

ODOTOGENIC TUMORS

Learning Objectives:

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

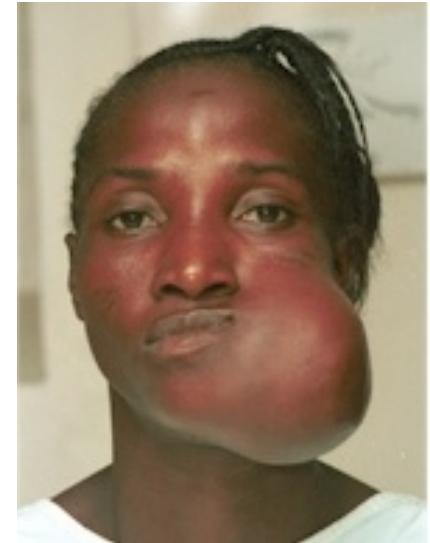
1. *Recognize types of odontogenic tumors.*
2. *Know how to be classified*
3. *How to differentiate among them*
4. *Characteristic radiographic feature of each.*
5. *Pathogenesis.*
6. *Characteristic histological feature of each.*

Natheer Al-Rawi

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

BENIGN
EPITHELIAL
OD.TUMORS

BENIGN
EPITHELIAL
OD.TUMORS

BENIGN
CONNECTIVE
TISSUE
OD.TUMORS

HAMARTOMAS

AMELOBLASTOMA
AOT
CEOT
COC
SQ.OD TU
CLEAR CELL TU
KOT

AMELOBLASTIC
FIBROMA
ODONTO
AMELOBLASTO
MA

ODONTOGENIC
MYXOMA
ODONTOGENIC
FIBROMA
CEMENTOBLAS
TOMA

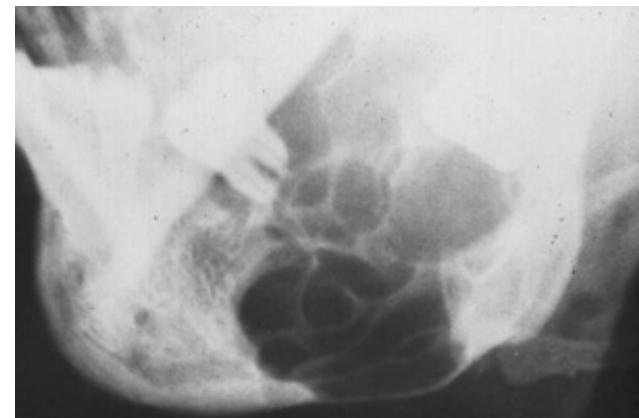
MALIGNANT OD.TUMORS

AMELOBLASTIC
CARCINOMS
MALIGNANT
AMELOBLASTOMA
ODONTOGENIC
CARCINOMA

ODONTOMA

I. AMELOBLASTOMA:

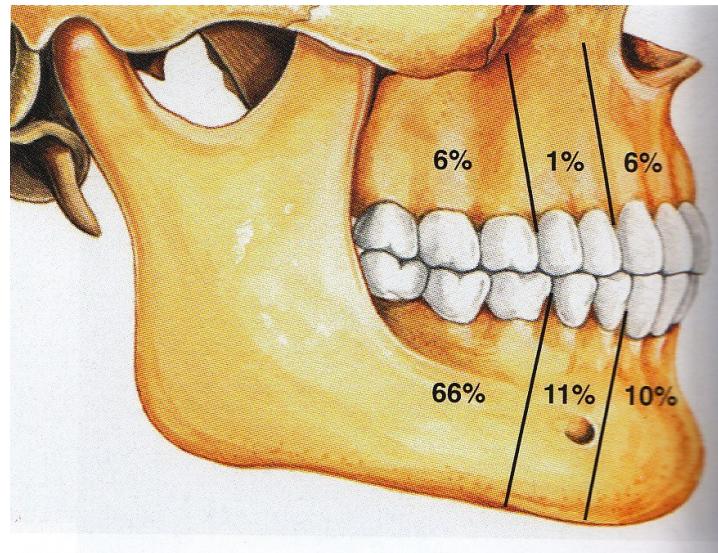
- Most common Odontogenic epithelial tumor of the jaw.
- Arise from remnants of Odontogenic epith. that remain within alveolar soft tissue & bone, “remnants of dental lamina, reduced enamel epith., rest of Malassez, basal cell layer overlying surface epith.”
- Age range between 30&50 years .
- 80% formed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

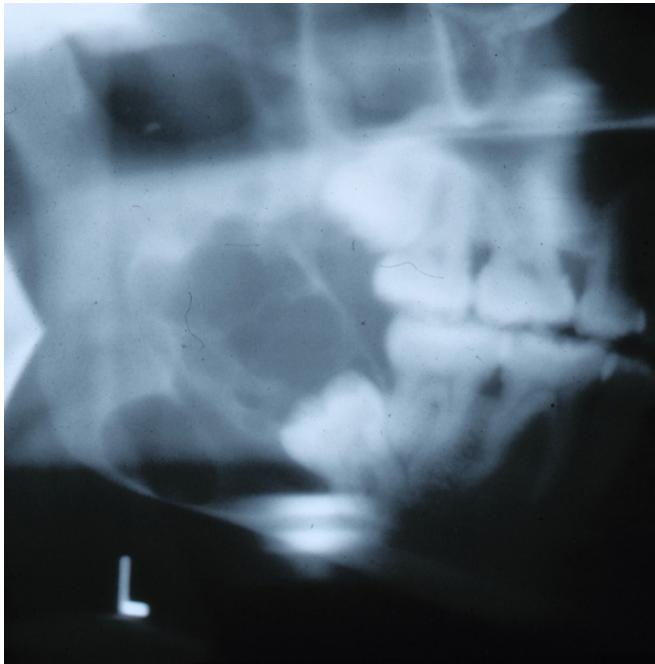


Clinical Features:

Three types of Ameloblastoma are generally recognized:

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



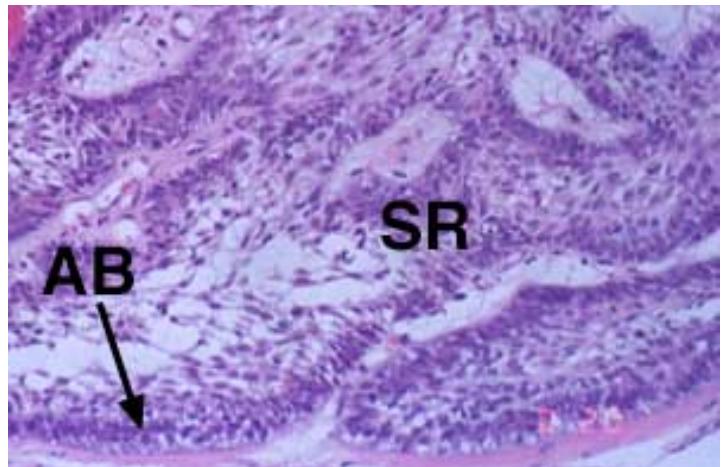
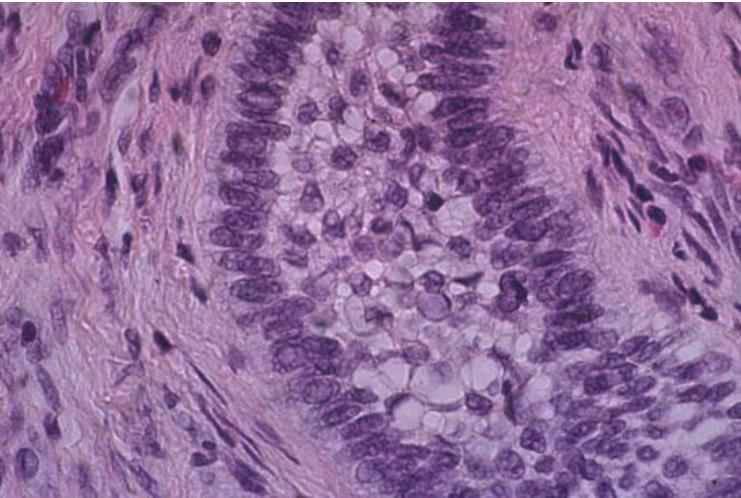


Common (Follicular) Ameloblastoma:

- Most common type & most readily recognizable type.
- Produce extensive deformities of mandible especially in molars & ascending ramus area & less commonly in maxilla.
- Characteristic 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.

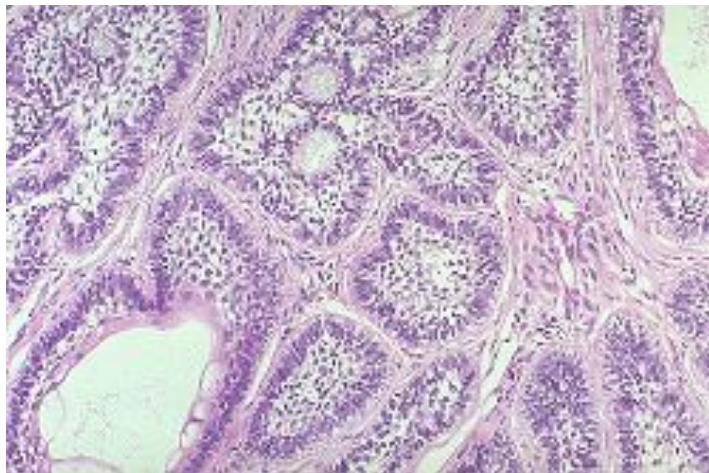
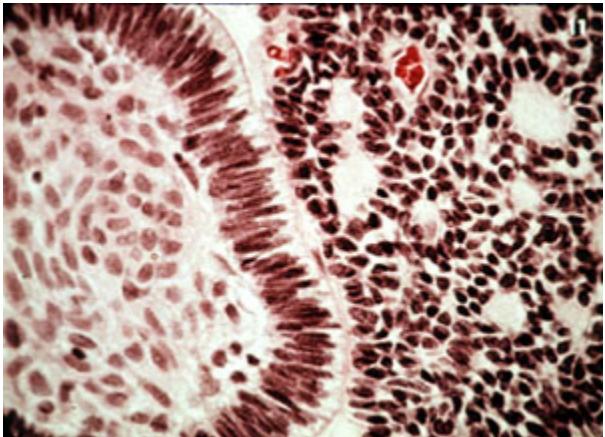
1. Follicular Pattern:

➤ Most prevalent, resembling the earlier stages of tooth development.

➤ Composed of epith. in the form of islands& strands.

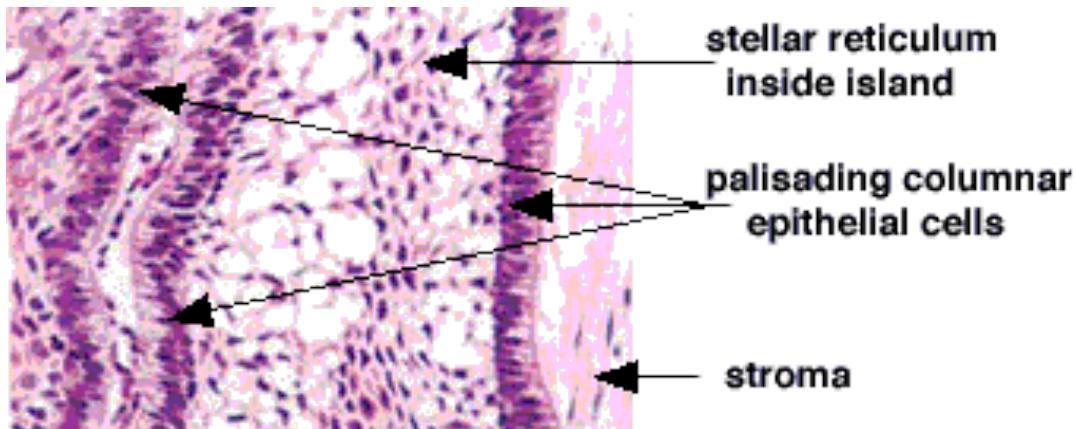
➤ The epithelial arrangement have an outer border composed of the palisaded ameloblast-like cells with reversed polarity , and centrally a stellate reticulum-like cells are seen which sometimes undergo areas of degeneration forming central microcysts.

