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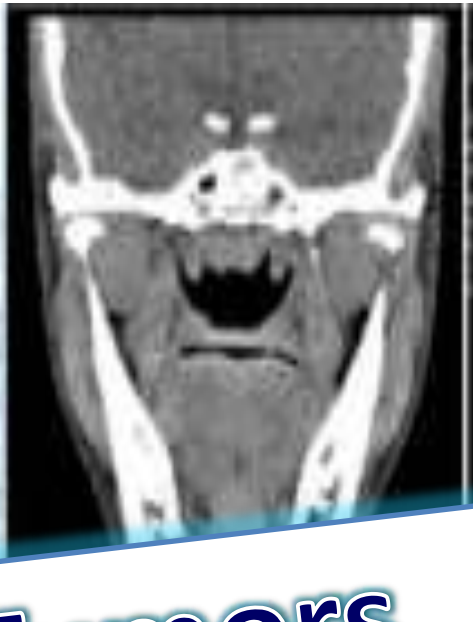


Benign Tumors Of The Jaws

INTRODUCTION

What Is A Benign Tumor?????

A new growth resembling the tissue of origin.

Spread by direct extension and **not by metastases**.

shows progressive and **slow rate of growth.**

TERMINOLOGIES

- **Hamartoma:**
  - Abnormal proliferation of tissue in its usual location that cease growing along with the tissues of the associated parts (e.g. odontoma).
  - Usually congenital and have a major period of growth at the time the rest of the body is growing

- **Hyperplasia**
  - Enlargement caused by an increase in the number of cells, and the tissue is in an normal arrangement.
  - Slow growing growths of new bone with normal architecture.
  - Believed to be a reaction to a stimulus such as inflammation.

Neoplasm

- Tumors that continue to grow indefinitely

- **Hypertrophy**
  - Enlargement caused by an increase in the size of the cells.

- **Teratoma**
  - Neoplasms composed of a mixture of tissues, more than one of which exhibits neoplasm proliferation
  - Congenitally acquired and usually found in the ovary

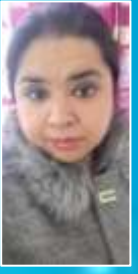
Classification of Benign Tumors

Odontogenic

- Epithelial or ectodermal
- Mesenchymal or mesodermal
- Mixed tissue origin
- Developmental malformation

Non Odontogenic

- Epithelial tissue
- Connective tissue
- Adipose tissue
- Cartilage tissue
- Bone tissue
- Vascular tissue
- Neural tissue
- Muscle tissue
- Salivary gland
- Teratoma



- **Mixed**
  - Ameloblastic fibroma
  - Ameloblastic fibro-odontoma
  - Odontogenic fibroma
  - Odontogenic myxoma
  - Odontome
  - Ameloblastic hemangioma
  - Odontogenic myxofibroma

esenchymal

- Dentinoma
- Cementoma
- Cementoblastoma

- **Developmental Malformation**
  - Dens invaginatus
  - Dens evaginatus

Salivary Gland Tumors

- Pleomorphic adenoma
- Wartin's tumor
- Basal cell adenoma
- Adenoma
- Lymphadenoma
- Sjögren's syndrome

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Adipose Tissue

Neural Tissue

- Traumatic neuroma
- Neurofibroma
- Neurofibromatosis
- Neurilemmoma
- Neuropolyendocrine syndrome
- Melanotic neuroectodermal tumor of infancy

Muscle Tissue

- Leiomyoma
- Rhabdomyoma
- Granular cell myoblastoma
- Congenital epulis of the new born

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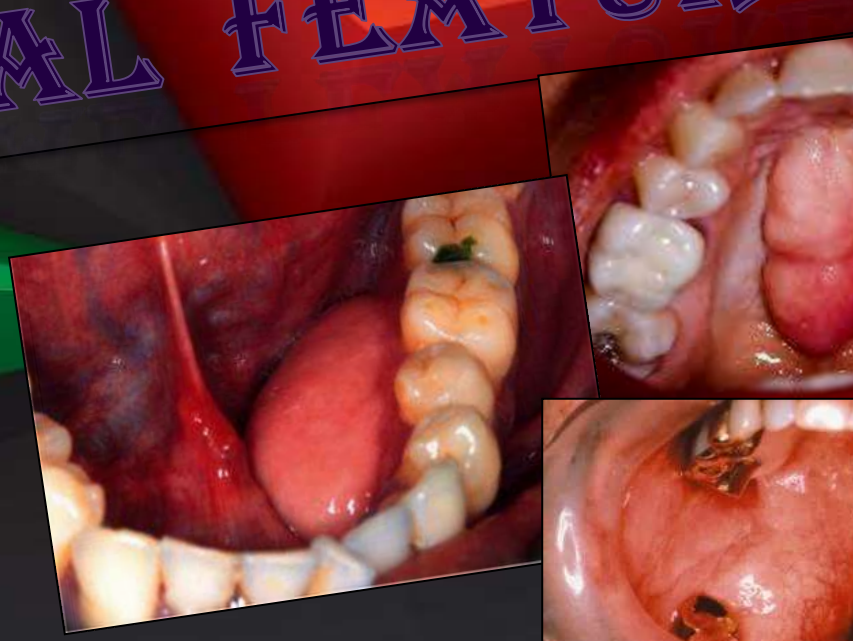
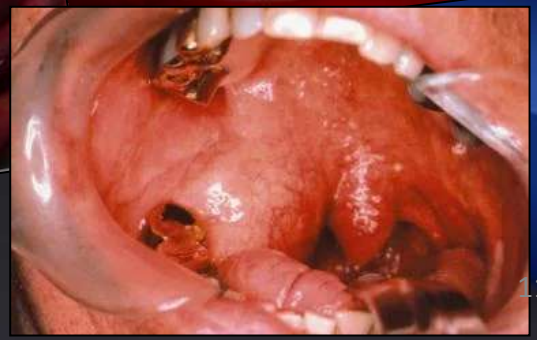
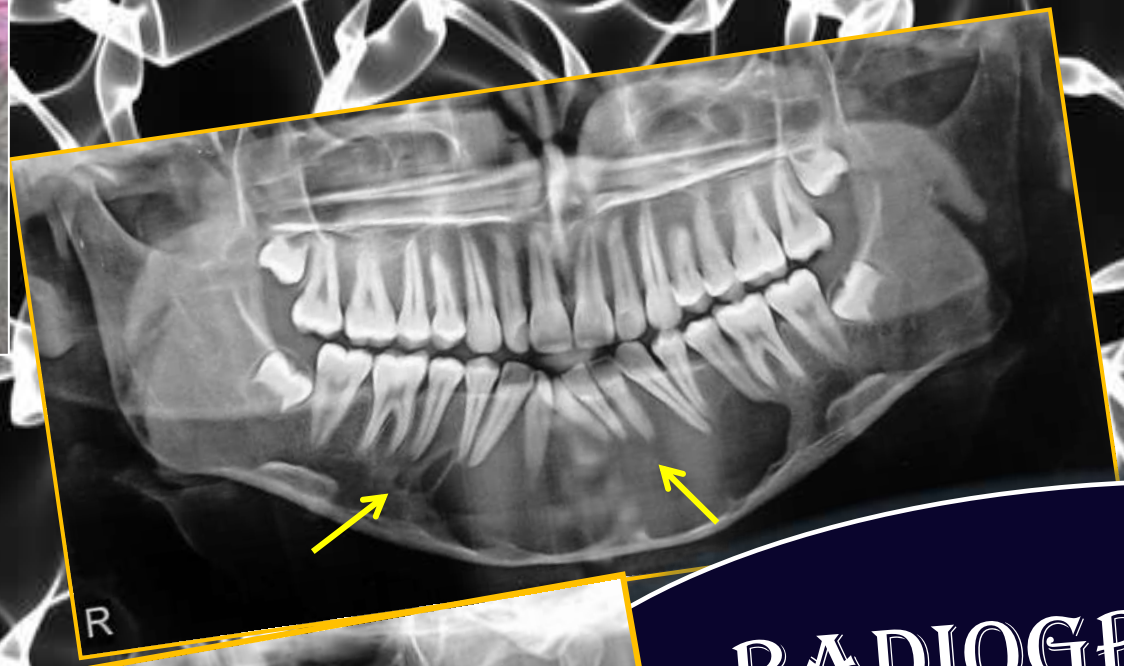
- Lymphangioma
- Rendu-Osler-Weber syndrome

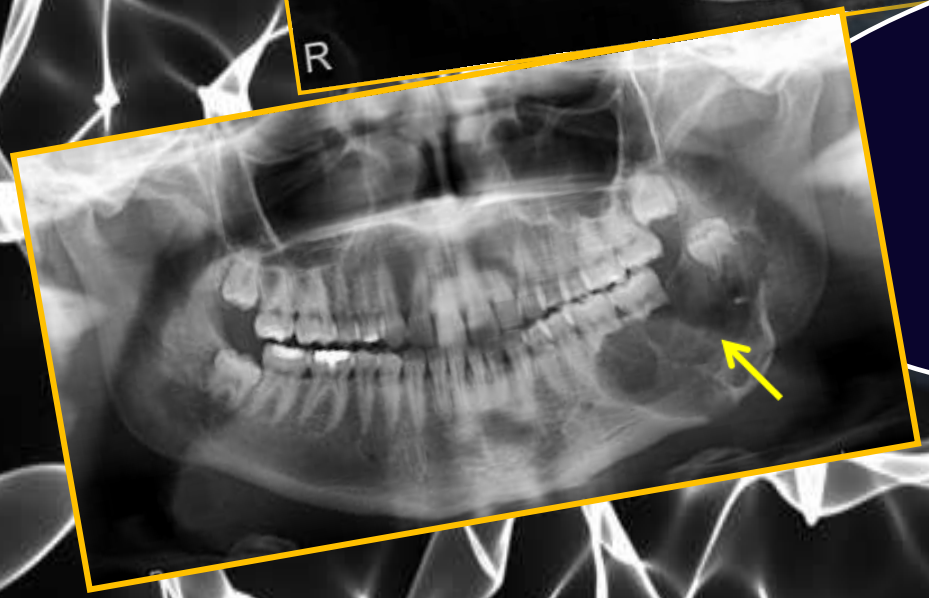
CLINICAL FEATURES





- Insidious in onset, slow growing and spread by direct extension and not by metastases.
- Have unlimited growth potential
- Well defined mass of regular, smooth outline with a fibrous capsule
- Resemble the tissue of origin histologically
- Detected clinically by enlargement of jaws or are found during a radiographic examination.
- Painless and not life-threatening unless they interfere with a vital organ by direct extension.
- Produce symptoms due to swelling and pressure effect on the surrounding structures





RADIOGRAPHIC FEATURES

Location:

- Odontogenic tumors occur in the alveolar process
- Vascular and neural lesions may originate inside the mandibular canal, arising from the neurovascular tissues
- Cartilaginous tumors occur in the jaw locations where residual cartilaginous cells lie. (around mandibular condyle)

- **Periphery and shape**
  - Borders are relatively smooth, well-defined or moderately defined and sometimes corticated or hyperostotic
  - The shape is usually round or oval, regularly shaped lesion.

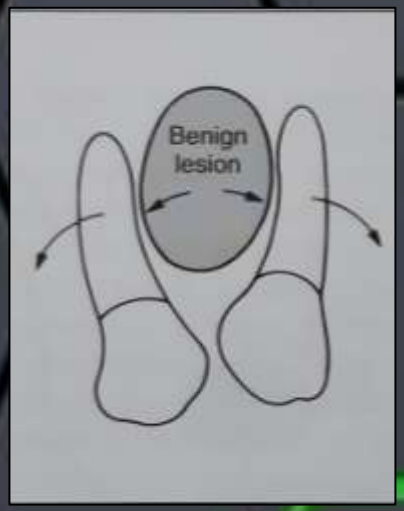
Internal Structure

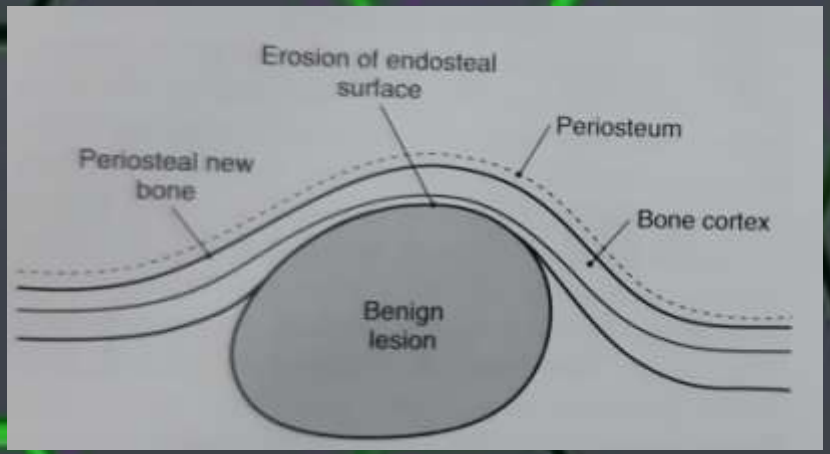
- Radiolucent, unilocular, multilocular, cystic, honey comb or soap bubble appearing lesion.
  - ❖ E.g. ameloblastoma, myxoma, hemangioma, CGCG

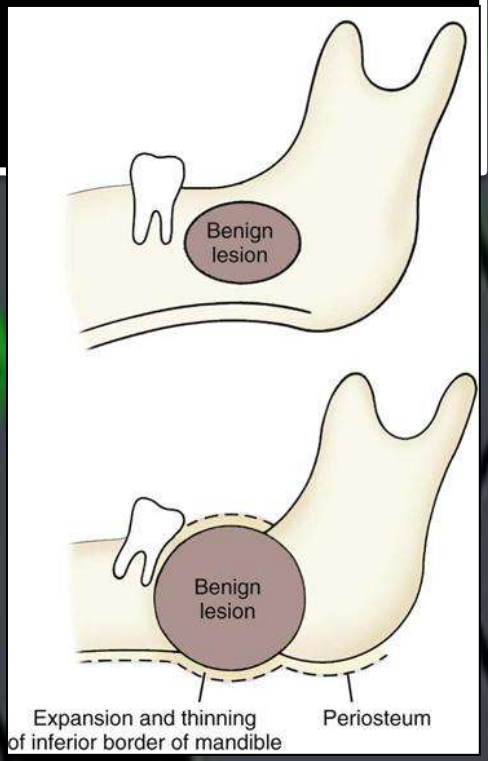
- Mixed radiopaque-radiolucent lesion
  - ❖ curved septae :- ameloblastoma
  - ❖ Irregularly thickened trabeculae :- CGCG
  - ❖ Numerous scattered radiopaque foci of varying size and density imparting a driven snow (CEOT) or mottled (AOT, odontome)

Effect on Surrounding Structures

- Displacement of teeth or bony cortices
- Displacement of vital structures like inferior alveolar canal
- Erosion, pathological fracture and infiltration or invasion of the adjacent normal bone
- Resorption of root, in a smooth manner







AMELOBLASTOMA

- Also called as Adamantoblastoma, Epithelial odontoma, Adamantinoma.

- True, aggressive neoplasm that arises from the ramnants of dental lamina and dental organ (odontogenic epithelium).

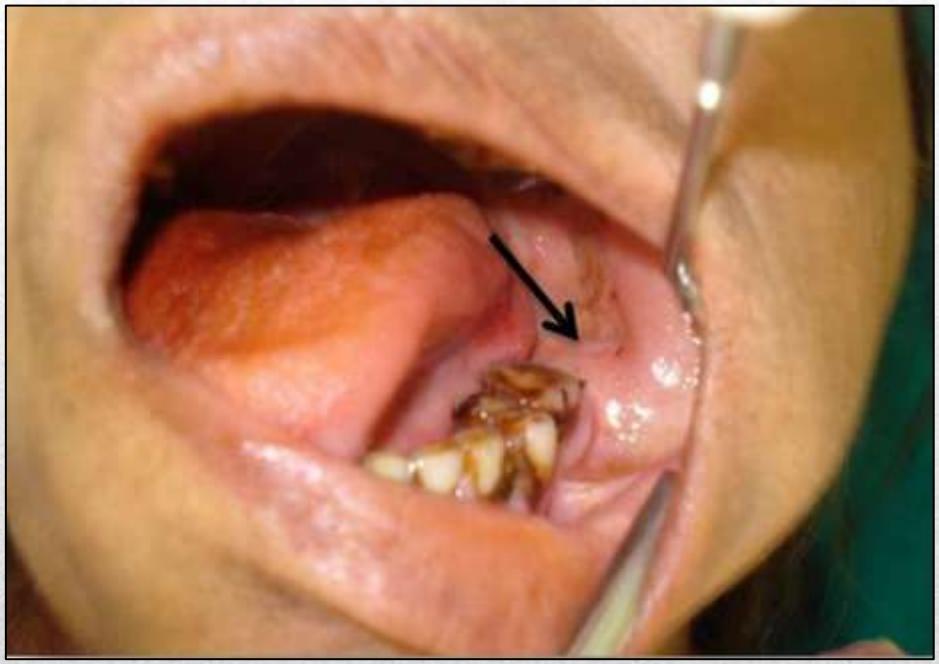
- Define as tumor that is unicentric, nonfunctional, intermittent in growth, anatomically benign and clinically persistent.

CLINICAL FEATURES

- Common in males (black), between 20 to 50 years of age.
- Begin as the central lesion of the bone which is slowly destructive but tends to expand bone rather than perforating it.
- Overlying mucosa appears normal and frequently discovered during routine dental examination.

- Facial asymmetry with mobility and displacement of involved tooth.
- Pain or paraesthesia
- Maxillary lesions dangerous than mandibular lesions.
- Ameloblastoma may form the epithelial lining of dentigerous cyst and is called as Mural ameloblastoma.

extraoral photograph of the patient, revealing a diffuse swelling over the left side of the face.



Intraoral photograph revealing a diffuse swelling from tooth 34 to retromolar region.

CLASSIFICATION

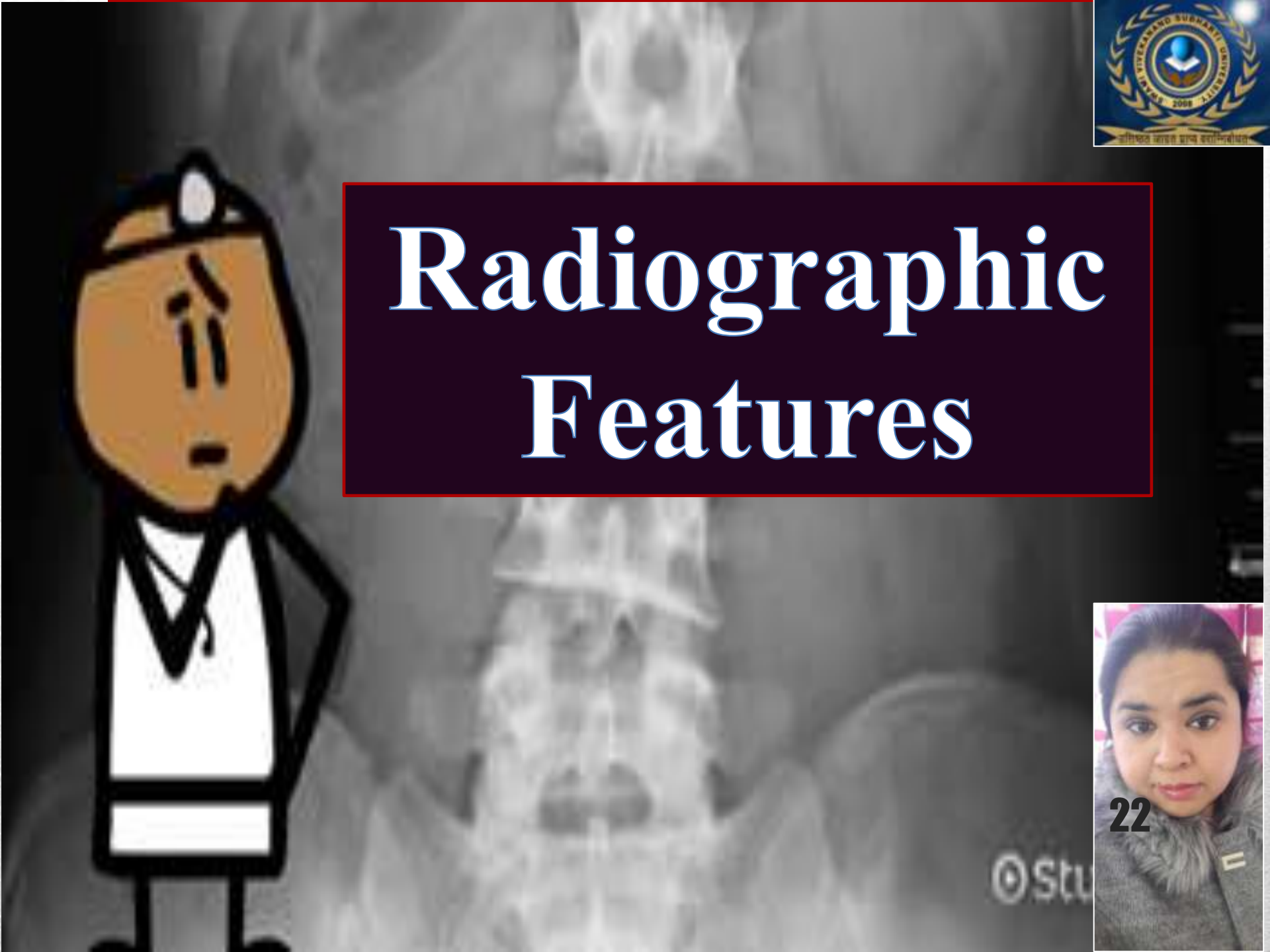
- Follicular ameloblastoma
- Plexiform ameloblastoma
- Acanthomatus ameloblastoma
- Basal cell ameloblasoma
- Unicystic ameloblastoma
- Plexiform unicystic ameloblastoma
- Granular cell ameloblastoma
- Papilleferous ameloblastoma
- Hemangio ameloblastoma
- Desmoplastic ameloblastoma
- Clear cell ameloblastoma
- Dentino ameloblastoma
- Melano ameloblastoma
- Kerato ameloblastoma

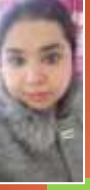
Histological

a, Rathke's pouch tumor)

bones

Radiographic Features





Location:

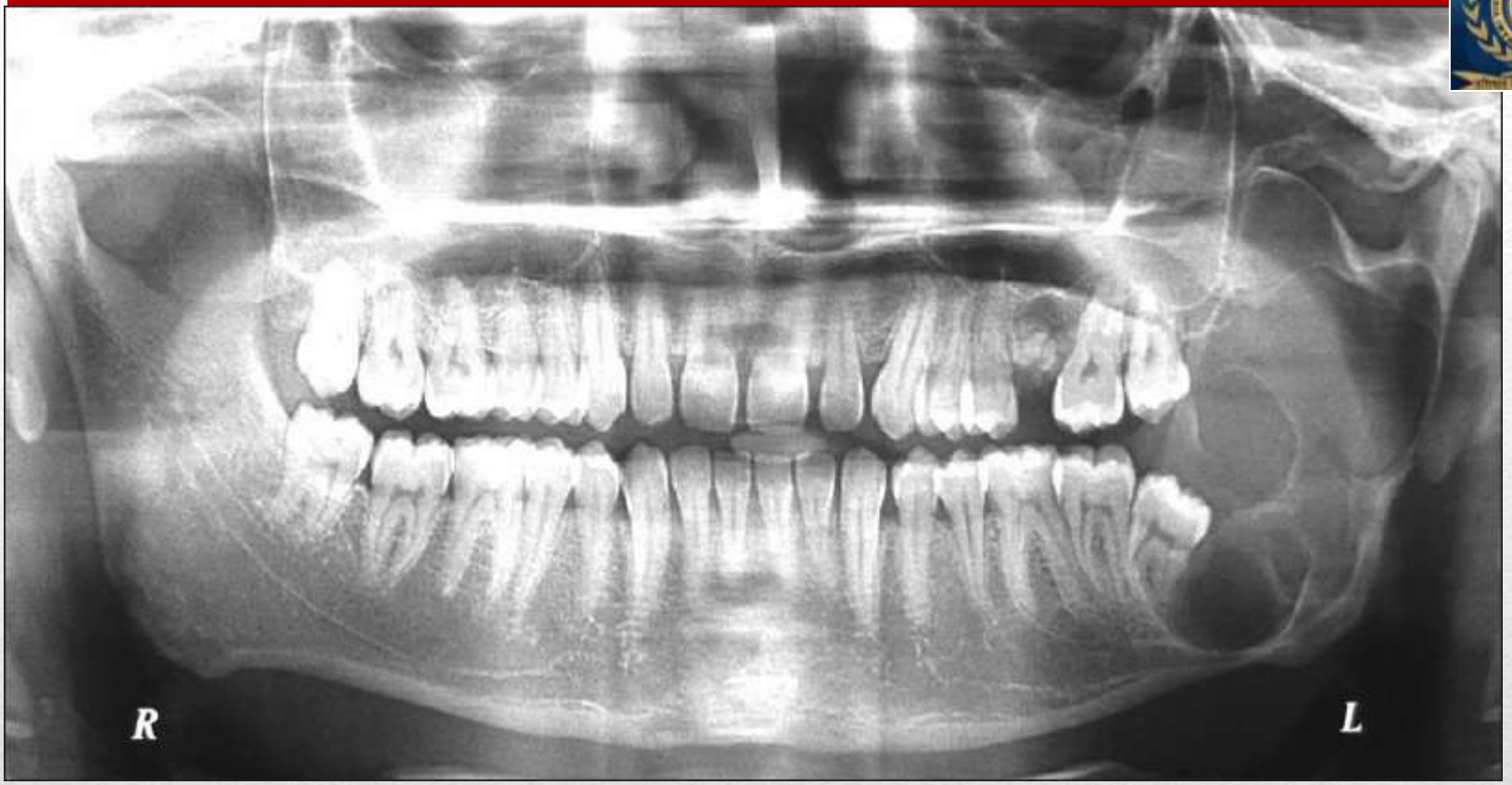
- Develop in the molar-ramus region of the mandible (80%) but may extend into the symphyseal region.
- In maxilla, develops in the third molar region and extends into the maxillary sinus and the nasal floor.

