greatest radiopacity.




- 
- Odontoma may be compound, complex or dilated, and while the World Health Organization classifies them as odontogenic neoplasms (tumours), they are more correctly classified as hamartomas.

- Compound odontomas (7i) have the appearance of two or more miniature teeth.



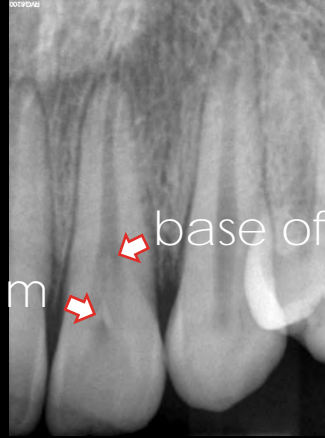


- 
- Dilated odontoma (7iii) can be thought of as a dens invaginatus with a very prominent surface invagination of enamel into the pulp space.



МАРИЯ ОЛЕГОВНА ТИХОНОВА

Dens invaginatus



foramen caecum

base of the invagination

Dens invaginatus



Dilated odontome

- 
- 3D imaging may be required if surgical intervention is required.





- There is a generalized anomaly of the teeth. The enamel is thin resulting in elongated tooth contacts and square- to rectangular-shaped crowns. The enamel contrasts normally with the dentin.




Choose the most likely disease category for Case 8.

- a. Normal anatomy/variation of normal.
- b. Developmental dental anomaly.
- c. Bone dysplasia.
- d. Metabolic disease.

- 
- Genetic anomalies of the teeth
 - Amelogenesis imperfecta
 - Dentinogenesis imperfecta
 - Dentin dysplasia

- 
- Amelogenesis imperfecta (8i)
 - At least 23 forms, distinguishable by their effects enamel formation, and by their pattern of genetic inheritance.


- Family with sequence similarity 83 member H (*FAM83H*)
 - Autosomal dominant.
- Enamelin (*ENAM*), enamelysin (*MMP20*)
 - Autosomal recessive.
- Amelogenin (*AMELX*)
 - X-linked.


- 
- Clinically, these gene mutations produce hypoplastic, hypomaturational, hypocalcified and hypomaturational with taurodontism) morphologies, but only the features of the hypoplastic variety (type I) are evident radiographically.

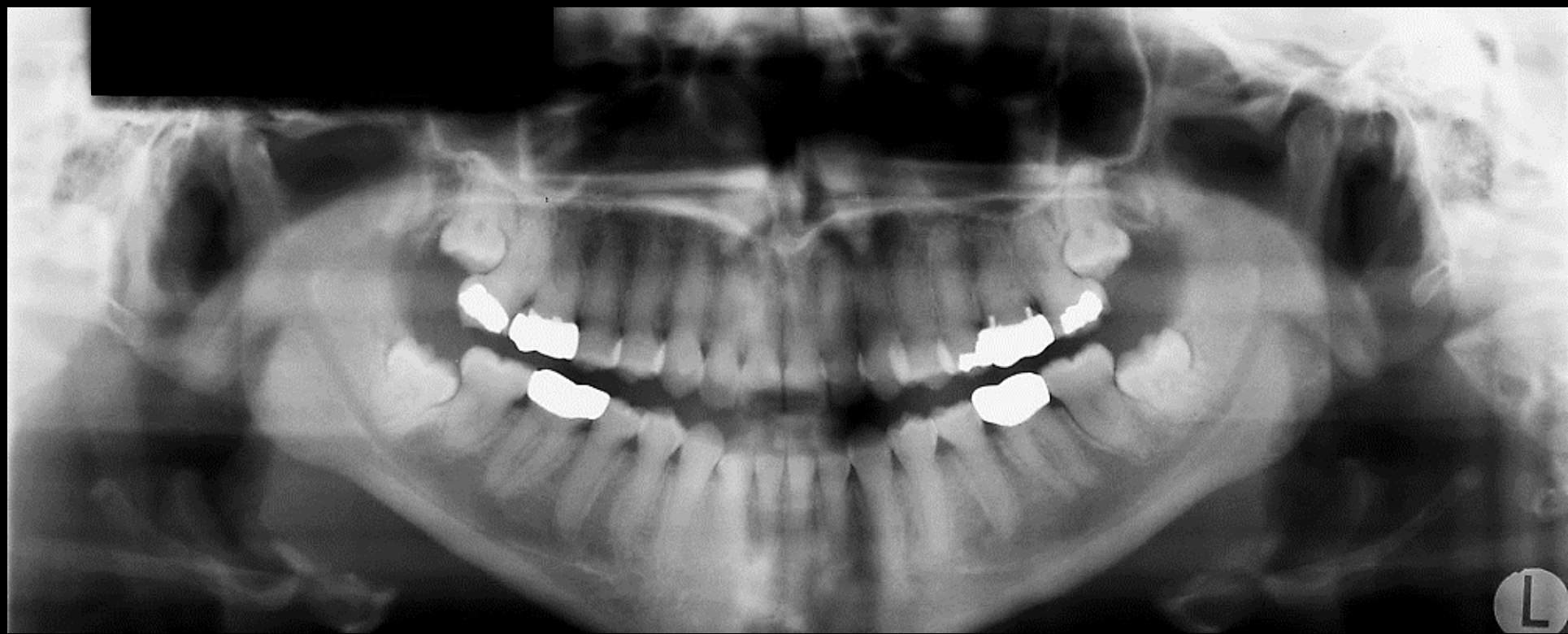
- 
- In hypoplastic AI, the enamel does not develop to its normal thickness, and it may be pitted.
 - On radiographs, enamel contrasts seemingly normally with dentin, but the crowns of the teeth are square or rectangular in shape.