➤ This degeneration may be due to ischemia within the large islands of epith. proliferation.



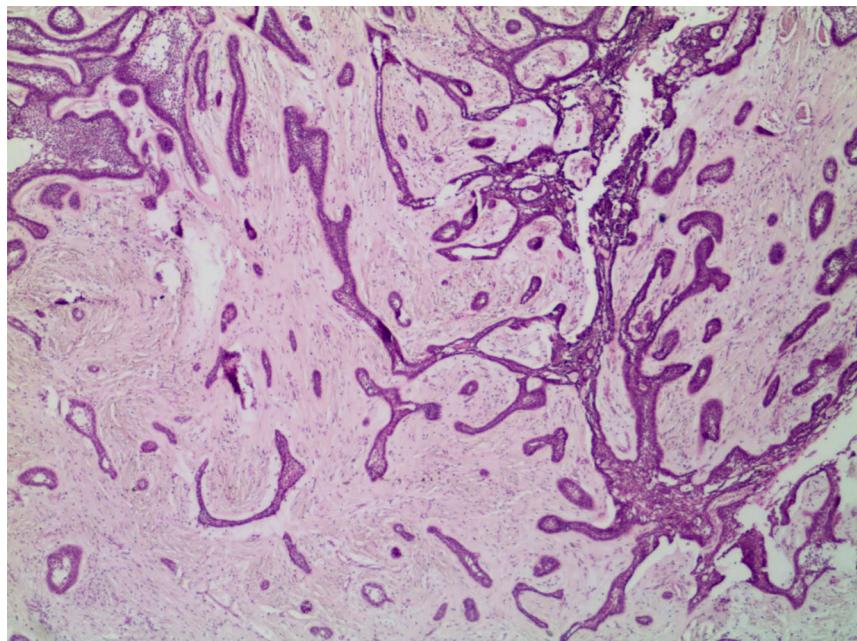
2. Plexiform Pattern:

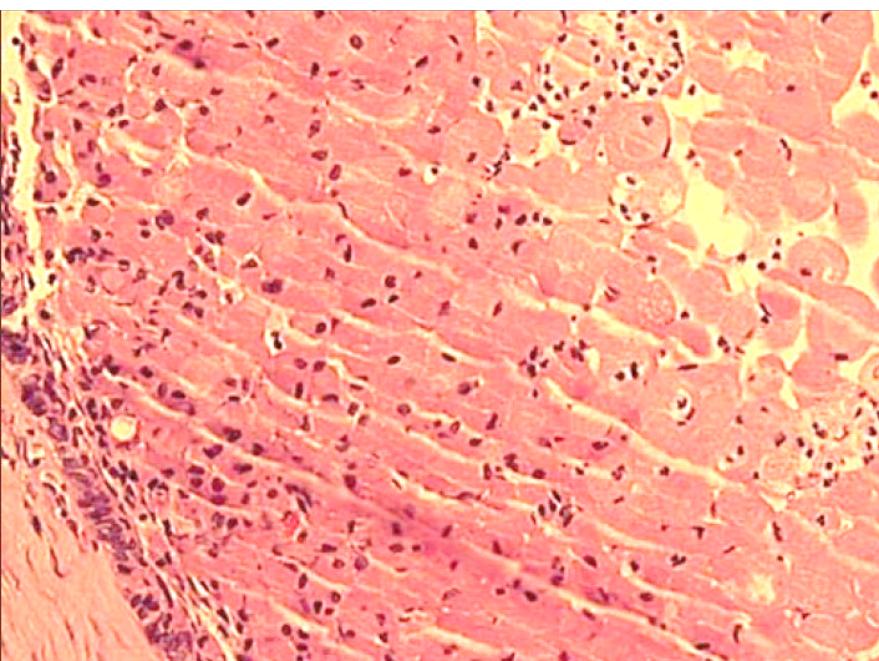
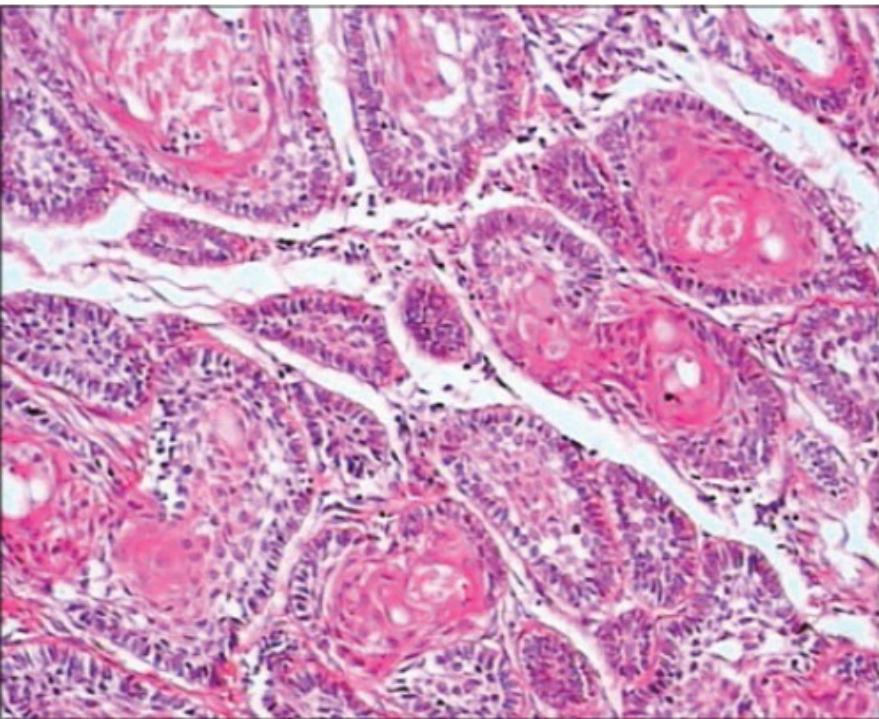
- Composed of epithelia that proliferate in a "fishnet" or mesh arrangement..