2. Periphery and shape:

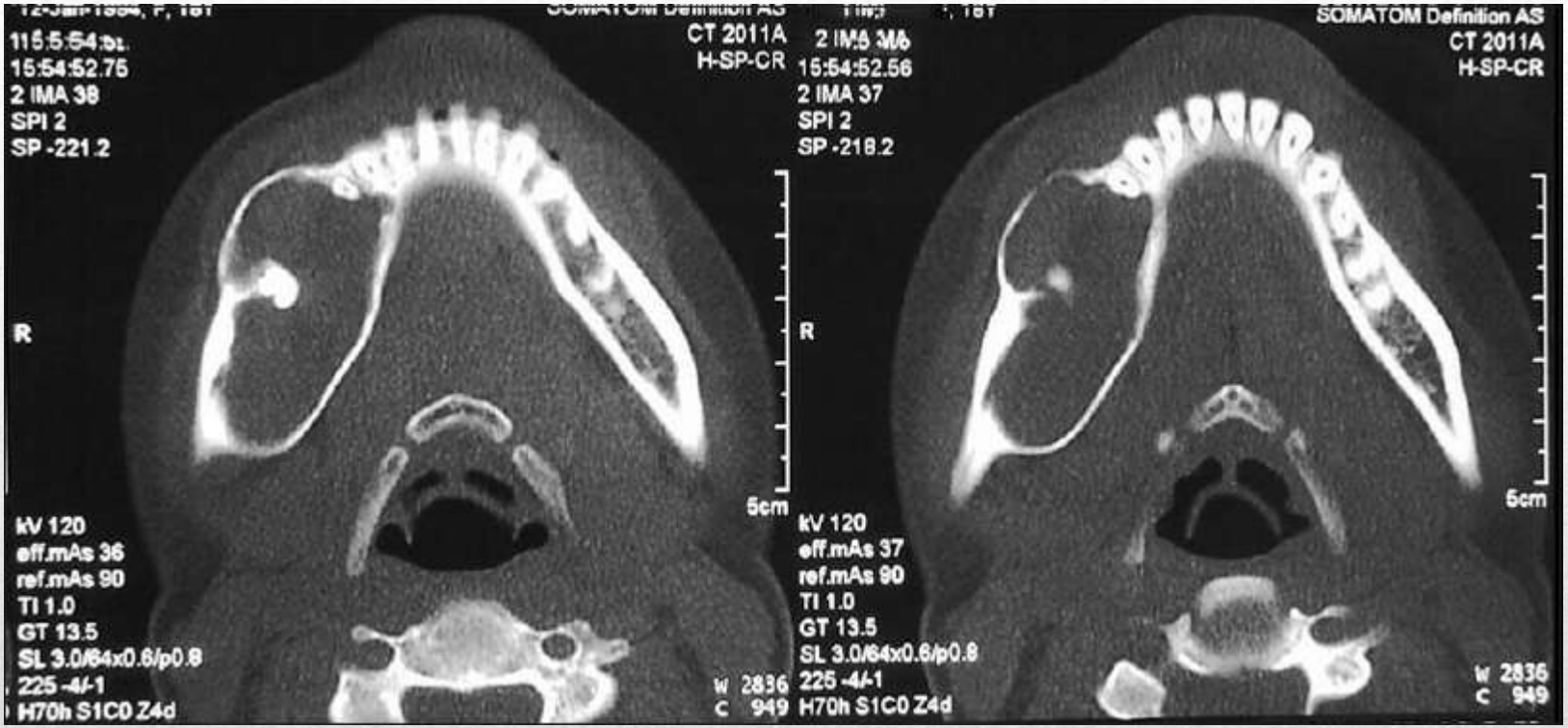
- Well define and frequently delineated by a cortical border.
- The periphery of lesions in the maxilla is usually ill defined.

3. Internal structure:

- Varies from radiolucent to mixed with presence of bony septa creating internal compartments.
- Septas are coarse and curved and originate from normal bone that has been trapped within the tumor.
- Septas are often remodeled into curved shapes providing a honey comb, soap bubble or spider web pattern.
- Loculations are larger in posterior mandible as compared to anterior.



OPG shows a well-defined multilocular radiolucency on the left side of the mandible with impacted third molar within the radiolucency



Computed tomography scan showing expansion and thinning of buccal and lingual cortices

4. Effect on surrounding structures:

- Extensive root resorption
- Tooth displacement
- Occlusal radiograph demonstrate thinning of adjacent cortical plate, leaving a thin “eggshell” of the bone.
- Perforation of the bone into the surrounding soft tissues or anatomic spaces.
- Unicystic types of ameloblastoma may cause extreme expansion

DIFFERENTIAL DIAGNOSIS

- Small and unilocular ameloblastoma
  - Residual cyst
  - Lateral periodontal cyst
  - Giant cell granuloma
  - Traumatic bone cyst
- Primordial cyst
  - Multilocular ameloblastoma
  - Odontogenic keratocyst
  - Odontogenic myxoma
  - Ossifying fibroma

MANAGEMENT

- Complete removal with resection
- Intraoral block excision
- Extraoral enbloc resection
- Peripheral osteotomy
- Radiation therapy may be used for inoperable tumors

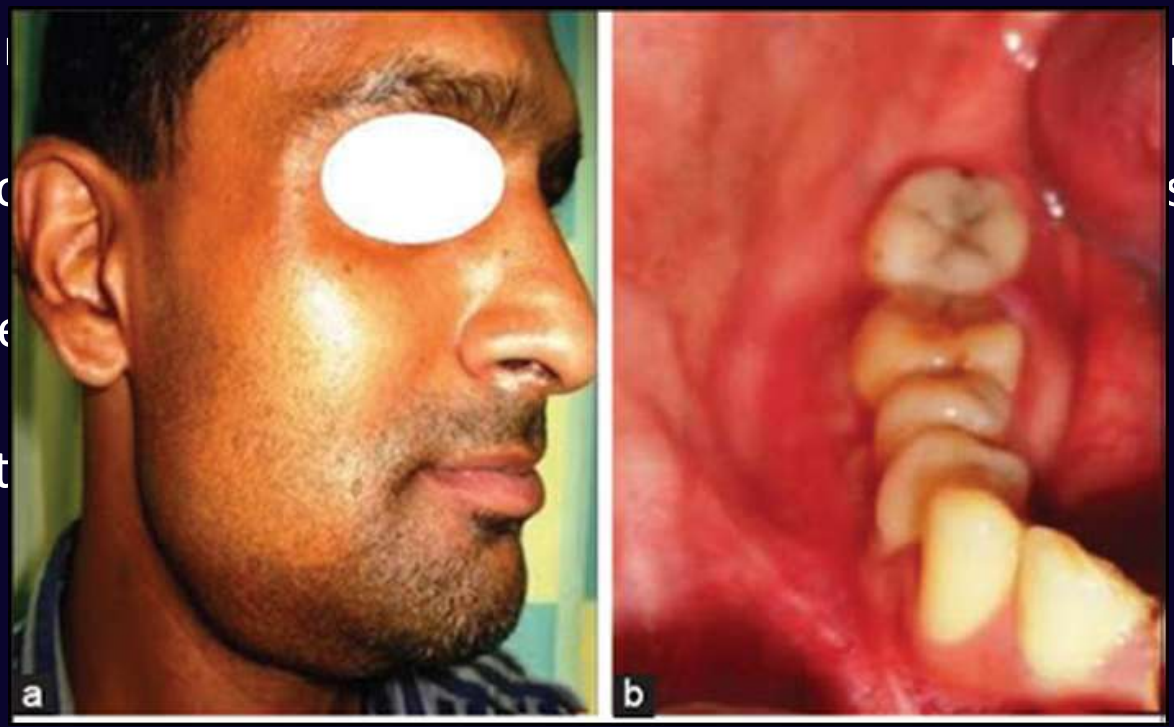
  especially those in the posterior maxilla

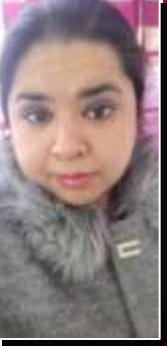
CALCIFYING EPITHELIAL ODONTOGENIC TUMOR

- Rare tumor that appears to arise from the reduced enamel epithelium or dental epithelium.
- Tumors are usually located within the bone and produced a mineralized substance within amyloid-like material.

CLINICAL FEATURES

- Common in males, with age range of 8-92 years (avg age 42yrs)
- Commo region
- Asympto sociated with paresthe
- Associat
- Cortical
- Palpation indicates a hard swelling with well defined or diffuse border





Radiographic Features

1. Location:

- Definite predilection for the mandible, develop in the premolar-molar area and is associated with unerupted or impacted tooth.
- Radiolucent area surrounding the crown of an unerupted or impacted tooth

2. Periphery and shape:

- Borders may vary from well-defined to diffuse to irregular & ill-defined

3. Internal structure:

- Unilocular or Multilocular (honeycomb pattern) with numerous scattered radiopaque foci, found close to the crown of embedded tooth

- Small thin, opaque trabeculae may cross the radiolucency in many directions. This gives a driven snow appearance.

4. Effect on surrounding structures:

- The
- Exp

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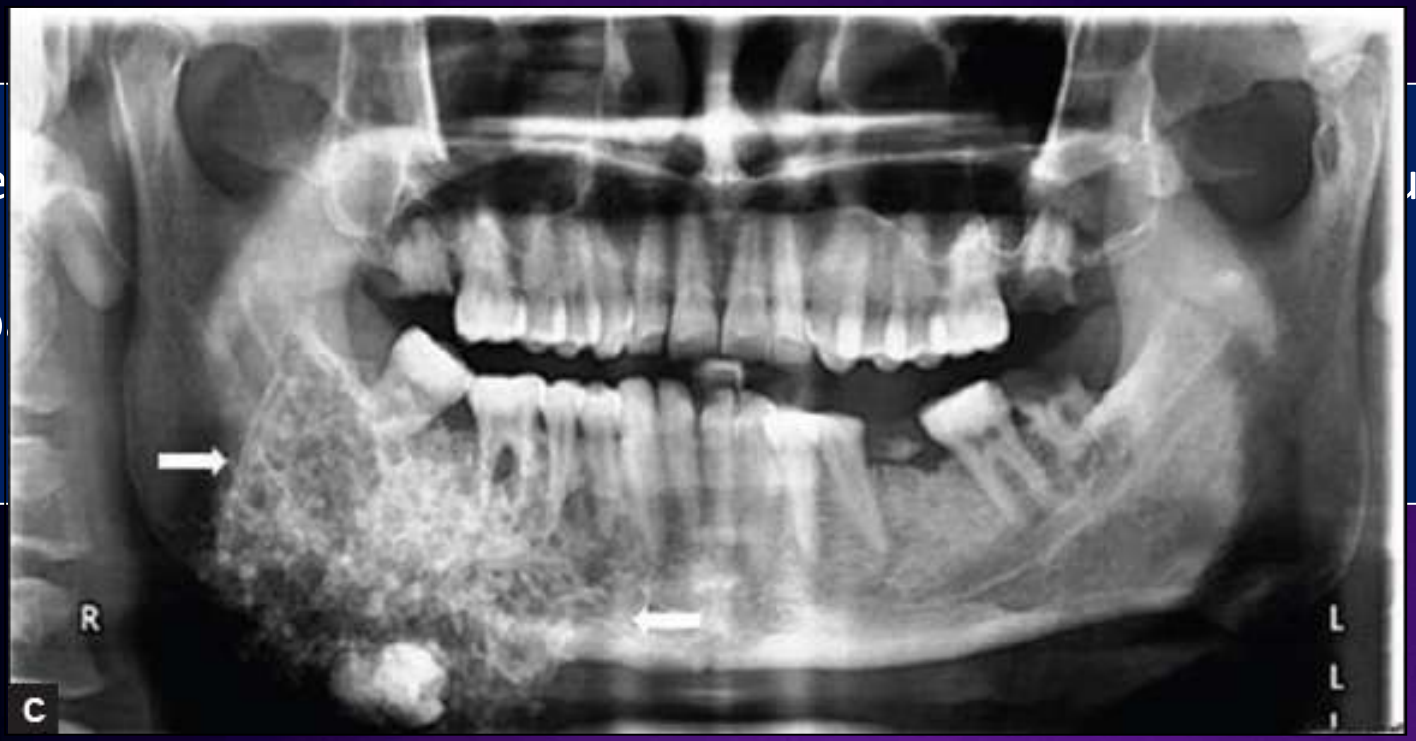

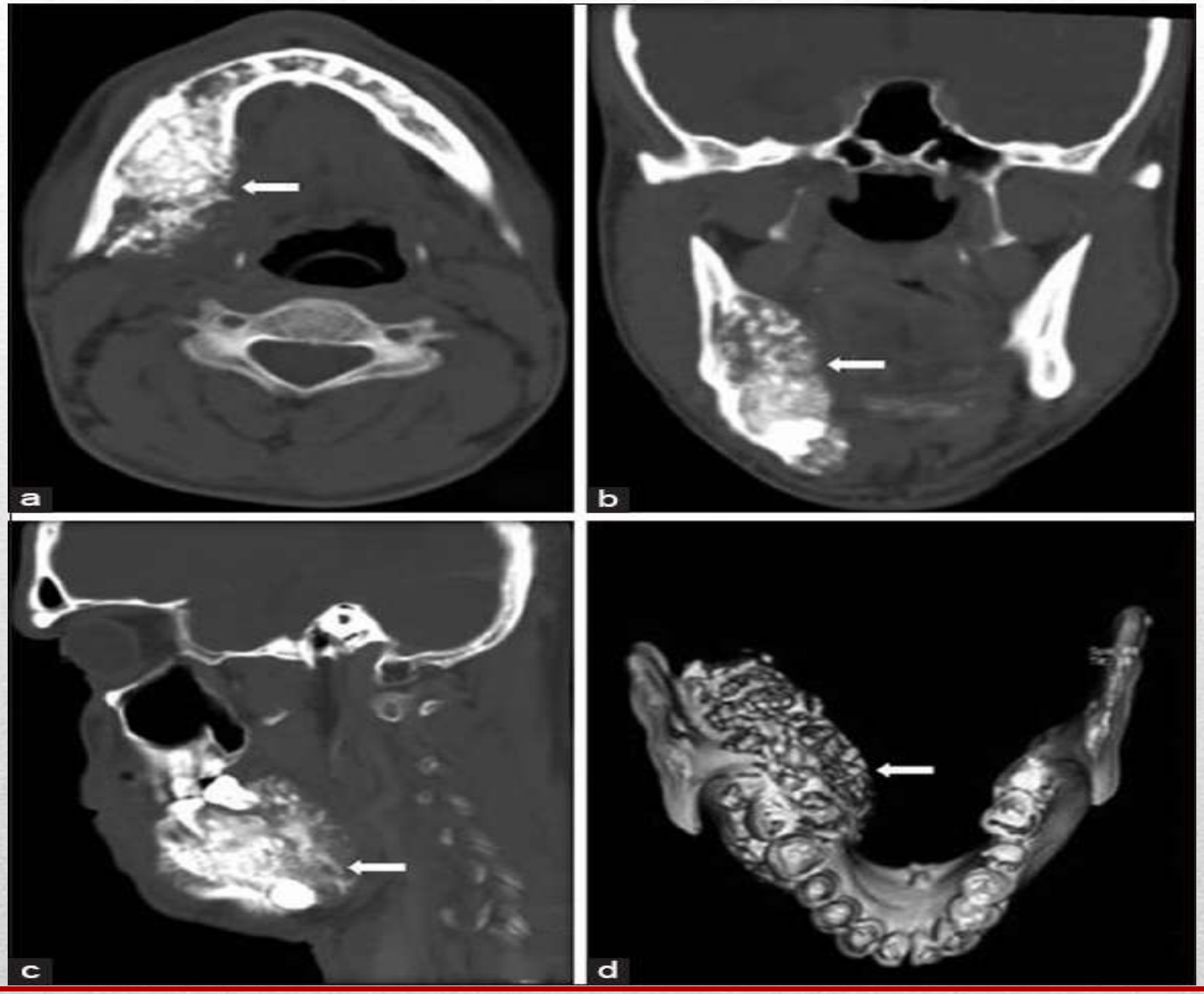
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DIFFERENTIAL DIAGNOSIS

- Dentigerous cyst
- Ameloblastoma
- Adenomatoid odontogenic tumor
- Calcifying odontogenic cyst
- Partially calcified odontoma:- has a capsule
- Central odontogenic fibroma :- fibroblasts are prominent and abundant

Adenomatoid Odontogenic Tumor

- Also k/a Adenoameloblastoma and Ameloblastic adenomatoid tumor.
- Called as two-third tumor
- Although AOT is called the Perfect Imitator of the Dentigerous Cyst, clinical features renders the diagnosis relatively obvious.
- Uncommon, non aggressive tumor of odontogenic epithelium.

- The presence of an intact capsule in most of the cases further reinforces the benign nature of the AOT.

- Hamartoma not a tumor.

- The origin of the AOT may be from enamel organ epithelium and it is classified as a mixed tumor because dentinoid material and occasionally enamel matrix is manufactured

CLASSIFICATION

- Peripheral
- Central
  - Follicular
  - Extrafollicular

CLINICAL FEATURES

- **Age and Sex**
  - Occurs in 2nd decade of life. Average age at occurrence is 17 years.
  - More common in females as compared to males (2:1).
  - ✓ **There are reports of AOT presenting in infants & also in individuals in 8th decade of life**

- **Site**
  - More common in maxilla usually cuspid region.
  - Involves both the bone and soft tissue in anatomic configuration.
  - ✓ **Cases have also been reported in the mandible , molar areas, in maxillary sinus & along with the embedded primary teeth.**

- **Signs and Symptoms**

  - Asymptomatic slow growing swelling or asymmetry, commonly associated with unerupted tooth.

  - It expands the cortices, but is non invasive.

  - The extraosseous tumor is very uncommon, and when seen it is usually located on the gingiva.

Radiographic Features

Location

- Occurs in the maxilla, usually in the incisor-canine-premolar region.

- Have a follicular relationship with the impacted tooth, however it does not attach at CEJ but surrounds the greater part of the tooth, most often a canine.

- Also associated with dilacerated tooth; anomalous tooth forms and supernumerary teeth

Periphery

- Well defined, unilocular radiolucency with corticated or sclerotic border.

✓ **Multilocular variant are also reported which gives credence to the occurrence of multiple AOT**

- **Internal Structure**
  - Radiopacities may develop in two-third of the cases.
  - It can be completely radiolucent ,or
  - May contain faint to dense clusters of ill-defined radiopacities.

