ODOTOGENIC TUMORS

Learning Objectives:

At the end of **Odontogenic tumors** lectures you should be able to:

1. *Recognize types of odontogenic tumors.*
2. *Know how to be classified*
3. *How to differentiate among them*
4. *Characteristic radiographic feature of each.*
5. *Pathogenesis.*
6. *Characteristic histological feature of each.*

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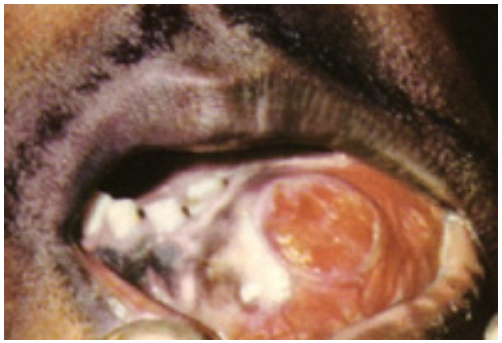
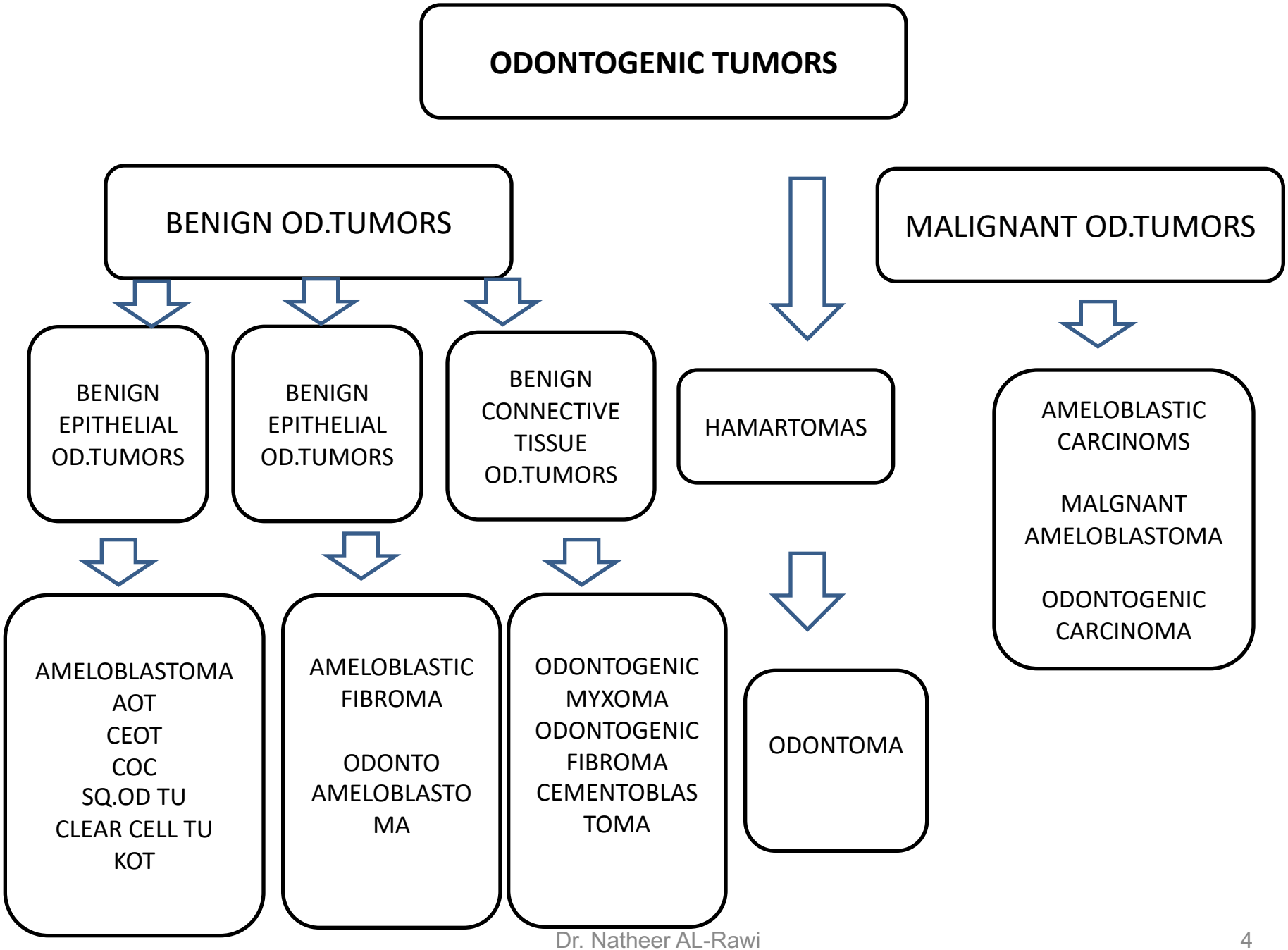
Thursday Sept 26th 2019

ODONTOGENIC TUMORS

- Odontogenic tumors are unique to the jaw, since they are originate from tissues associated with tooth development.
- **Majority arise intra-osseously,**
- **Rarely arise in the gingival tissues (peripherally)**

ODONTOGENIC TUMORS




ODONTOGENIC TUMORS
BENIGN OD.TUMORS
MALIGNANT OD.TUMORS
BENIGN EPITHELIAL OD.TUMORS
BENIGN EPITHELIAL OD.TUMORS
BENIGN CONNECTIVE TISSUE OD.TUMORS
HAMARTOMAS
AMELOBLASTIC CARCINOMS
MALGNANT AMELOBLASTOMA
ODONTOGENIC CARCINOMA
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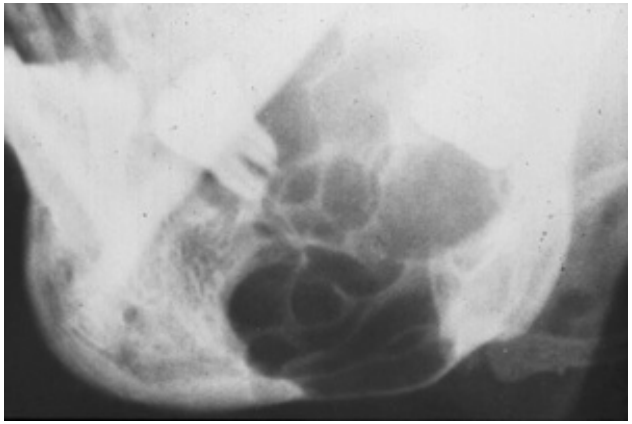
AMELOBLASTIC FIBROMA
ODONTO AMELOBLASTO MA
ODONTOGENIC MYXOMA
ODONTOGENIC FIBROMA
CEMENTOBLAS TOMA
ODONTOMA

I. AMELOBLASTOMA:

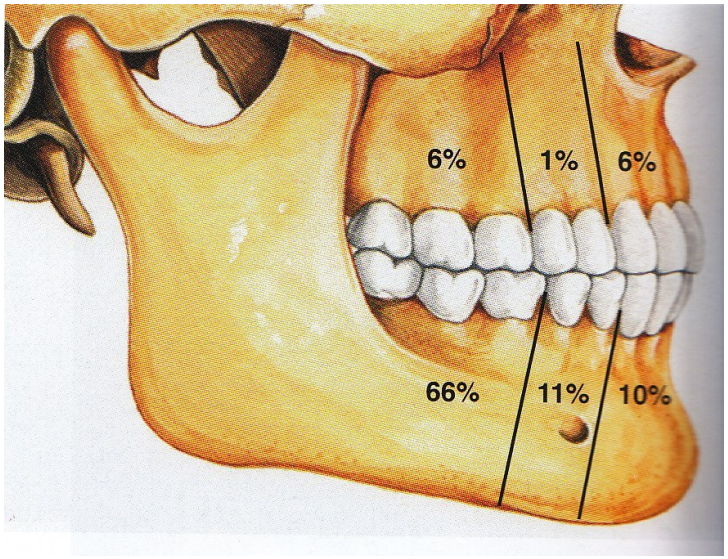
- Most common Odontogenic epithelial tumor of the jaw.
- Arise from remnants of Odontogenic epith. that remain within alveolar soft tissue & bone, "remnants of dental lamina, reduced enamel epith., rest of Malassez, basal cell layer overlying surface epith."
- Age range between 30&50 years .
- 80% formed in mandible, of these, 70% develop in the posterior molar region & often involve the ramus.
- It is locally invasive, but does not metastasize.