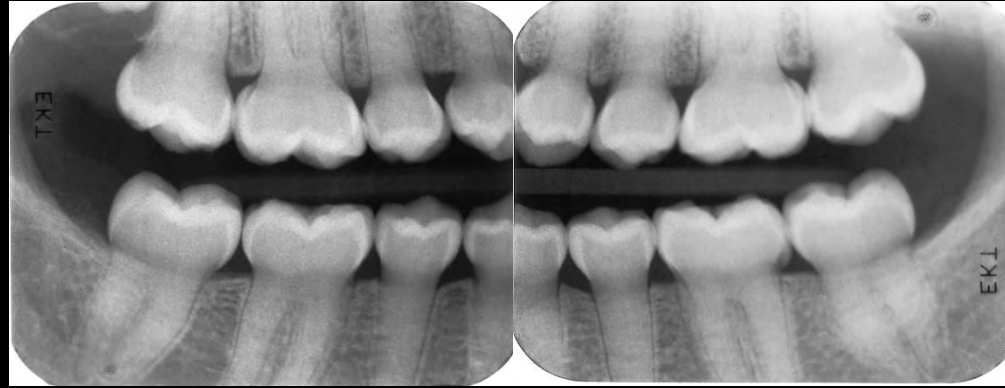




- 
- Dentinogenesis imperfecta (8ii)
 - An autosomal-dominantly-acquired anomaly of dentin formation, also referred to as “hereditary opalescent dentin”, acquired due to mutations of the dentin sialophosphoprotein gene (*DSPP*) gene.

- 
- The teeth may be yellow-brown to opalescent gray, and in some cases, the overlying enamel may break away from the dentin.
 - The crowns of these teeth show a bulbous morphology with marked constrictions at the CEJs, and the roots may appear spindle-shaped.





- 
- Dentinogenesis imperfecta may also be associated with osteogenesis imperfecta.



▫ Dentin dysplasia (8iii)

- A genetic, autosomal-dominantly-acquired anomaly of dentin also believed to be caused by a mutation of the *DSPP* gene, or at least a gene in close proximity to the *DSPP* gene.
 - There are two types; a radicular type (I) and a coronal type (II).

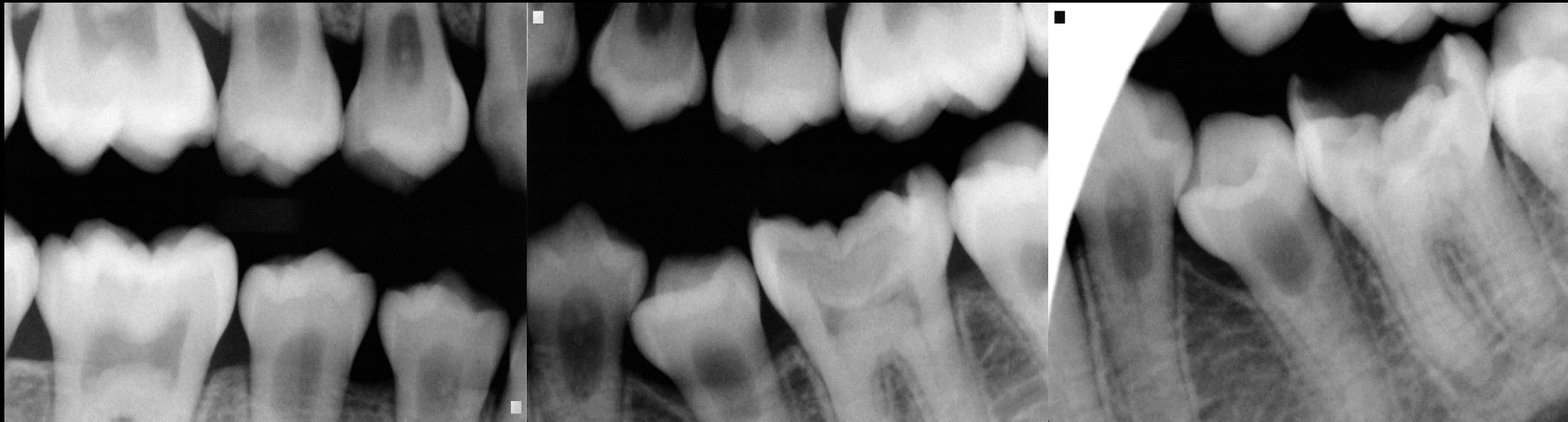
- 
- Type I DD crowns are characterized normal shape and colour, however the roots are short and appear hypoplastic.
 - The pulps may have a half-moon or *demi-lune* shapes, or have large pulp stones nearly obliterating the pulps.