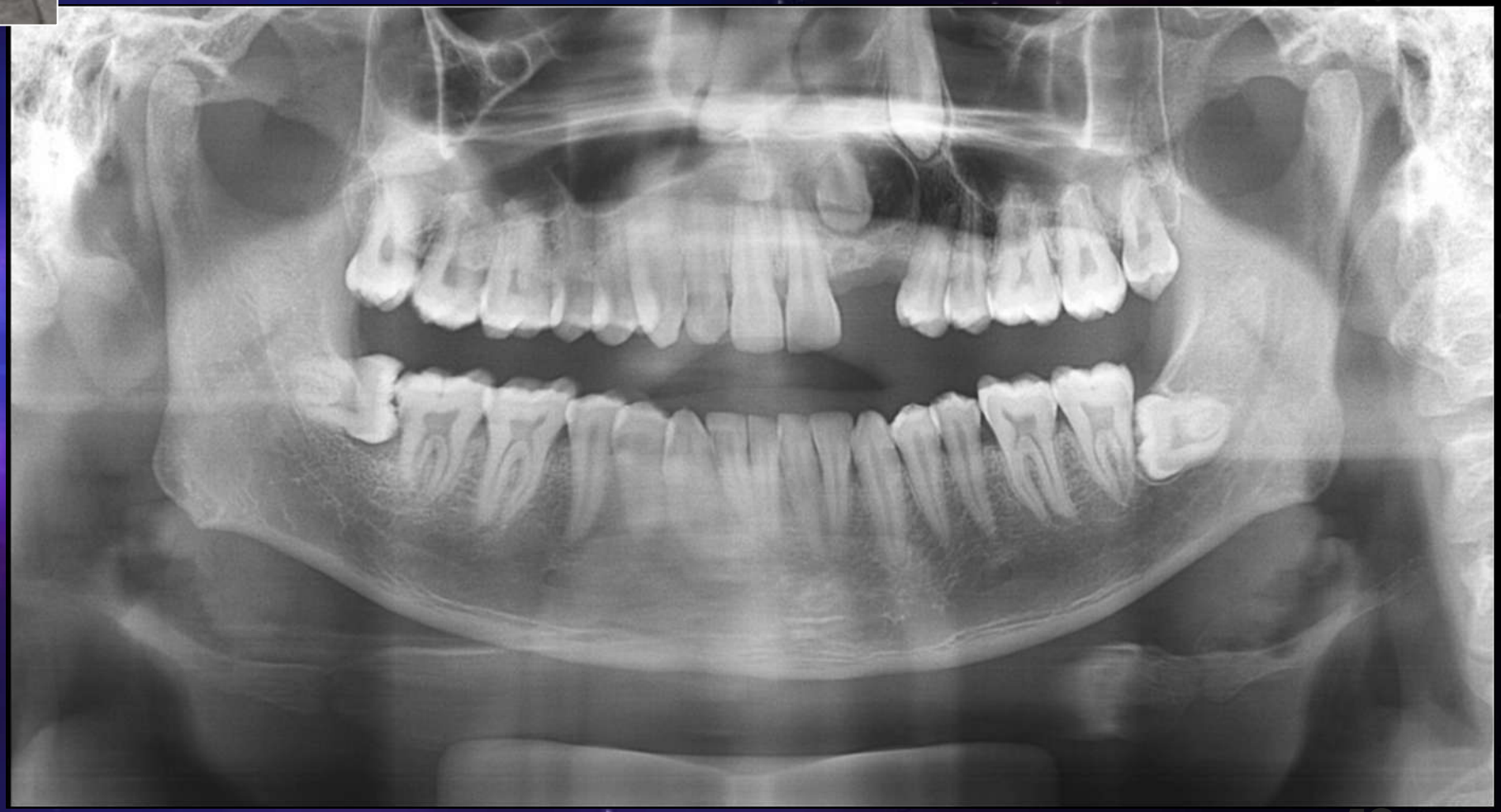
- Cluster of Pebbles

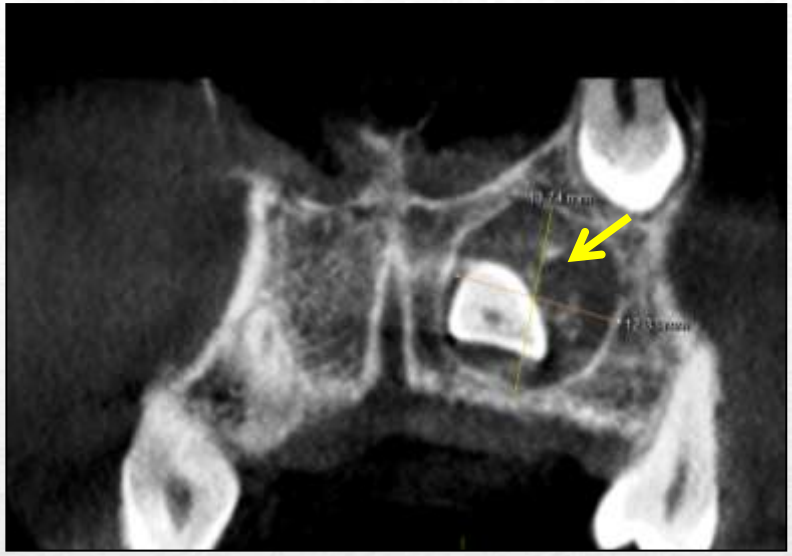
- The lesion may give a typical target appearance; which has a radiolucent circumferential halo which envelopes a dense, central and radiopaque mass.

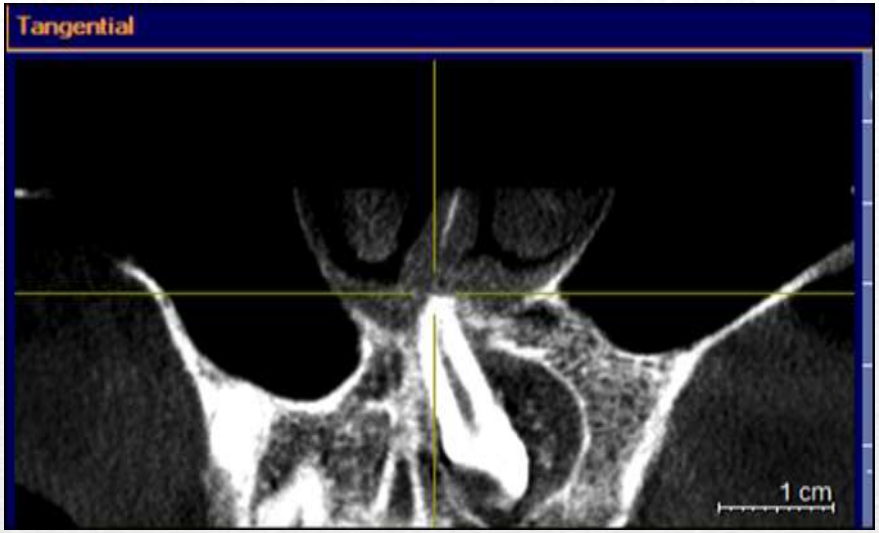
Effects on Surrounding Structures

- As tumor enlarges it causes displacement of the adjacent teeth, hypoesthesia and root resorption.
- Prevents the eruption of the associated impacted tooth.
- Expansion of the cortices may occur, but the outer cortex is maintained.

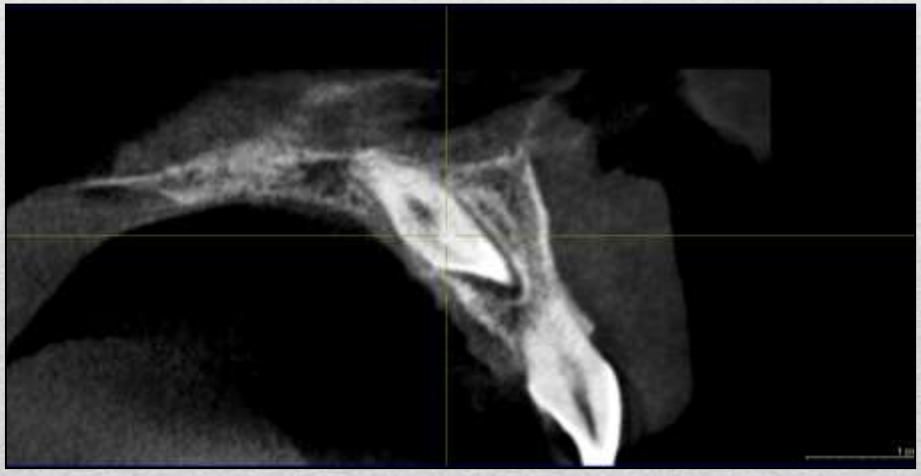
✓ **When the tumor occurs independently of unerupted teeth, it is often encapsulated.**



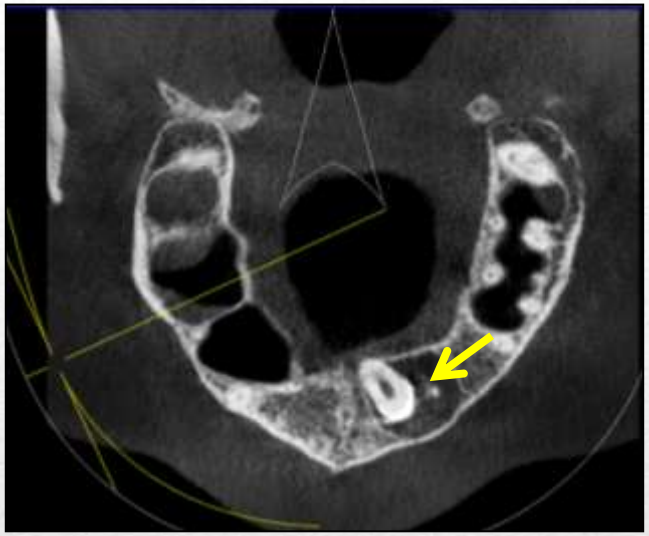


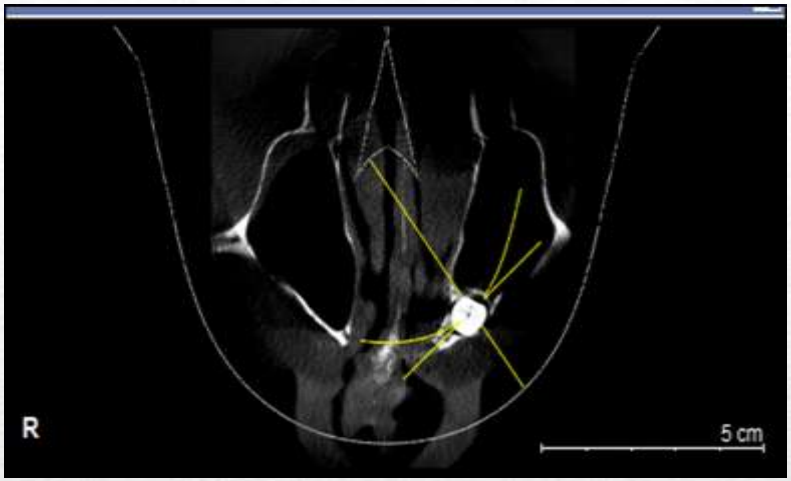


Tangential section



Sagittal section



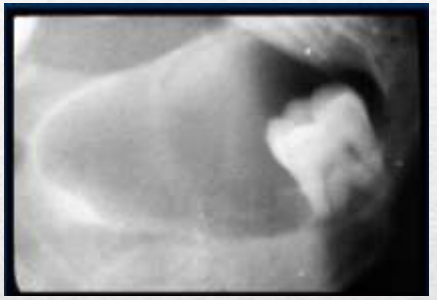


Axial section

3D- section

DIFFERENTIAL DIAGNOSIS

- Follicular Cyst:
  - If the attachment of the radiolucent lesion is more apical than the CEJ



- Calcifying Odontogenic Cyst
  - Difficult to differentiate from the extra follicular type of AOT.
  - Occurs in the older age group and usually in the premolar area

- Ameloblastic Fibro-odontoma
  - Common in the posterior mandibular region.
  - Multilocular and radiopacities of enamel and dentin are seen inside the radiolucency.
  - In AOT, snow flakes are seen at the periphery

- Calcifying Epithelial Odontogenic Tumor
  - Common in the posterior mandibular region

- Ameloblastoma
  - Common in the older age group and posterior region
  - Often multilocular.

- Dentigerous Cyst
  - Seen in 2nd to 4th decade of life as compared to AOT
  - Seen in younger age group
  - Most common in the posterior region
  - Present around the CEJ of impacted tooth

- Odontogenic Fibroma or Myxoma
  - Has tennis racket appearance

MANAGEMENT

- Conservative surgical excision with curettage is effective because tumor is not locally invasive, is well encapsulated and is separated easily from the bone.

- The recurrence rate is 0.2%

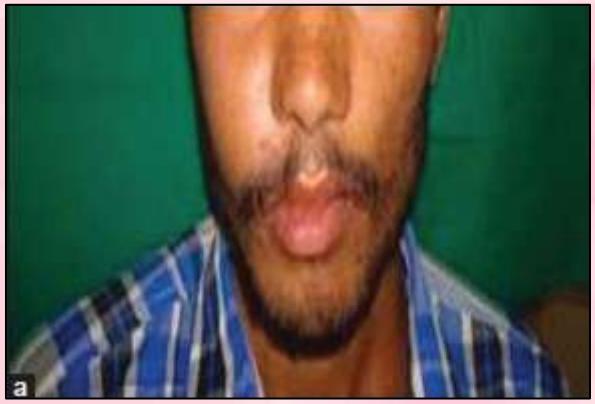
Benign Cementoblastoma

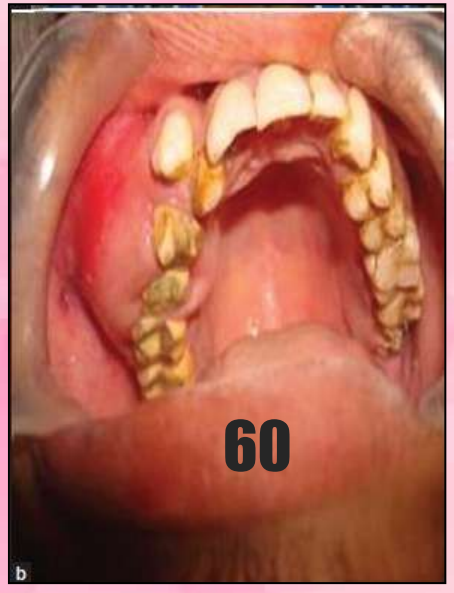
Definition:

- Slow growing mesenchymal neoplasm composed principally of cementum.
- Manifests as a large bulbous mass of cementum or cementum like tissue on the roots of the teeth.

Clinical Features:

- More common in males, between the age of 12-65 years.
- The tumor most often develops with permanent teeth but in rare cases occurs in the primary teeth.
- Commonly occurs in the mandible, in the premolar and 1st molar region.
- Solitary, slow growing tumor and may displace teeth.
- Involved tooth is often vital and painful.





Radiographic Features

1. Location:

- Occur more often in the mandible and form most commonly on a premolar or 1st molar

2. Periphery:

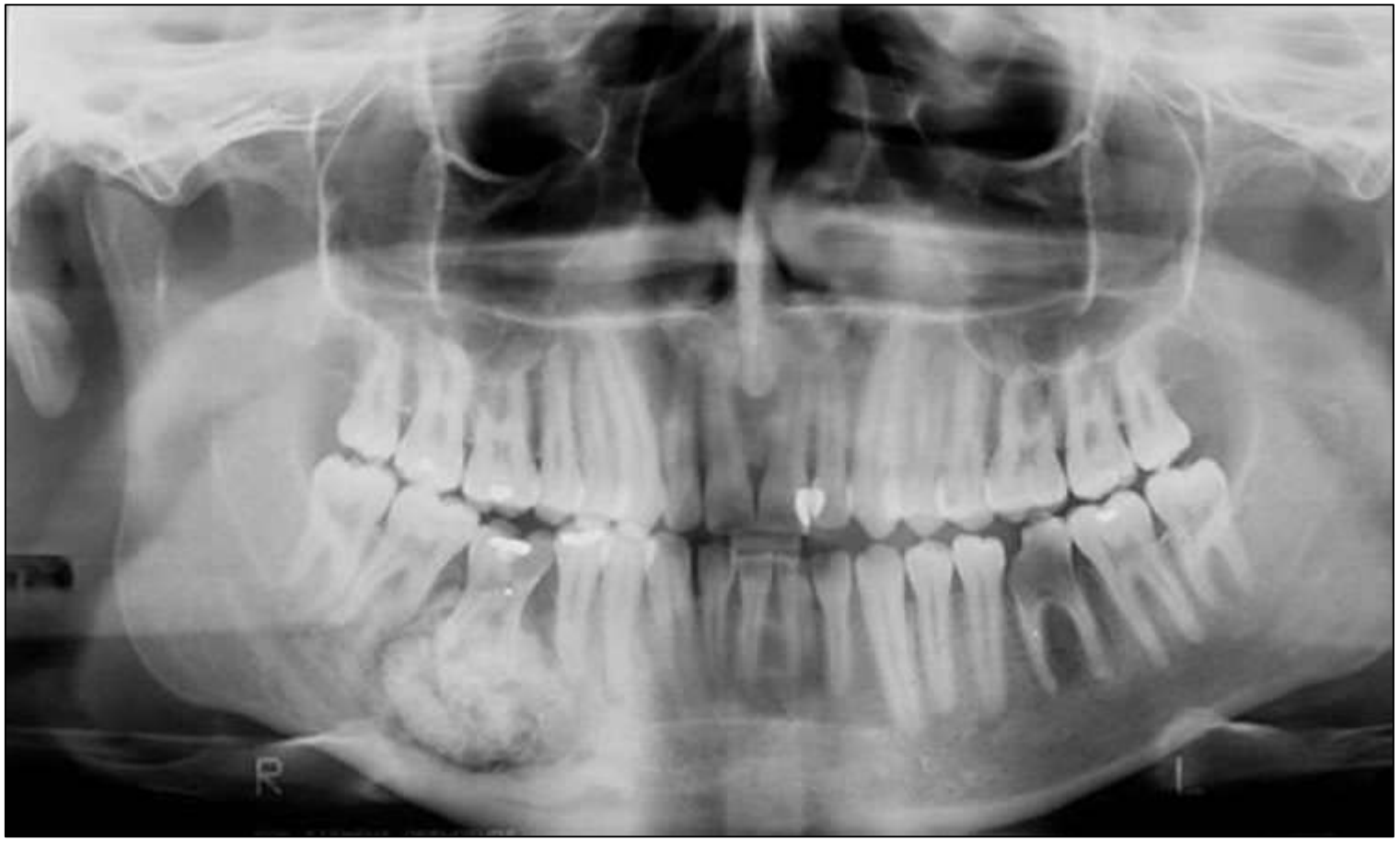
- Well-defined radiopacity with a cortical border surrounded by a ell-defined radiolucent band just inside the cortical border

3. Internal structure:

- Appear as mixed radiolucent-radiopaque lesions that may have an amorphous or wheel spoke pattern

4. Effect on surrounding structures

- If the root outline is apparent, in most cases various amount of external resorption can be seen.
- If large enough , tumor can cause expansion of the mandible, but with an intact outer cortex.



- Panoramic radiograph showing a radiopaque lesion that is surrounded by a radiolucent halo and is in contact with the roots of the mandibular second premolar and the first and second molars.

DIFFERENTIAL DIAGNOSIS

- **Periapical cemental dysplasia**
- **Periapical sclerosing osteitis**
- **Enostosis**
- **Hypercementosis**
- **Chronic focal sclerosing osteomyelitis**

MANAGEMENT

- It is self limiting.
- Excision with extraction of the associated tooth or tumor may be amputated from the tooth which is then endodontically treated

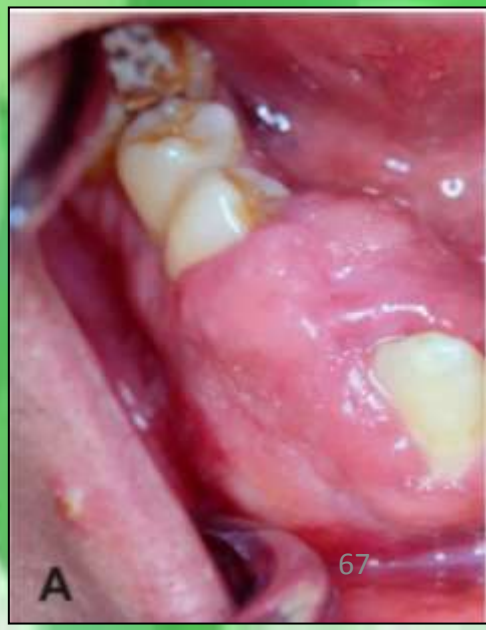
Central Odontogenic Fibroma

1. Definition:

- Also k/a simple odontogenic fibroma, odontogenic fibroma.
- Rare neoplasm, which may occur centrally or in the periphery.
- According to histological appearance it is divided into two types:-
  - ❑ The simple type which contains mature fibrous tissue with sparsely scattered odontogenic epithelial rests.
  - ❑ The granular or WHO type, which is more cellular, has more epithelial rests & may contain calcifications, which resemble dysplastic dentin, cementum or osteoid.

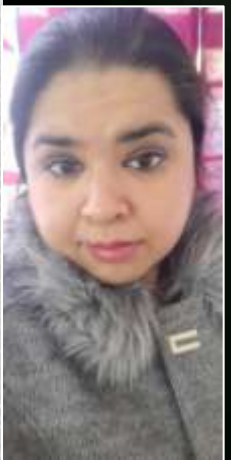
CLINICAL FEATURES

- Common in females, between 11-30 years of age.
- Common in the mandible in the premolar-molar region and in the maxilla and in the region anterior to the 1st molar.
- Usually asymptomatic or the patient may complain of swelling with mobility of teeth.



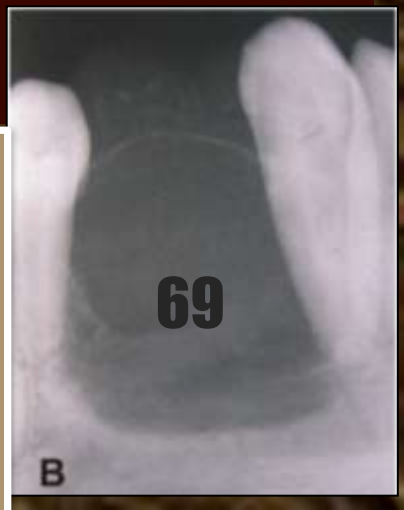
Intra-oral view demonstrating gingival swelling in the alveolar ridge between canine and premolar teeth.

RADIOGRAPHIC FEATURES



Smaller lesions are unilocular and larger lesions are multilocular

- Internal septa may be fine and straight or granular
- Some lesions are totally radiolucent whereas unorganized internal calcifications may be seen in others
- Expansion with maintenance of a thin cortical boundary or may grow along the bone with minimum expansion
- Tooth displacement and root resorption



radiolucent osteolitic lesion with internal osseous septa, and points of calcifications on buccal surface. Besides, shows a thin radiopaque line around the superior aspect of the lesion and resorption of the lamina dura without radicular resorption.