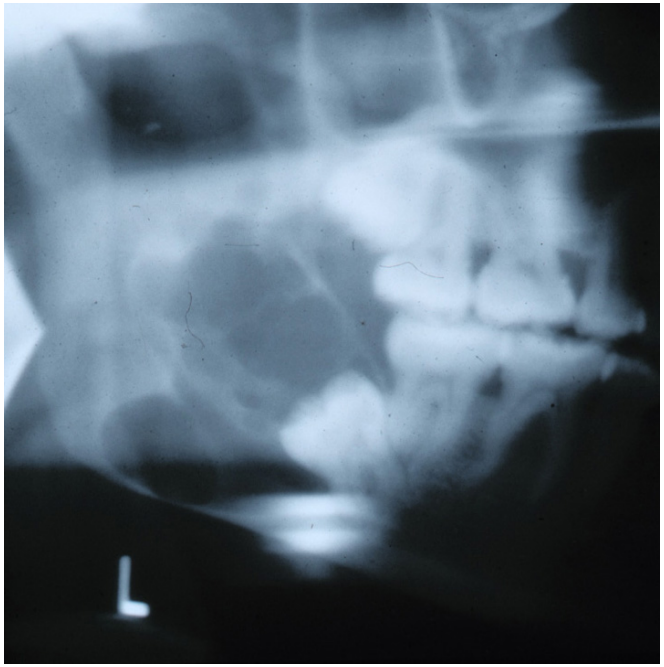


Clinical Features:

Three types of Ameloblastoma are generally recognized:

- **Common (Follicular, Polycystic) Ameloblastoma (86%).**
- **Unicystic Ameloblastoma (13%)**
- **Peripheral Ameloblastoma (1%)**





Common (Follicular) Ameloblastoma:

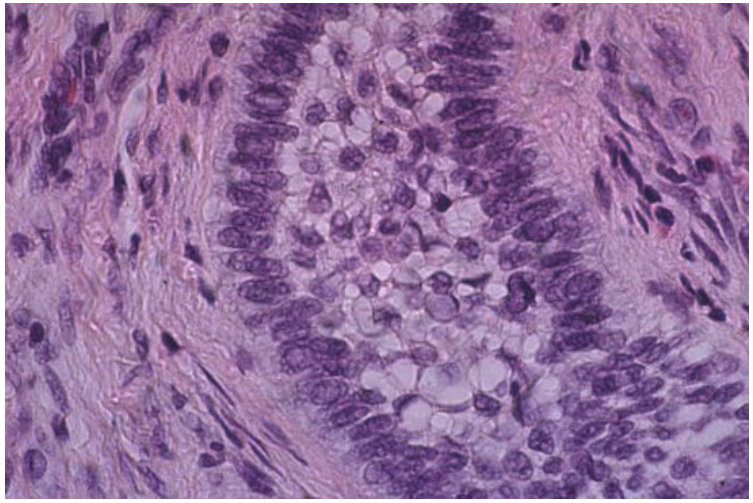
- **Most common type & most readily recognizable type.**

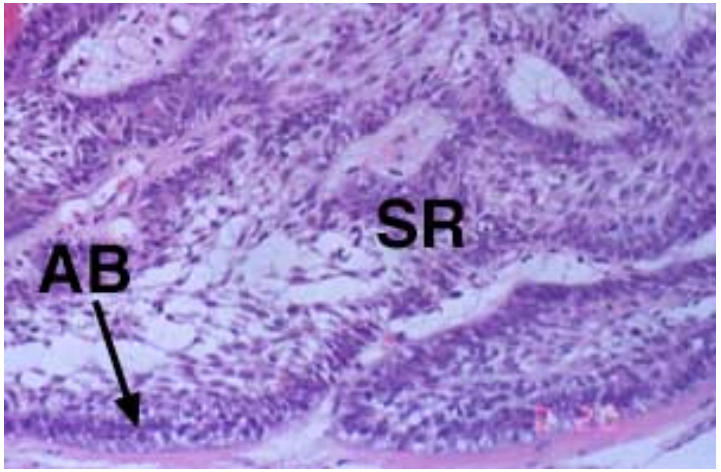
- **Produce extensive deformities of mandible especially in molars & ascending ramus area & less commonly in maxilla.**

- **Charecterstic feature of this type is: tendency to expand the bony cortices, due to their slow growth which allows time for the periosteum to produce a thin shell of bone a head of expanding lesion"Eggshell crackling" which is diagnostic sign of Ameloblastoma.**

Radiographically:

- **Multilocular radiolucency or soap bubble appearance.**



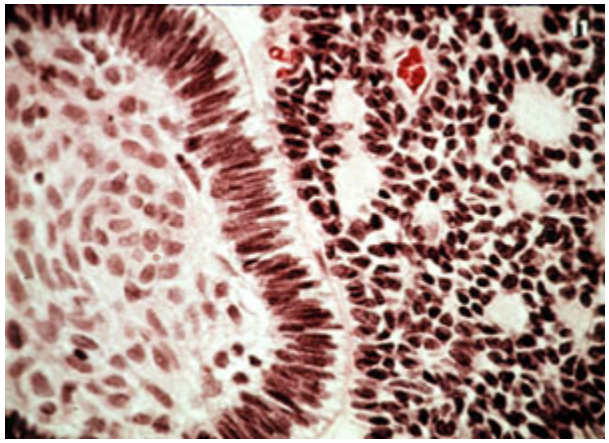


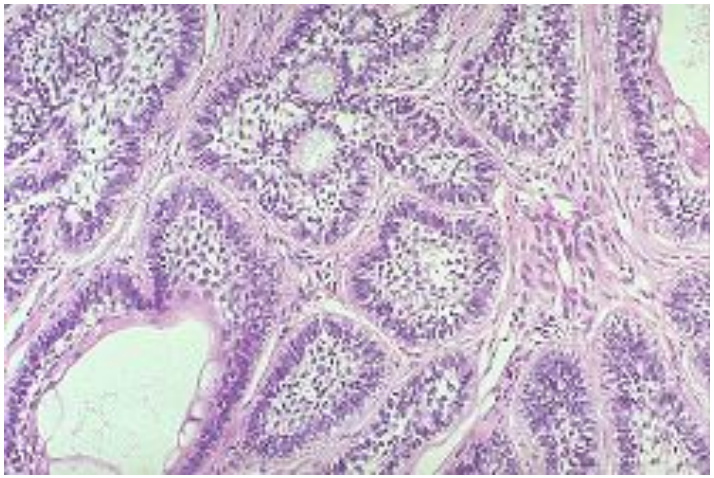
Histologically:

Generally Ameloblastoma is composed of:

✓Islands & trabeculae of epithelial cells in C.T stroma.

