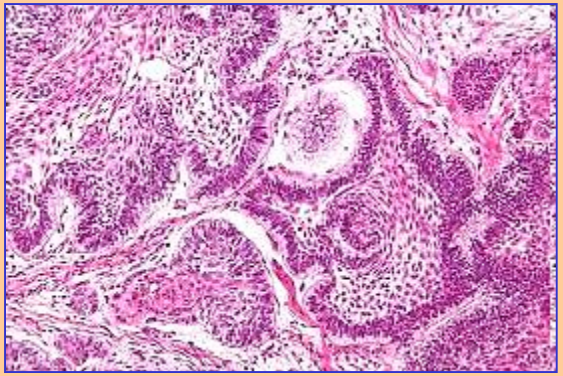
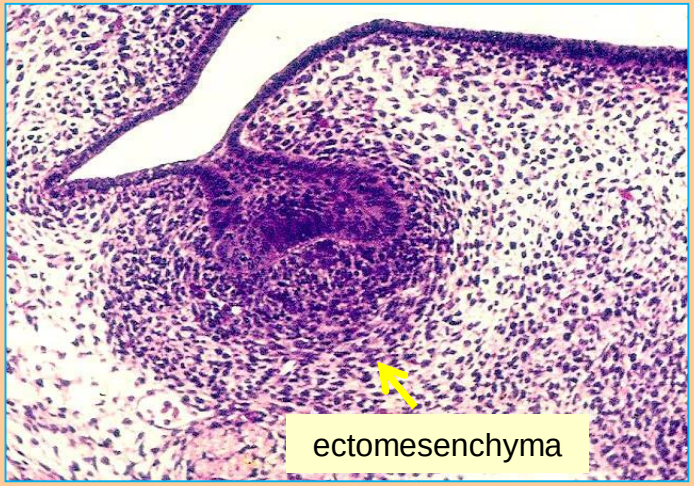
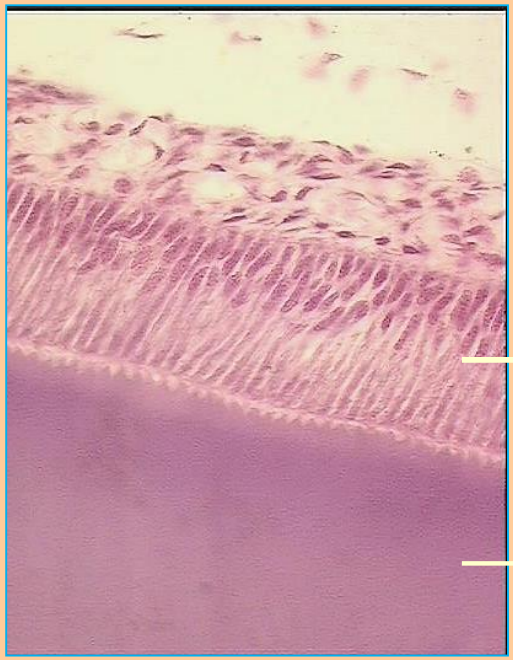
Odontogenic tumors

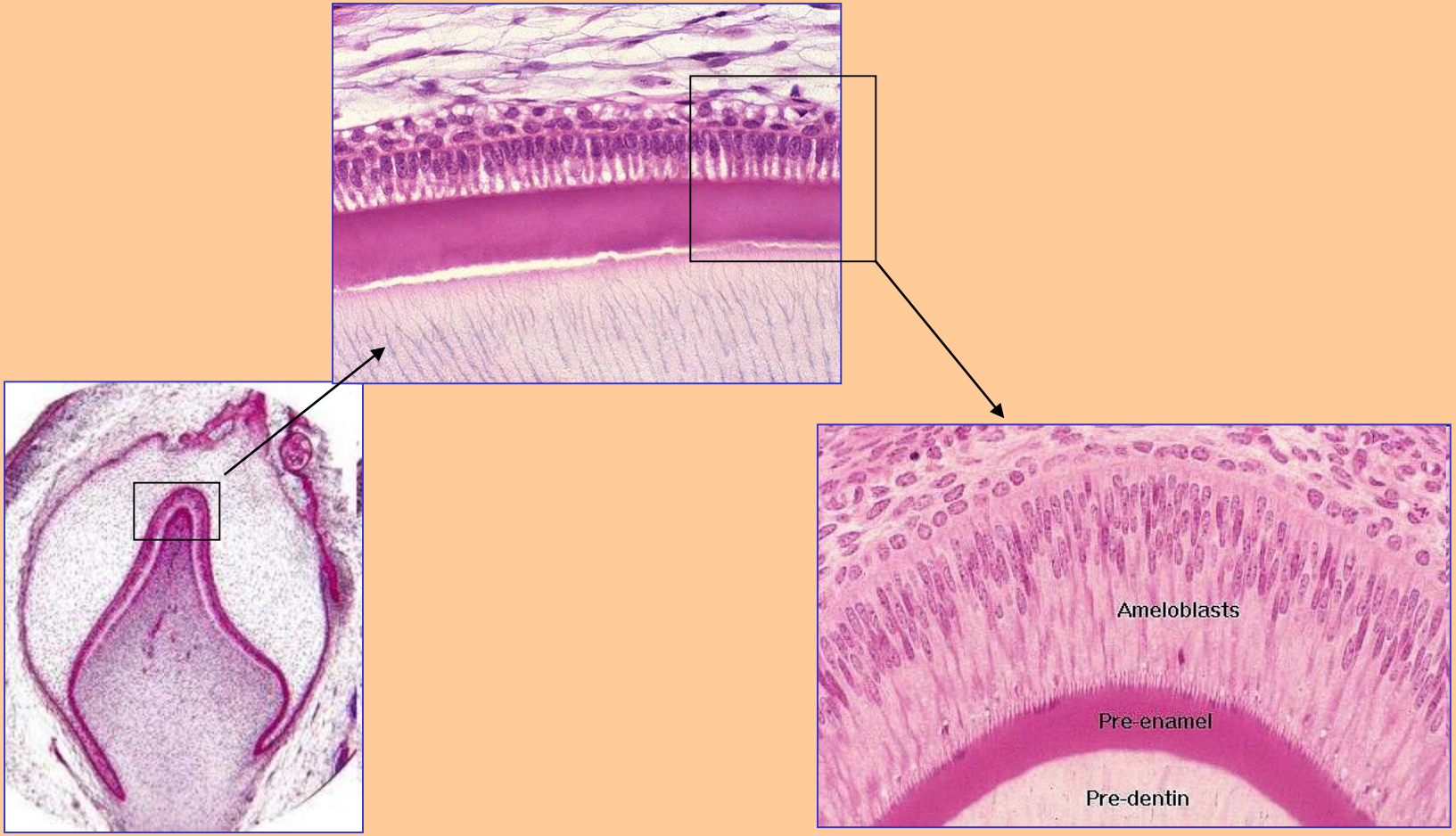


Dr. Attila Zalatnai


ectomesenchyma

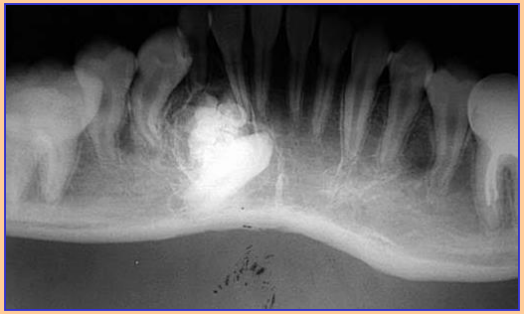

ameloblasts
enamel

Development of tooth



ODONTOMES

Non neoplastic, developmental (hamartomatous) lesions, containing enamel and dentin



1. Invaginated tooth (dens invaginatus, dens in dente)

In the early tooth development stage the enamel organ is invaginated toward the root

↓

risk of pulpitis

2. Evaginated tooth

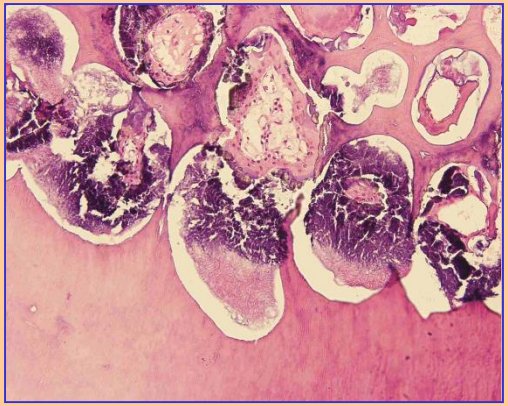
Elevated, cusp-like tubercle from the occlusal surface of premolars, covered with enamel