DIFFERENTIAL DIAGNOSIS

- Central desmoplastic fibroma
- Odontogenic myoma
- Giant cell granuloma

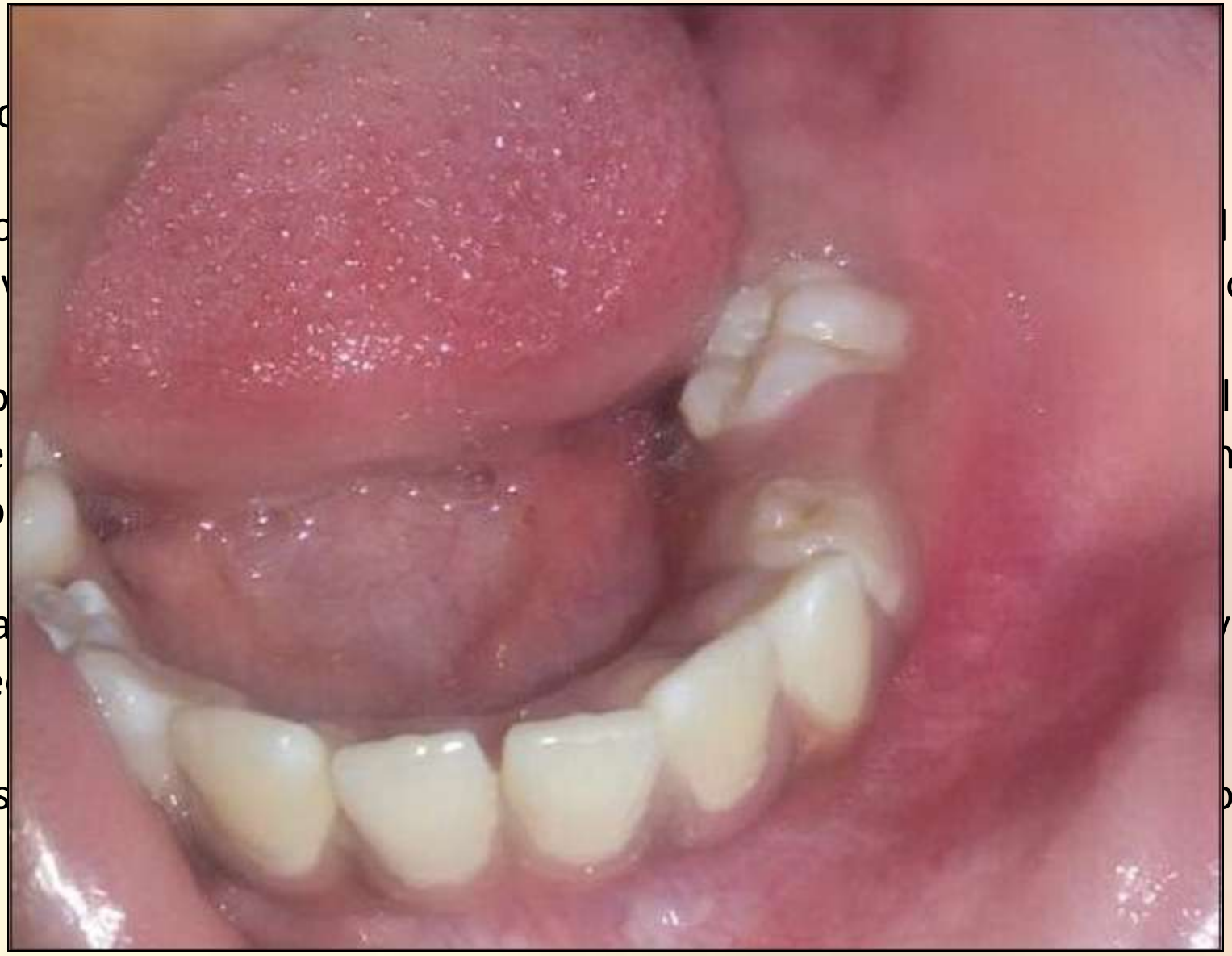
MANAGEMENT

- Simple excision
- Have a very low recurrence rate.

AMELOBLASTIC FIBROMA

- Also k/a soft odontoma, mixed odontogenic tumor, Fibroadamantoblastoma, Granular cell ameloblastic fibroma.
- Characterized by neoplastic proliferation of maturing and early functional ameloblasts and the primitive mesenchymal components of the dental papilla.
- Enamel, dentin and cementum are not formed in this tumor.

CLINICAL FEATURES



- No yrs).
- Co l may inv on
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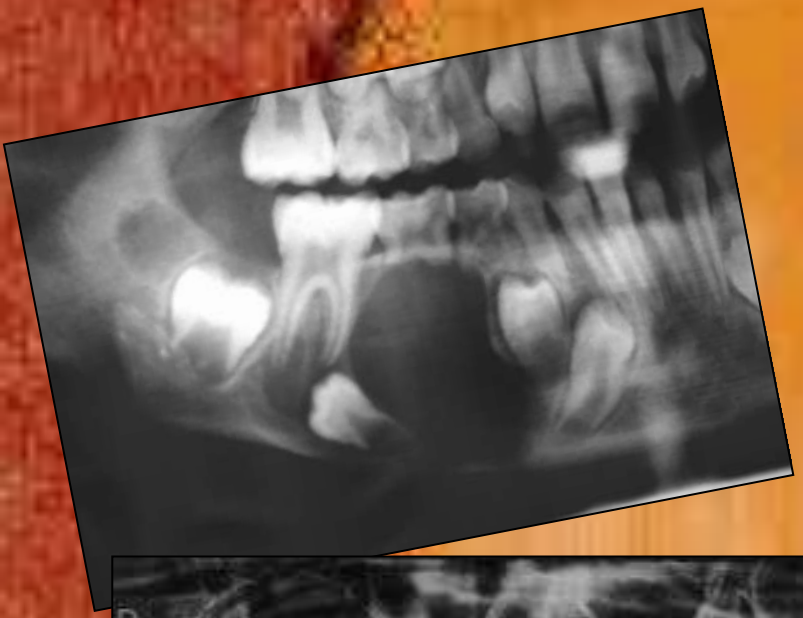
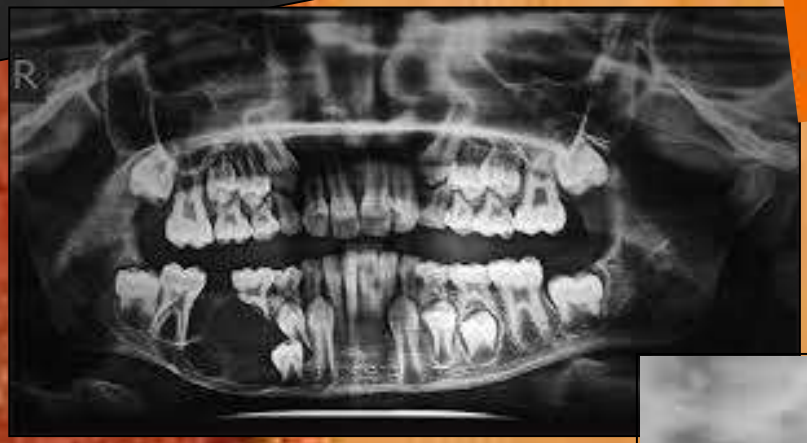
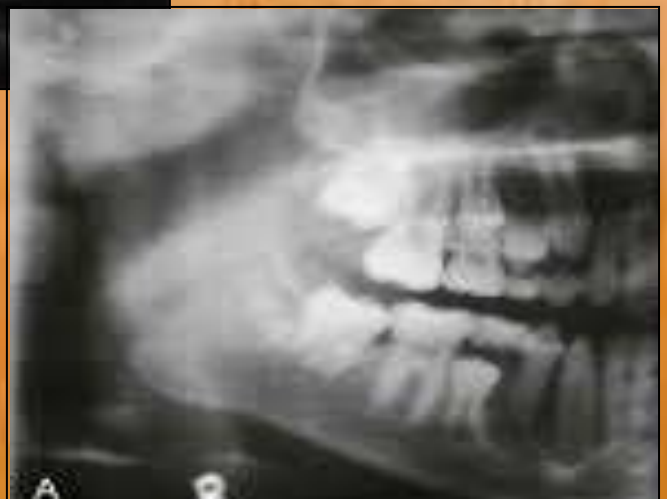
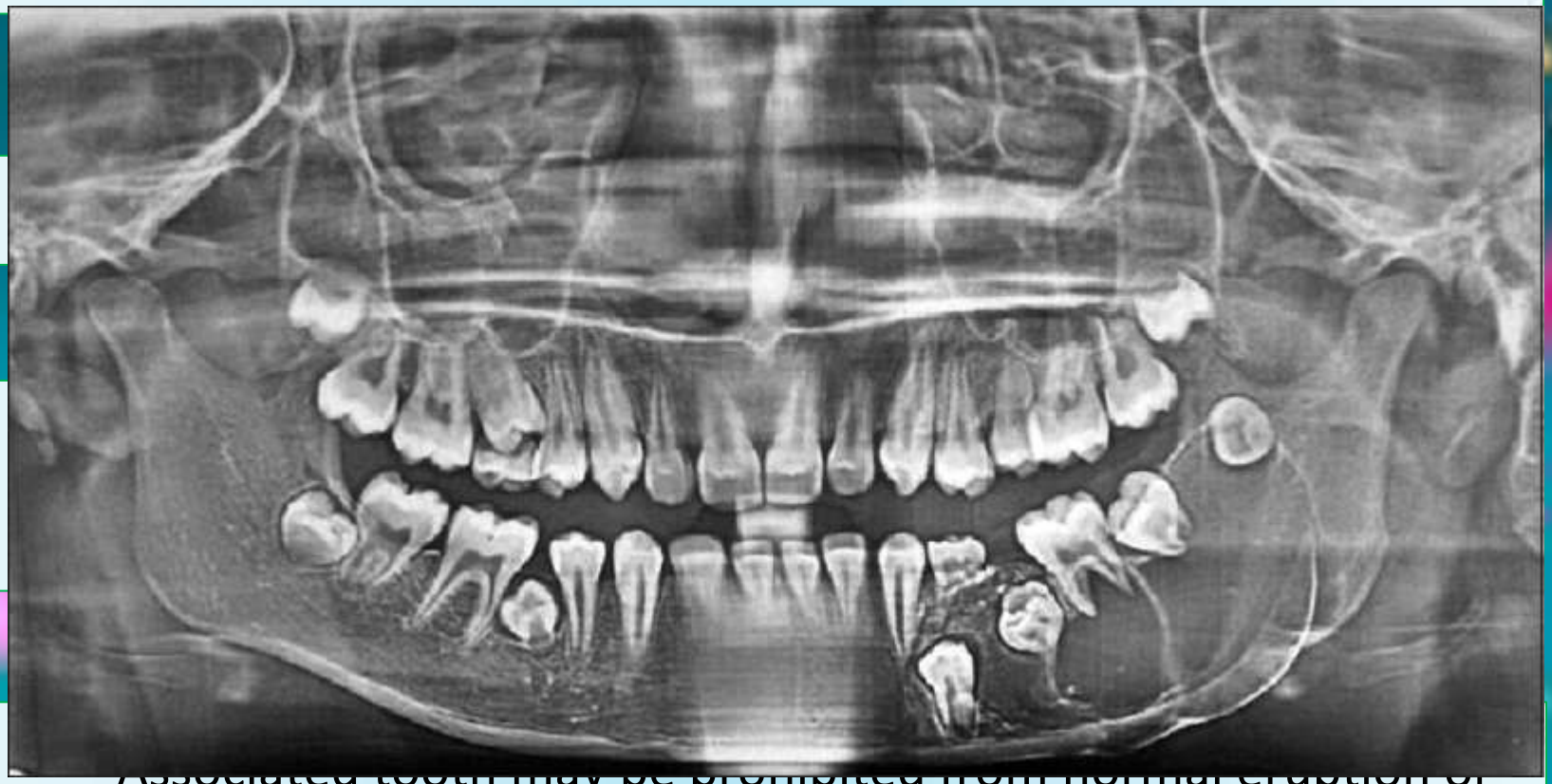


RADIOLOGICAL FEATURES





- Usually seen as an unilocular radiolucency but may sometimes appear multilocular with indistinct curved septa.



Associated tooth may be prohibited from normal eruption or may be displaced in an apical direction.

DIFFERENTIAL DIAGNOSIS

- Small dentigerous cyst
- Hyperplastic follicle
- Ameloblastoma
- Giant cell granuloma
- Odontogenic myxoma

MANAGEMENT

- Conservative surgical enucleation with mechanical curettage of the surrounding bone.

Odontoma

- Odontogenic origin

- Both epithelial and mesenchymal cells exhibit complete differentiation with enamel, dentin and cementum laid down in abnormal pattern.

- Odontome may arise from any of the dental tissues i.e enamel, dentin and cementum.

- Hamartoma and not a true tumor.

- The WHO classification defines CO as follows: “a malformation in which all the dental tissues are represented, individual tissues being mainly well formed but occurring in a more or less disorderly pattern”.

- When the tooth components are less well-organized and tooth like structures are not formed, the lesion is termed as complex odontome.

- Compound-complex odontome

- Ameloblastic odontoma:- Uncommon tumor

CLASSIFICATION

- Ectodermal Origin
  - Enameloma (enamel pearl, enamel nodule)
- Mesodermal Origin
  - Dentinoma
  - Cementoma

- Mixed

  - Complex composite odontoma :- Non discrete masses of dental tissue

  - Compound composite odontomas :- Multiple well formed teeth

  - Compound complex odontoma

  - Geminated odontoma

  - Dilated odontoma with dens in dente.

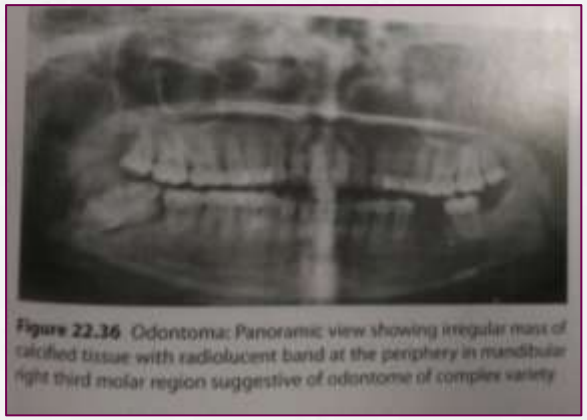
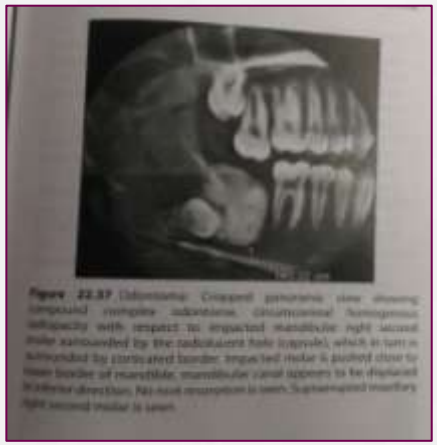


Figure 22.36 Odontoma: Panoramic view showing irregular mass of calcified tissue with radiolucent band at the periphery in mandibular right third molar region suggestive of odontome of complex variety

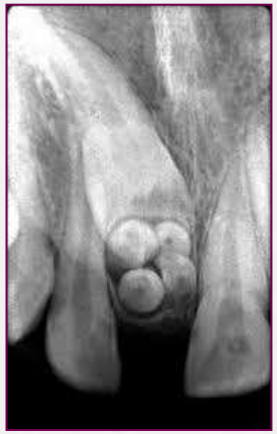
1.) complex odontome



2.) compound-complex odontome

Fig. 11.14: Cystic complex odontome showing radiopacity surrounded by radiolucent capsule (Courtesy: Dr Bhaskar Patel)

3.) cystic complex odontome



4.) compound odontome

ETIOLOGY

- Local trauma
- Infection
- Genetic:-
  - Inherited
  - Mutant gene
  - Interference : postnatal, with genetic control of tooth development

TO BE NOTED

- Earlier lesions are not clinically apparent.

- The formation of odontomas begins in children when the natural dentition is developing, and routine radiographs are rarely made of patients at this age .

CLINICAL FEATURES

- **Age and Sex**
  - First and second decade of life
  - No gender predilection

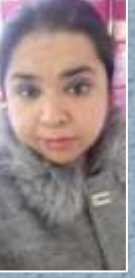
- **Site**
  - Compound odontome :- occurs in incisor, canine area of maxilla
  - Complex odontome :- occurs in mandibular 1st & 2nd molar
  - unusual situation includes the maxillary sinus, inferior border of the mandible, ramus and the condylar region

- **Frequency**
  - compound odontome is twice as common as complex odontome.

- **Symptoms**
  - alveolar swelling in the jaw
  - facial asymmetry
  - sign of infection

- **Signs**
  - absence of a tooth or teeth from the arch in the presence of odontome
  - expansion of the jaw

- **Teeth**
  - Impaction malpositioning, diastema, aplasia, malformation and deviation of adjacent teeth.
- **Development of cyst**
  - sometimes, cyst develops in relation with a complex and compound odontome, but it is very rare.



TO BE NOTED

- The mechanism of odontoma eruption appears to be different from tooth eruption because of the lack of periodontal ligament and root in odontoma.

- Therefore the force required to move the odontoma is not linked to the contractility of the fibroblasts, as in the case for teeth.

- Although there is no root formation in odontoma, its increasing size may lead to the sequestration of the overlying bone and hence occlusal movement or eruption.

- An increase in the size of the odontoma over time produces a force sufficient to cause bone resorption.

RADIOGRAPHIC FEATURES

- **GENERAL**

  - Site : situated between the roots of teeth

  - Appearance: irregular mass of calcified material surrounded by narrow radiolucent bands with a small outer periphery.

- **Compound Composite Odontome**

  - Appearance : number of teeth like structures in the region of canine

  - Internal structure : Cluster of small shapeless dense masses of solid tissue

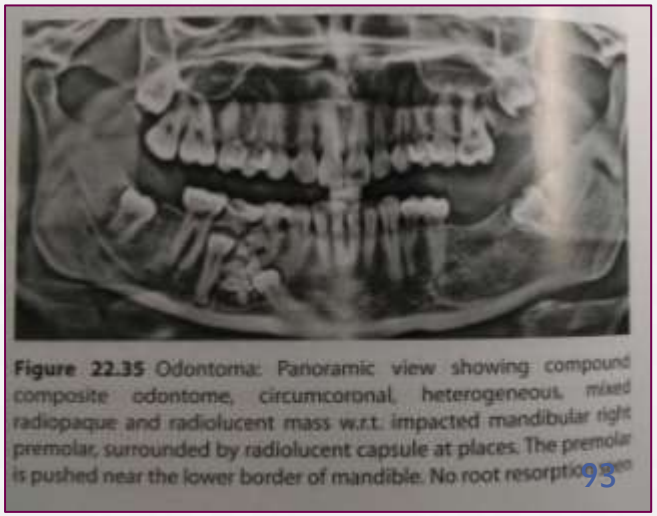


Figure 22.35 Odontoma: Panoramic view showing compound composite odontome, circumcoronal, heterogeneous, mixed radiopaque and radiolucent mass w.r.t. impacted mandibular right premolar, surrounded by radiolucent capsule at places. The premolar is pushed near the lower border of mandible. No root resorption seen

❖ Characteristic of Teeth :

- Periodontal and pericoronal characteristic of unerupted tooth.
- Radiopaque mass is surrounded by a radiolucent line.

❖ Margin :

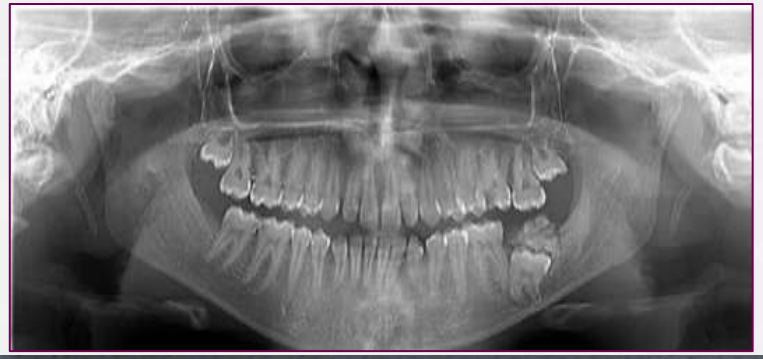
- well-defined borders but may vary from smooth to irregular.
- may have hyperostotic b0orders.

- **Complex Composite Odontome**

  - Appearance : Dense radiopaque mass, sometimes lying in clear space.

    Density>bone & >= teeth.

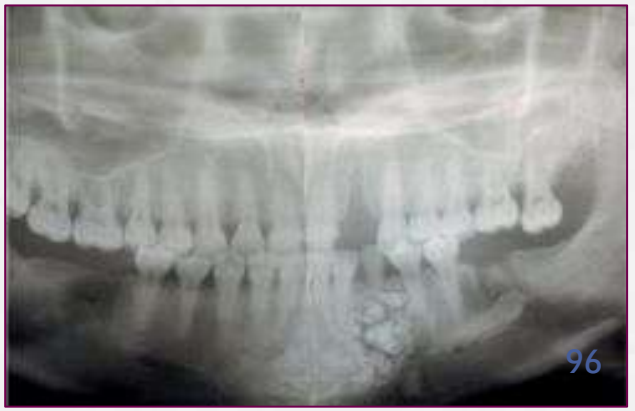
  - Internal Structure :
    - well-defined radiolucency containing irregular masses of calcified tissue.
    - associated with unerupted teeth.



- **Cystic Odontome**

  - solid mass of the odontome without any associated erupted tooth.

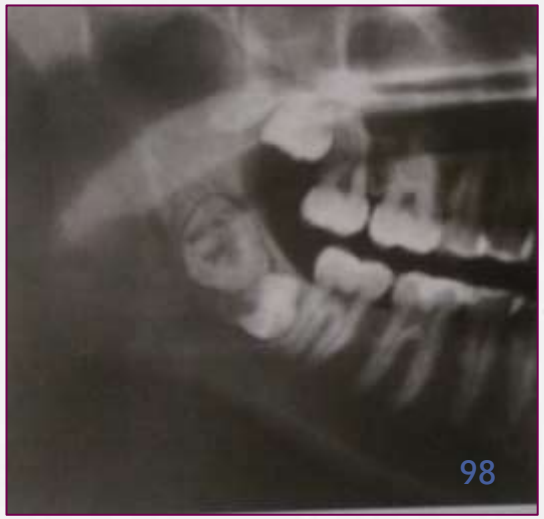
  - cystic cavity and well-defined and corticated margins



- **Cystic Compound Odontome**
  - Area of bone destruction appears as a dark shadow
  - Well-defined margins lined by cortical border
  - White opacities
  - Amorphous granular densities
  - Denticles with enamel caps

- **Dilated Odontoma**

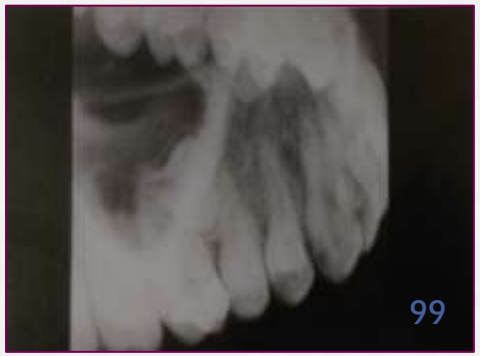
  - Single calcified structure with more radiolucent central portion that has an overall form of a doughnut



- **Gemination and Geminated Composite Odontome**

  - Attempt at division of a single tooth germ by an invagination , with resultant incomplete formation of two teeth is gemination.

  - The addition of more or less misshapen one or both components is termed as geminated composite odontome.

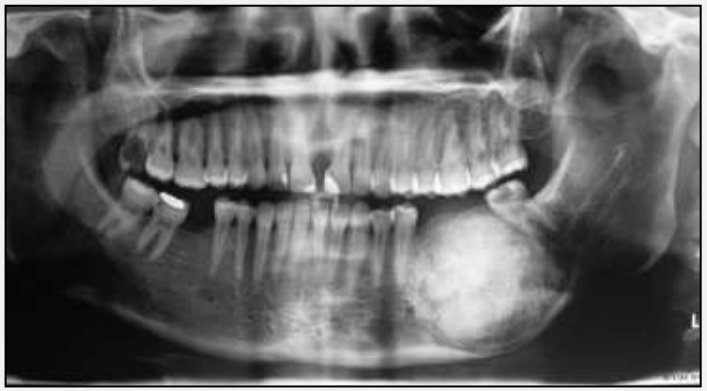


Invaginated odontome

DIFFERENTIAL DIAGNOSIS

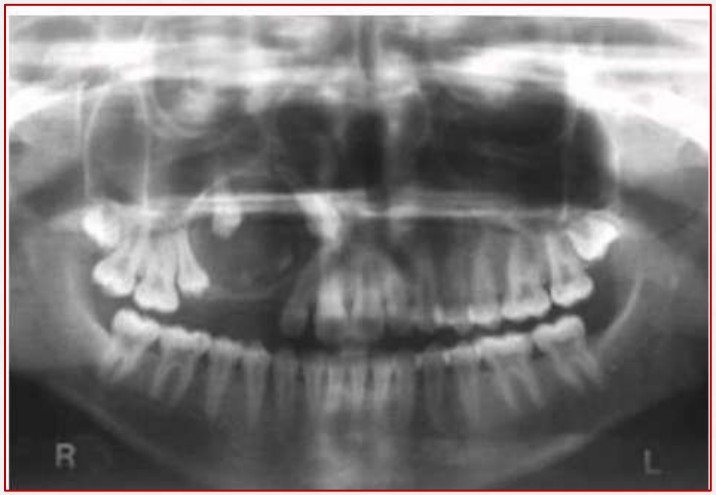
Cementifying or Ossifying Fibroma

- Well defined radiopacity surrounded by a thin radiolucent line that represents the non calcified fibrous tissue at the periphery.