✓These epithelial processes composed of well-organized single layer of tall,colouminar,Ameloblast-like cells which have nuclei at the opposite pole of the basement membrane "Reversed polarity" which surround a core of loosely arranged polyhedral or angular cells resembling stellate reticulum .





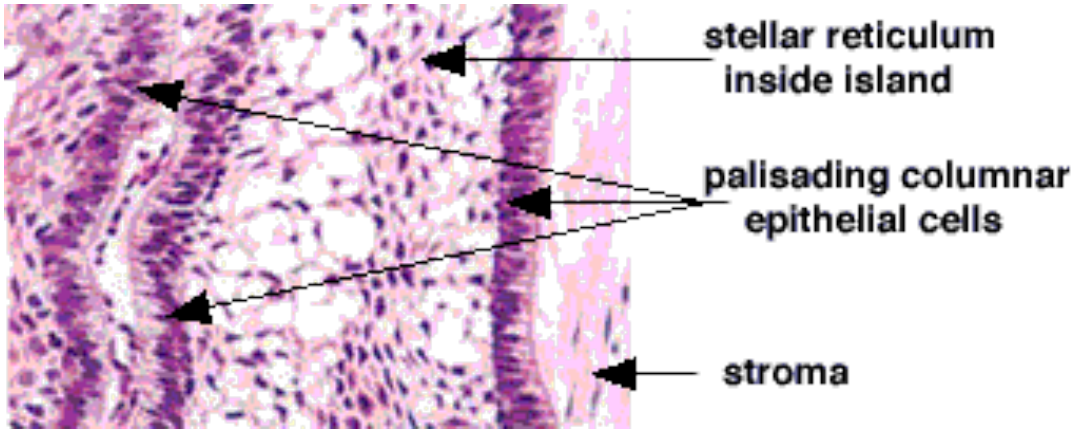
are:

1. Follicular Pattern:

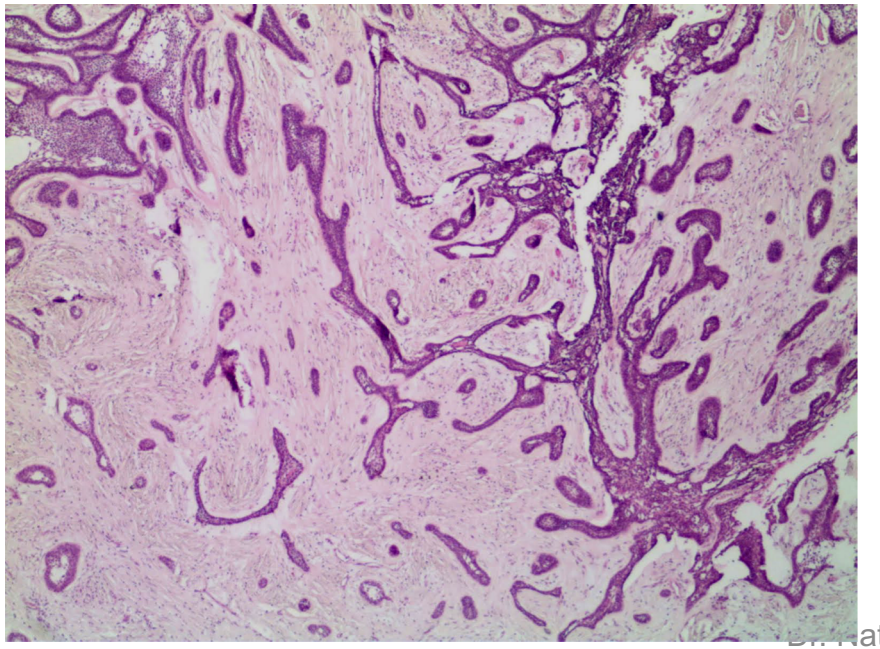
- **Most prevalent, resembling the *earlier stages of tooth development.***
- **Composed of epith. in the form of islands& strands.**
- **The epithelail arrangement have an outer border composed of the palisaded ameloblast-like cells with reversed polarity , and centrally a stellate reticulum-like cells are seen which sometimes undergo areas of degeneration forming central microcysts.**
- **This degeneration may be due to ischemia within the large islands of epith. proliferation.**

2. Plexiform Pattern:

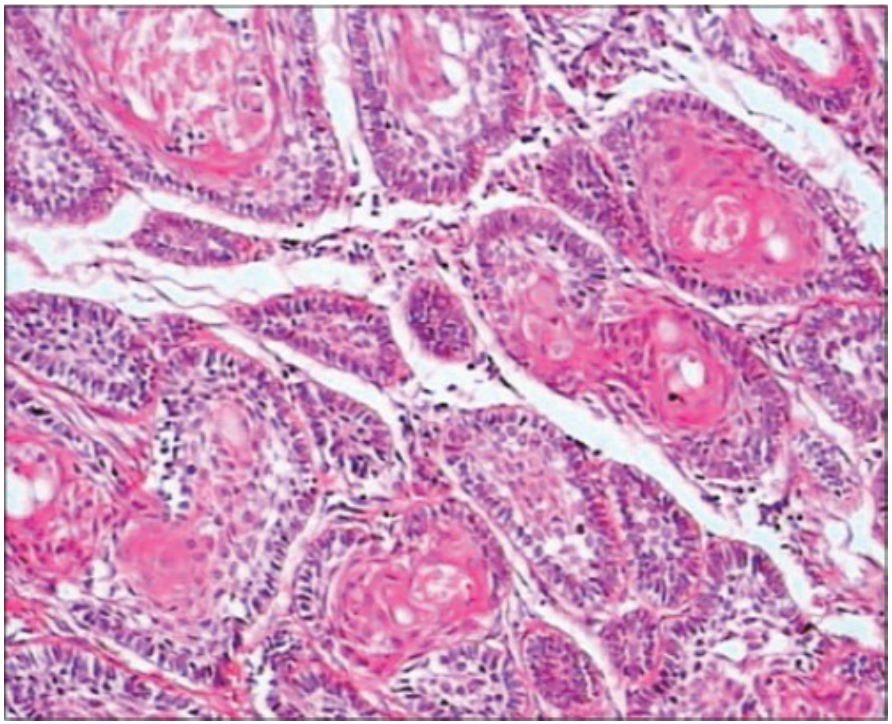
- Composed of epithelia that proliferate in a "fishnet" or mesh arrangement..