3. Enameloma (enamel pearl)

Small droplet of enamel on the root of tooth

Symptomless; incidental finding

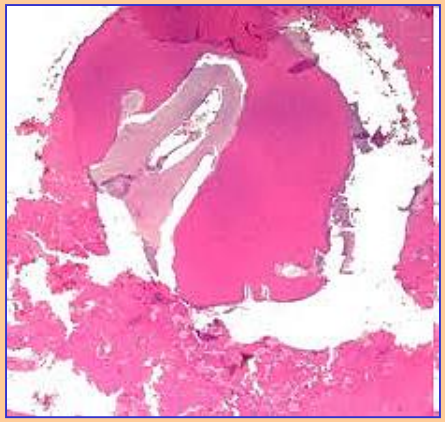
4. Complex odontome (dental hamartoma)



- tumor-like lesion, with disorderly arranged dental tissues
- 20-30 years of age, molar region of mandible
- slowly growing, painless
- usually incidental finding
- sometimes radially positioned structures
- enamel, dentine, cementum with irregular arrangement

  \+ varying amount of odontogenic epithelium, or mesenchyme

5. Compound odontome



- higher degree of differentiation
- numerous, tooth-like structures (denticles)
- „bag of marbles”
- first two decades of life
- especially in the anterior maxilla
- more limited growth potential
- may be associated with calcifying odontogenic cyst

BENIGN ODONTOGENICTUMORS (WHO)

Mainly in young adults; slowly growing; intraosseal

a./ Odontogenic epithelium with mature, fibrous stroma without odontogenic ectomesenchyme

b./ Odontogenic epithelium with odontogenic ectomesenchyme, with or without hard tissue formation

c., Mesenchyme and/or odontogenic ectomesenchyme with or without epithelium

MALIGNANT TUMORS

a./ Odontogenic carcinomas

b./ Odontogenic sarcomas

Ben / mal = 100 : 1

classification

Malignant

Od . carcinoma & od. sarcoma

Benign

Odontogenic Epithelium

1-Ameloblastoma

2-Squamous Od. T.

3-Calcificying E. Od.T. {Pinborg T.}

4-Adenomatoid Od.T.

Odontogenic ectomesenchyme

Od fibroma

Od myxoma

Cementoma :

Cemento-ossifying fibroma

Periapical cemental dysplasia

Florid cemento-osseous dysplasia

Od.epith. With od. Ectomesenchyme with or without dental hard tissue

1-Ameloblastic fibroma

A. fibro-odontoma

A. fibro-dentinoma

2-Complex & compound odontome

BENIGN TUMORS

Slow, expansive growth, mostly painless or slightly painful

Can be very large

BENIGN TUMORS 1.

a./ Odontogenic epithelium with mature, fibrous stroma without odontogenic ectomesenchyme

- Ameloblastoma, solid/multicystic type
- Ameloblastoma, extraosseous/peripheral type
- Ameloblastoma, desmoplastic type
- Ameloblastoma, unicystic type
- Squamous odontogenic tumor
- Calcifying epithelial odontogenic tumor
- Adenomatoid odontogenic tumor
- Keratocystic odontogenic tumor * (odontogenic keratocyst)

Ameloblastoma (in German literature: adamantinoma)

- In Caucasians: 10%-a of odontogenic tumors
  in blacks: 60%
- Benign but locally invasive
- Wide age range (mainly: 40-50 ys)
- 80% in mandible (intact cortical)
- Slowly growing, early cases are incidental findings
- In maxilla: may extend into the sinuses
- Loosening of the teeth

X-ray: multicystic radiolucency, soap-bubble-like
around the roots: variable resorption
around the wisdom tooth: may simulate follicular cyst