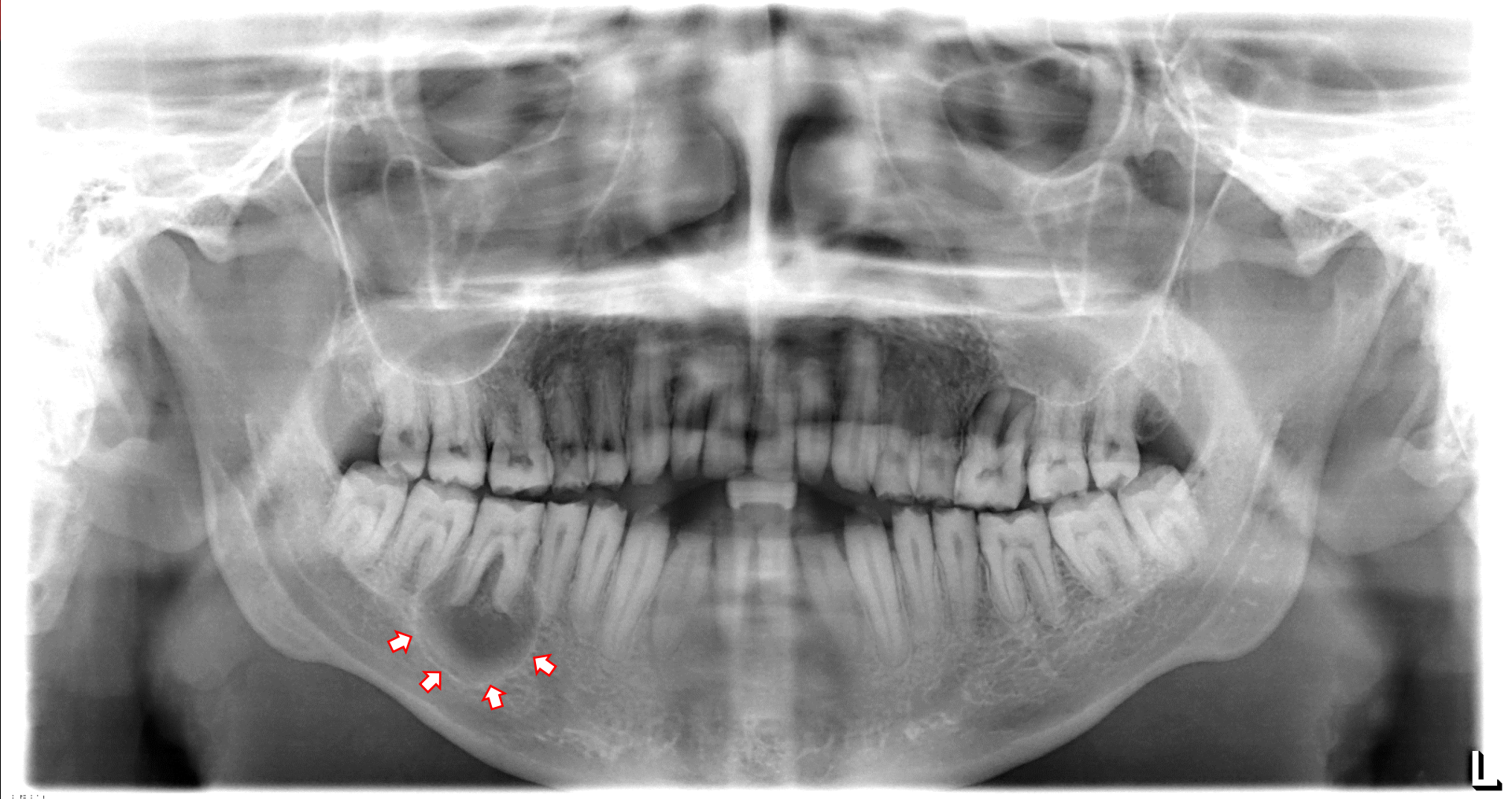
- Type II DD is characterized by normally shaped crowns and roots, however the pulps have a “thistle” shape and very narrow root canals.



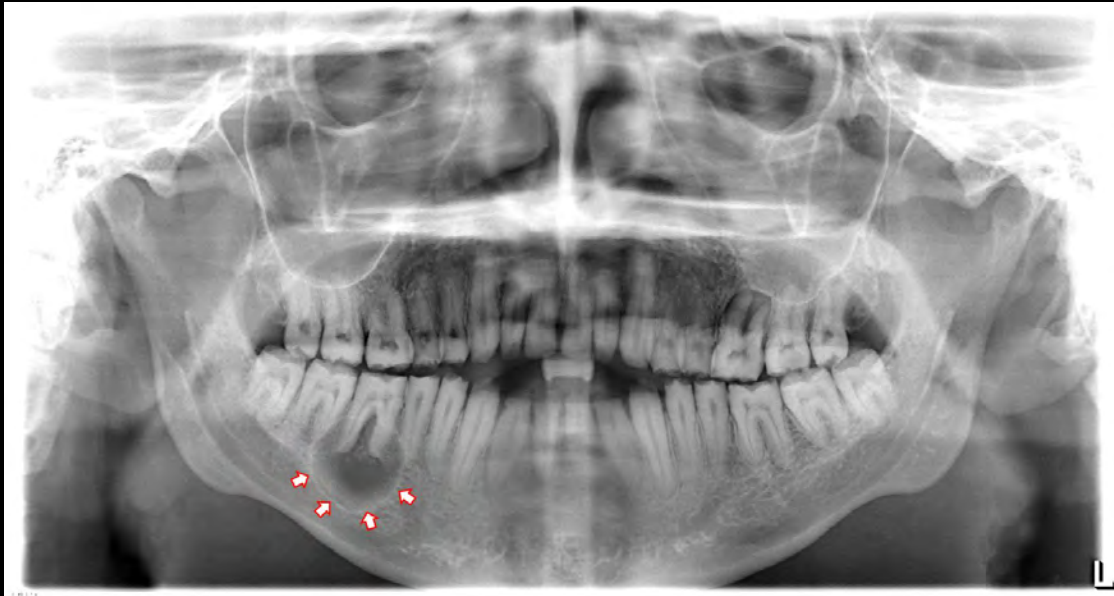


- 
- 3D imaging is not required to diagnose genetically-inherited dental anomalies.

- 
- ...and because a patient can have as many diseases as s/he pleases.





- There is a well-defined, corticated, radiolucent entity situated at the root apices of the molar tooth. The epicentre of the entity is located apical to the molar roots. There is superior-inferior compression and displacement of the inferior alveolar canal.



Choose the most likely disease category for Case 9.

- a. Healing.
- b. Malignant neoplasm.
- c. Inflammation.
- d. Bone dysplasia.

- 
- Rarefying osteitis (9i) is a localized inflammatory response of bone, commonly resulting from odontogenic infection:
 - Pulpal necrosis (periradicular)
 - Periodontal disease (pericoronal)


- 
- Rarefaction refers to the condition of becoming lighter, or less dense.
 - Radiographically, rarefaction refers to a loss of bone mineralization that results in the appearance of increased radiolucency.

- In the context of pulpal necrosis, rarefying osteitis is an “umbrella” term for the following 3 histopathologic entities: (peri) radicular abscess, (peri) radicular granuloma and radicular cyst.
 - Radiographically, it is *impossible* to distinguish between the three.