- Odontoma is associated with unerupted molar teeth.
- More radiopaque than fibroma
- Seen at younger age as compared to fibroma.

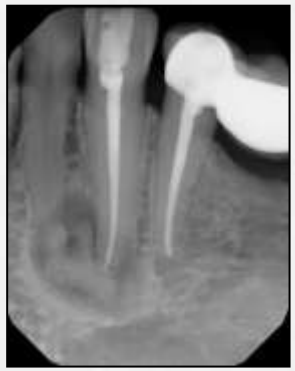
Adenomatoid Odontogenic Tumor



- Rarely as opaque as the complex type and found in association with maxillary canines.

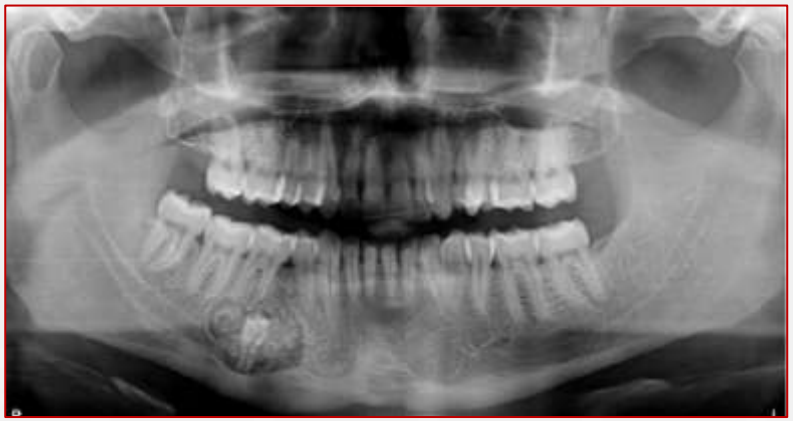
Periapical Cemental Dysplasia

- Smaller than complex type and is limited to mandibular anterior region.
- Usually multiple lesions and has a wider sclerotic border



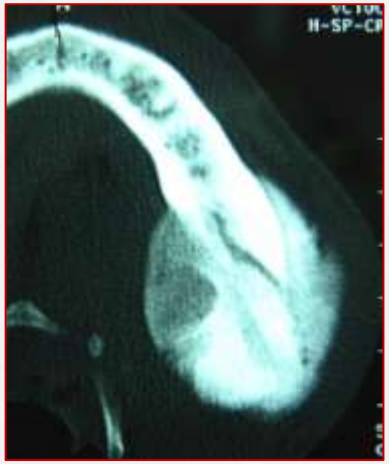
- Odontomas have well-defined corticated borders.
- Soft tissue capsule is more uniform and better defined.

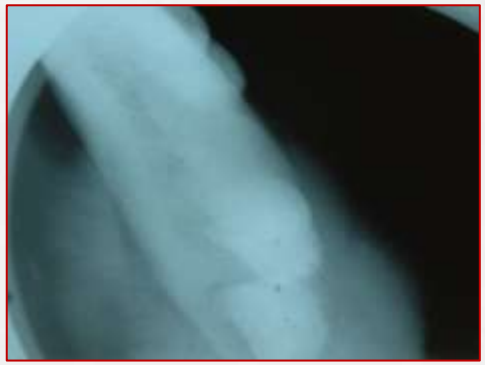
Calcifying Epithelial Odontogenic Tumor



- Rare, less opaque and develops in the midline.

Fibrous Dysplasia





- Mottled or smoky pattern, poorly defined borders.

DIAGNOSIS

Radiological Diagnosis

Compound

- Has more than one fragment
- Common in maxillary incisor and canine region
- Shows shapeless mass of tooth structure

Complex

- It has one solid mass
- Commonly seen in mandibular molar area
- Disorganized mass of tooth structure

MANAGEMENT

- The treatment for odontomas in both primary and permanent dentition is their surgical removal.

- If odontomas are extirpated early without disturbing the underlying tooth germ, the eruption of the impacted teeth can then be expected spontaneously or after orthodontic traction.

- However, underlying impacted teeth are sometimes extracted in association with the removal of odontomas.

- Every effort should be made to preserve lower impacted primary molars.

- In general, if the root of the impacted tooth is still developing, the tooth may erupt normally; but, once the root apex has closed, the tooth has lost its potential to erupt

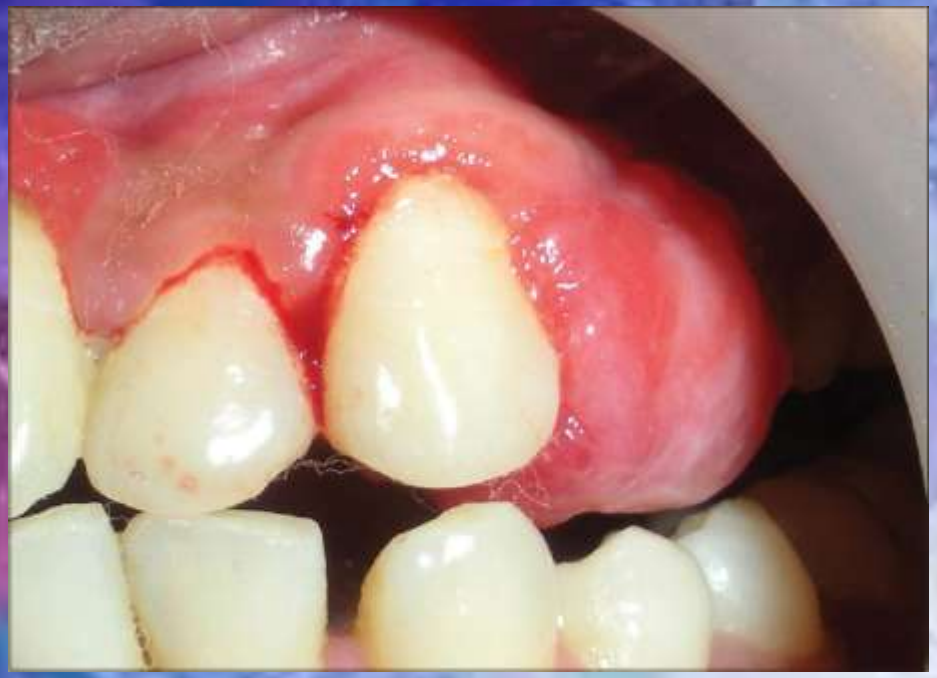
- Do not recur and are not locally invasive

ODONTOGENIC MYXOMA

- Also k/a Myxoma, Myxofibroma, Fibromyxoma, Odontogenic Fibromyxoma.
- Benign intraosseous neoplasm that arises from odontogenic ectomesenchyme and resembles the mesenchymal portion of the dental papilla..
- Develop only in the facial bones.
- Occasionally related to a tooth that failed to erupt or missing.

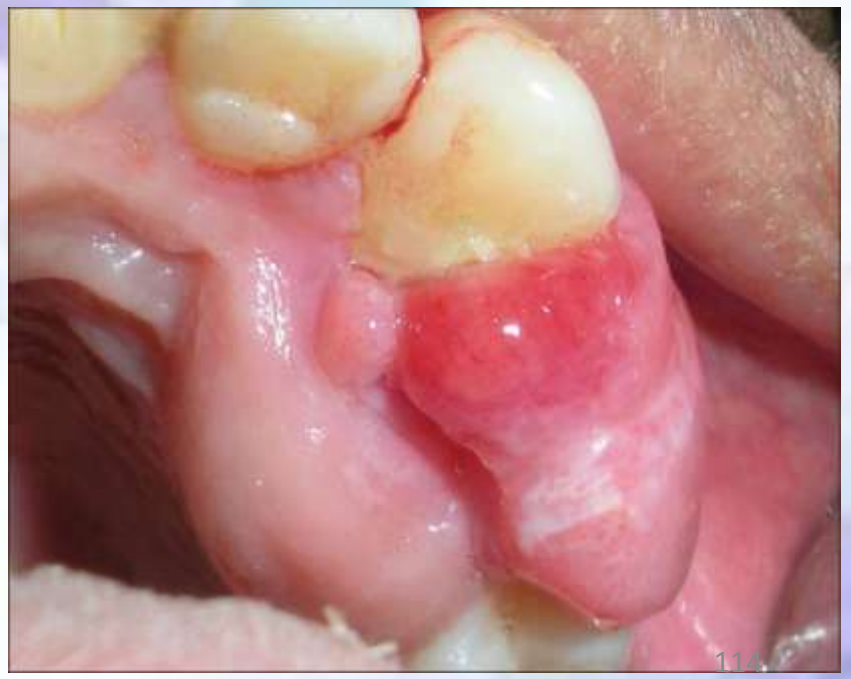
CLINICAL FEATURES

- Common in females, with an age range of 10-30 years.
- Common in the mandible in the premolar-molar area and in the maxilla in the alveolar process in premolar-molar area and the zygoma.
- Associated with congenitally missing tooth/teeth.
- slow growing hard fusiform swelling which may cause facial asymmetry and pain.
- Perforate the cortical plate producing bosselated surface.
- Involved teeth may be displaced and loosened.
- Causes exophthalmus



a. Buccal view

b. Palatal view



RADIOGRAPHIC FEATURES

1. Location:

- Occur more often in the mandible and form most commonly on a premolar and molar areas and rarely in the ramus and condyle

2. Periphery:

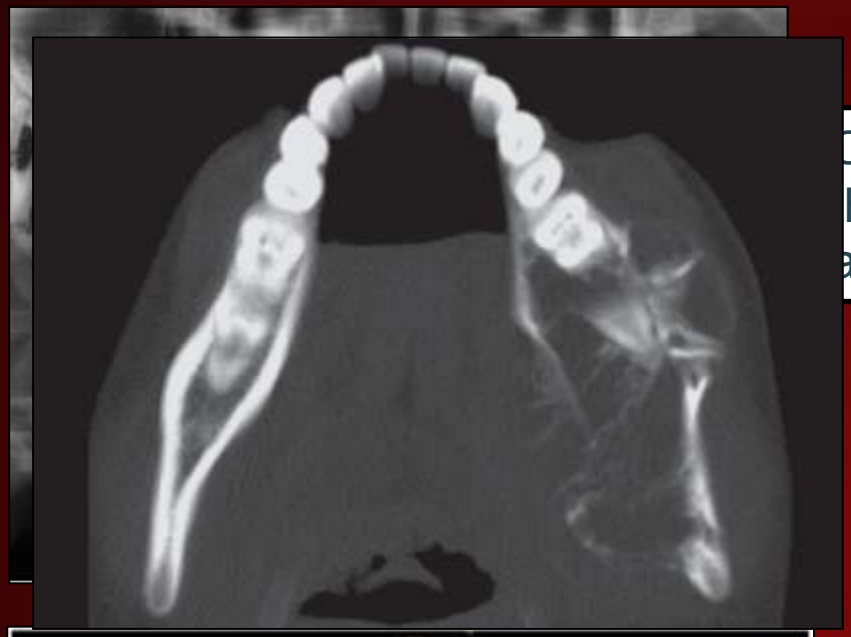
- Well-defined with a cortical border. In maxilla it may be poorly defined.

3. Internal structure :-

- If it occurs pericoronally within an impacted tooth it may appear cyst like, with an unilocular outline.
- Mostly appear multilocular having a mixed radiolucent-radiopaque internal pattern
- There is presence of septa which give it a multilocular appearance.(tennis racket like or step ladder pattern)

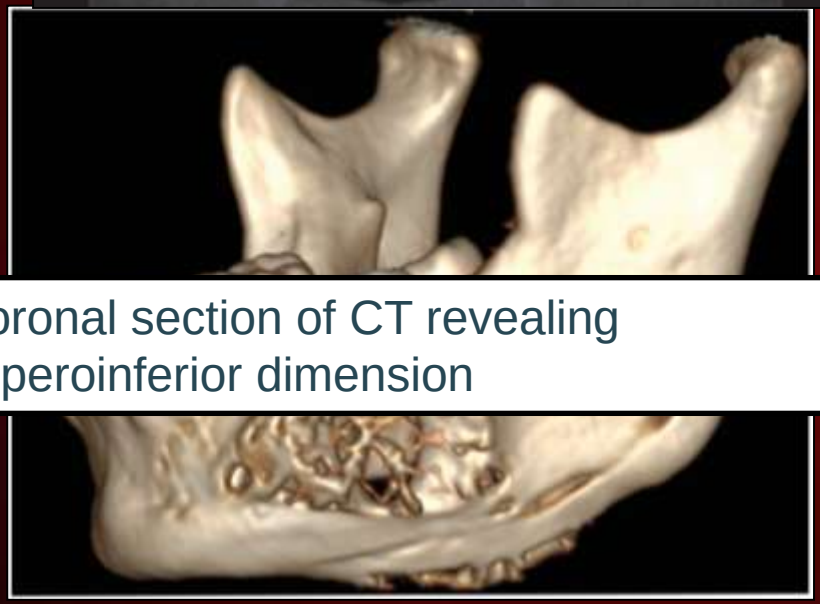
4. Effect on Surrounding Structures :-

- Displacement and loosening of tooth involved
- Lesion scallops between the roots of adjacent teeth
- Has tendency to grow along the involved bone without tha same amount of expansion seen in other benign tumors.



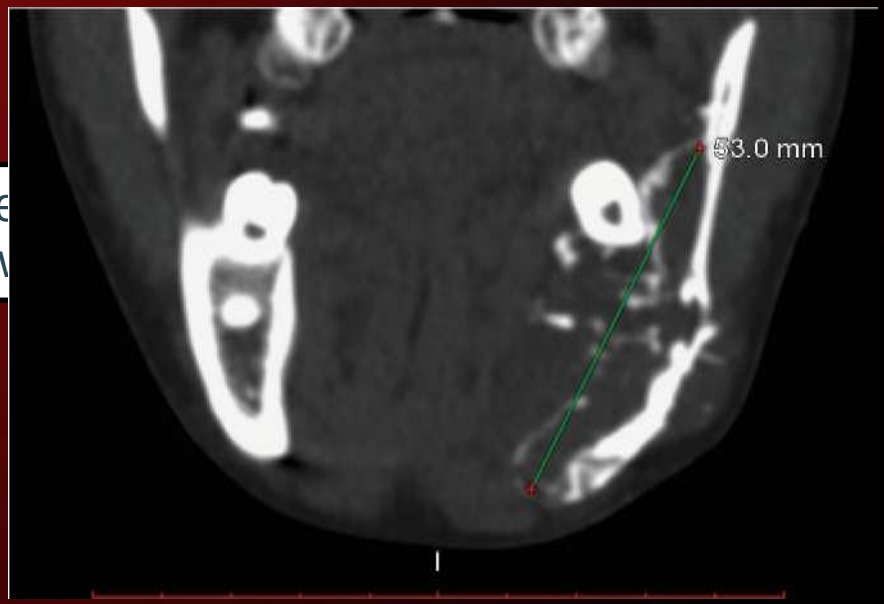
OPG showing multilocular radiolucency on the left-side mandible with “tennis-racket appearance”

Axial section showing mesiodistal extension



Thre
show

Coronal section of CT revealing superoinferior dimension

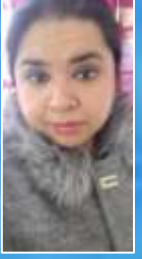


DIFFERENTIAL DIAGNOSIS

- Central giant cell granuloma
- Ameloblastoma
- Cherubism
- Giant cell lesion of hyperthyroidism
- Metastatic carcinoma
- Aneurysmal bone cyst
- Central hemangioma

MANAGEMENT

- Surgical excision with generous amount of surrounding bone

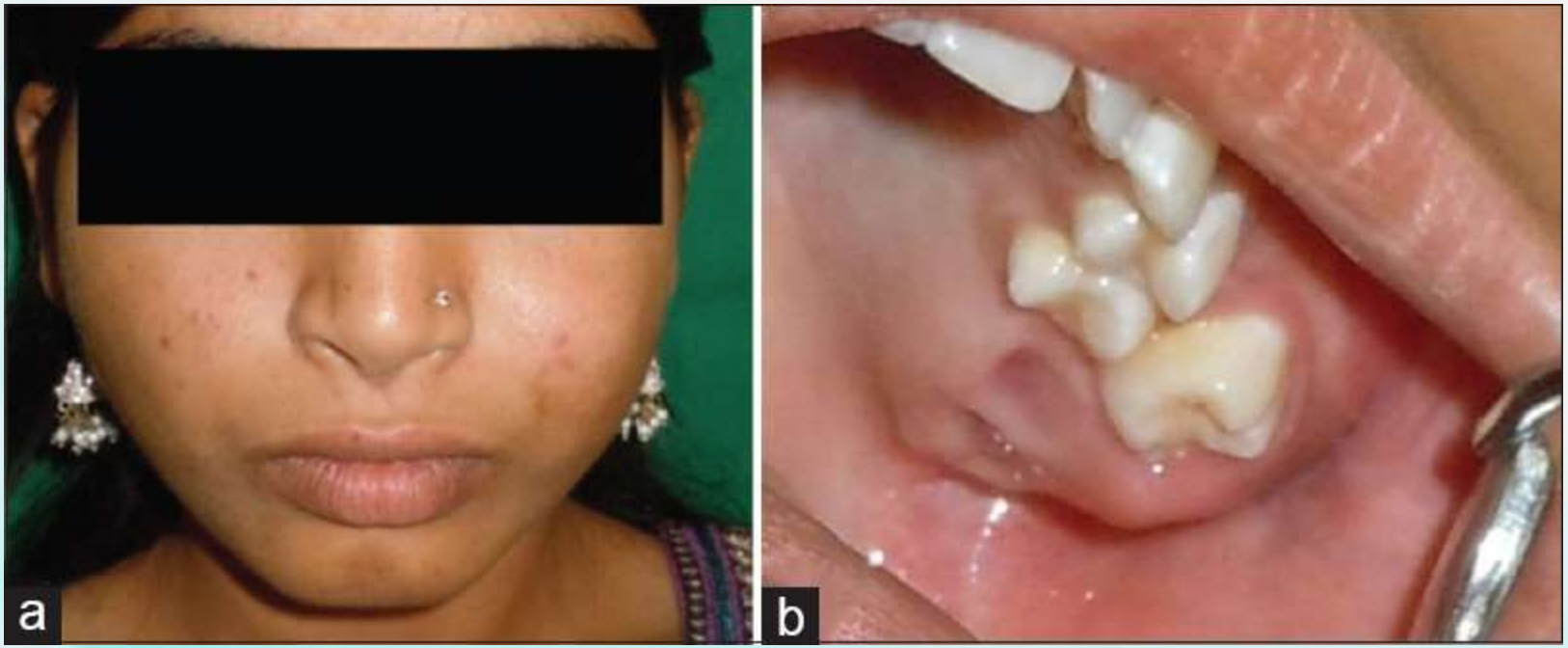


AMELOBLASTIC FIBRO-ODONTOMA

- Mixed tumor with all the elements of an ameloblastic fibroma but with scattered collections of enamel and dentin.

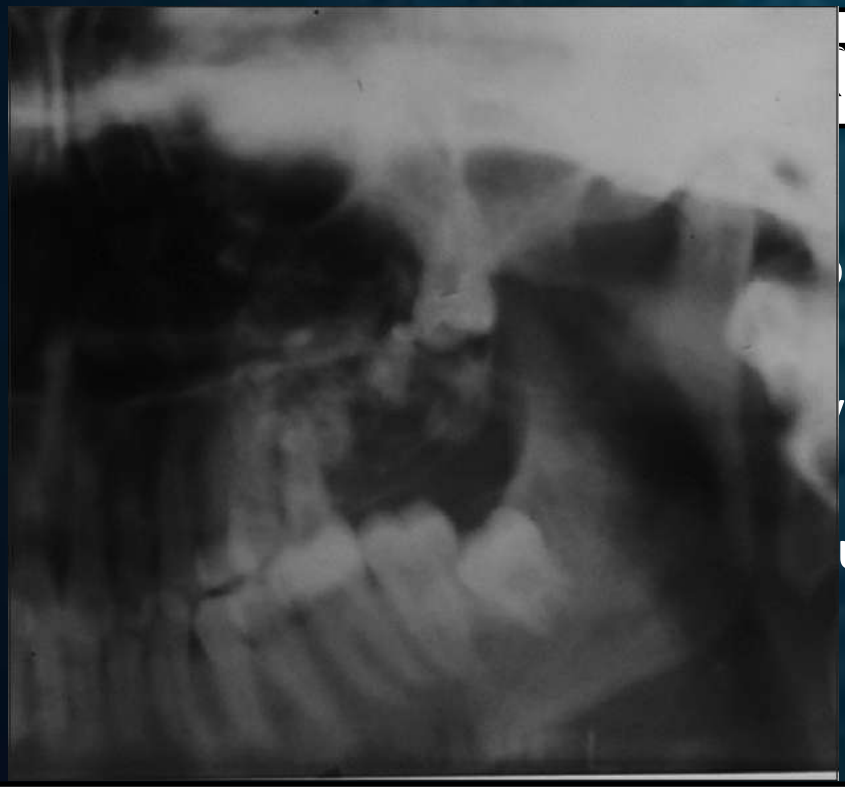
CLINICAL FEATURES

- Common in males, seen in younger age group.
- Common in the posterior aspect of the mandible in the molar region and in the maxilla it involves the maxillary sinus
- Epicenter is usually occlusal to the developing tooth or towards the alveolar crest.