Location: central (intraosseal); peripheral

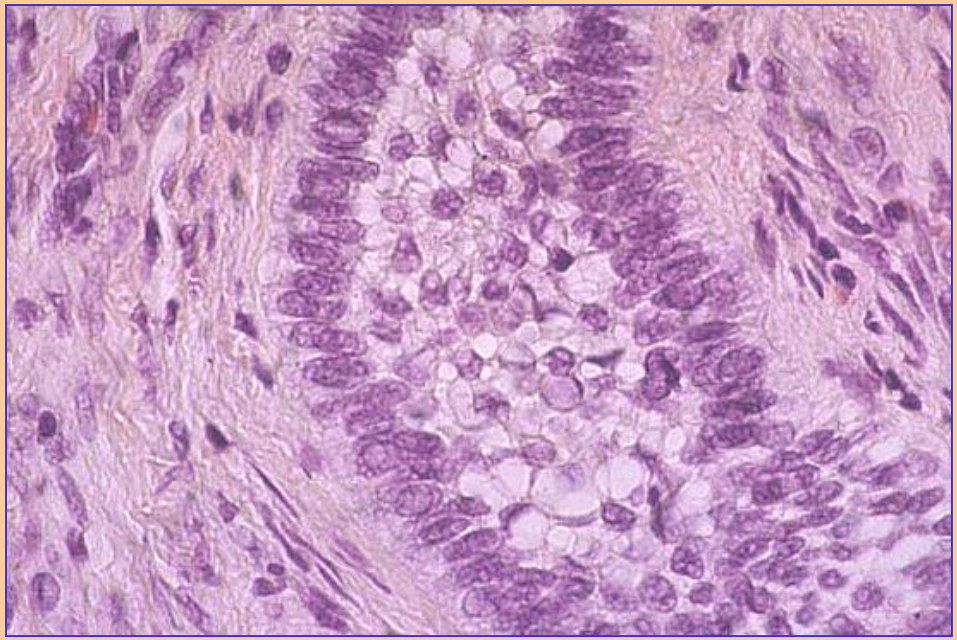
Ddg.: odontogenic cyst

Ameloblastoma

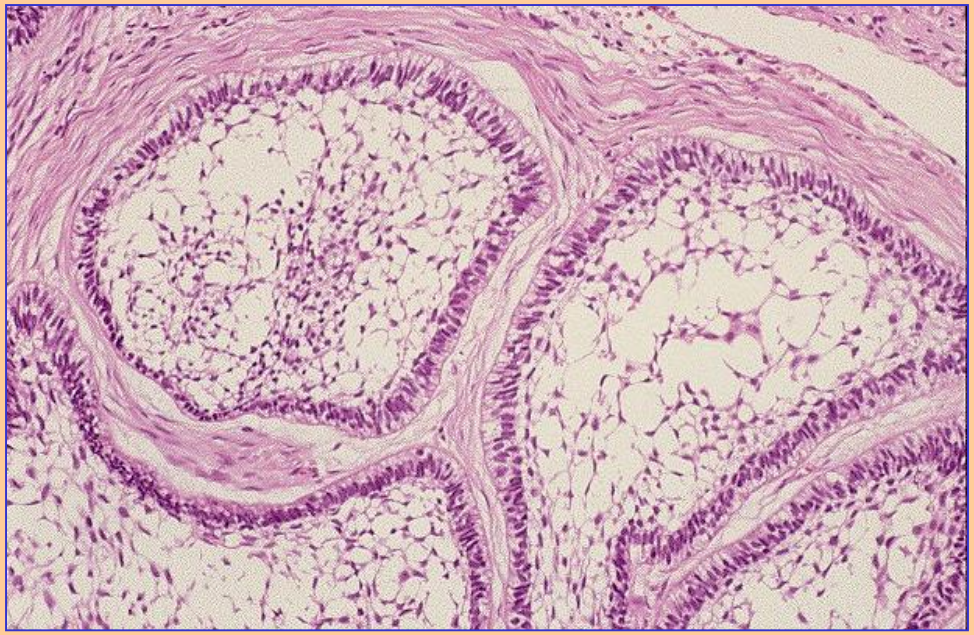
Histology: variable

2 major patterm: follicular

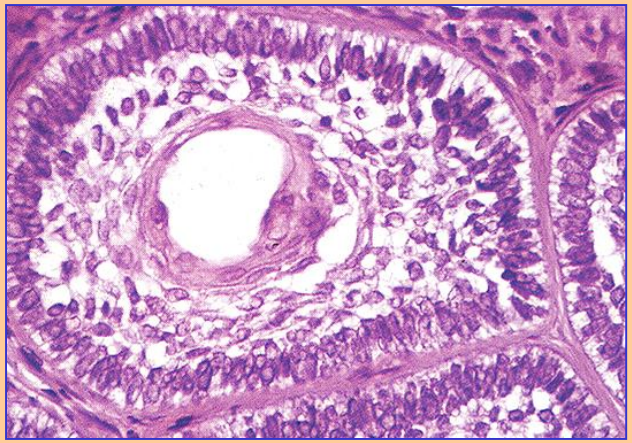
plexiform

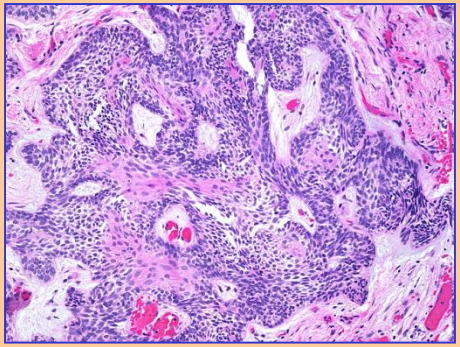


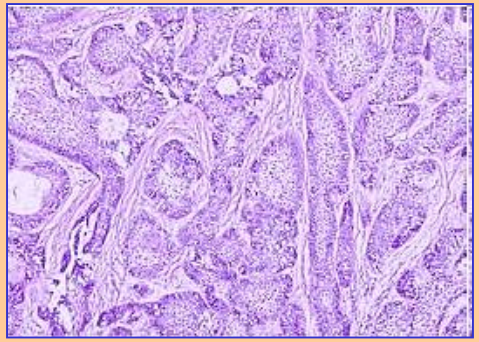
Follicular ameloblastoma



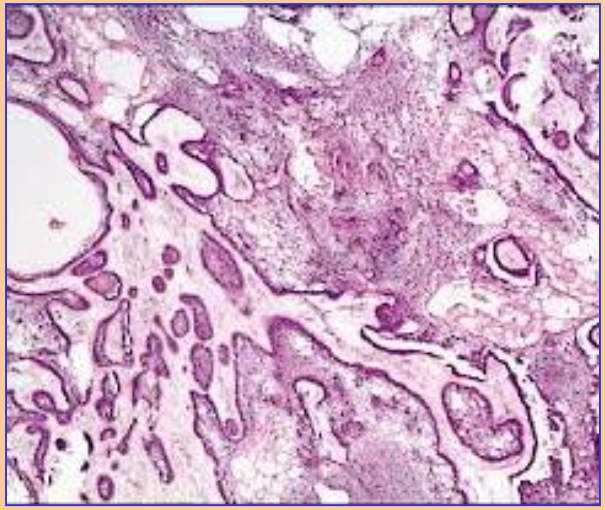
- mature, fibrousus (nontumorous) stroma
- roundish islands resembling the developing teeth
- centrally: loose, stellate cells
- periphery: ameloblastic cells
- variants: microcystic, squamous metaplasia, granular cells, basaloid
- nuclei: reverse polarity!



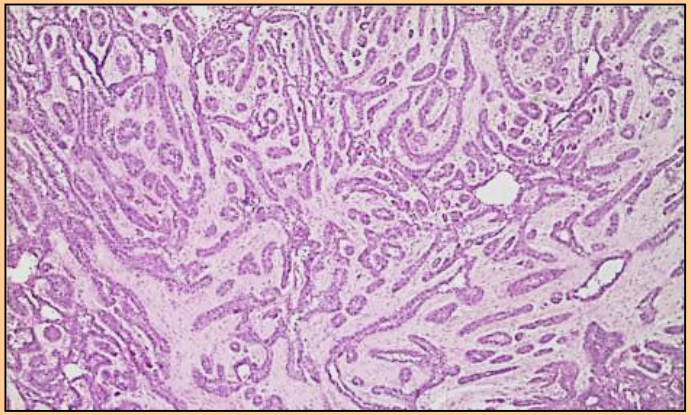




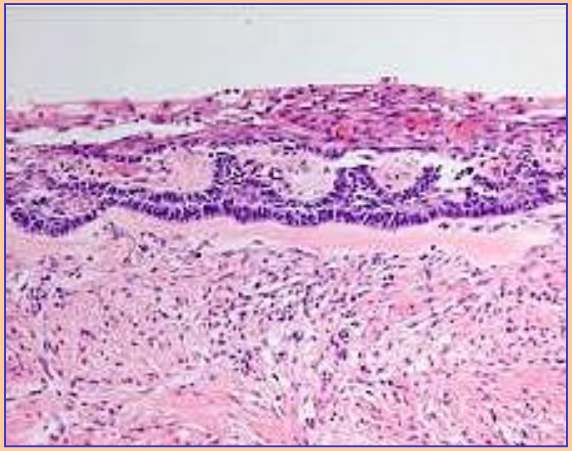
Plexiform ameloblastoma



- anastomozing strands
- degenerative signs: cystic degeneration



Unicystic ameloblastoma



- 5-10 % of all ameloblastomas
- younger age (20 – 30 ys)
- ddg.: dentigerous cyst

Peripheral (extraosseal) ameloblastoma

- gingival tumor (bone is not involved!)
- less invasive
- mainly basaloid cells

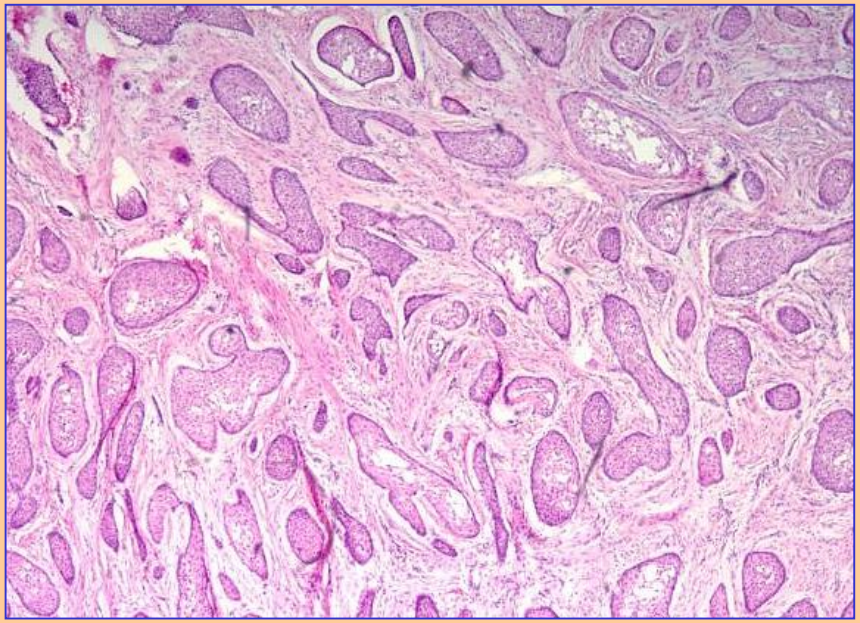
Behavior of the ameloblastomas

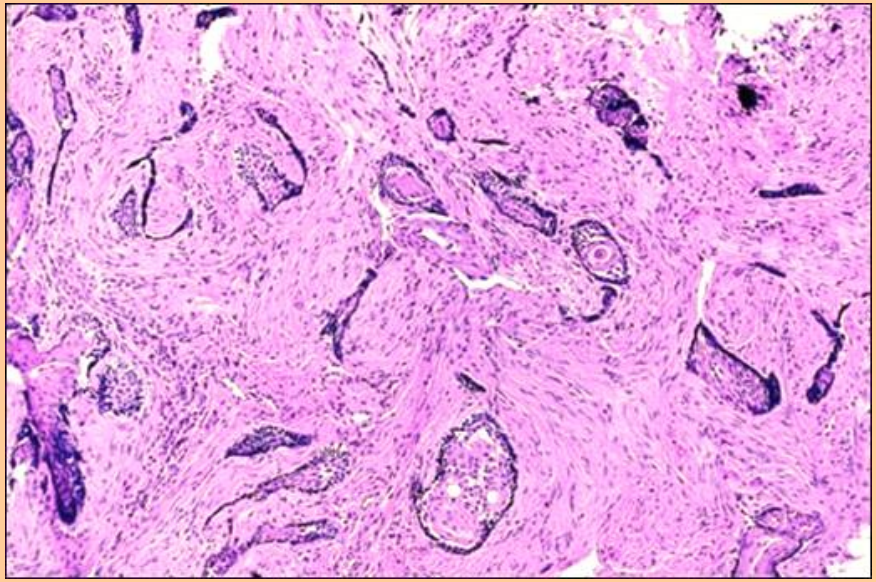
May persist for decades

Expansive ➔ invasive

Recurrence rate: 30 – 100 % (frequently late)