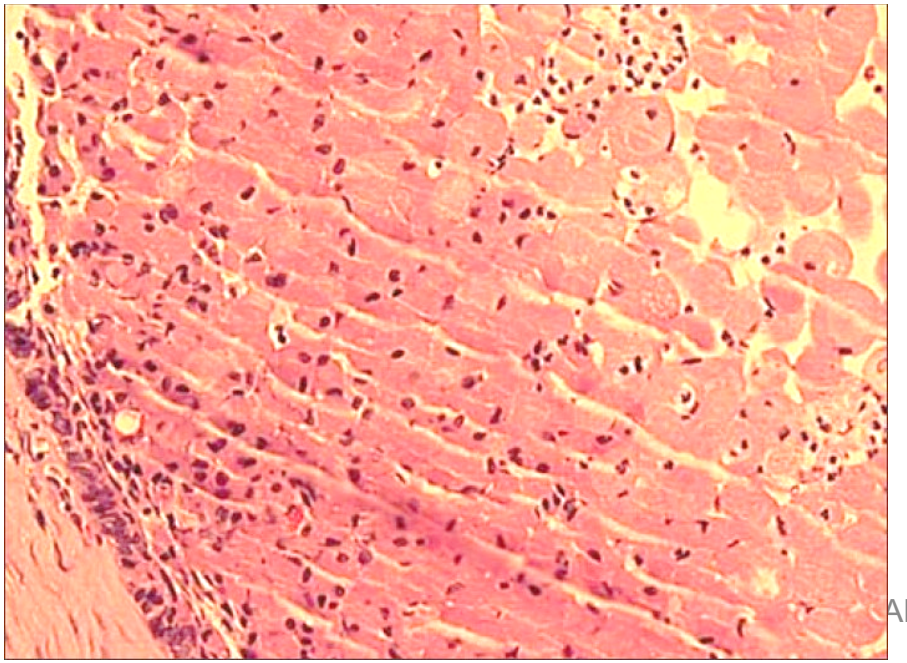


In many areas the basal cells do not resemble ameloblasts, because they lack the distinctive reversed polarization of the nucleus



- Large& small cyst-like areas are present that are not necessarily caused by the degeneration of epith. but are the result of strangulation & degeneration of C.T stroma by the proliferating epithelia.





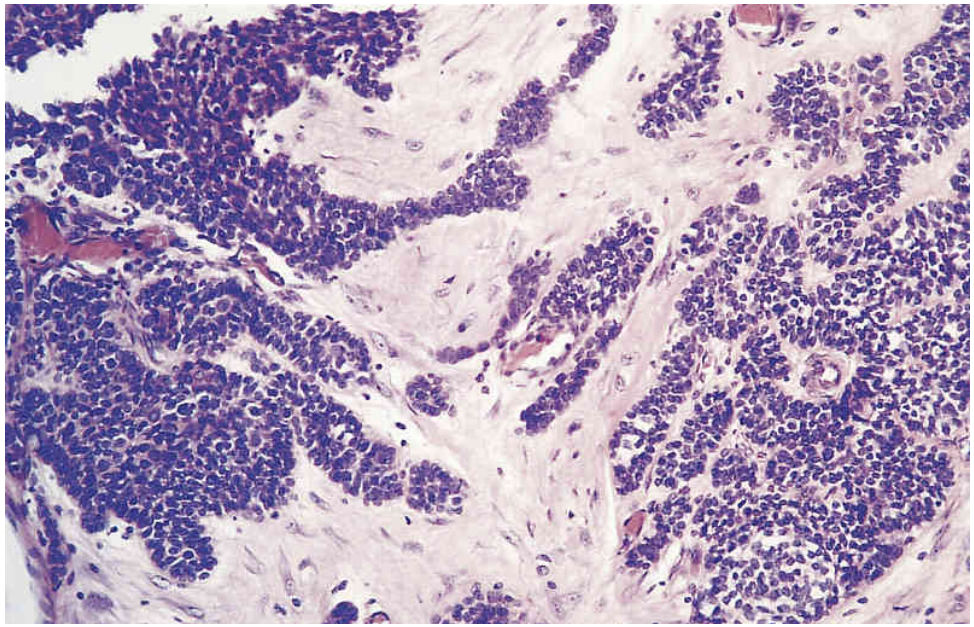
Follicular Ameloblastoma histo subtypes:

- **Acanthomatous Pattern:**

➢ Follicular epithelia show transformation of central epithelial cells into squamous cells that produce keratin within individual cells or in the form of keratin pearls.

- **Granular cell Pattern:**

➢ Rare, it resembles follicular type, but the epithelia particularly in the central areas of tumor islands forms sheets of large eosinophilic granular cells.

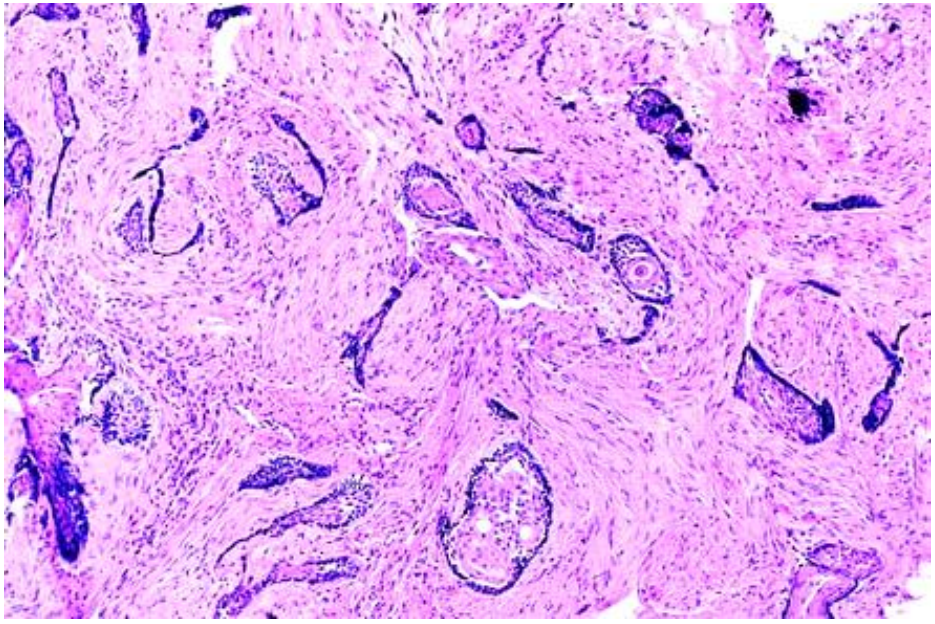


5. Basal cell Pattern:

- Rare, but composed of more darkly stained cells with little evidence of palisading at periphery.
- They have mistaken for basal cell carcinoma.

3. Desmoblastic Pattern:

- This composed of islands & strands that have cuboidal & darkly stained cells.



- The epithelial component is widely separated by fibrous tissue that is dense & scar-like.

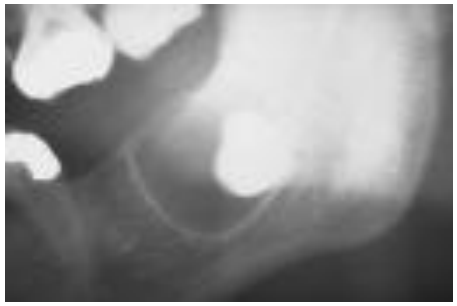
This variant has a mixed radiolucent/radiopaque radiographic appearance that resembles Fibro-osseus lesions.

IT IS MORE DIFFICULT TO TREAT, BECAUSE IT PENETRATES THE SURROUNDING BONE TRABECULAE & REMAINS UNDETECTED.

These histological variants do not affect tumor behavior.

Unicystic Ameloblastoma:

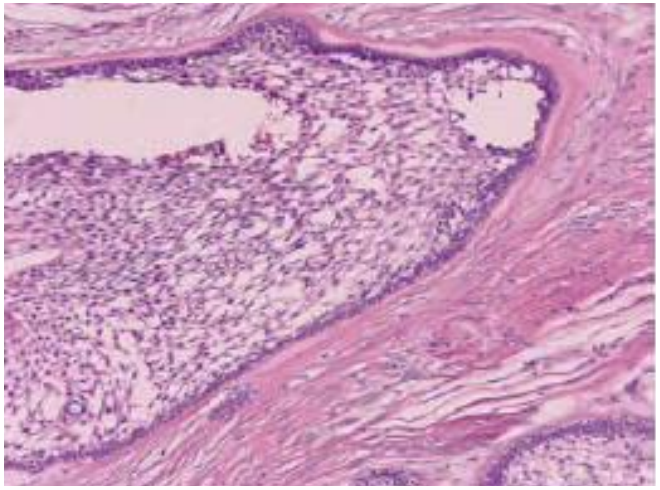
- Most of these lesions are found during biopsy examination of a large unilocular cyst commonly associated with the crown of an impacted tooth of young patients.