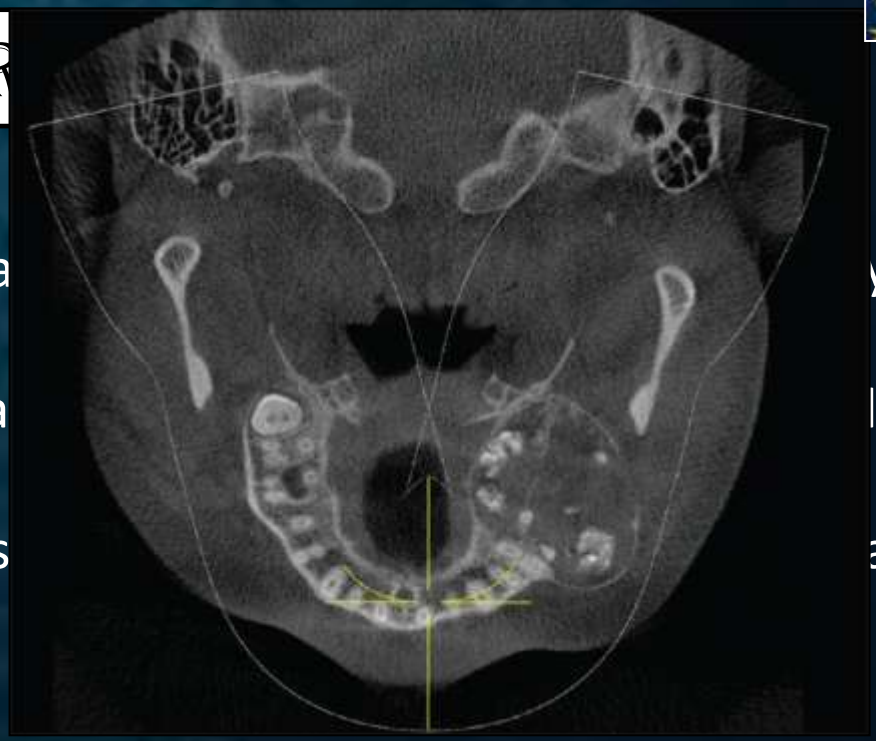


a) Extraoral swelling on the left side of middle third of face;

(b) Intraoral view showing swelling with indentations of the opposing teeth



Cropped OPG showing large mixed radiopaque and radiolucent lesion in left maxillary posterior region with missing 27 and impacted 28 within lesion



CBCT image showing expansion of cortex in the left maxillary molar region and lesion extending till tuberosity with perforations in buccal cortical plate

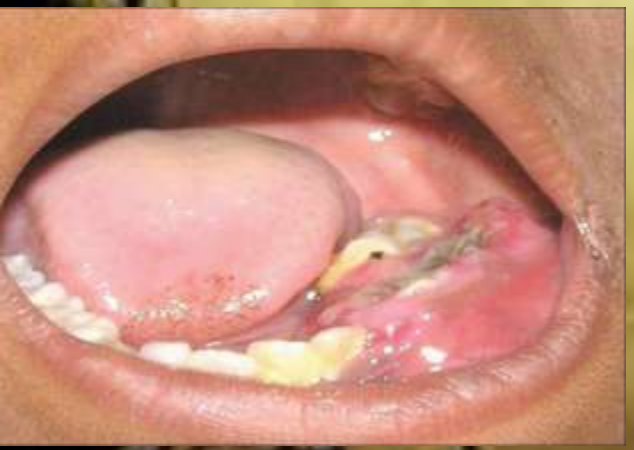
Nonodontogenic Tumors

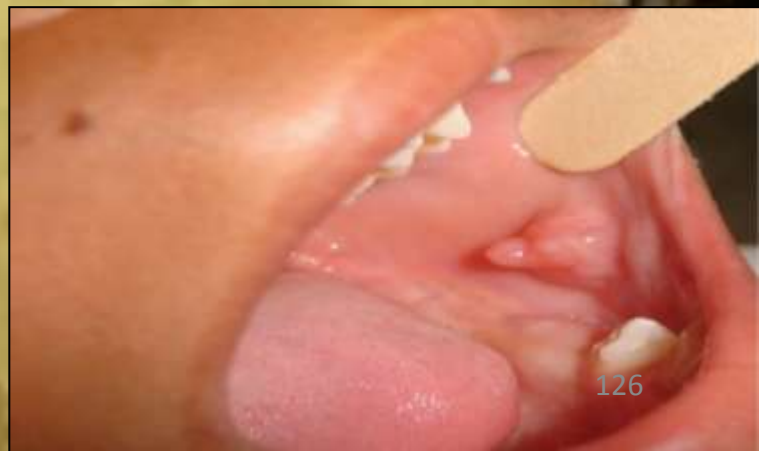
NEURILEMOMA

- Also k/a Schwannoma, Perineural Fibroblastoma, Neurinoma
- Tumor of neuroectodermal origin, arising from the Schwann cells that make up the inner layer covering of the peripheral nerves.
- Common intraosseous nerve tumor

CLINICAL FEATURES:

- No sex predilection and occurs at any age.
- Common sites: mandible and sacrum, located within an expanded inferior alveolar nerve canal, posterior to the mental foramen.
- Symptoms: swelling, pain, paresthesia
- Slow growing tumor



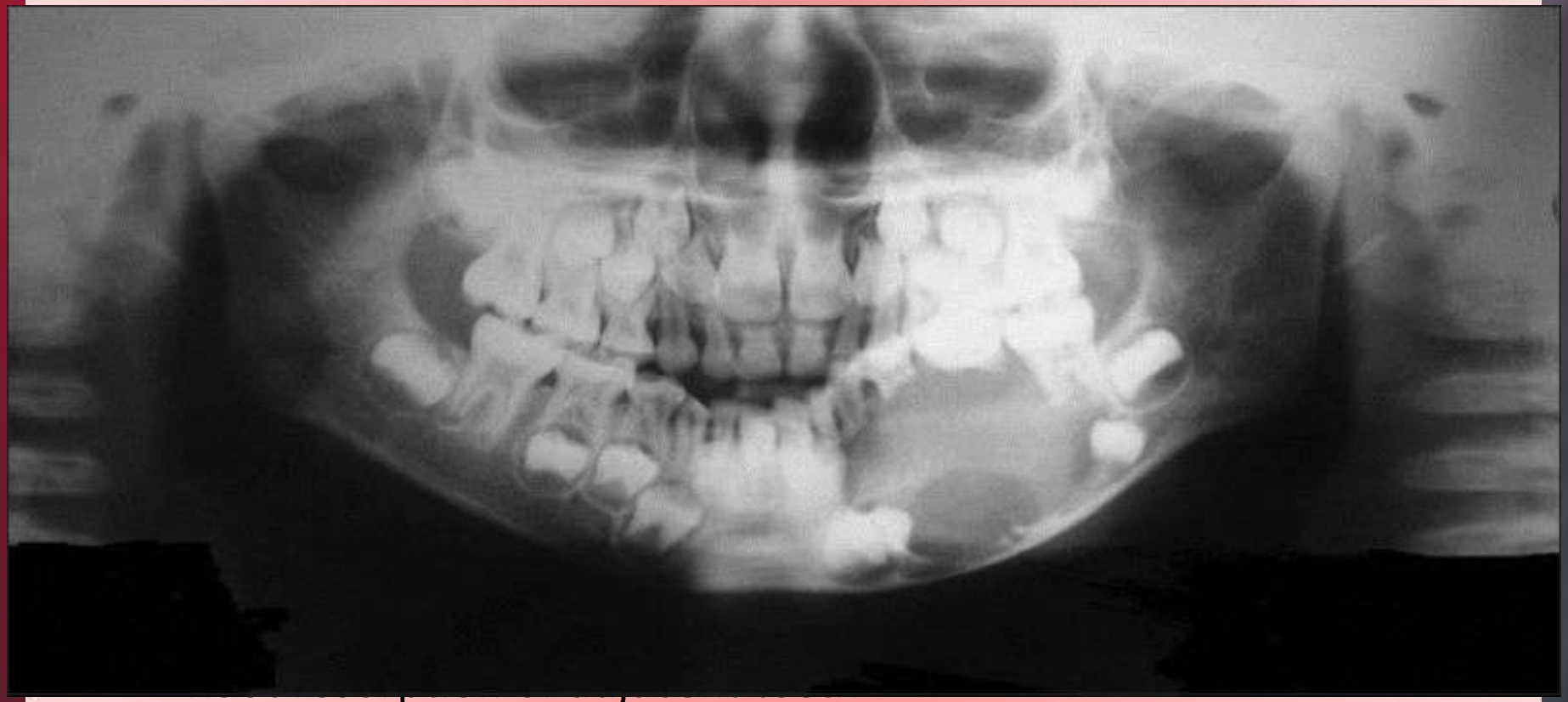


RADIOGRAPHIC FEATURES

- **Location :**
  - ❖ Mandible>maxilla
  - ❖ Located within expanded inferior alveolar nerve canal

- **Periphery :**
  - ❖ Well-defined radiolucency with corticated margins
  - ❖ Small lesions may appear cyst like, but as the tumor expands the canal it becomes fusiform in shape

- **Internal Structure:**



DIFFERENTIAL DIAGNOSIS

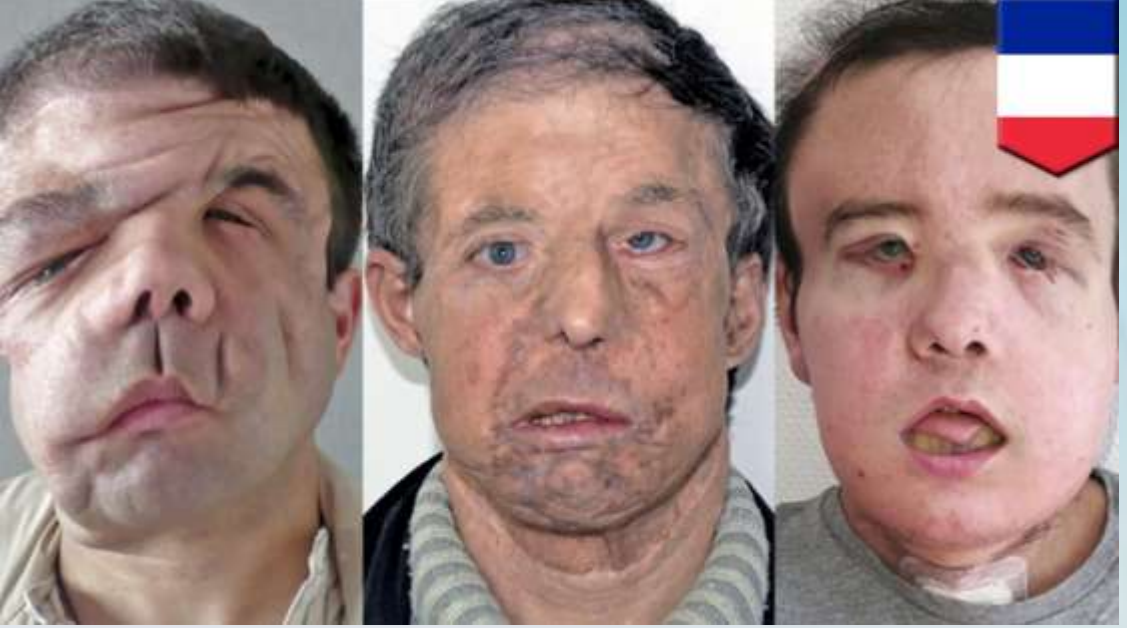
- Cysts:- no expansion of inferior alveolar canal
- Ameloblastoma:- occurs above the canal
- Vascular lesion:- increases the girth of the canal down the entire length

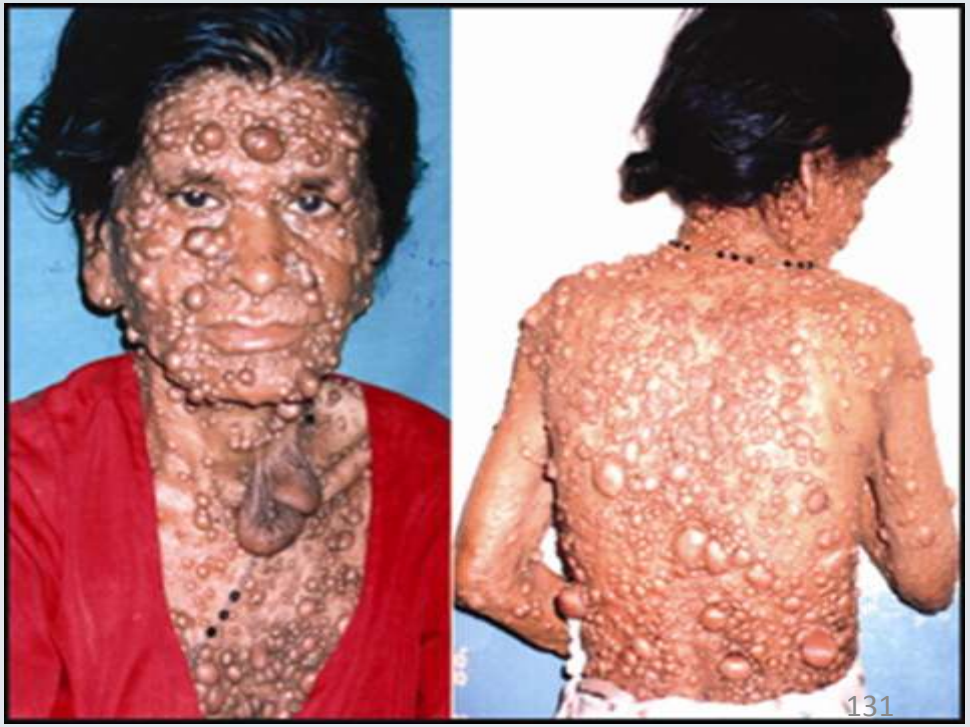
MANAGEMENT

- Surgical excision

NEUROFIBROMATOSIS

- Also c/a von Recklinghausen's disease
- Syndrome consisting of Café au lait spots on the skin, multiple peripheral nerve tumors and a variety of other dysplastic abnormalities of the skin, nervous system, bones, endocrine organs and blood vessels.
- Types:
  - Neurofibromatosis 1
  - Neurofibromatosis 2
- **Oral lesions may occur as apart of NF-1 or may be solitary and are called segmental or form first manifestations**





• CLINICAL FEATURES

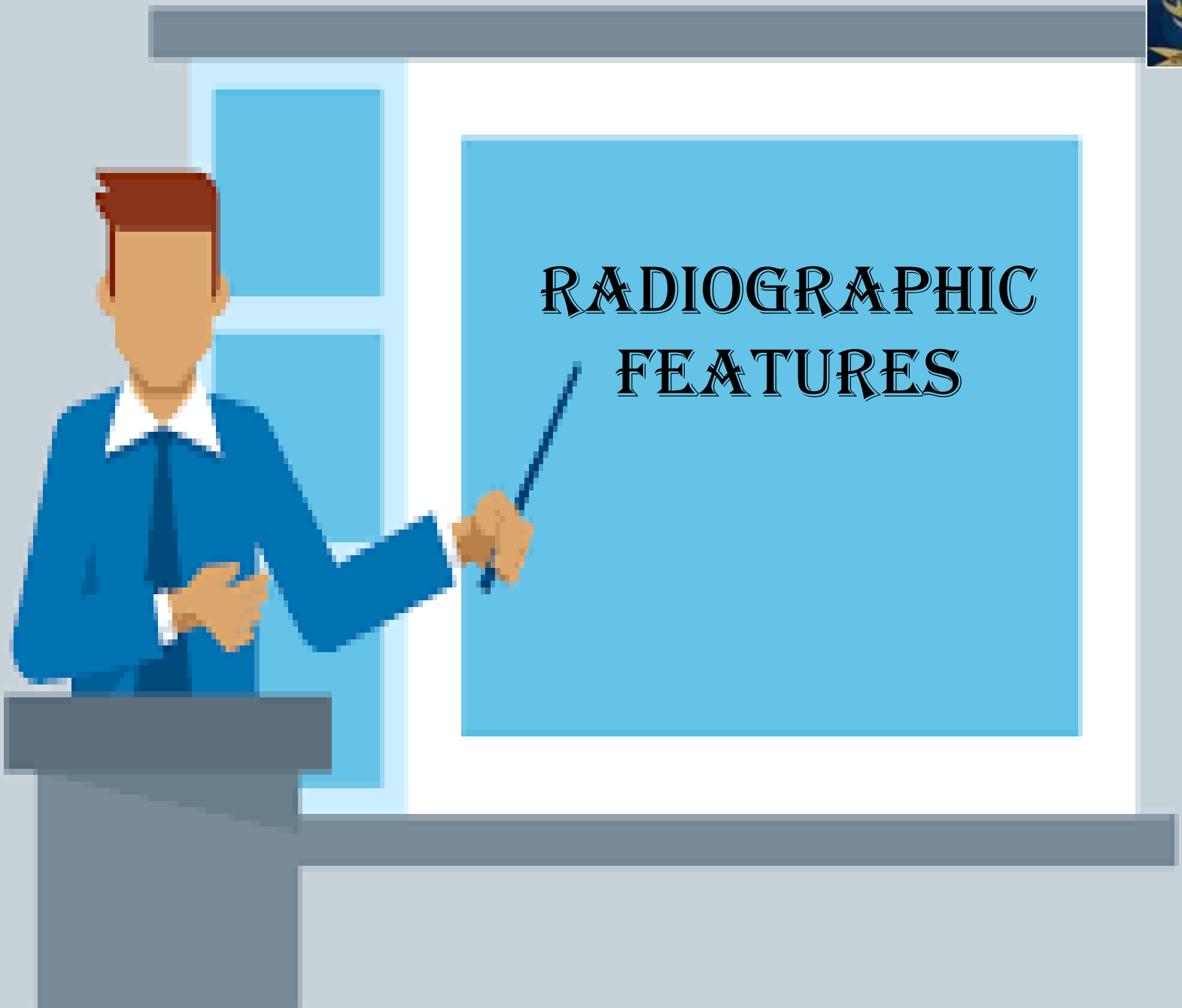
- Genetic disease and is manifested gradually during childhood and adult life.
- Peripheral nerve tumors are of two types: Schwannomas and Neurofibromas.
- Café au lait spots become larger and numerous with age
- Other skin lesions: freckles, soft pedunculated, cutaneous neurofibromas and firm , subcutaneous neurofibromas.
- Central neurofibromas are rare.

TO BE NOTED

Criteria for diagnosis of NF-1 (***CALBORN***) - *at least 2*

C - **C**afe au lait spot (6 or more, 5mm in < 10 years old, 15mm for >10)
A- **A**xillary freckels
L - **L**isch nodule
B - **B**ony lesion (eg: sphenoid dysplasia)
O - **O**ptic glioma
R - **R**elative (first degree family history)
N - **N**eurofibroma

- mild learning disabilities are common
- incidence of seizure is 20 times that of normal population
- associated with phaeochromocytoma and syringomyelia


RADIOGRAPHIC
FEATURES

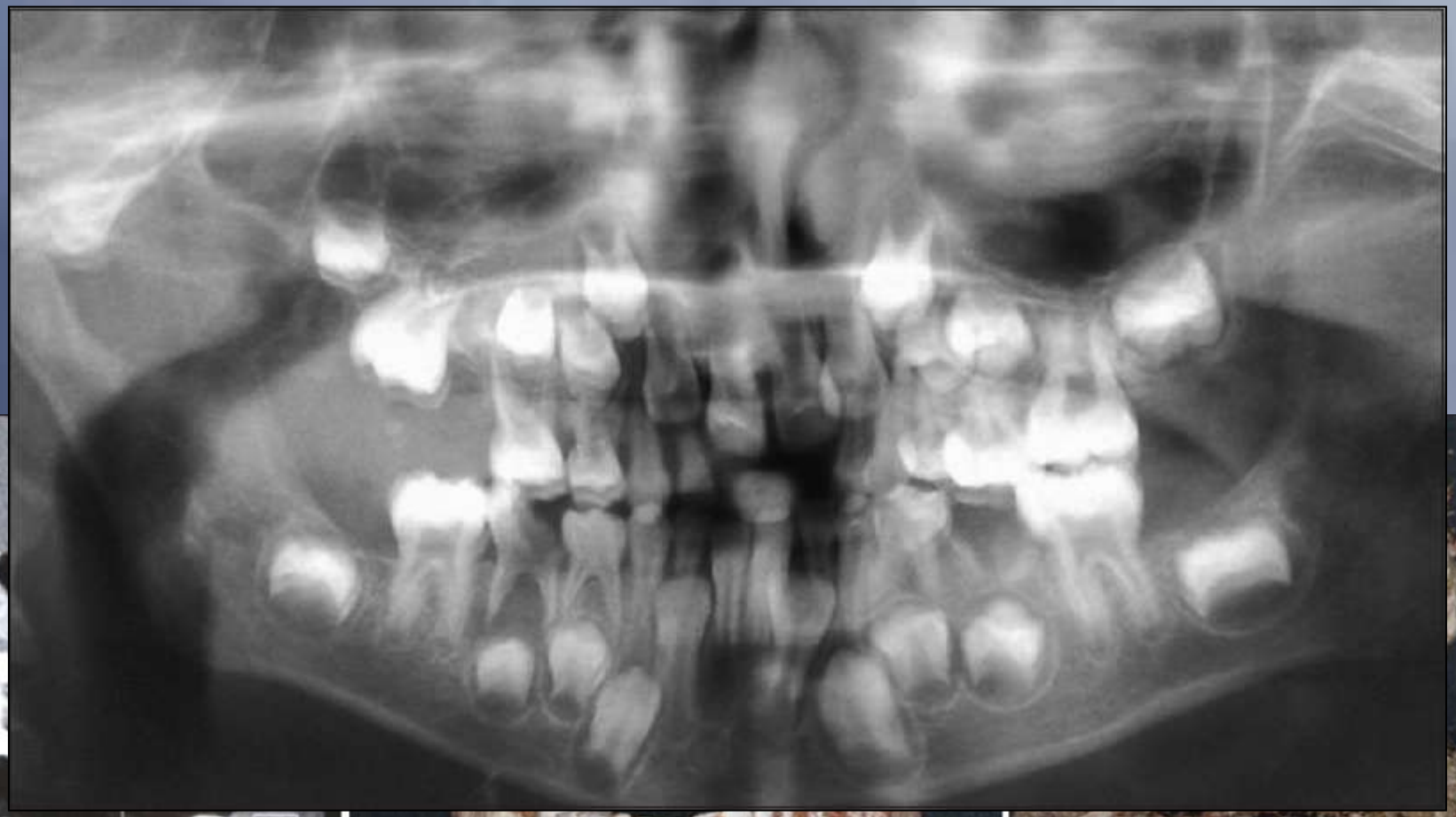
- Alterations in the shape of the mandible

  - Enlargement of the coronoid notch in either or both the horizontal and vertical dimension
  - An obtuse angle between the body and ramus
  - Deformity of the condylar head
  - Lengthening of the condylar neck
  - Lateral bowing and thinning of the ramus

- Enlargement of the mandibular canal and mental and mandibular foramina

- Erosive changes to the outer contour of the mandible

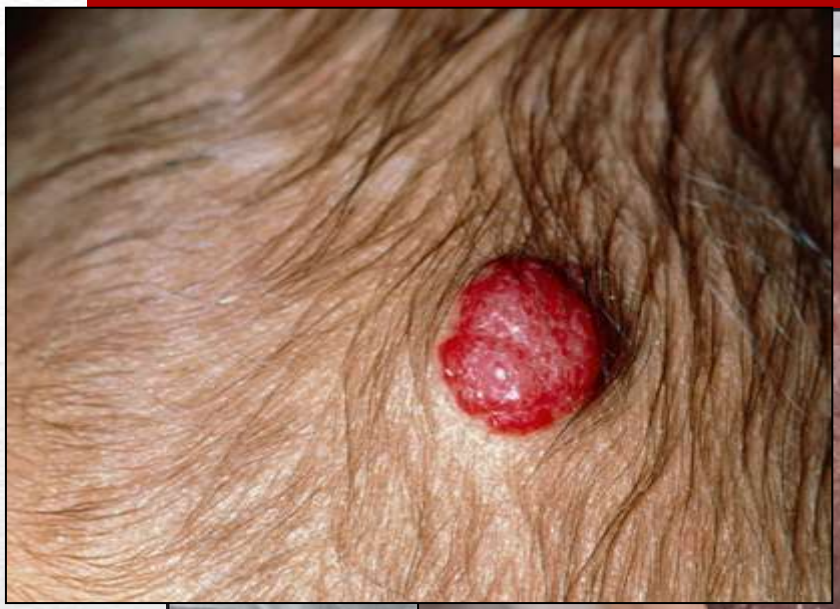
- Interference with normal eruption of molars