- **What we don't call this...**

- endodontic lesion (but endodontic treatment usually fixes them).
- lesion of endodontic origin/LEO (neither a lion nor horoscope sign).
- periapical radiolucency/PARL (lots of things can occur in a periapical position; not just this).

- 
- The earliest radiographic evidence of rarefying osteitis may be a subtle, localized increase in the width of the periodontal ligament space.
 - Changes in bone mineralization may not be seen early on.



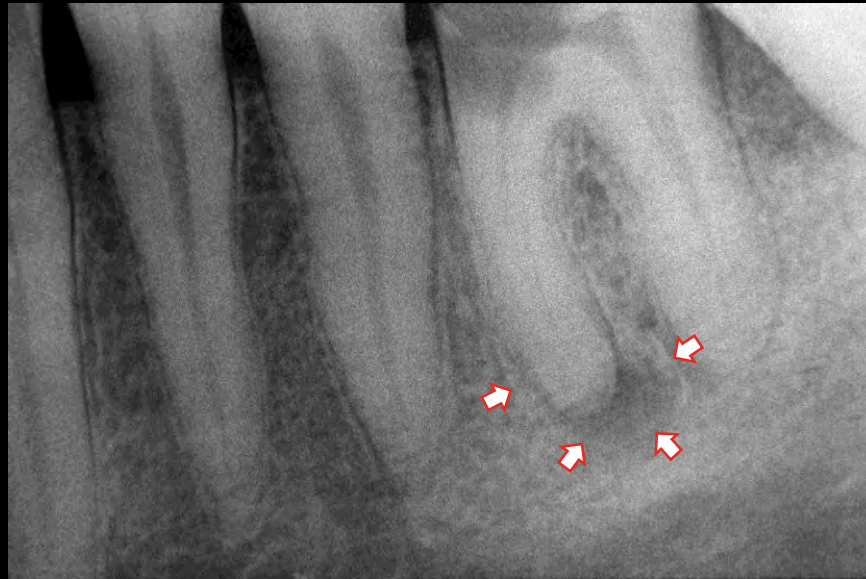


Anatomical Group	Diagnostic Agreement (n)	Diagnostic Disagreement (n)	Chi-square
Maxilla	728	182	$\chi^2 = 4.327$ p = 0.038
Mandible	612	195	
Molar	790	246	$\chi^2 = 7.707$ p = 0.021
Premolar	372	99	
Incisor/canine	178	32	
Multi-rooted teeth	894	271	$\chi^2 = 3.601$ p = 0.058
Single rooted teeth	446	106	
Mandibular molars	442	151	$\chi^2 = 10.236$ p = 0.069
Maxillary molars	438	95	
Maxillary premolars	243	63	
Maxillary incisors/canines	137	24	
Mandibular premolars	129	36	
Mandibular incisors/canines	41	8	



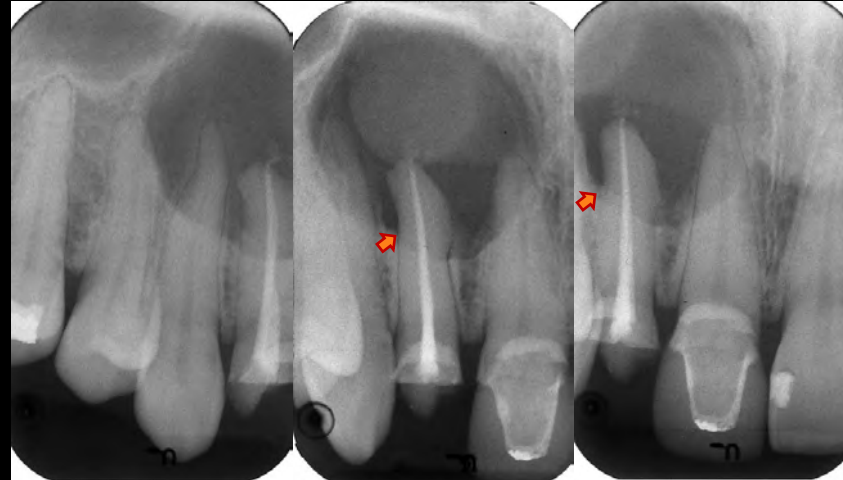
Note the epicentre of the developing radiolucency; it is periapical.





Outward displacement with loss of the lamina dura
may be seen with time.

- As the lesion enlarges, the lamina dura ultimately forms the corticated periphery of the lesion.

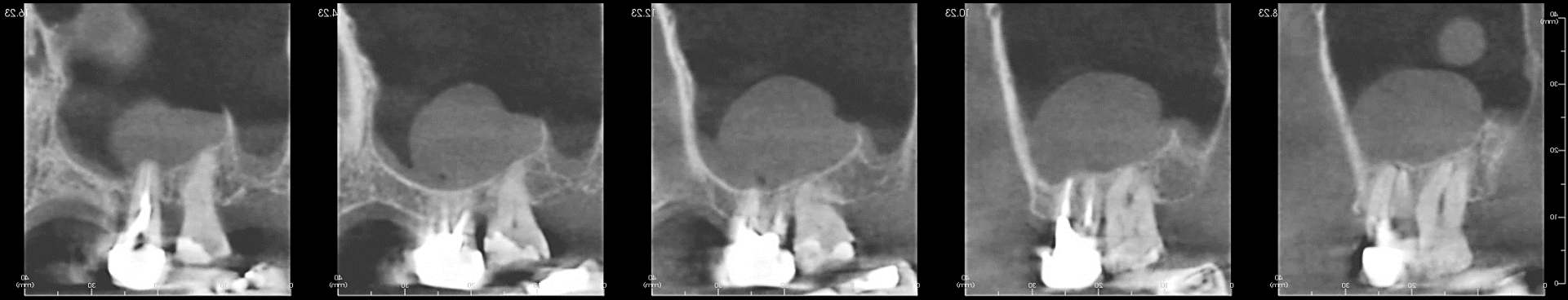


- Note the lamina dura and periodontal ligament spaces of teeth 1.1 and 1.3 are undisturbed.