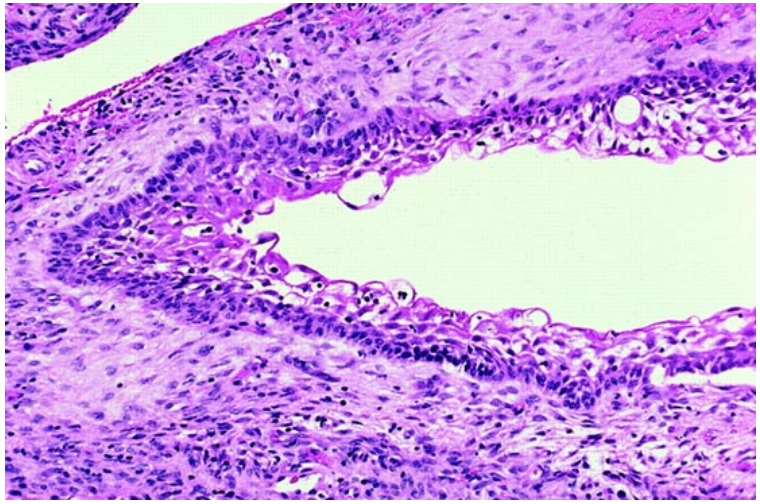


- 10-15% of all intra osseous ameloblastoma
- Whether the lesion is transformed from normal cyst lining or arise de novo from pre existing odontogenic epithelial remnants can not be determined.
- It is usually associated with a severely displaced mandibular third molar.

Radiographically:

- It appears as a unilocular radiolucency
- with well-demarcation & even corticated.





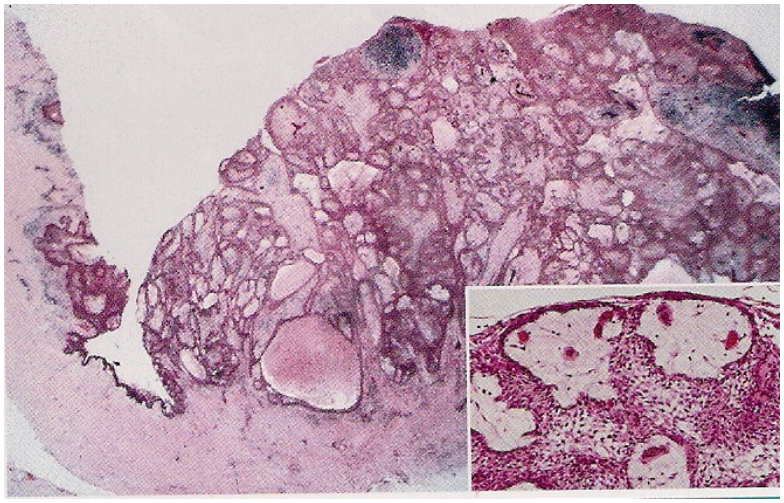
Histologically:

Three histological variants:

1.Luminal Unicystic Ameloblastoma

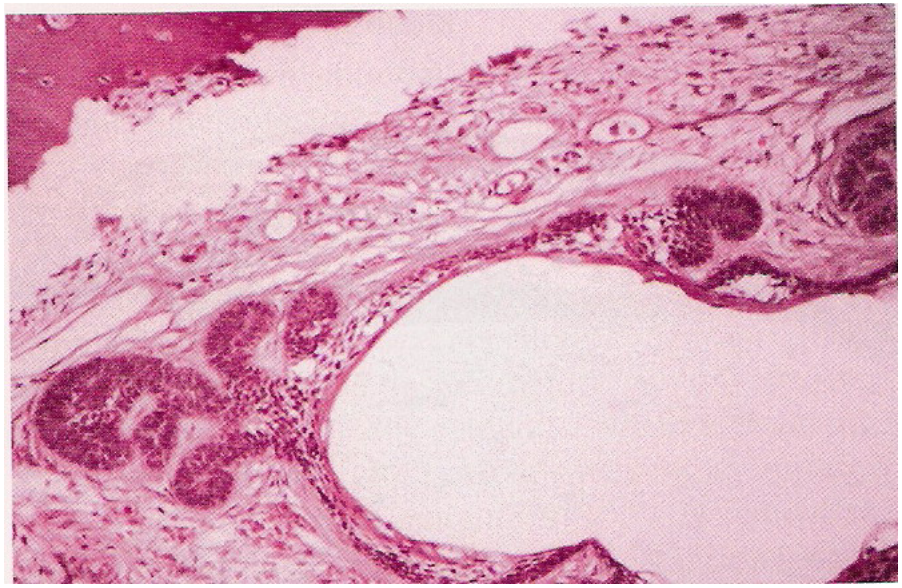
Uniformly thickened fibrous C.T capsule surrounding a solitary large fluid-filled lumen.

- **Epithelial lining is of a uniform thickness of palisaded columnar or cuboidal basal cell layers with hyperchromatic nuclei & reverse polarity with cytoplasmic vacuolization.**



2.Intraluminal Unicystic Ameloblastoma

One or more nodules of ameloblastoma project from cyst lining to the lumen mostly of plexiform type (*Plexiform unicystic ameloblastoma*).



3. Intramural Unicystic Ameloblastoma

The fibrous cyst wall is infiltrated by typical *follicular or plexiform* ameloblastoma

Peripheral (Extra osseus) Ameloblastoma:

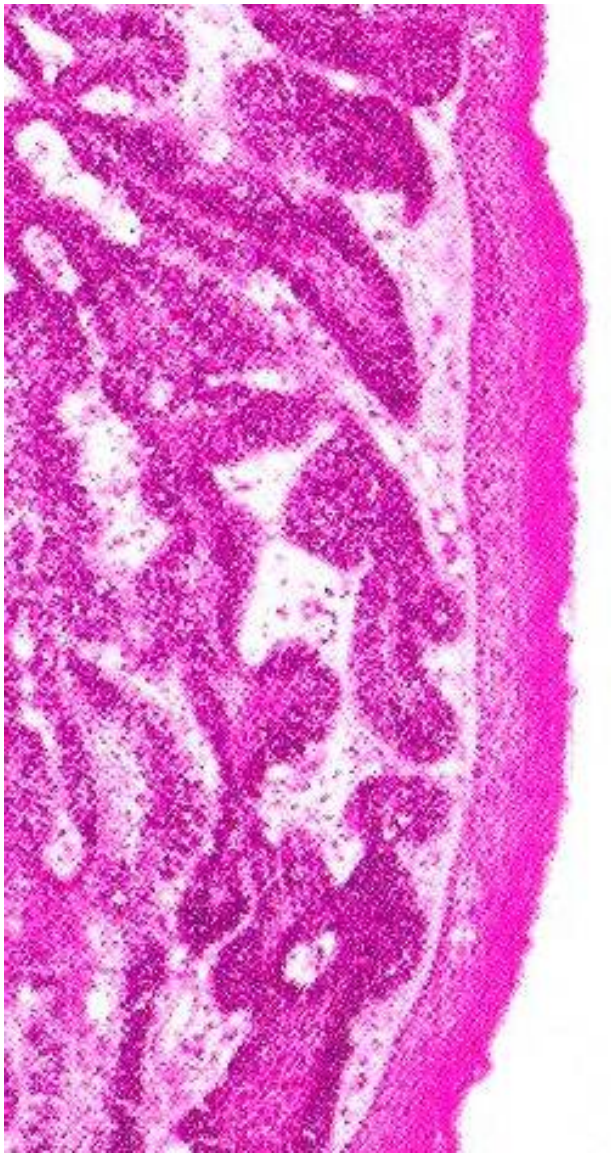
- **Uncommon (1%), histologically resemble intraosseous common ameloblastoma, but is limited to the soft tissue of the posterior gingiva.**