OPG reveals an ill-defined mixed density lesion with the radiodensity similar to soft tissue is evident in the alveolar ridge with respect to developing tooth buds of 14, 15, and 16

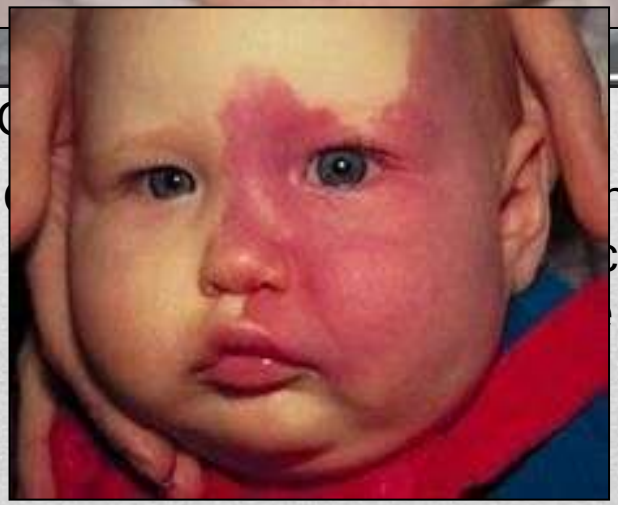
HEMANGIOMA

- Proliferation of blood vessels creating a mass, connected to the main vascular system, that represents a neoplasm .
- Skin and subcutaneous tissues
- Types:
  - Central
  - Capillary
  - cavernous



Strawberry hemangioma

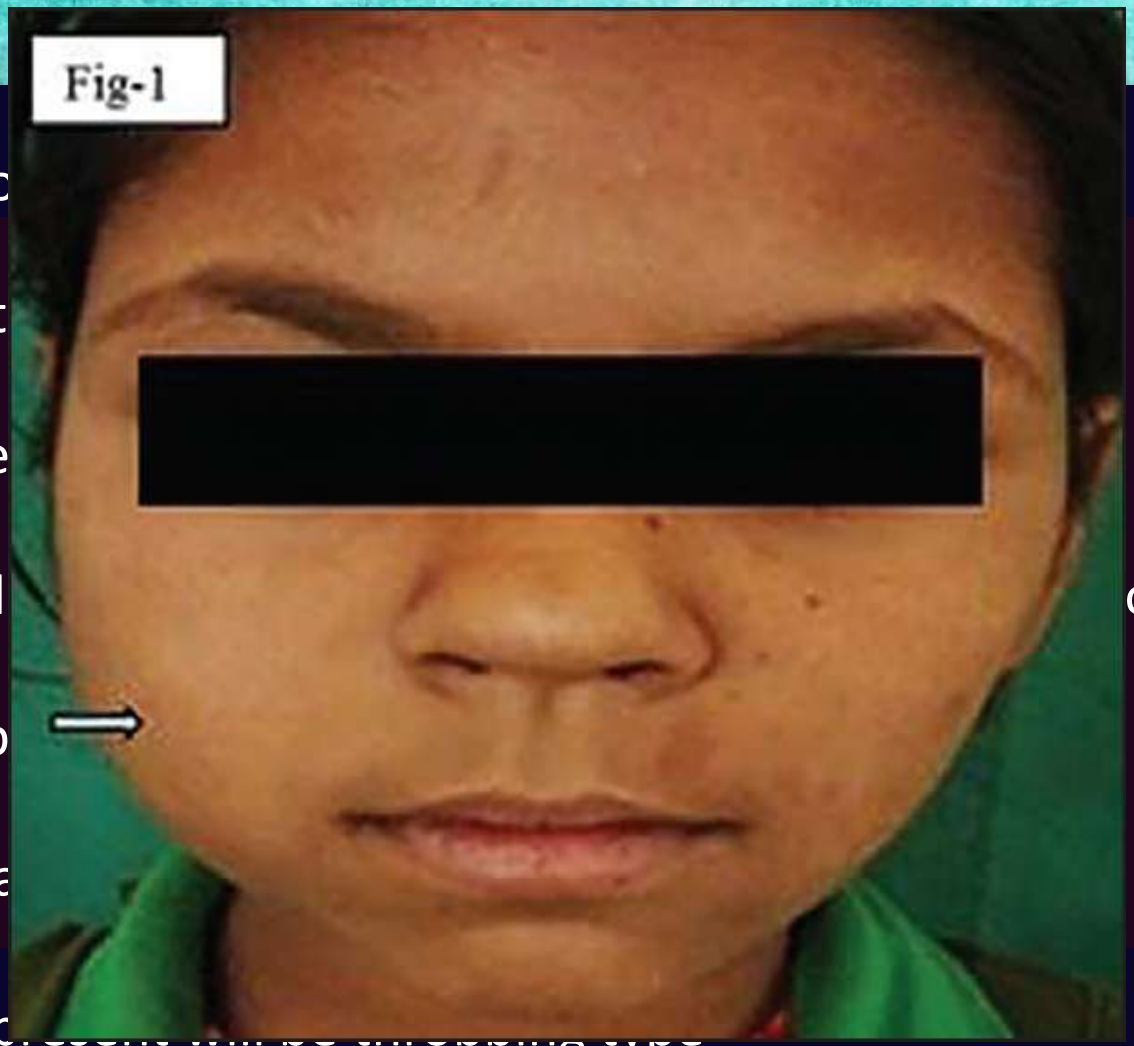
Salmon's patch



ngioma
cy with

Port wine stain

CLINICAL FEATURES



- Commc
- • Anest
- • Loose
- • Bleed oth
- • Pump
- • Aspira
- Pain if p
- Tumors may be compressible with bruit on auscultation.

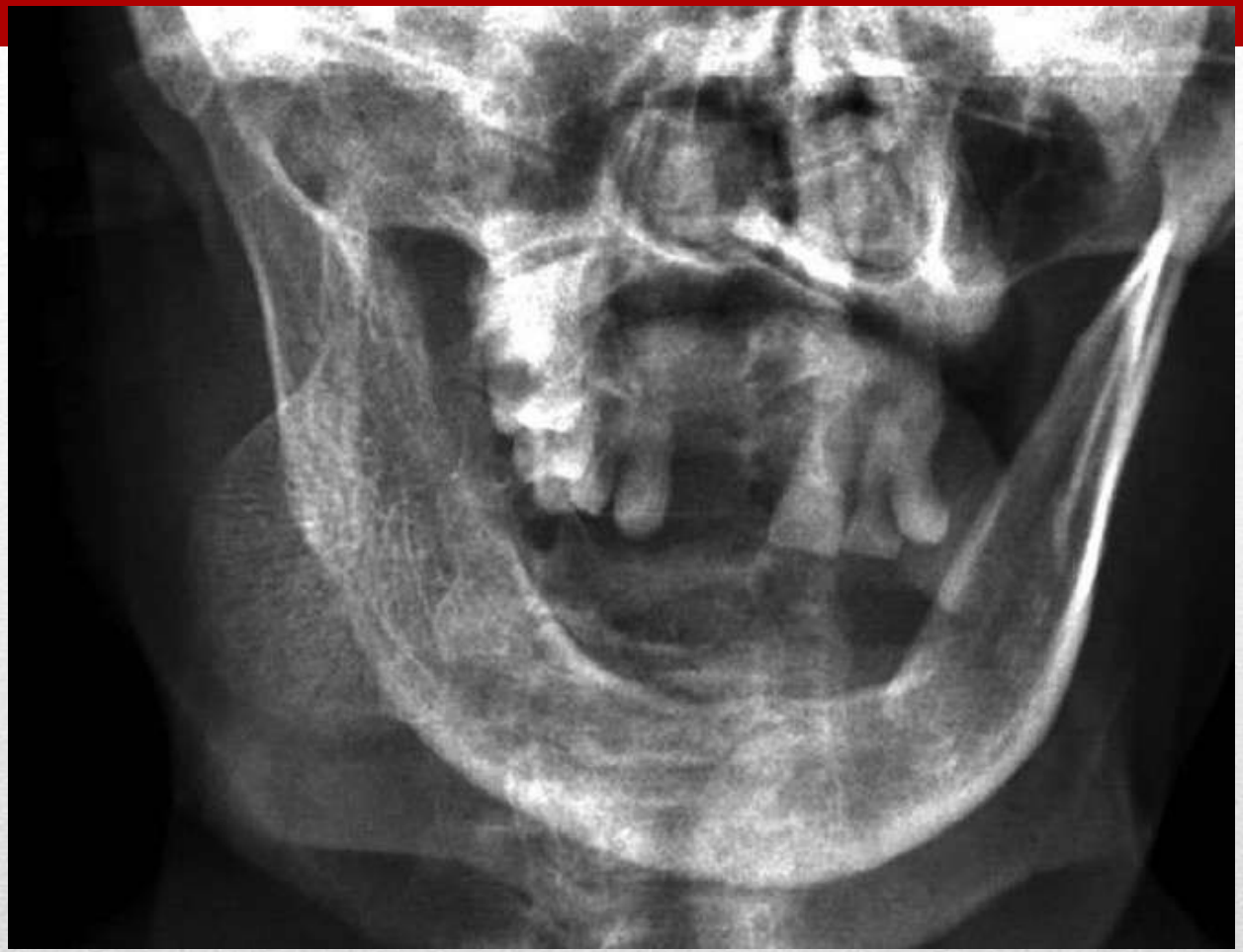
Radiographic Features

1. Location:

- Affects the mandible twice as compared to maxilla

2. Periphery and shape:

- Periphery well defined and corticated.
- In cases it may be simulated and give the appearance of malignant tumor.
- Formation of linear spicules of bone emanating from the surface of the bone in a sun ray like appearance.
- The periphery of lesions in the maxilla is usually ill defined.



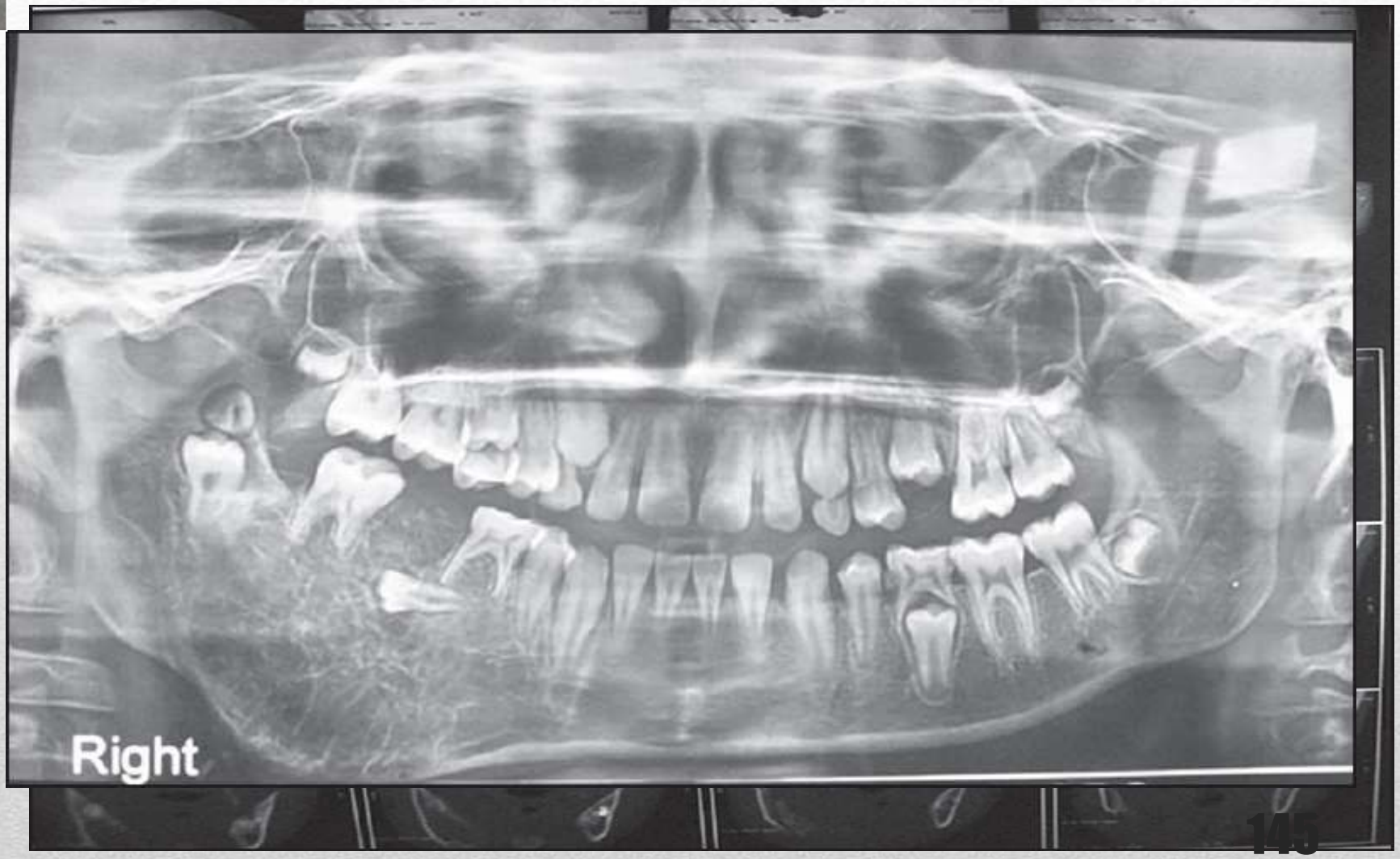
Posterior anterior view showing well defined expansile lesion in relation to the right side of the mandible with radiating trabeculae with characteristic sunburst pattern

3. Internal structure:

- Multilocular appearance
- Enlarged marrow spaces, surrounded by coarse, dense and well-defined trabeculae
- Internal trabeculae may produce a honey comb, soap bubble appearance.
- Formation of phleboliths (small areas of calcification or concretions found in a vein with slow blood flow)

4. Effect on surrounding structures:

- Roots of teeth in the region of vascular lesion are often resorbed or displaced
- Inferior alveolar nerve canal enlarges, canal is enlarged along its entire length and it shape may change to a serpiginous path.
- Mandibular or mental foramen may be enlarged.


Right

DIFFERENTIAL DIAGNOSIS

- Central giant cell granuloma
- Aneurysmal bone cyst
- Ameloblastic fibroma
- Ameloblastoma
- Cherubism
- Odontogenic keratocyst

MANAGEMENT

- Should be treated without delay because it may result in lethal exsanguinations.
- En bloc resection
- Laser and cryosurgery
- Corticosteroid injections
- Radiation therapy
- Embolization

CENTRAL GIANT CELL GRANULOMA

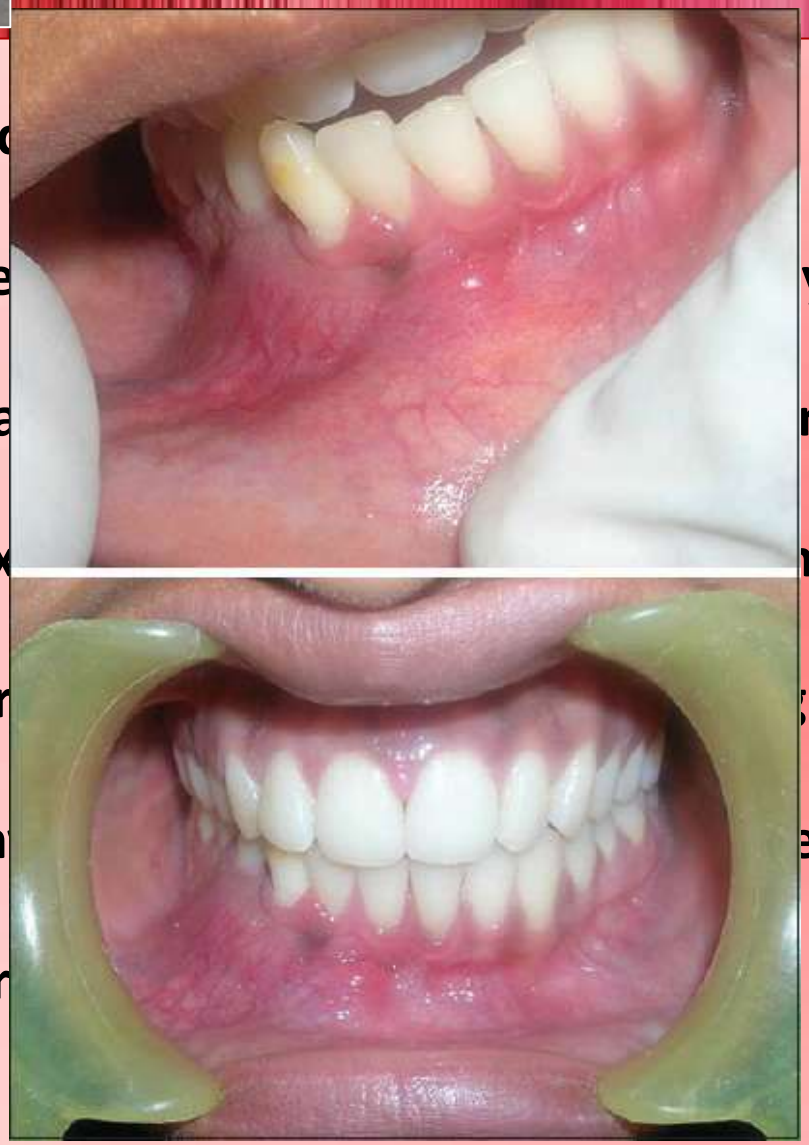
- Osteoclastoma, myeloid sarcoma, chronic hemorrhagic osteomyelitis, giant cell tumor , giant cell reparative granuloma.

- **Definition:**

Non neoplastic bone lesion, reactive to some unknown stimulus. However, radiologically characteristics are similar to that of a benign tumor.

- **Types:**
  - Non aggressive: exhibits slow growing benign behavior
  - Aggressive : shows typical features of rapidly growing destructive lesion

Clinical Features



Intraoral view showing the swelling in relation to 42, 43, and 44 region

- Ac
- Le y be found on routine examination
- Pa n palpation and purplish red in color
- Ex m
- Pr of deciduous teeth
- In e but maintain their vitality till they ar

RADIOGRAPHIC FEATURES

1. Location:

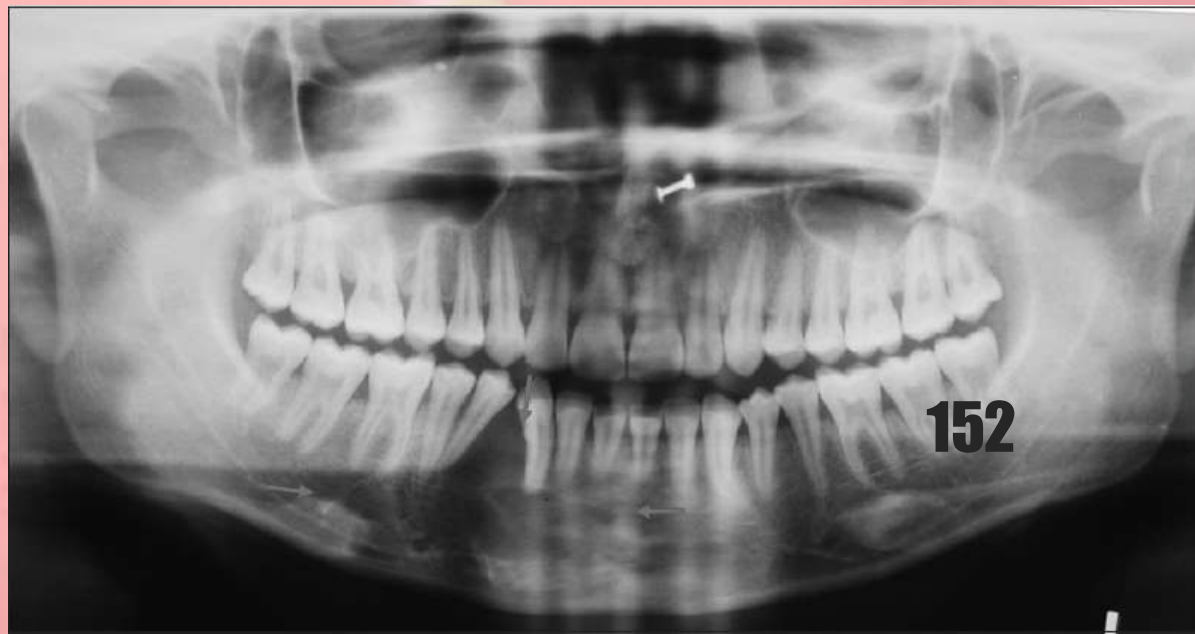
- Mandible more common as compare to maxilla
- Epicenter of the lesion is usually anterior to the first molar
- Maxillary lesion arise anterior to the cuspid
- Lesions can cross the midline of the mandible

2. Periphery

- Slow growing neoplasm
- Solitary unilocular or multilocular lesion, with well-defined margins but no cortication.
- Lesions in the maxilla may have an ill-defined, almost malignant appearing border. Sometimes the outer cortical plate may be destroyed instead of expanded.