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

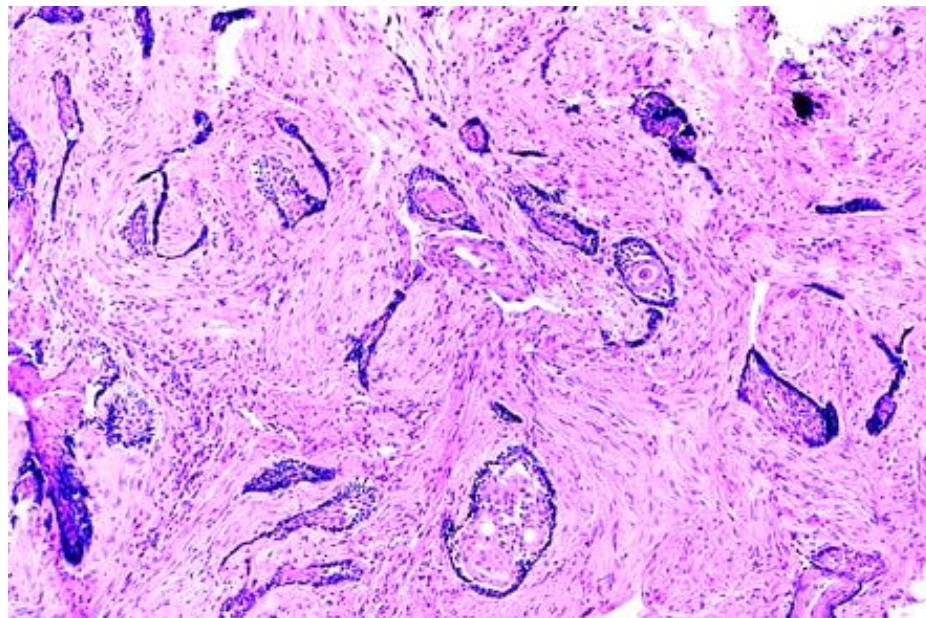
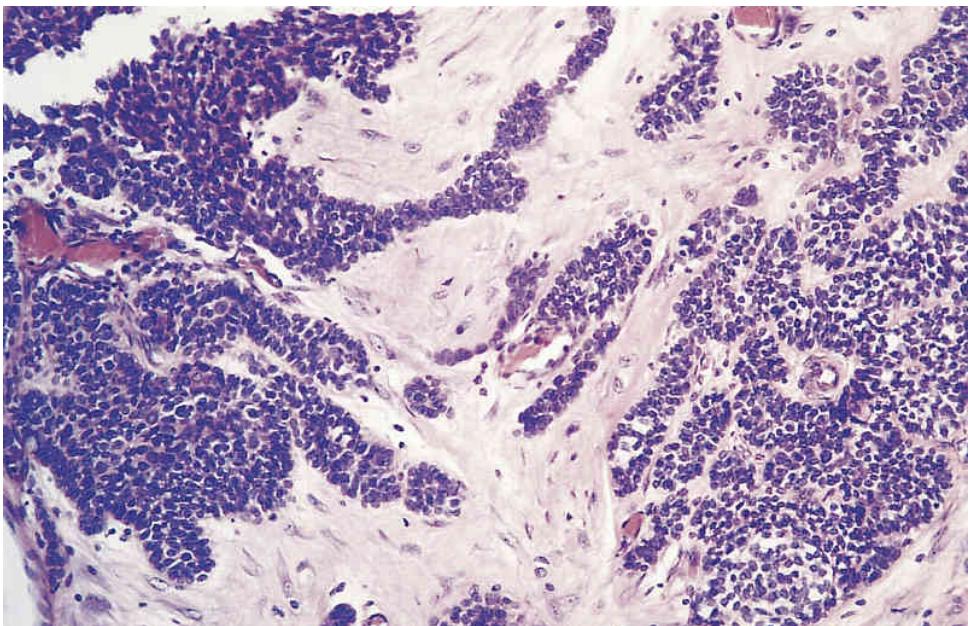
- Large& small cyst-like areas are present that are not necessarily caused by the degeneration of epith. but are the result of strangulation & degeneration of C.T stroma by the proliferating epithelia.





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.

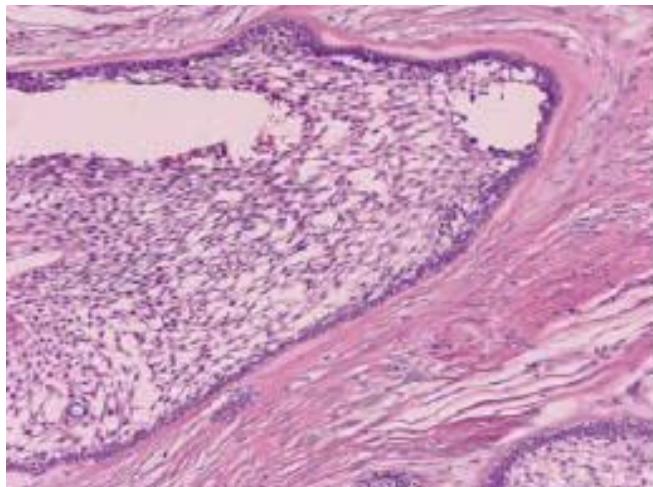
Unicystic Ameloblastoma:

- **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:

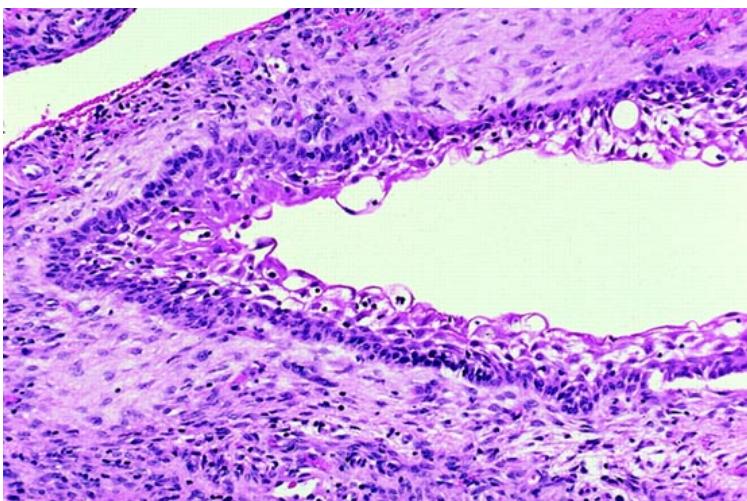
- **It appears as a unilocular radiolucency**
- **with well-demarcation & even corticated.**

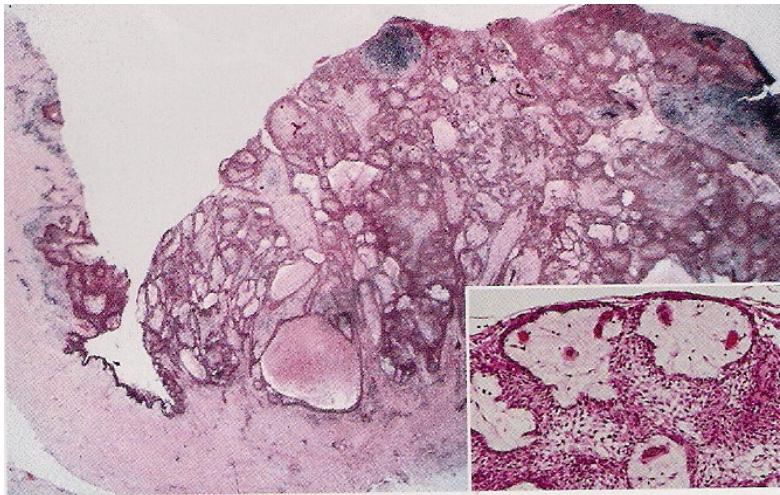


Histologically:
Three histological variants:

1. Luminal Unicystic Ameloblastoma
Uniformly thickened fibrous C.T capsule surrounding a solitary large fluid-filled lumen.

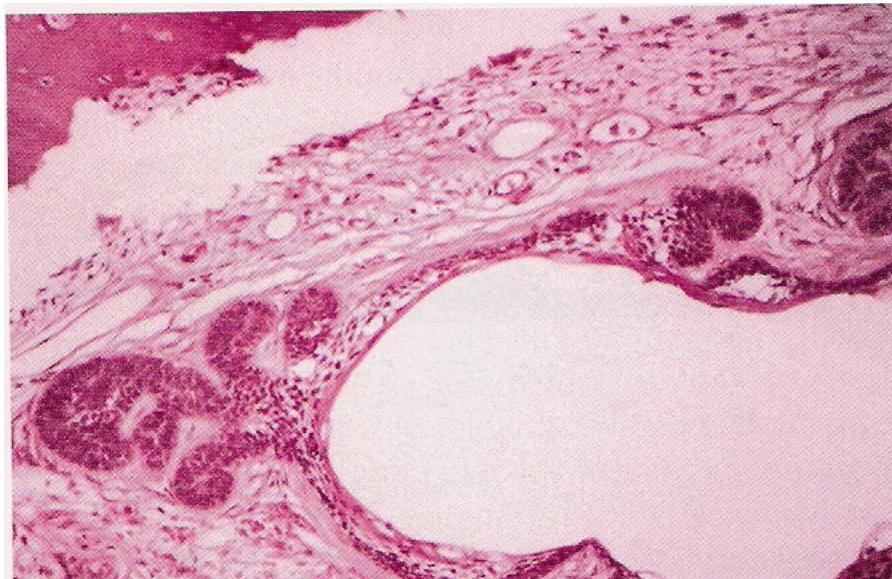
➤ **Epithelial lining is of a uniform thickness of palisaded columnar or cuboidal basal cell layers with hyperchromatic nuclei & reverse polarity with cytoplasmic vacuolization.**





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:

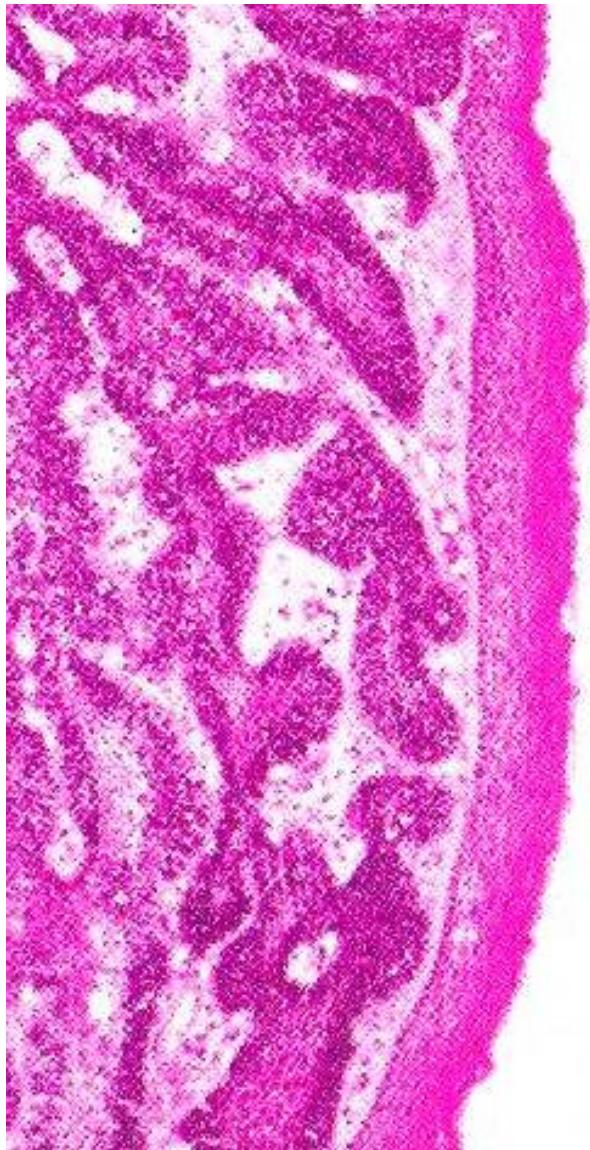


- Uncommon (1%), histologically resemble intraosseous common ameloblastoma, but is limited to the soft tissue of the posterior gingiva.
- It is easy to diagnose when the lesion exhibits the classic histological patterns of the intraosseous common ameloblastoma & has a history of continuous growth.