- **It is easy to diagnose when the lesion exhibits the classic histological patterns of the intraosseous common ameloblastoma & has a history of continuous growth.**

Clinically:

- **Painless, firm, sessile or pedunculated nodule of the gingiva with smooth surface & normal cortication.**

- **Resemble Pyogenic granuloma or fibroma**



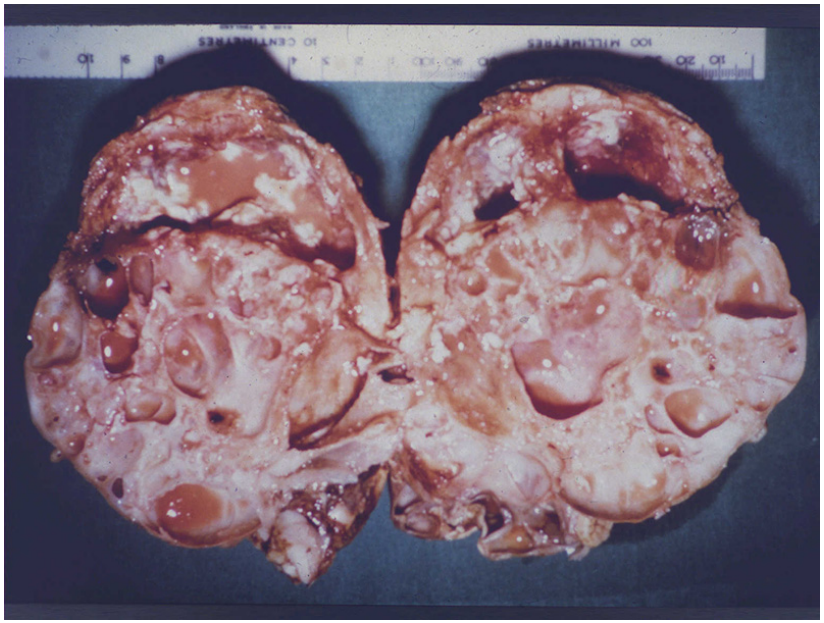
Radiographically:

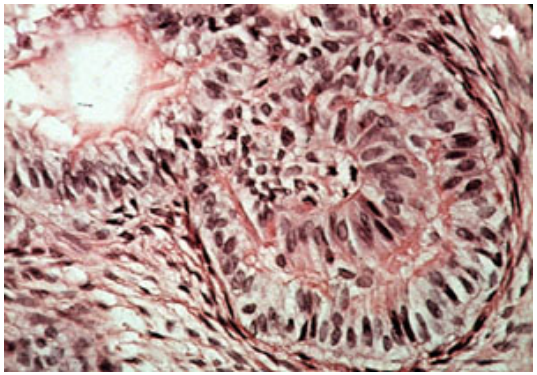
- **Only superficial saucerization of the cortical plate .**

Histologically:

- **Islands & strands of ameloblastic epithelia that occupy the lamina properia under epithelia.**
- **The epithelial islands exhibits *plexiform or follicular* variant.**

Treatment of Ameloblastoma: Local excision to Block resection





II. ADENOMATOID ODONTOGENIC TUMOR (AOT):

- **Completely benign lesion & probably hamartoma (3-7% of all Od. Tu).**

- **Appear as well-circumscribed lesion derived from odontogenic epithelia that usually occurs around the crown of unerupted anterior teeth of young patients & is composed of epithelia in ductal patterns interspersed with spherical calcification..**

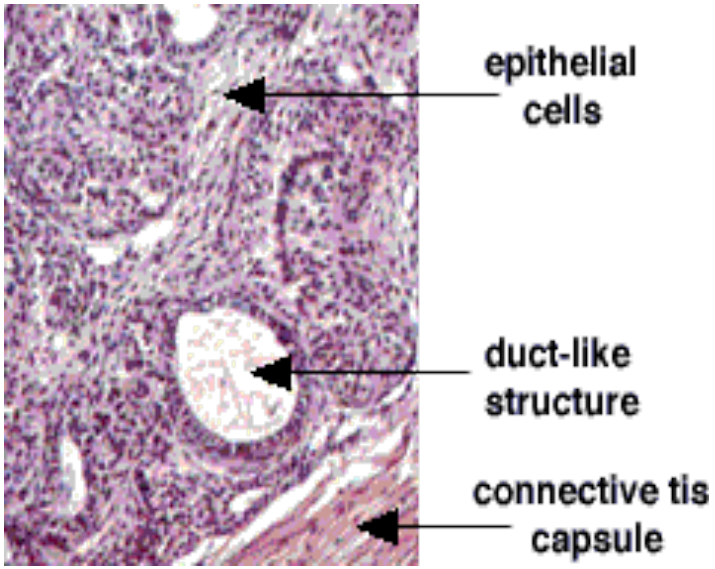
- **It originates from reduced enamel epithelia of post secretory phase of enamel organ development.**

Clinically:

- **Asymptomatic, small (≤ 3 cm) lesion associated with an impacted tooth & often *causes bone expansion & failure of the tooth to erupt.***
- **Commonly it affects <u>young adults of second decade of life with female predilection &</u> mostly in <u>anterior maxilla</u>, which is very slowly growing.**

Radiographically:

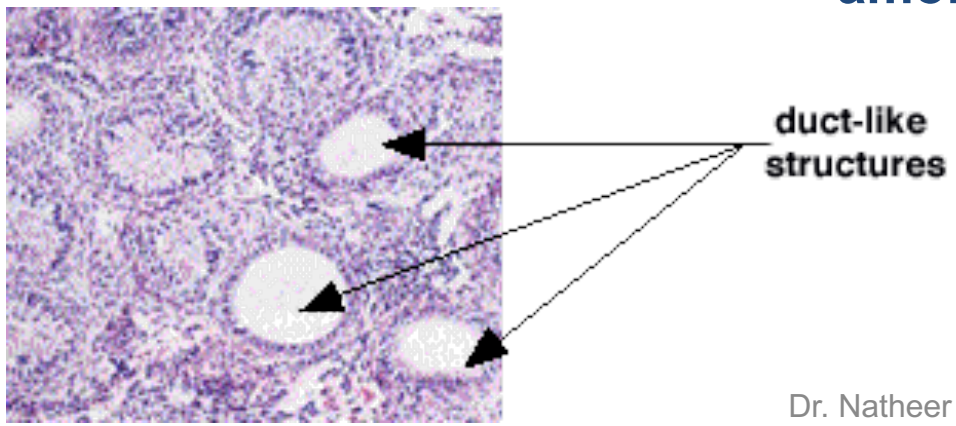
- Unilocular radiolucency with well-corticated borders that contains a tooth.
- The Lesion surround the crown of impacted tooth(cuspid), like dentigerous cyst & the difference between them are:
  - Radiolucency extends apically beyond CEJ.
  - Sometimes, the presence of flecks of radiopacities (snow flake).