3. Internal Structure:

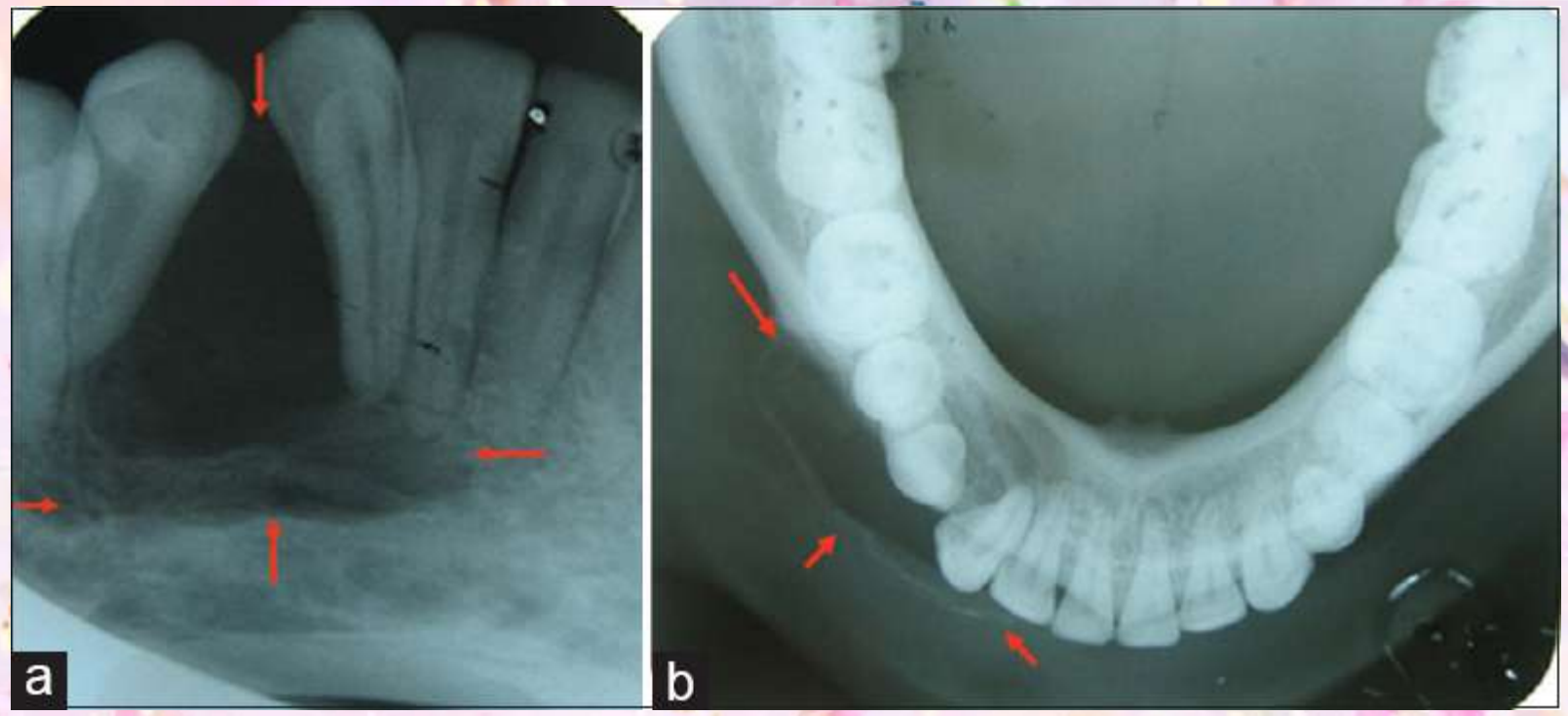
- No evidence of internal structure when small, sometimes a stubble granular pattern of calcification organized into wispy septas may be seen.
- Honeycomb appearance



Panoramic view showing the radiolucency in relation to 42, 43, and 44

4. Effect on Surrounding Structure

- Displace and resorb teeth
- Resorption of root is not a constant feature but when it occurs, it may be profound and irregular in outline.
- Lamina dura of teeth within the lesion is missing
- Displacement of inferior alveolar canal inferiorly
- Expansion of cortical border of maxilla and mandible

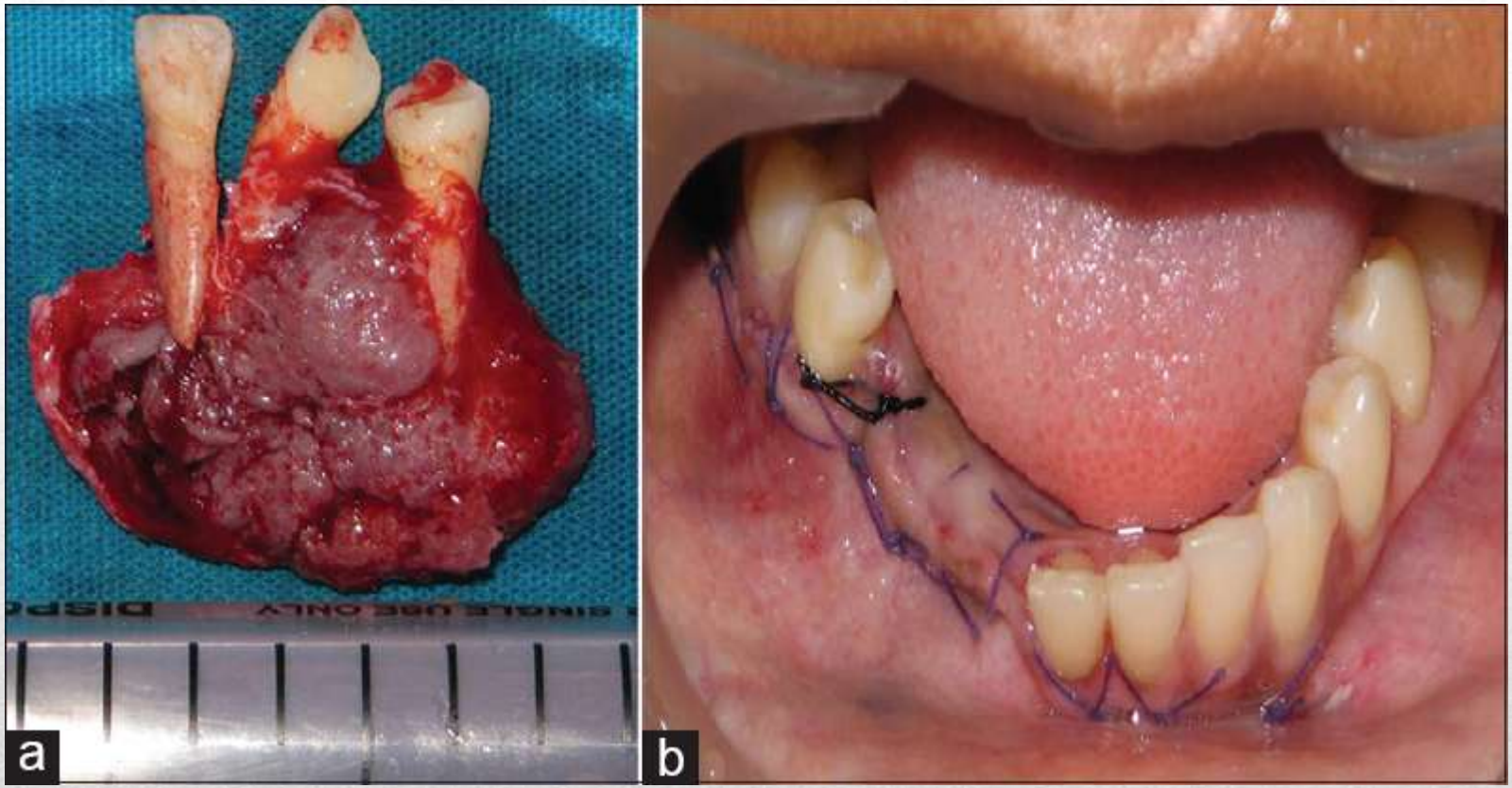


a) Intraoral periapical radiograph showing unilocular radiolucency with displacement of roots of 43 and 44.

b) Occlusal radiograph showing expansion of cortical plate in relation to 42, 43, and 44

Differential Diagnosis

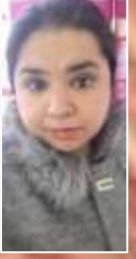
- Ameloblastoma
- Aneurysmal bone cyst
- Odontogenic myxoma
- Giant cell tumor
- Traumatic bone cyst
- Browns tumor of hyperparathyroidism
- Cherubism
- Central hemangioma



(a) Gross specimen of surgically excised lesion with embedded teeth.
(b) View showing placement of sutures after surgical excision

GARDNER'S SYNDROME

- Type of familial multiple polyposis, in which there is associated neoplasm.
- Hereditary condition characterized by multiple osteomas, multiple enostosis (dense bone islands), cutaneous sebaceous cysts, subcutaneous fibromas and multiple polyps of the small and large intestines.
- Associated osteomas appear in the second decade
- Commonly found in the frontal bone, mandible, maxilla and sphenoid bone

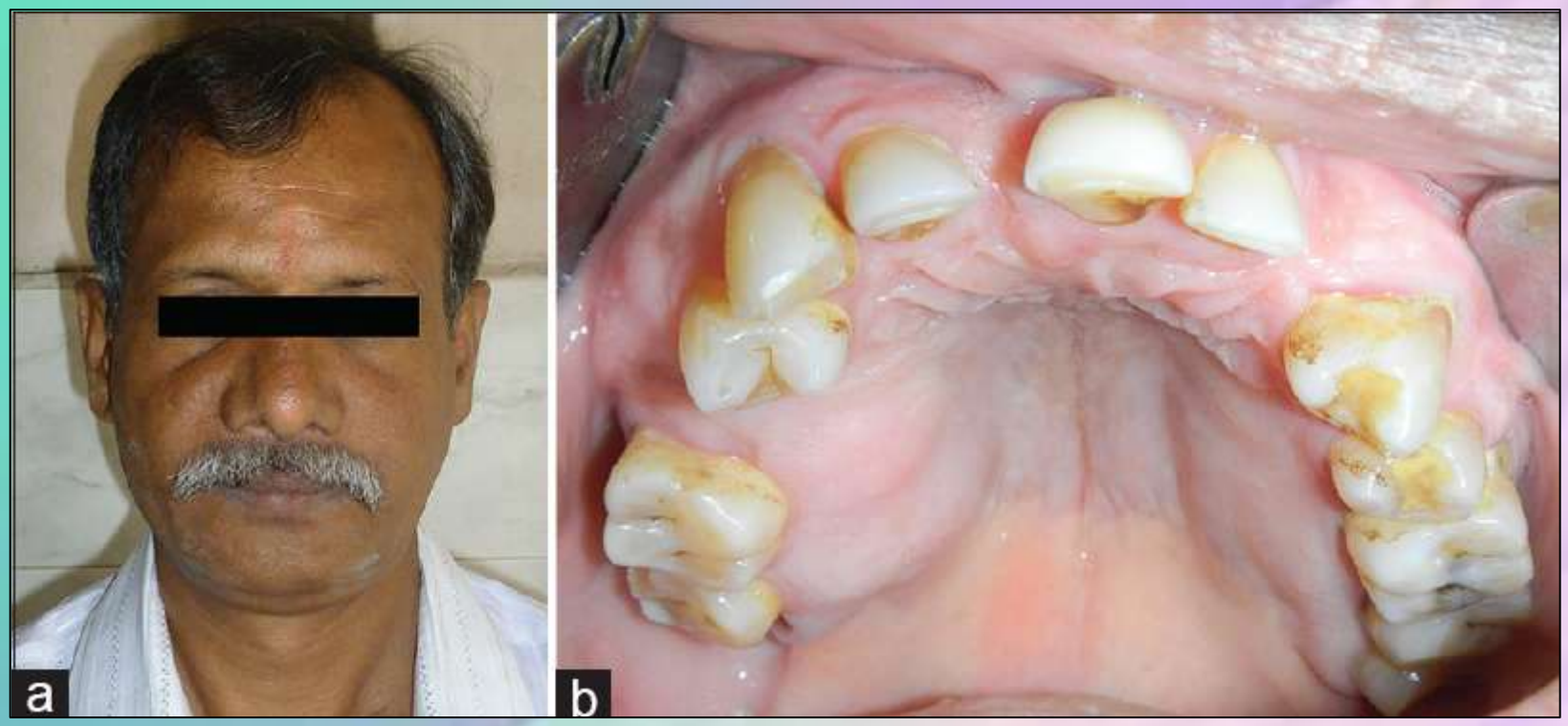


- The osteomas and enostosis develop before intestinal polyps which tend to undergo malignant change, **early recognition of the syndrome may be life saving.**

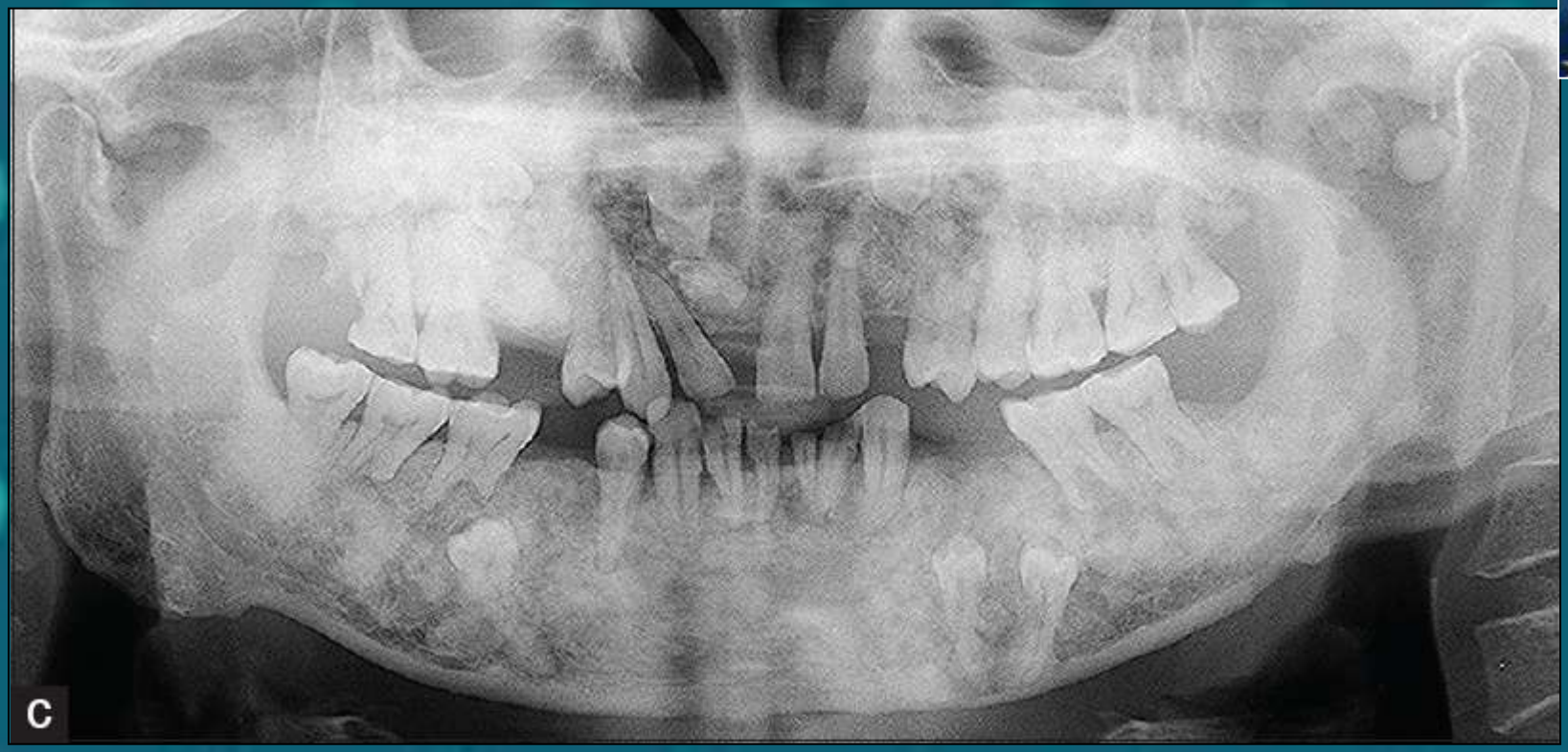
- Multiple unerupted supernumerary and permanent teeth are present in both the jaws.

MANAGEMENT

- Early recognition of the syndrome is important so the patient may be referred to the required specialist.



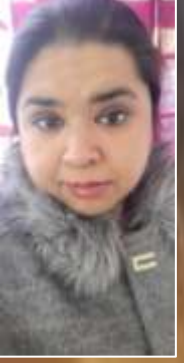
(a) Extraoral photograph shows fullness of nasolabial folds on both sides with small bony swellings seen on the right temple region. (b) Bony swellings seen on the right and left sides of the palate.



OPG shows impacted teeth w.r.t. 11, 15, 23, 34, 35, and 45. Resorption of the roots w.r.t. 46 and 47 is noted. Dense radio-opacities are seen on the right and left maxilla in premolar-molar region. Maxilla and mandible show diffuse radiopaque areas suggestive of dense bone islands or enostoses. Surgical defect seen on the left lower border of mandible and a well-defined round radio-opacity is seen on the left sigmoid notch

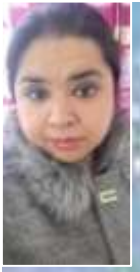
OSTEOBLASTOMA

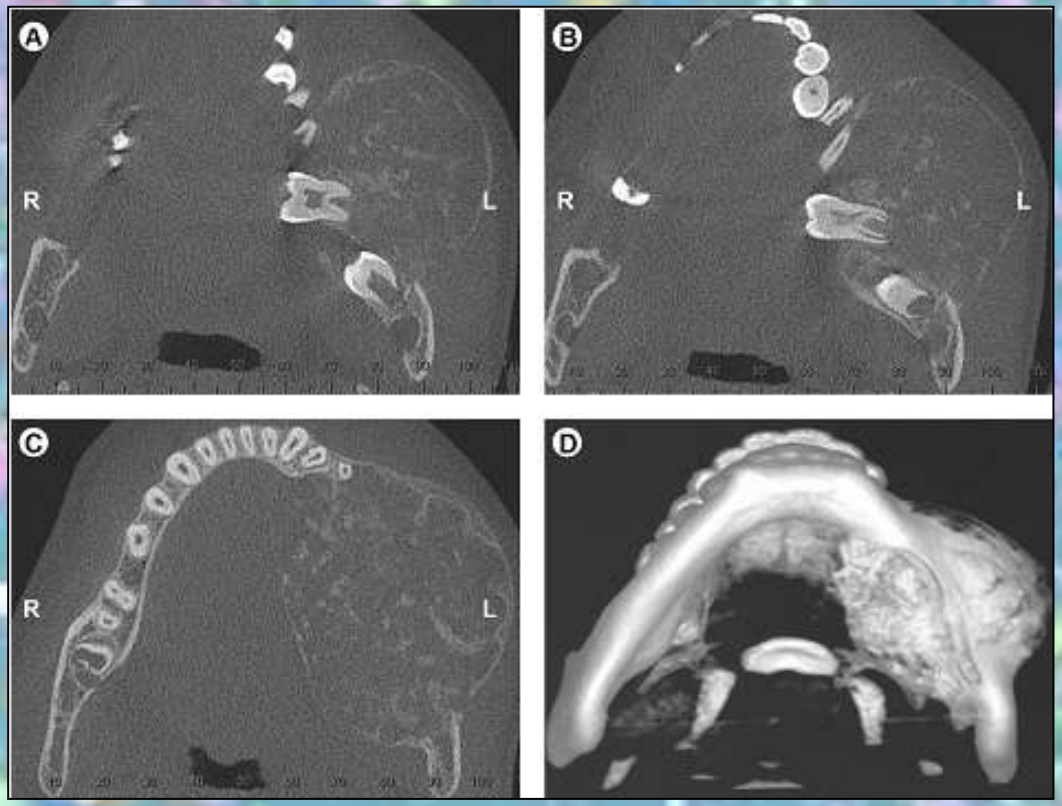
- Also c/a Giant Osteiod Osteoma
- Rare benign tumor of the osteoblasts with areas of osteiod and calcified tissue.
- More common in males, between 2nd and 3rd decade of life
- Common in vertebral column and sacrum, rarely found in jaws.
- Localized expansion of bone with pain and swelling of the affected area.



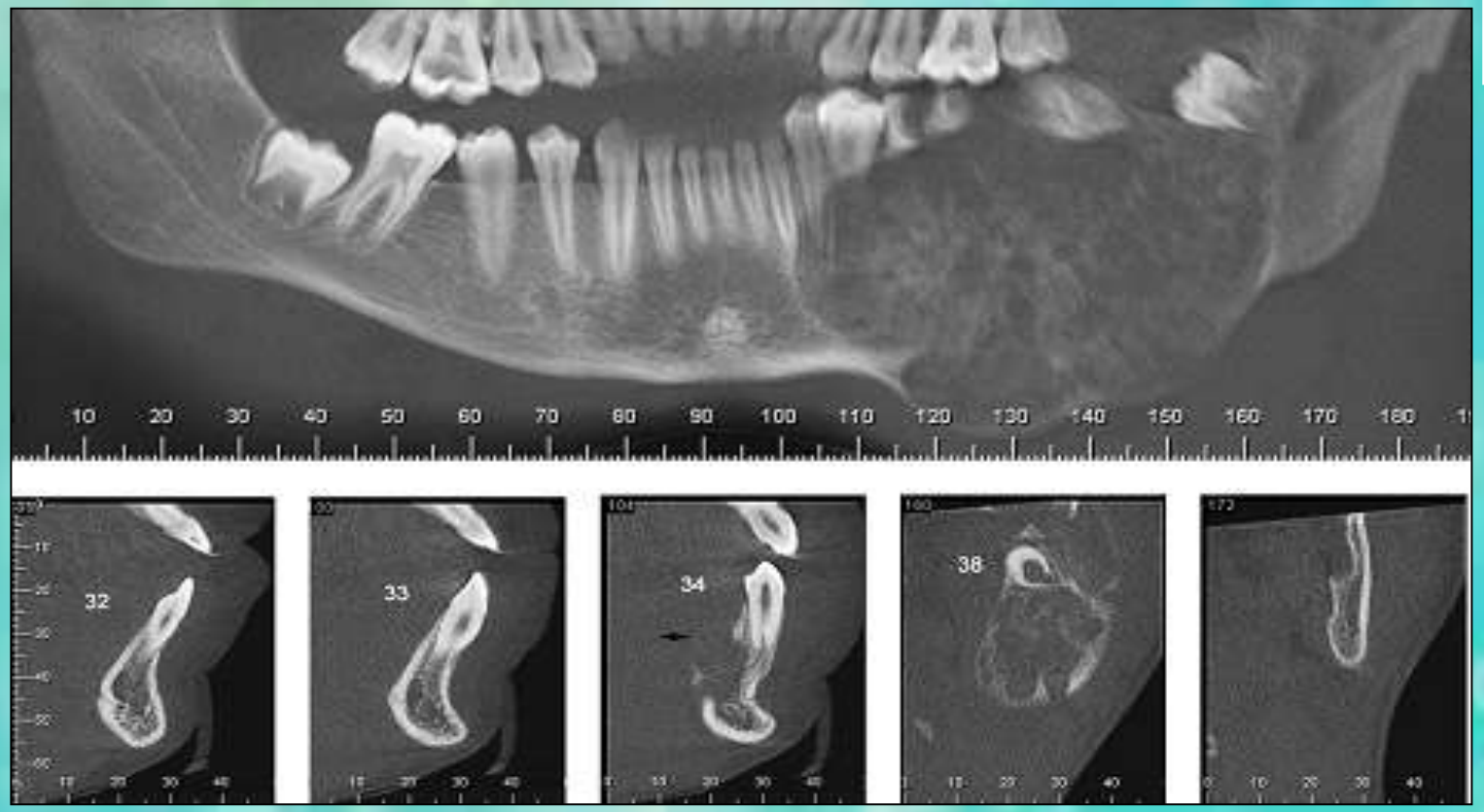
RADIOGRAPHIC FEATURES

- Seen as radiolucent lesion or may show varying degree of calcification.
- Borders are diffuse or show some sign of calcification
- Mandibular lesion may have a radiolucent halo with outer cortical boundaries
- Internal calcification may appear as sun-ray or fine granular bone trabeculae





Axial reconstructions (A, B, C) and three-dimensional reconstruction (D) exhibiting horizontal inclusion of the mandibular left second molar, extension of the lesion and effects on the buccal cortical and lingual cortical and teeth.



- A multilocular hypodense image is verified, causing expansion, thinning and destruction of the corticals in the mandibular body region on the left side and extending anteriorly up to the region of the mandibular left lateral incisor.

THANK YOU