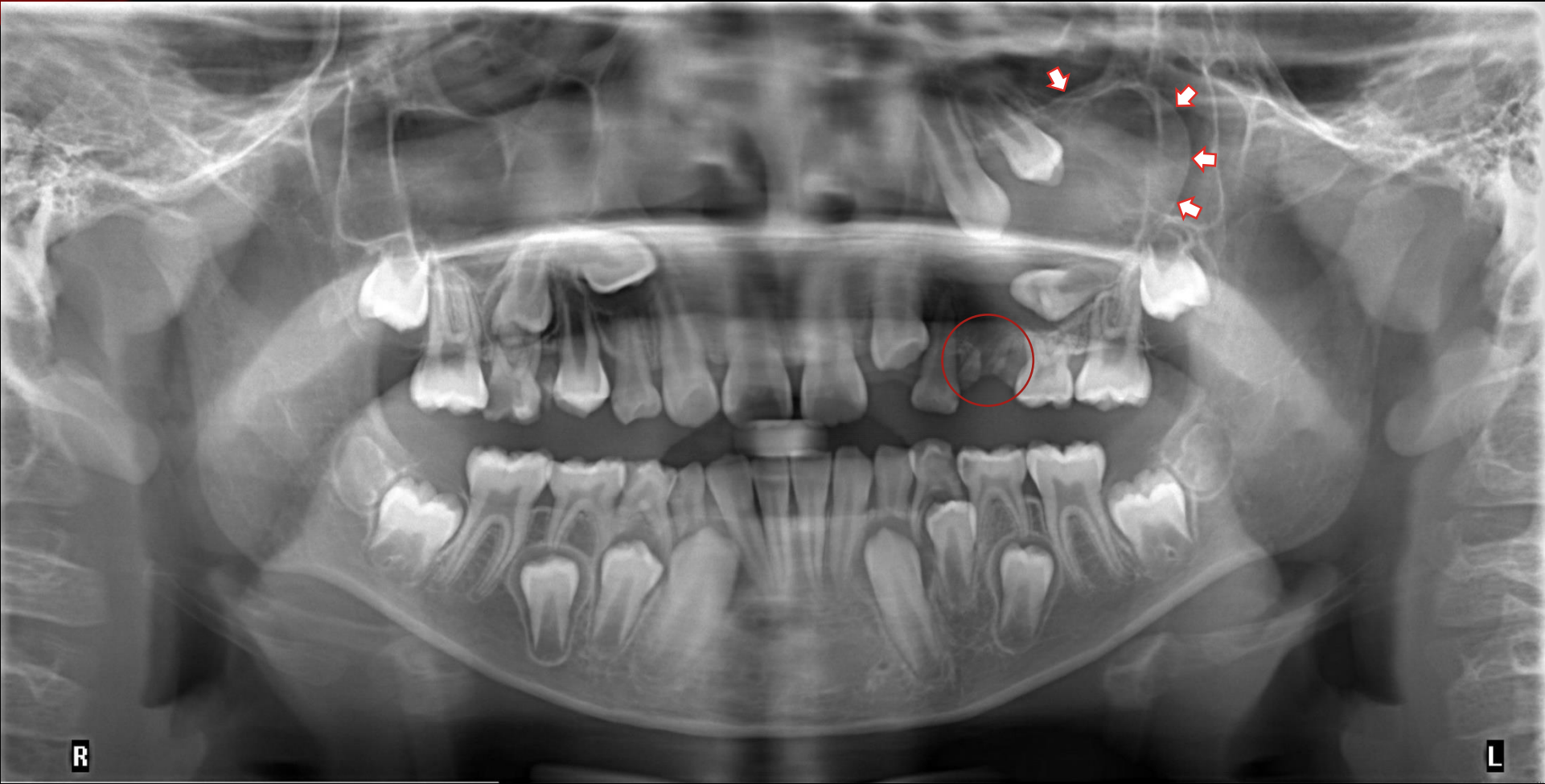




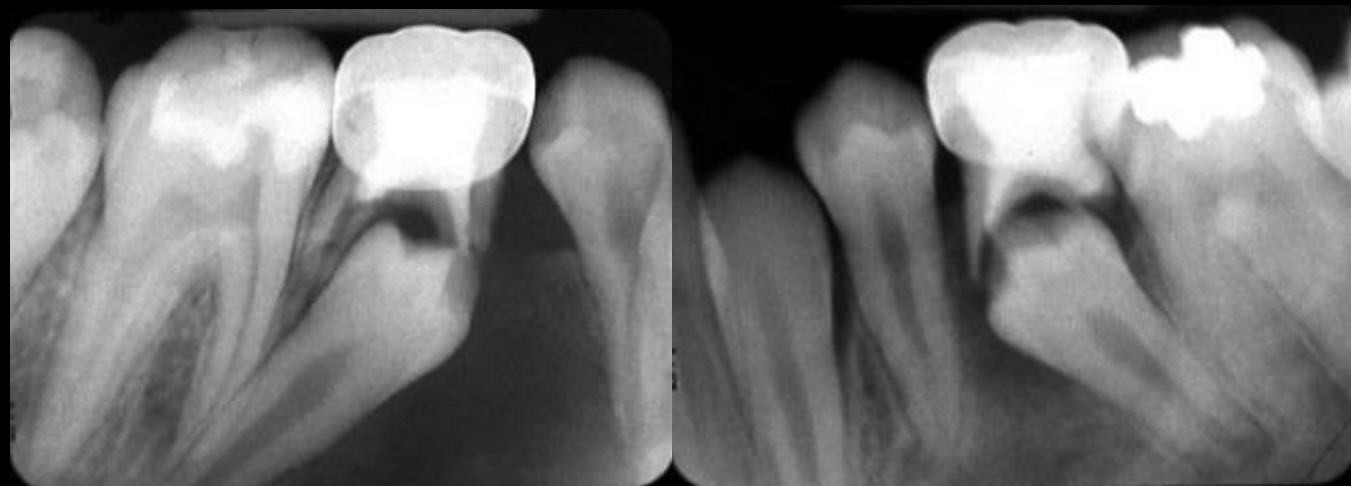
rarefying osteitis

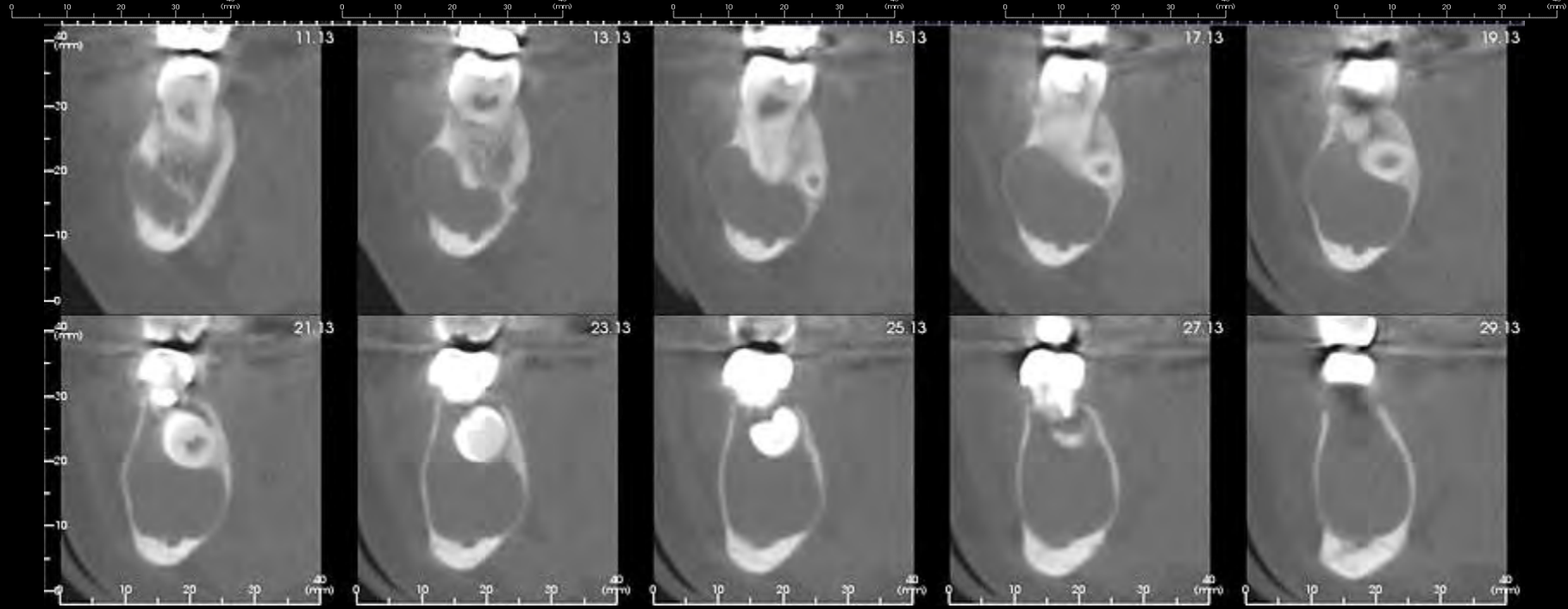


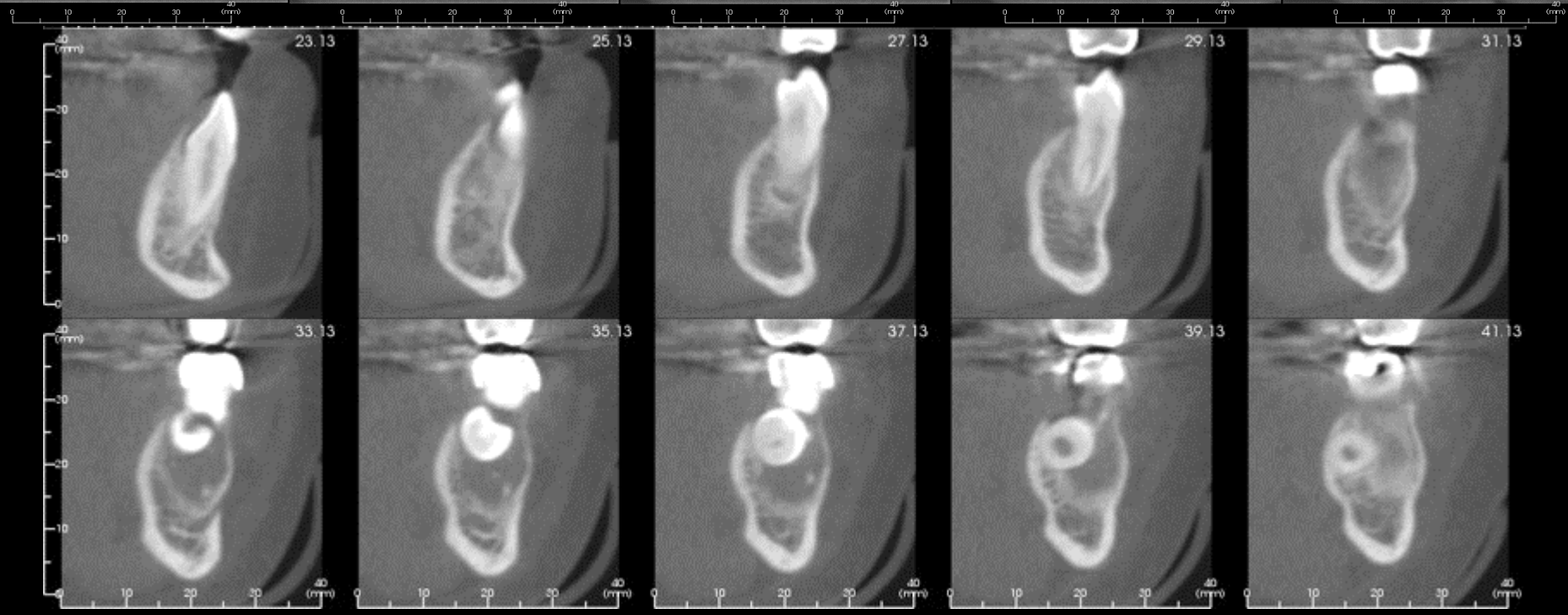
retention pseudocyst




rarefying osteitis

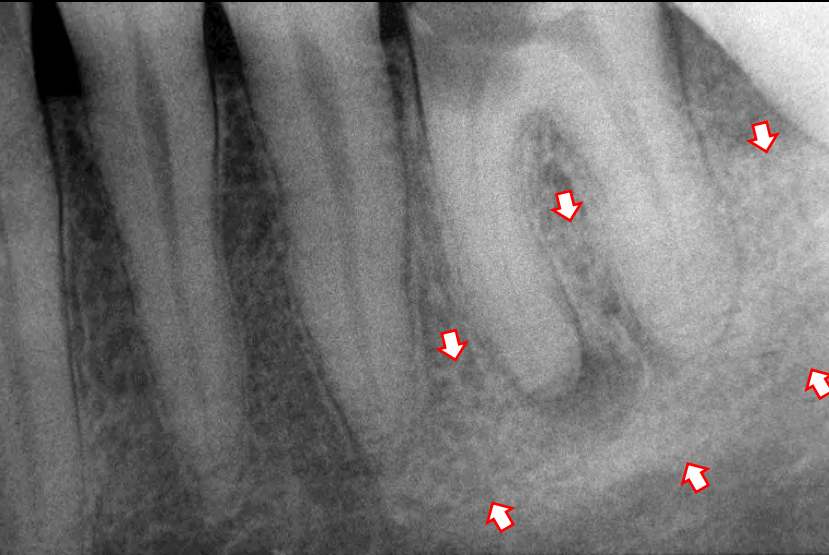