Clinically:

- Painless, firm, sessile or pedunculated nodule of the gingiva with smooth surface & normal cortication.
- Resemble Pyogenic granuloma or fibroma



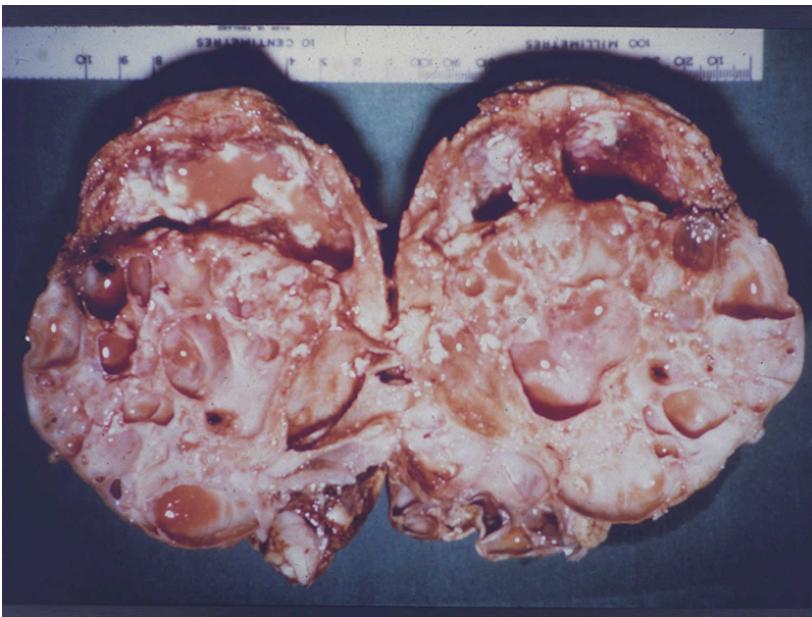
Radiographically:

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.**

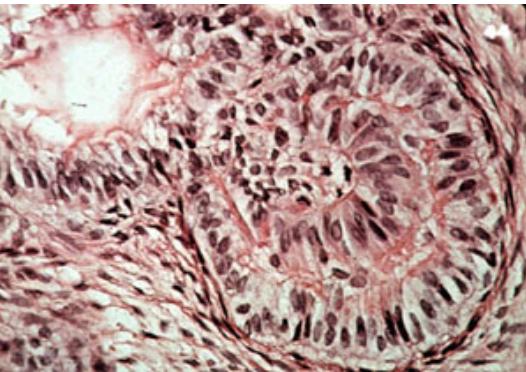
Treatment of Ameloblastoma: Local excision to Block resection





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.**



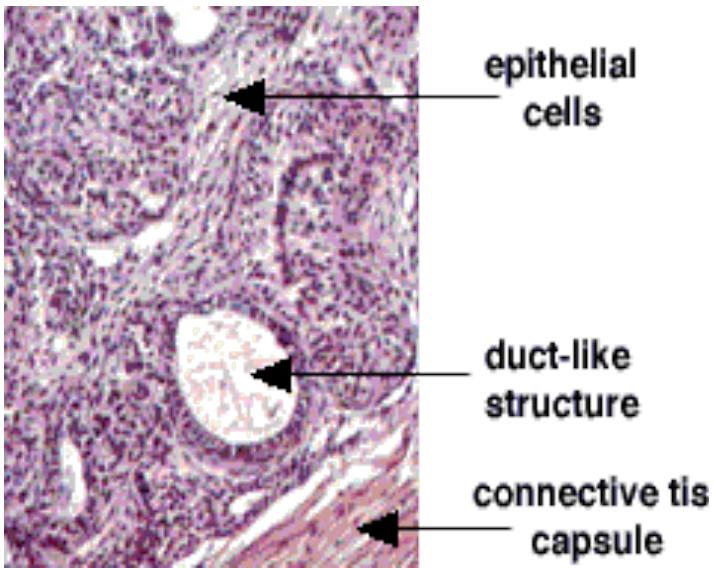
Clinically:

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



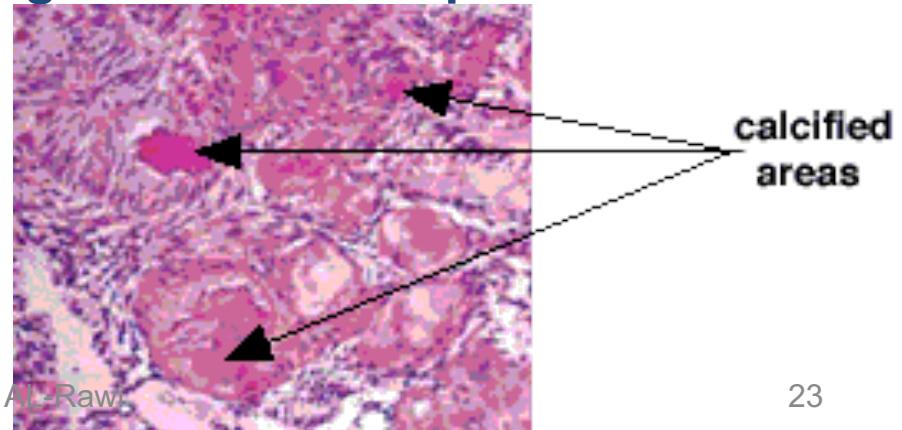
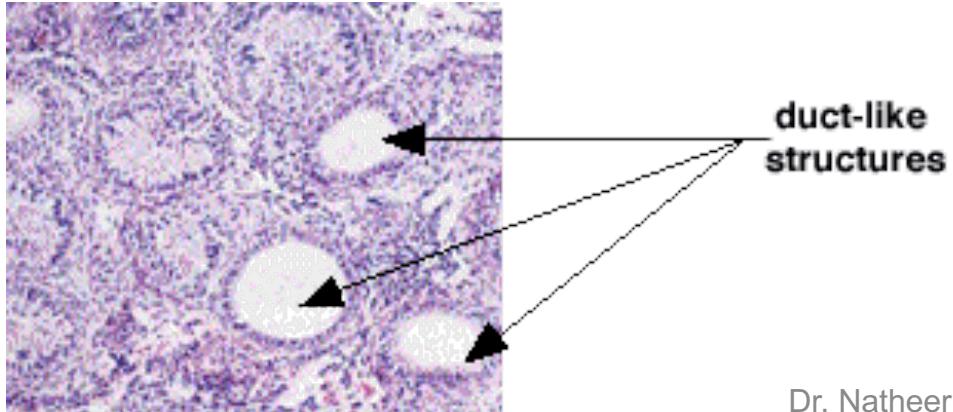
Radiographically:

- **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:

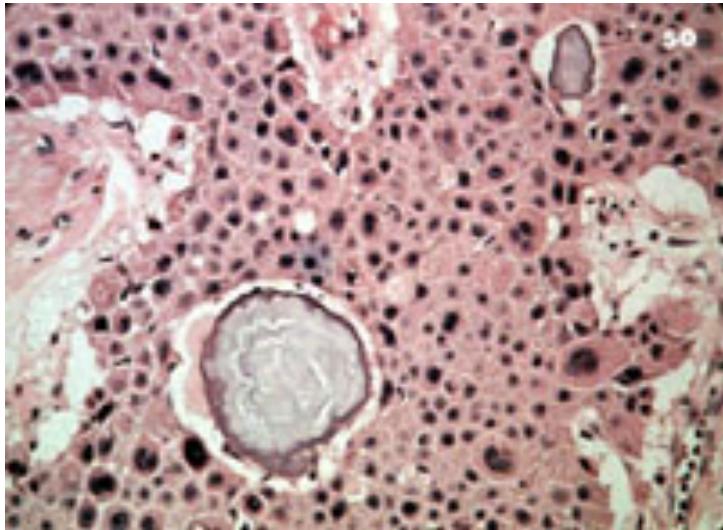
- The lesion is biologically non aggressive & requires conservative treatment.
- Its recognition & differentiation from other epithelial odontogenic lesions particularly ameloblastoma is of utmost importance. Why?
- Enucleation is treatment of choice with no tendency for recurrence.



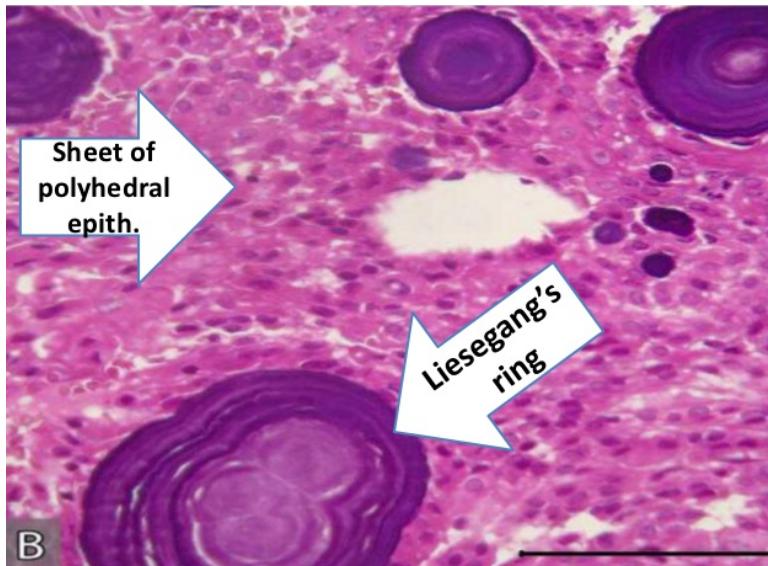
III. CALCIFYING EPITHELIAL ODONTOGENIC TUMOR (PINDBORG TUMOR) CEOT:

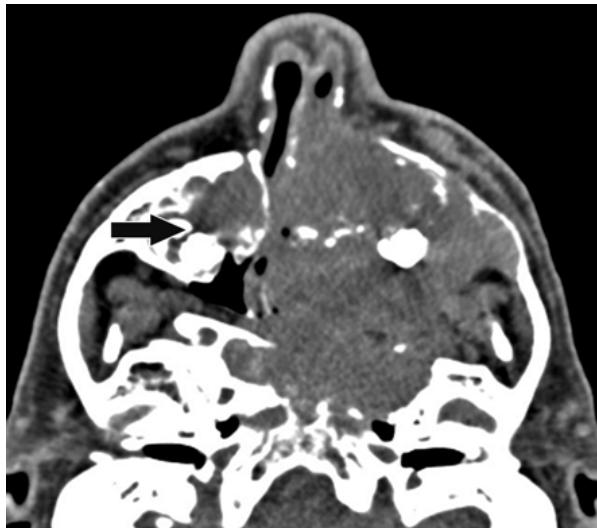
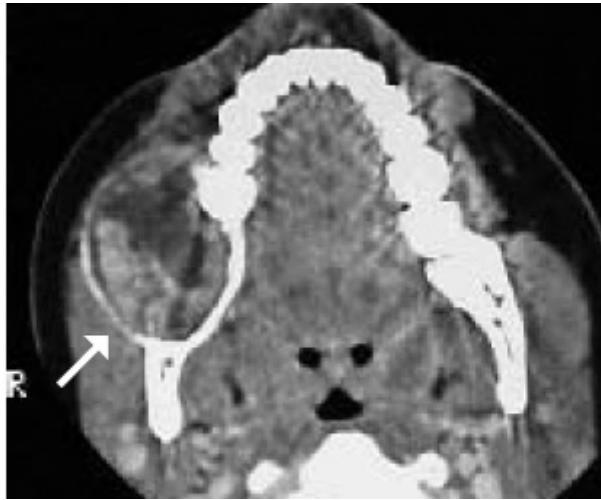
- CEOT is locally aggressive tumor consisting of strands of squamous & clear cells that are often accompanied by spherical calcification & amyloid staining hyaline deposits.
- It is important because it could be mistaken for a poorly differentiated carcinoma.