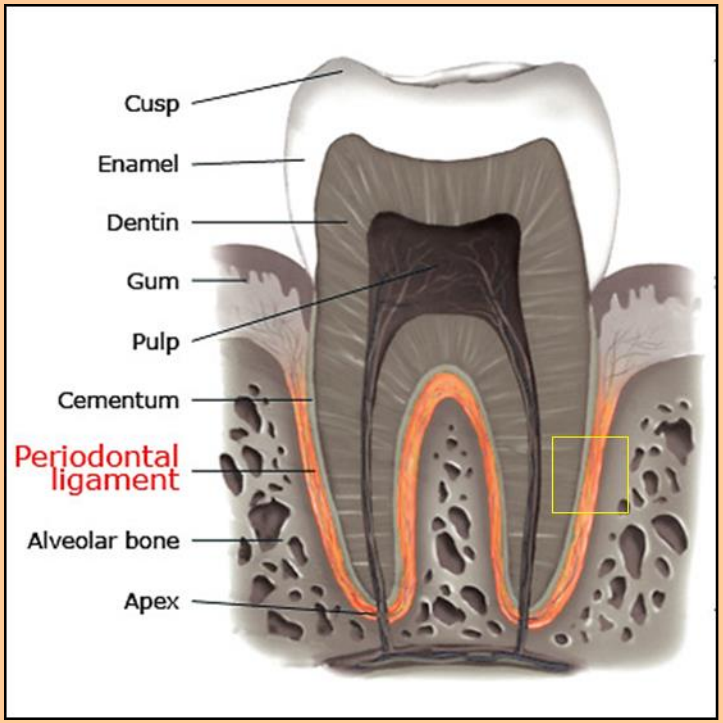
Squamousus odontogenic tumor

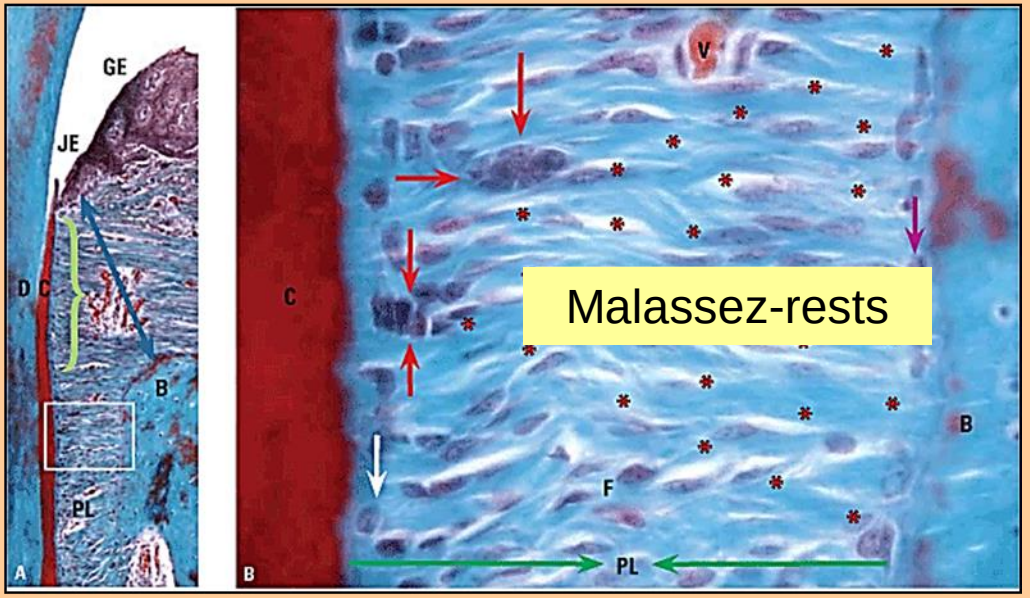




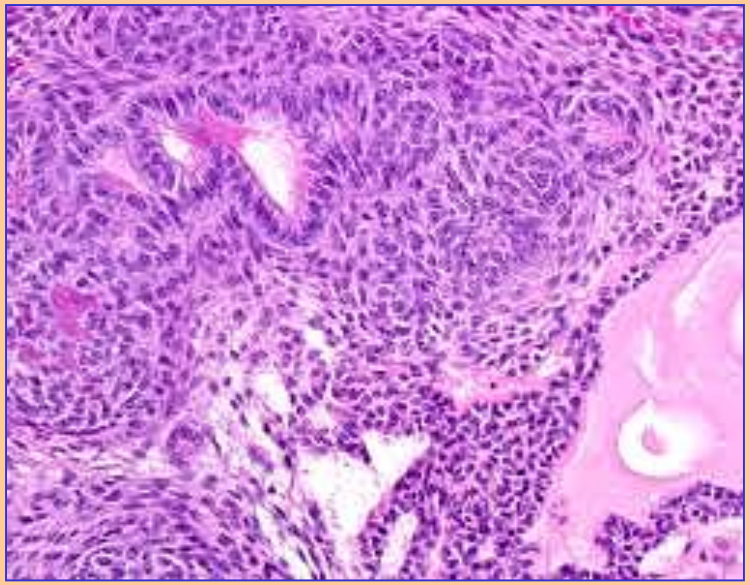
- x-ray: sharply circumscribed, radiolucent, sclerotic borderl
- near the root
- irregular squamous islands in fibrousus stroma
- most probably arises from the Malassez-restsl

Ddg.:
Desmoplastic ameloblastoma


Cusp
Enamel
Dentin
Gum
Pulp
Cementum
Periodontal ligament
Alveolar bone
Apex


GE
JE
D
C
B
PL
A
V
C
B
F
PL
B
Malassez-rests

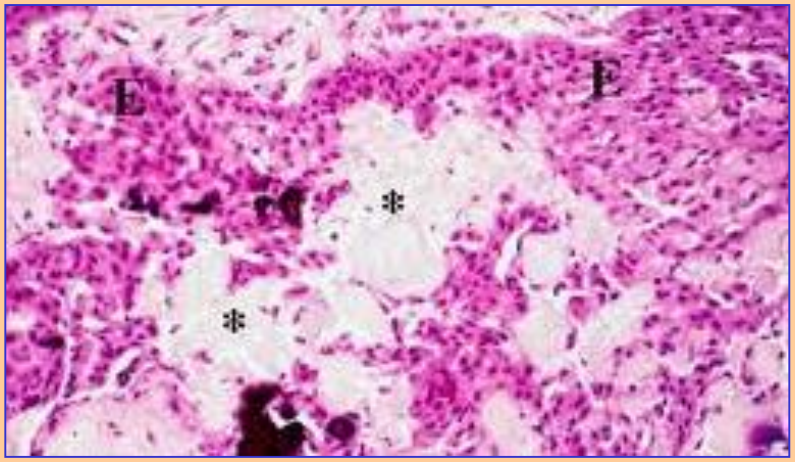
Adenomatoid odontogenic tumor

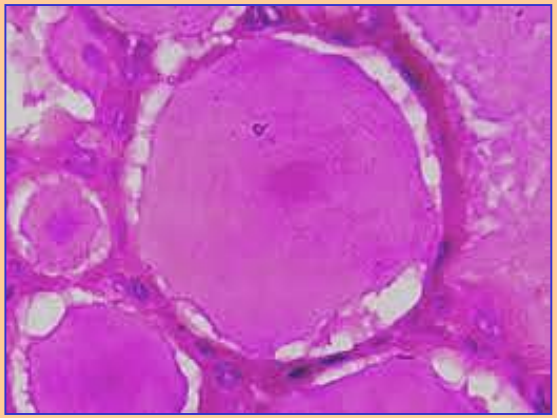


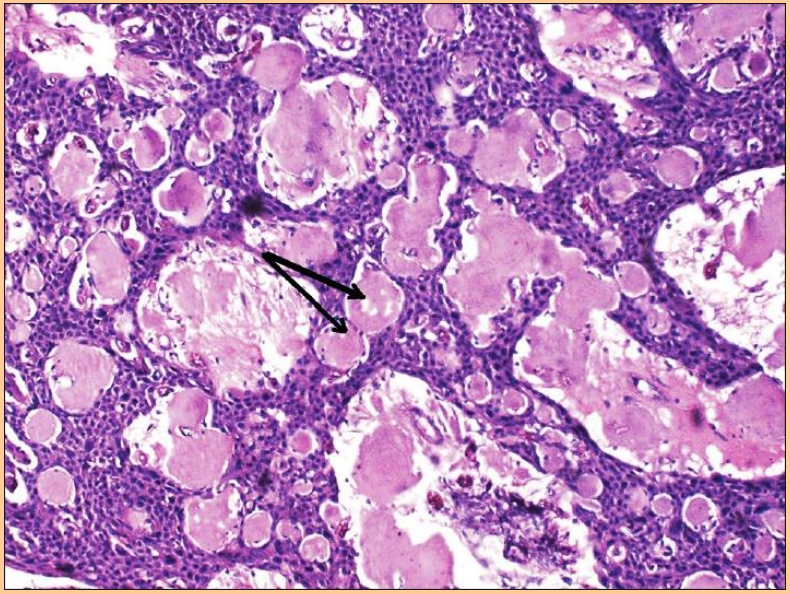
- young age (20-30 ys)
- mainly anterior maxilla
- slowly growing swelling
- X-ray: well circumscribed, radiolucent
- may be associated with unerupted tooth