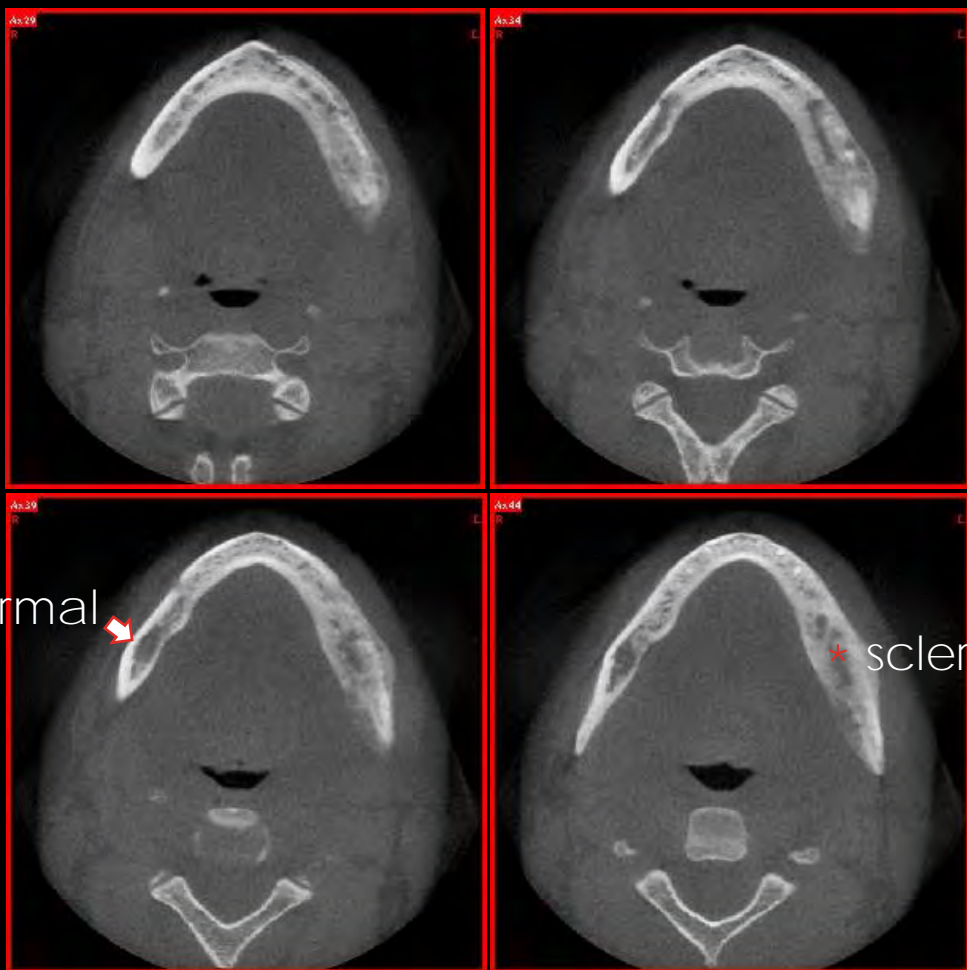


- 
- Sclerosis refers to a “hardening” of tissue.
 - Radiographically, sclerosis refers to a diffuse increase in mineralization of bone and results in the appearance of increased radiopacity.

- Sclerosing osteitis (9ii) occurs under the same conditions as does rarefying osteitis, except that the process results in a diffuse increase in bone density [N.B., not 'condensing osteitis'].








normal

* sclerosis

- 
- 3D imaging may be required if the requisite features of rarefying osteitis cannot be seen due to anatomical/location constraints.