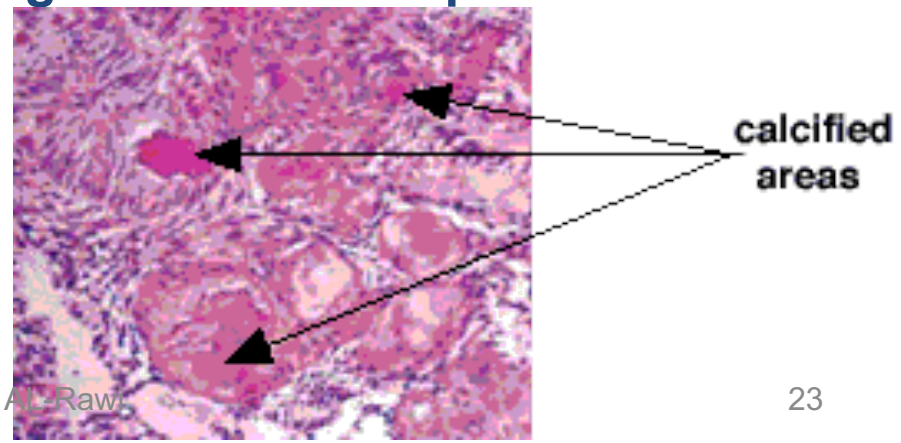


Histologically:

- **Well defined capsule encloses strands of spindle- shaped epithelia, among which are microcysts resembling duct cut in cross section & lined by colouminar cells similar to ameloblasts.**
- **These microcysts have led to the tumor being called "Adenomatoid" , but they are not ducts & are never seen cut longitudinally.**

❖ **Fragments of amorphous or crystalline calcification may also seen among the sheets of epithelial cells.**





Behavior & treatment:

- The lesion is biologically non aggressive & requires conservative treatment.

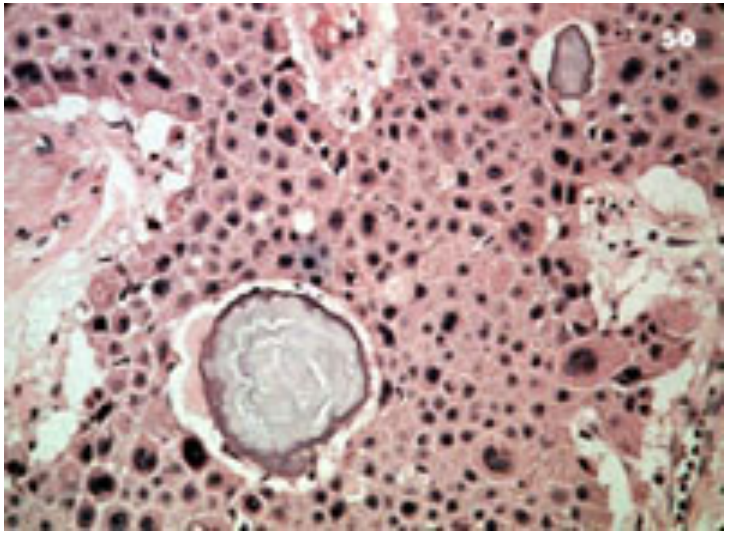
- Its recognition & differentiation from other epithelial odontogenic lesions particularly ameloblastoma is of utmost importance.Why?

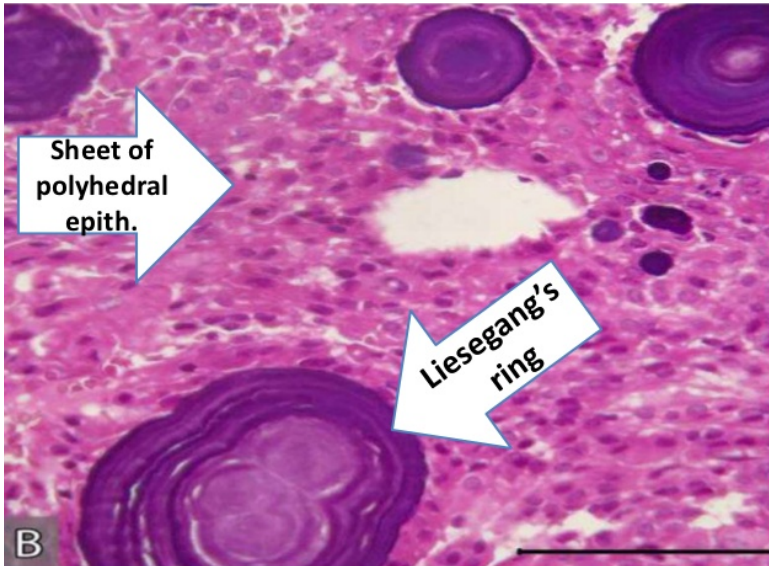
- Enucleation is treatment of choice with no tendency for recurrence.

III. CALCIFYING EPITHELIAL ODONTOGENIC TUMOR (PINDBORG TUMOR) CEOT:

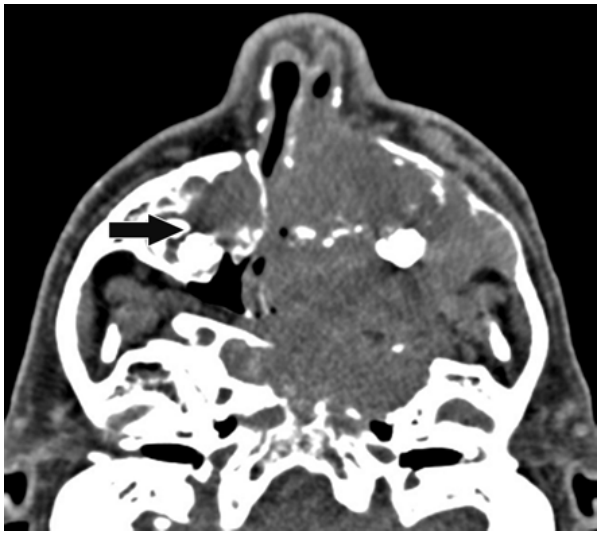
- CEOT is locally aggressive tumor consisting of strands of squamous & clear cells that are often accompanied by spherical calcification & amyloid staining hyaline deposits.
- It is important because it could be mistaken for a poorly differentiated carcinoma.

Histologically:





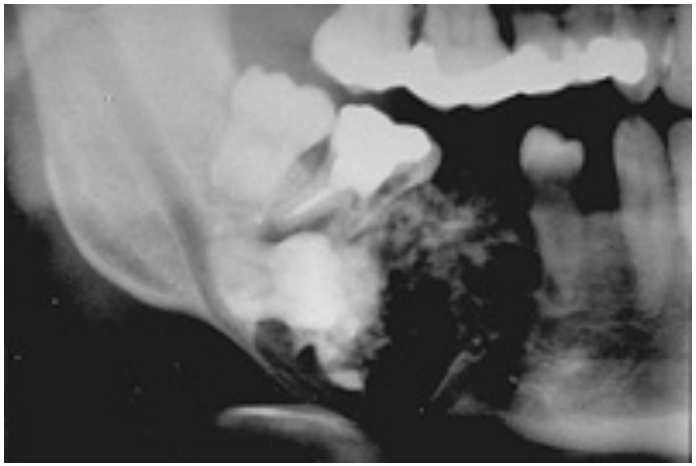
- It originates from the epithelial rest of dental lamina & / or reduced enamel epithelia that overlies the crowns of the teeth.
- Mostly it affects the posterior body of the mandible.
- *It differs from ameloblastoma by:*
- Being composed of epithelial cells that do not resemble ameloblasts.
- By usually containing spherical diffuse calcification within the epithelial islands & C.T stroma.