- well circumscribed solid / partly cystic / cystic
- very scant stroma
- epithelium: ducts, tubules, resembling ameloblasts
- rarely calcification
- no recurrence

Calcifying epithelial odontogenic tumor (= Pindborg-tumor)







- mandible
- x-ray.: irregular
- irregular islands of squamous cells embedded into fibrous stroma
- significant polymorphism (does NOT indicate malignancy!)
- calcified globules
- sometimes amyloid
- less agressive than the ameloblastoma

Keratocysts

Odontogenic keratocyst

(WHO: keratocystic odontogenic tumor)

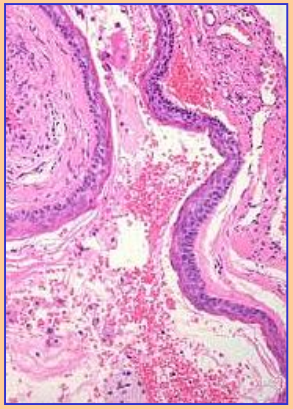
- frequently more agressive than other cystsl
- more frequent recurrance rate
- may be associated with nevoid basal cell cc syndr.l

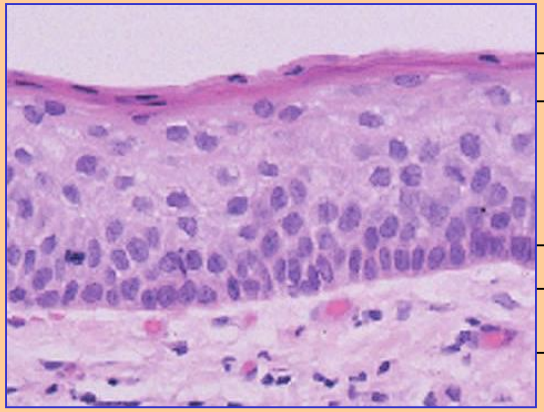
65-75% mandible (mainly molar)

Young adults

Unilateral, sclerotic rim

May be secondarily inflamed





Orthokeratinized odontogenic keratocyst

Teenagers, young adults

Male predominance (60-70%)

Mainly in the posterior part of mandible

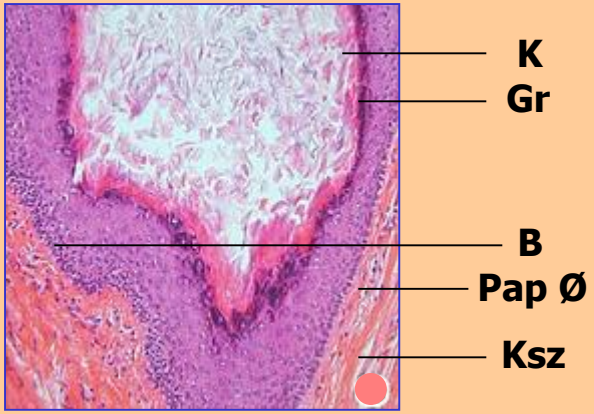
70% associated with impacted toothl

(ddg.: follicular cyst)

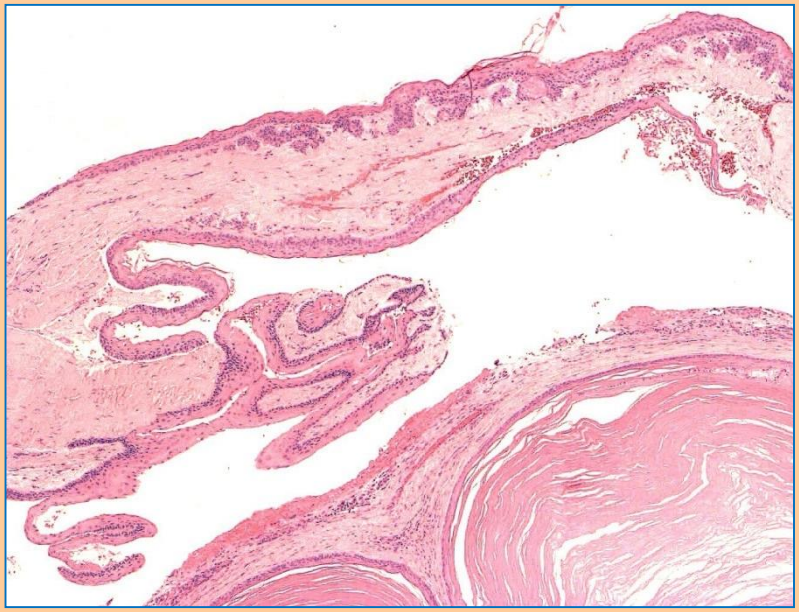
Usually unilocular

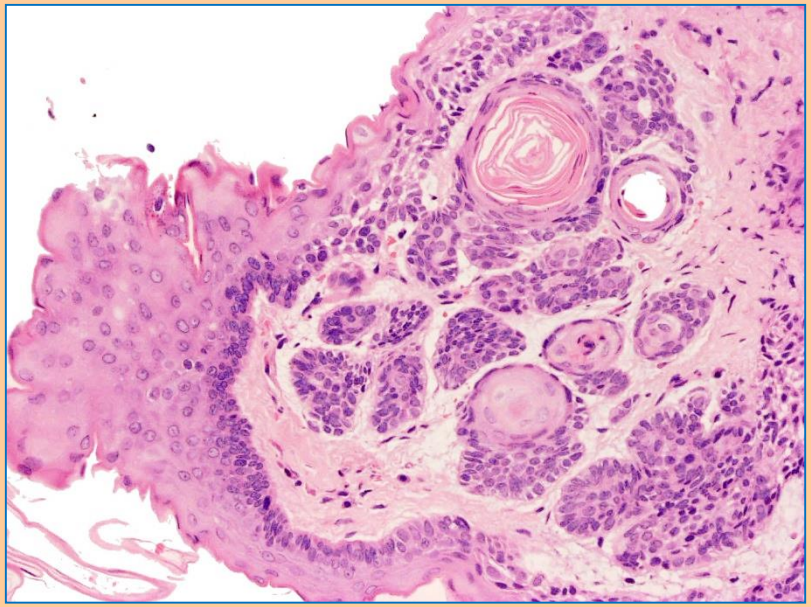
Rare recurrence rate (~ 3 %)