R

PaX-i



- There is a poorly-defined, non-corticated, diffuse, radiolucent process involving the body and ramus of the mandible on the right side. Both the cancellous and cortical bone of the mandible are involved. The bone support surrounding the molar teeth in the right posterior mandible has been lost, as has the external oblique ridge and inferior alveolar canal. The lamina dura and periodontal ligament spaces have also been lost.



Choose the most likely disease category for Case 10.


- a. Normal anatomy/variation of normal.
- b. Benign neoplasm.
- c. Malignant neoplasm.
- d. Inflammation.



- Primary radiolucent tumours

- These are tumours that arise locally, and by extension, infiltrate adjacent tissues and spaces; most commonly squamous cell carcinoma.




- 
- With time, infiltration into bone is characterized by a radiolucent area that may have the appearance of a “cookie bite” with typically poorly-defined borders.

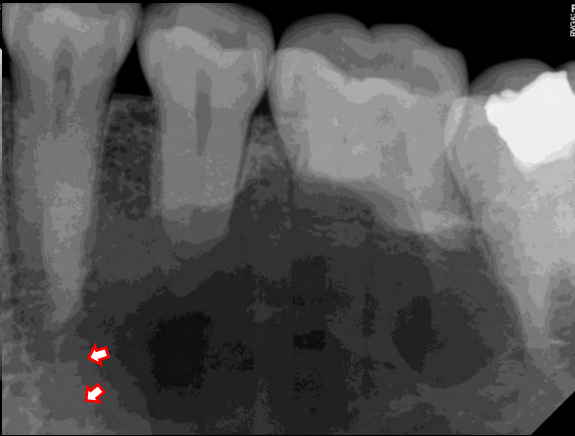
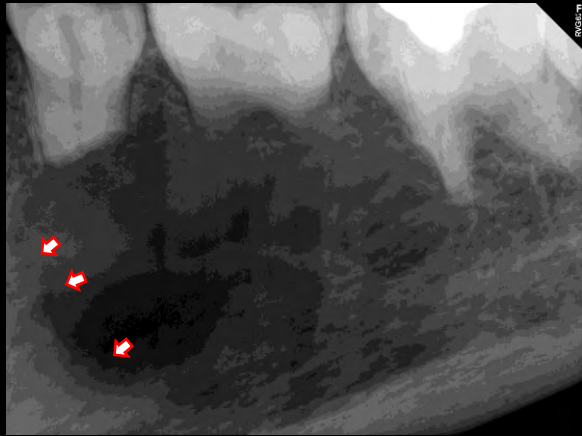


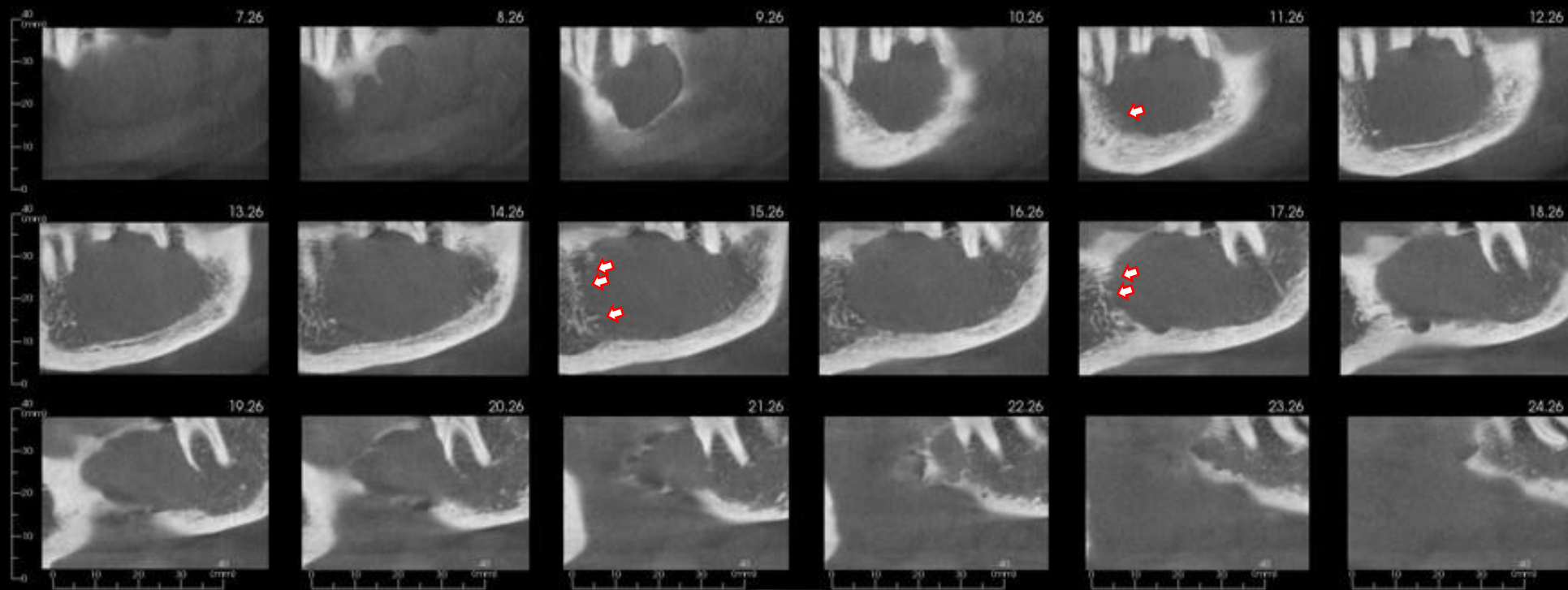





- 
- Metastatic radiolucent tumours
 - These are tumours that arise from within the bone, and grow from the inside to the surface.







- 
- Malignant neoplasia should be imaged using multidetector CT in a hospital for staging, and biopsied.

Thank you.

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UNIVERSITY OF TORONTO
FACULTY OF DENTISTRY

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