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.**

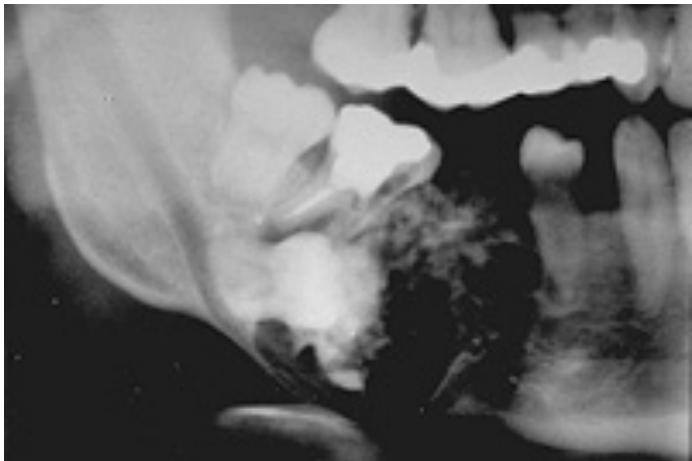
Radiographically:

- 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

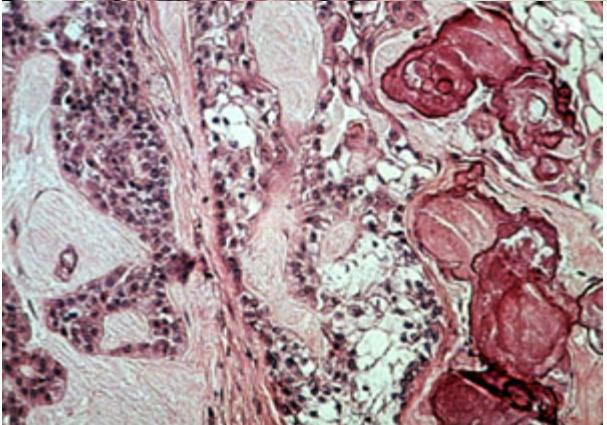
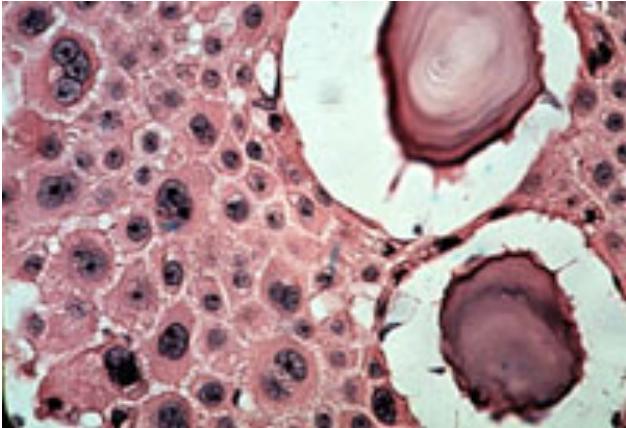
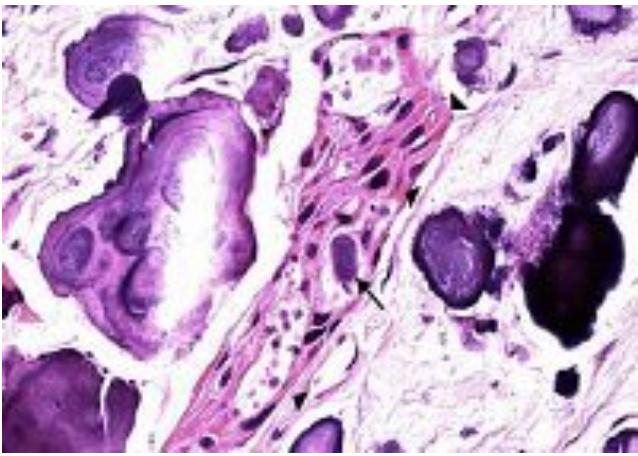
Differential Diagnosis:

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



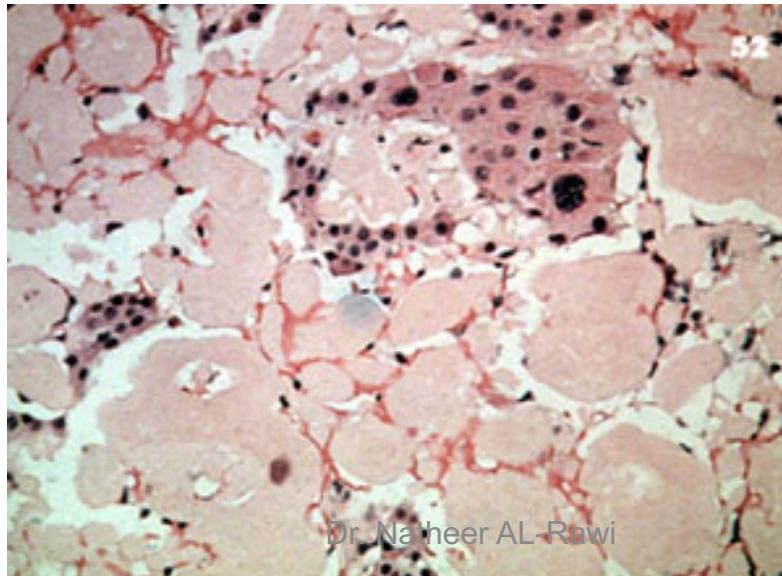
Histologically:

- 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.



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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...