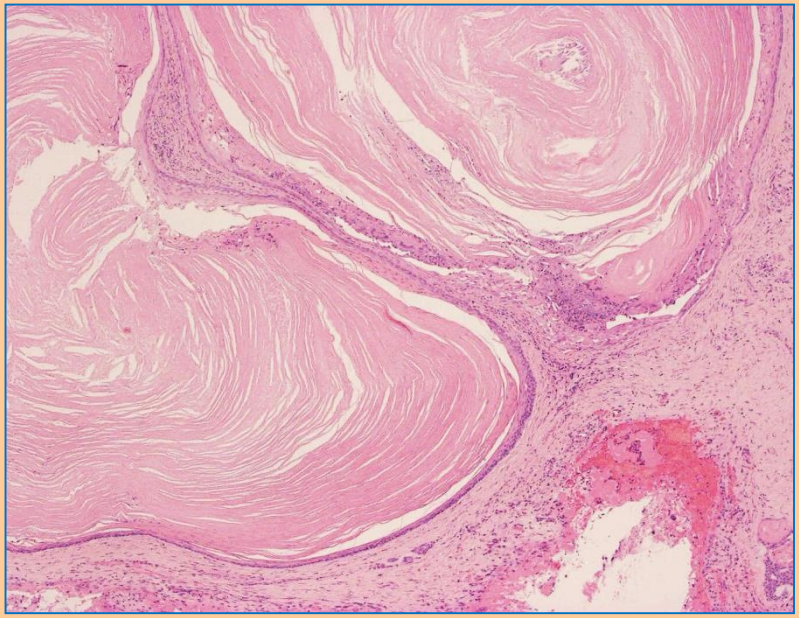
No association with Gorlin-syndromel

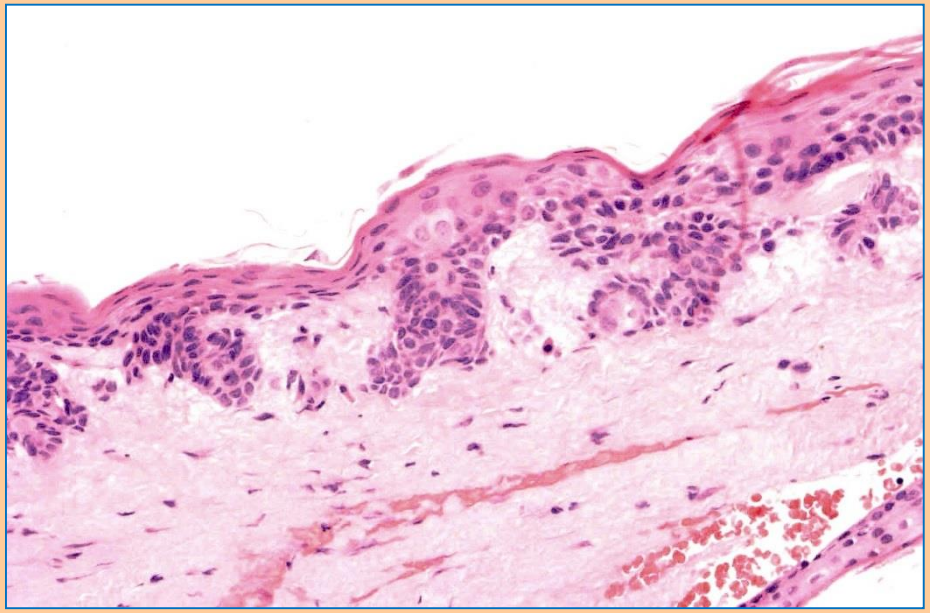


Keratocystic odontogenic tumor









BENIGN TUMORS 2.

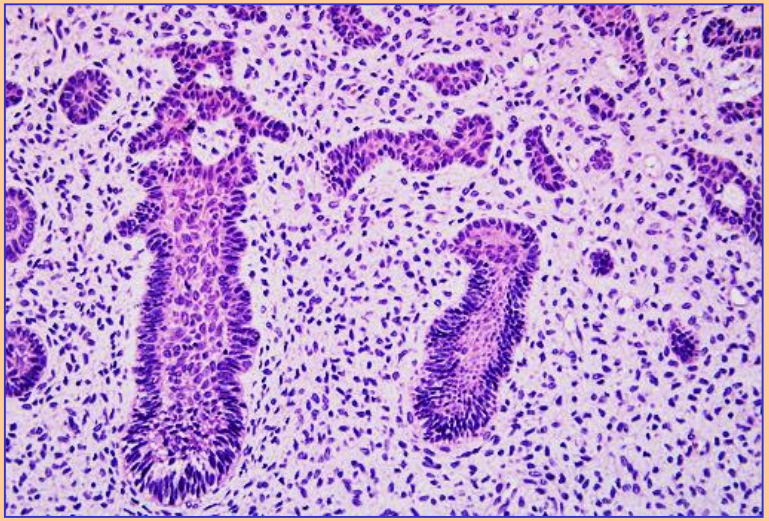
b./ Odontogenic epithelium with odontogenic ectomesenchyme, with or without hard tissue formation

- Ameloblastic fibroma
- Ameloblastic fibrodentinoma
- Ameloblastic fibro-odontoma
- Odontoma, complex and compound
- Odontoameloblastoma
- Calcifying cystic odontogenic tumor ** (Gorlin-cyst)
- Dentinogenic ghost cell tumor

Ameloblastic fibroma

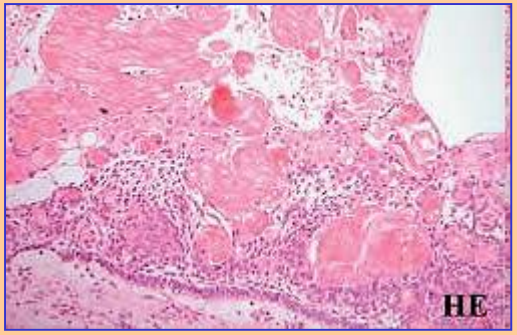
- uncommon over 20 years of age
- benign, but may recur
- hypercellular mesenchyme
- both the epithelial, and the mesenchymal elements are neoplastic

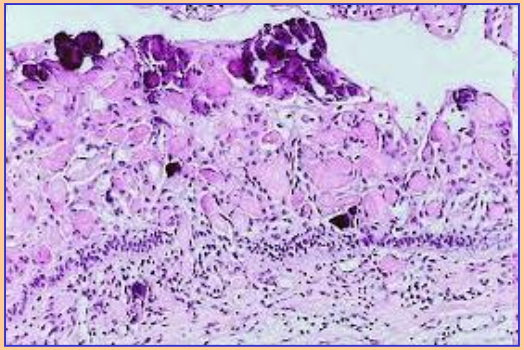
  (ddg..: ameloblastoma!)
- well circumscribed
- slowly growing swelling



Calcifiying cystic odontogenic tumor ** (Gorlin-cysta)
Dentinogenic ghost cell tumor

- rather hamartoma than real neoplasm
- more frequent under 40 years of age
- mandibular, maxillary involvement
- slowly growing, otherwise symptomless lesion
- x-ray: well circumscribed, unilocular of multilocular, radiolucent





- basally ameloblastic cells
- loose, stellate cell layer
- keratinized „ghost cells”
- tiny, calcified foci
- sometimes foreign body giant cells
- Dentinogenic ghost cell tumor: solid, irregular structure

BENIGN TUMORS 3.

c., Mesenchyme and/or odontogenic ectomesenchyme with or without epithelium

- Odontogenic fibroma
- Odontogenic myxoma / myxofibroma
- Cementoblastoma

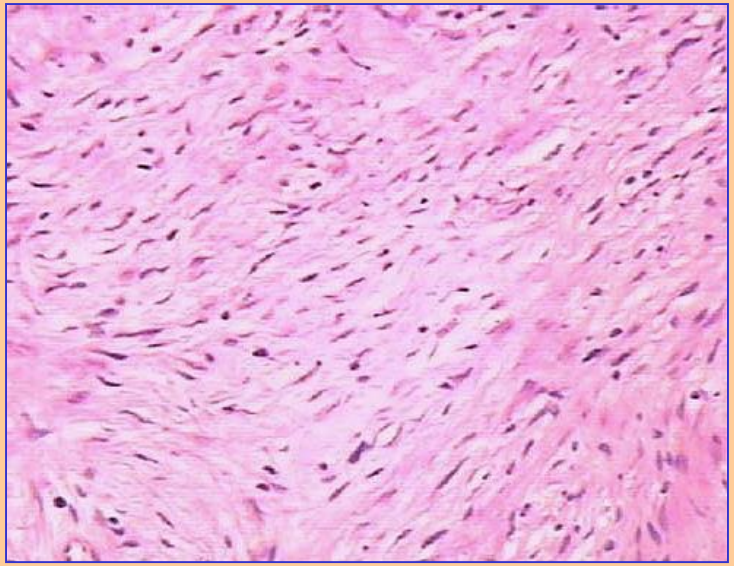
Bone related lesions

-Ossifying fibroma

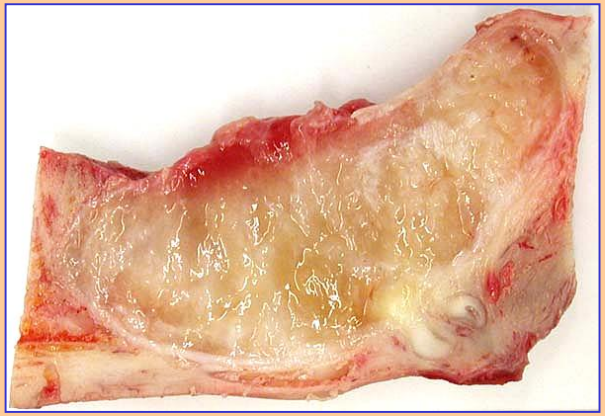
- Fibrous dysplasia
- Osseous dysplasia
- Central giant cell lesion (granuloma)
- Cherubism
- Aneurysmal bone cyst
- Simple bone cyst