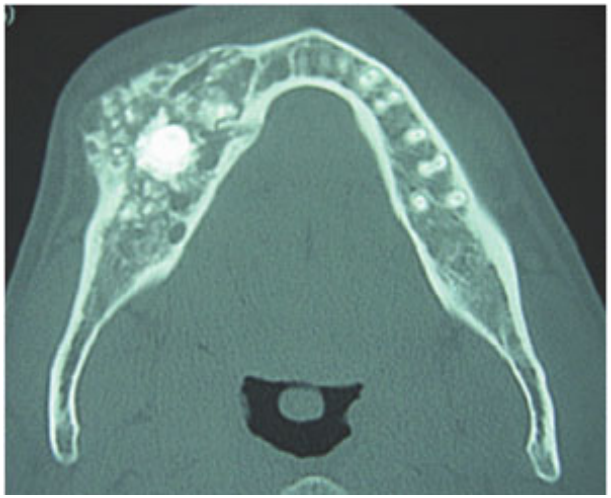


CEOT occurs as either:
a central "Intraosseous" or Peripheral "Extraosseous" lesions.

- **Central CEOT occurs mainly in mandibular molar area as a slowly growing painless mass**
- **Nasal obstruction, epistaxis & proptosis are sometimes experienced in the maxilla.**

- **Peripheral CEOT is most commonly occurs in the anterior part of the mouth as superficial soft tissue swelling of the gingival in tooth-bearing & edentulous areas of the jaw.**





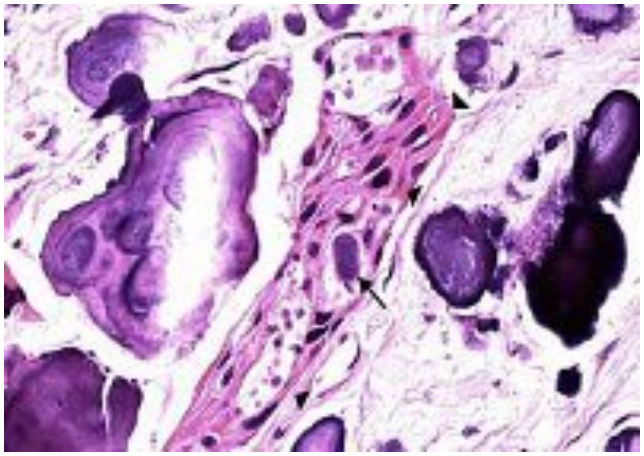
Radiographically:

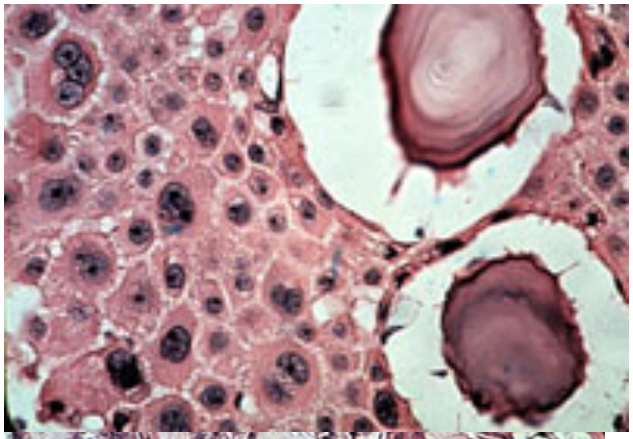
- Since calcifications are usually small, lesion tend to occur as uni or multi locular radiolucency with scalloped margins

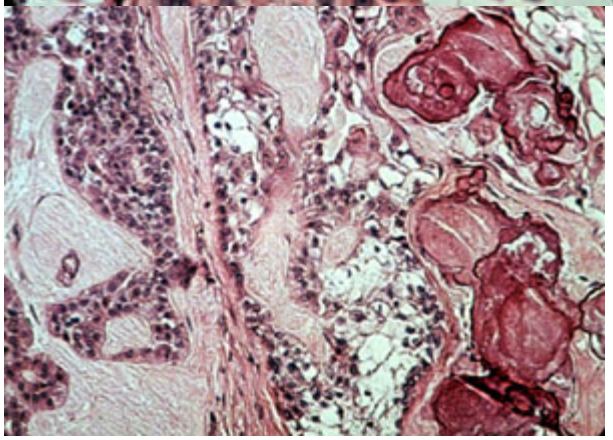
✓with faint flecks of calcified structure around crown of impacted mand. molar

Differential Diagnosis:

- *Dentigerous cyst*
- *Adenomatoid odontogenic tumor*
- *Ameloblastic Fibroodontoma*





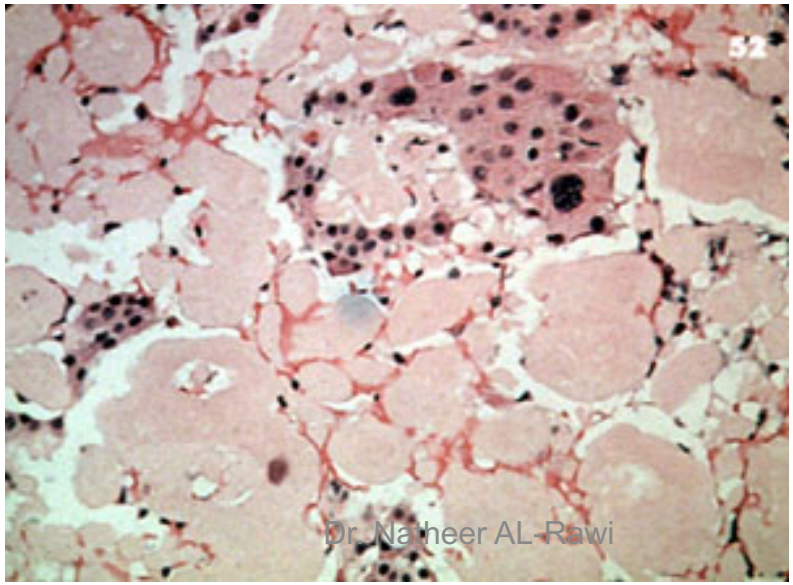


Histologically:

- **Sheets of polyhydral cells with prominent intercellular bridges.**
- **Cells exhibit pleomorphism, multinucleation,& occasionally hyperchromatism, but with rare mitotic figures & *lack of stromal inflammatory reaction*.**
- **Pools of homogenous eosinophilic materials are often found within & between the epithelial sheets, along with spherical calcification occurs.**
- **Concentric spherical calcifications (Liese-gang ring calcifications) are scattered throughout the epithelia & C.T.**
- **Peripheral lesions has distinct clear epithelial cells.**

The nature of eosinophilic deposits is believed to be a form of Amyloid, since it stain positively with amyloid stains like: Congo red or Thioflavin T stains.

Another interpretation is that: the deposits are abnormal form of tissue degeneration, enamel matrix, keratin ,or basal lamina.



Treatment:

The lesion is locally invasive & without capsule formation, so resection that includes a margin of normal soft tissue or bone is recommended.


TO BE CONTINUED...