Odontogenic fibroma

- arises from dental mesenchymal tissues (periodontal ligament, dental papilla…)
- well circumscribed
- easy to remove
- mature fibroblastic proliferation

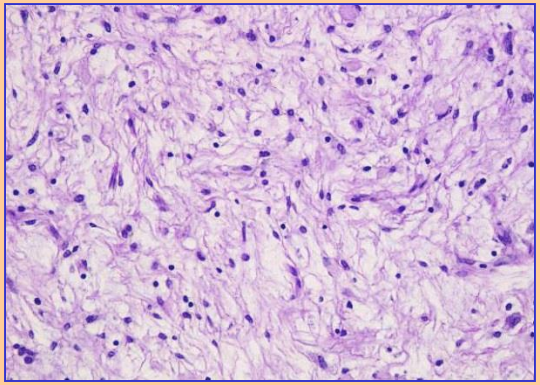


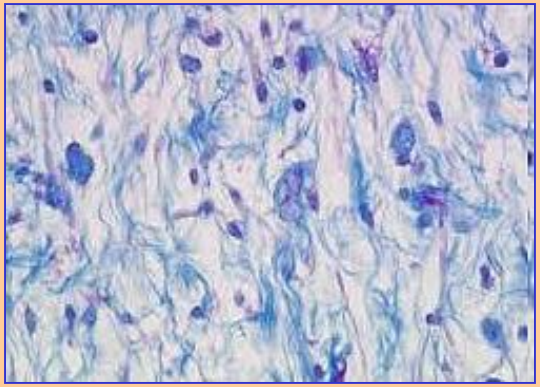
Odontogenic myxoma/myxofibroma



- benign, but localy invasive
- x-ray.: multilocular, radiolucent
- in the vicinity the root may be resorped
- well circumscribed, but no capsule
- large amount of connective tissue ground
- stellate cells (sometimes also remnants of odontogenic epithelium)

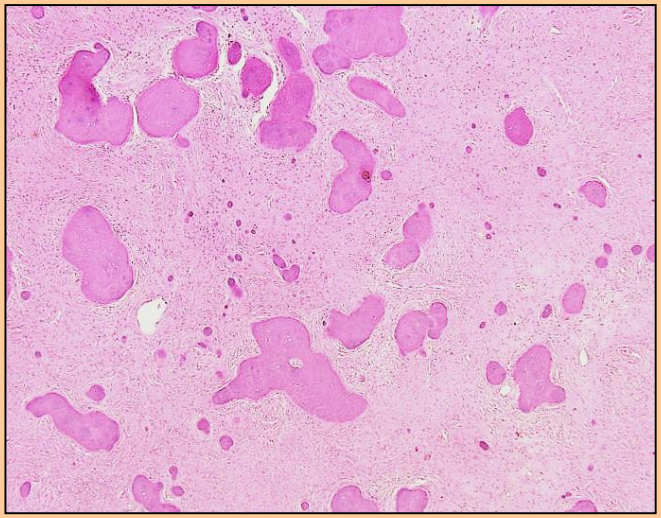
- abundant GAG substance
- variable amount of collagen
- recurrence rate: 10 – 30 %

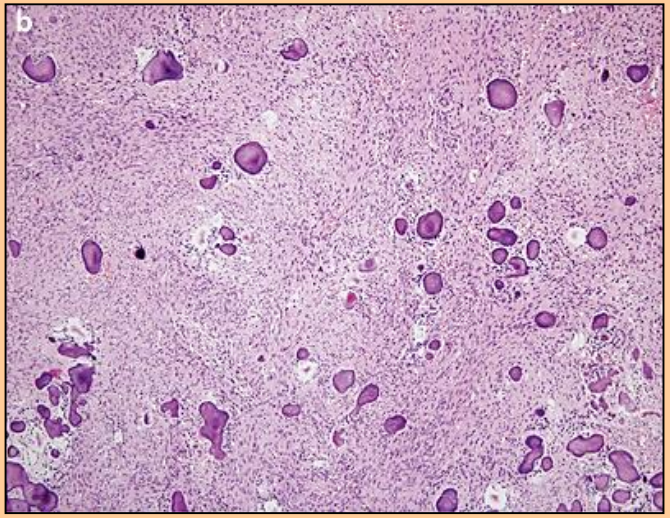




Ossifying / cementifying / fibroma

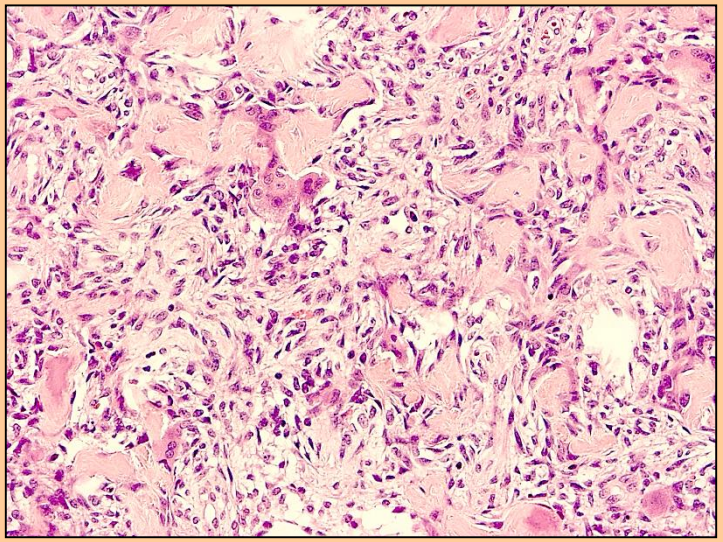
- Sharply circumscribed!
- Characteristic in women between 20-40 years of age
- Mainly the posterior third of mandible is involved

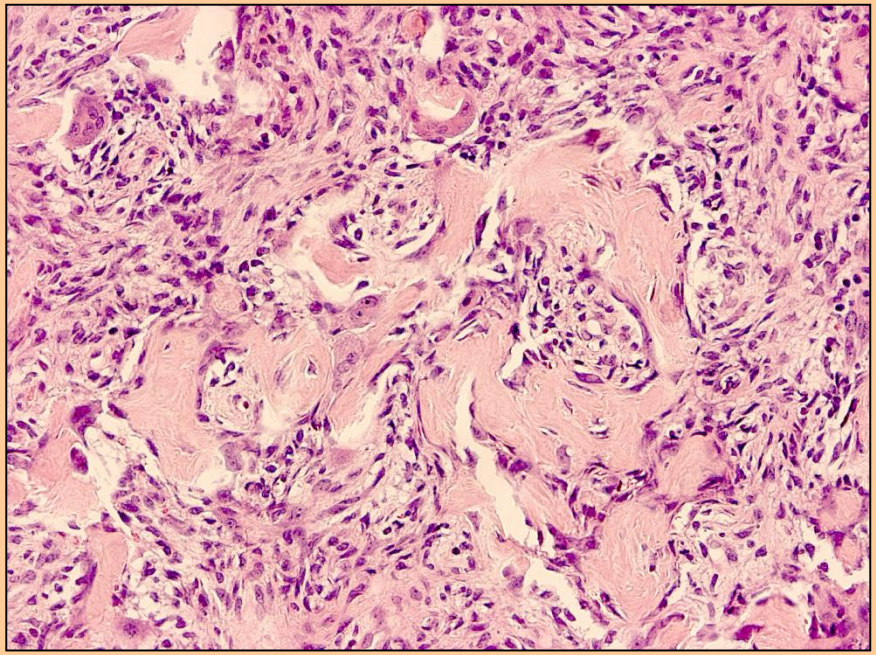




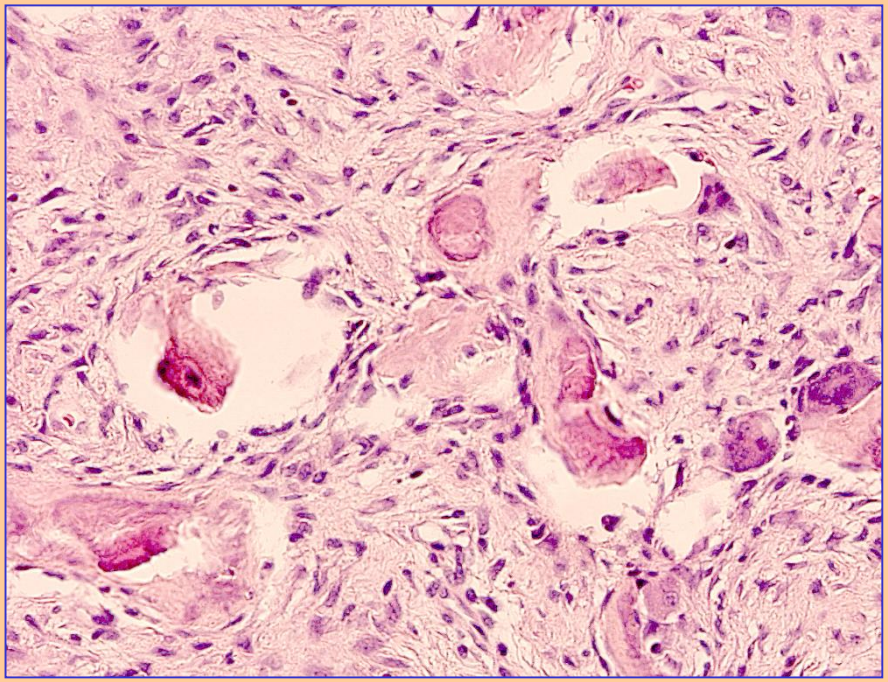
Variants: (1) juvenile trabecular OF; (2) juvenile psammomatuos OF

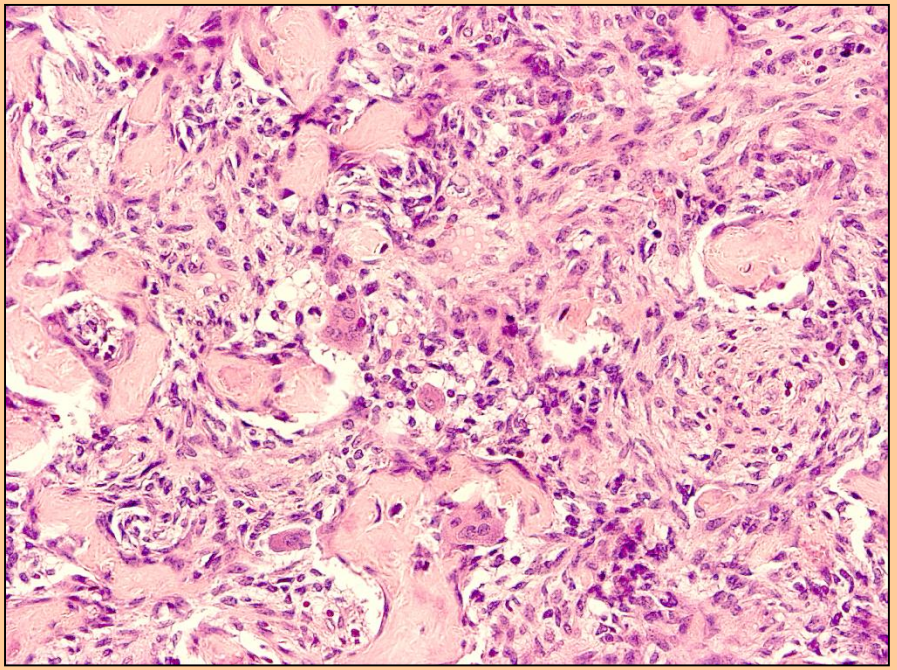
Juvenile (aggressive) ossifying fibroma

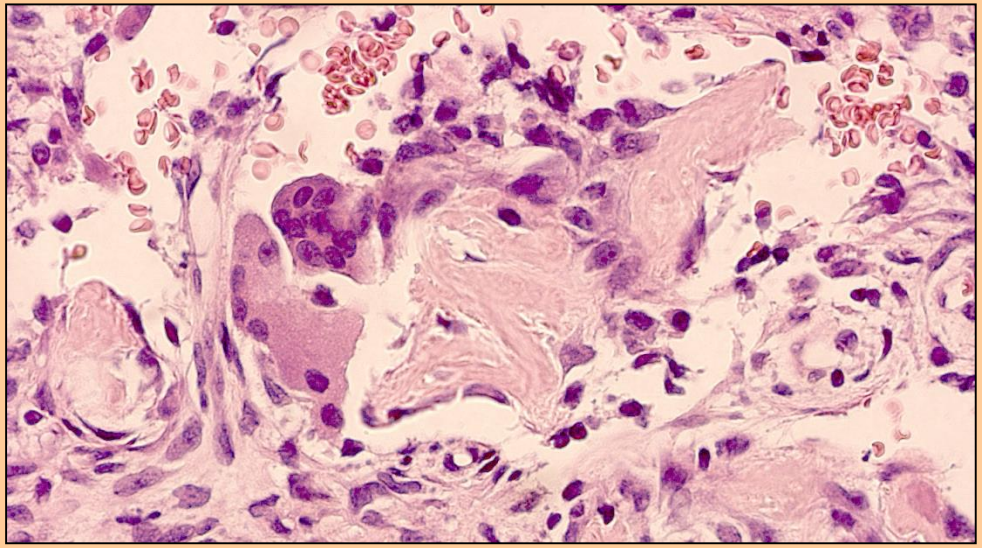




Juvenile (aggressive) ossifying fibroma







MALIGNANT TUMORS

1. **Odontogenic carcinomas**

- Metastasizing (malignant) ameloblastoma
- Ameloblastic carcinoma (primary and secondary type)
- Primary intraosseous squamous cell carcinoma (solid, derived from odontogenic cysts)
- Clear cell odontogenic carcinoma
- Ghost cell odontogenic carcinoma

2. **Odontogenic sarcoma**

- Ameloblastic fibrosarcoma
- Ameloblastic fibrodentino-and fibro-odontosarcoma

Ameloblastic carcinoma

Follicular or plexiform

Hypercellular; stellate-cell-stroma

Heavy mitotic activity

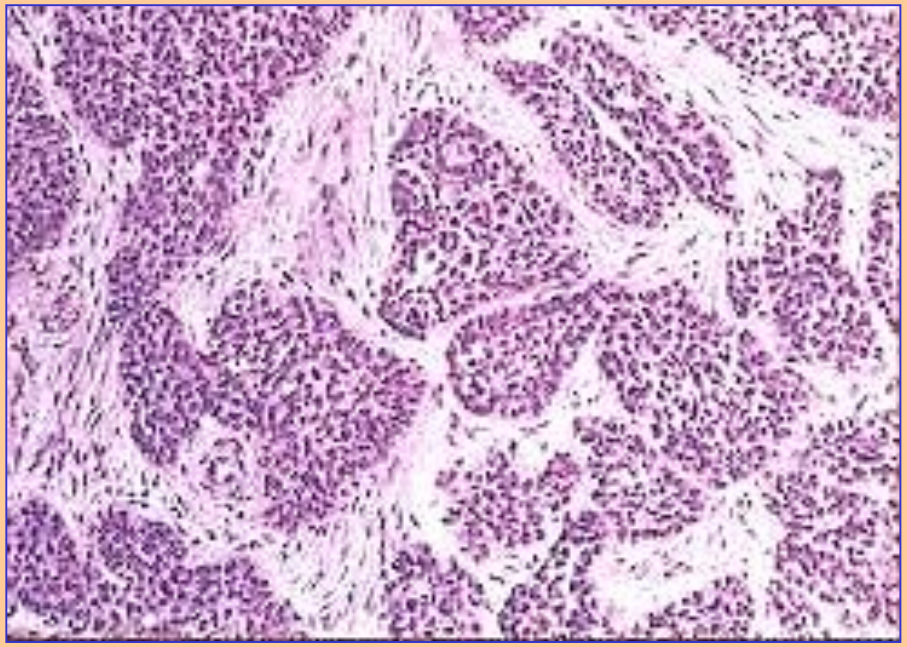
Variable polymorphism

Odontogenic sarcoma

Mostly fibrosarcoma

Counterpart of the ameloblastic fibroma

May contain non-neoplastic hard tissues



Intraosseal squamous cell carcinoma (mandible)