CYSTS OF THE ORAL CAVITY

DEPARTMENT OF ORAL AND MAXILLOFACIAL PATHOLOGY & ORAL MICROBIOLOGY

What is a cyst????

Kramer (1974) has defined a cyst as ‘a pathological cavity having fluid, semifluid or gaseous contents and which is not created by the accumulation of pus’.

Most cysts, but not all, are lined by epithelium.

Cysts of the Oral Cavity includes…..

A. Cysts of jaws

B. Cysts of maxillary antrum

C. Cysts of soft tissues (Oral and paraoral)

The cysts of the jaws, ***according to the presence or absence of epithelial lining*** are divided into

A. Epithelial lined cysts (true cysts) or
B. Non-epithelial lined cysts (pseudocysts)

The epithelial-lined cysts may be either of :

1. ***Developmental origin***
2. ***Inflammatory origin***

Cysts of developmental origin may be either:

(a) Odontogenic, meaning arising from odontogenic tissues
(b) Non-odontogenic, meaning cysts arising from ectoderm involved in the development of the facial tissues

A. CYSTS OF JAWS:

It can be divided into:

1. Odontogenic cysts:

    a. Developmental cysts
    b. Inflammatory cysts

2. Nonodontogenic cysts -Developmental cysts

3. Nonepithelial cysts - Pseudocysts

1. ODONTOGENIC CYSTS

a. Developmental cysts

1. Dentigerous cysts
2. Eruption cyst
3. Lateral periodontal cyst
4. Botryoid odontogenic cyst
5. Odontogenic keratocyst
6. Calcifying odontogenic cyst
7. Glandular odontogenic cyst
8. Gingival cyst of new born
9. Gingival cysts of adult

b. Inflammatory cysts

1. Radicular cyst
2. Residual cyst
3. Paradental cyst

2. NONODONTOGENIC CYSTS-DEVELOPMENTAL CYSTS:

1. Median anterior maxillary cyst (Naso palatine Duct cyst)
2. Median palatal cyst
3. Globulomaxillary cyst
4. Median mandibular cyst
5. Nasoalveolar cyst

3. NONEPITHELIAL CYSTS - PSEUDOCYSTS:

1. Solitary bone cyst
2. Aneurysmal bone cyst
3. Stefne bone cavity

B. CYSTS OF THE MAXILLARY ANTRUM:

1 Sinus Mucocele

2 Retention cyst

3 Pseudocyst

4 Postoperative maxillary cyst

C. CYSTS OF SOFT TISSUES (ORAL AND PARAORAL):

1. Dermoid cyst
2. Epidermoid cyst
3. Branchial cleft cyst
4. Thyorglossal cyst
5. Cystic hygroma
6. Cysts of salivary glands
   - Mucocele
   - Mucous retention cyst (salivary duct cyst)
7. Heterotopic gastrointestinal cysts

CLASSIFICATION OF ODONTOGENIC CYSTS ACCORDING TO TISSUE OF ORIGIN:

1. Derived from rests of malassez
    - Periapical cyst
    - Residual cyst
2. Derived from reduced enamel epithelium
    - Dentigerous cyst
    - Eruption cyst
3. Derived from dental lamina (Rests of Serres)
    - Odontogenic keratocyst
    - Gingival cyst of the newborn
    - Gingival cyst of the adult
    - Lateral periodontal cyst
    - Glandular odontogenic cyst
4. Unclassified
    - Paradental cyst
    - Calcifying odontogenic cyst

ODONTOGENIC CYSTS:

A. DEVELOPMENTAL CYSTS

DENTIGEROUS CYST

PATHOGENESIS:

- It originates after the crown of the tooth has been completely formed by accumulation of fluid between the reduced enamel epithelium and the tooth crown.

- If the cyst were to originate before tooth crown formation were completed, the result would be either a primordial cyst or a cyst involving a tooth exhibiting enamel hypoplasia, and such is not the case.

CLINICAL FEATURES:

- This cyst is always associated initially with the crown of an
  - impacted,
  - embedded or
  - unerupted tooth.

- A dentigerous cyst may also be found enclosing a complex compound odontoma or involving a supernumerary tooth.

- The most common sites of this cyst are the mandibular and maxillary third molar and maxillary cuspid areas, since these are the most commonly impacted teeth.

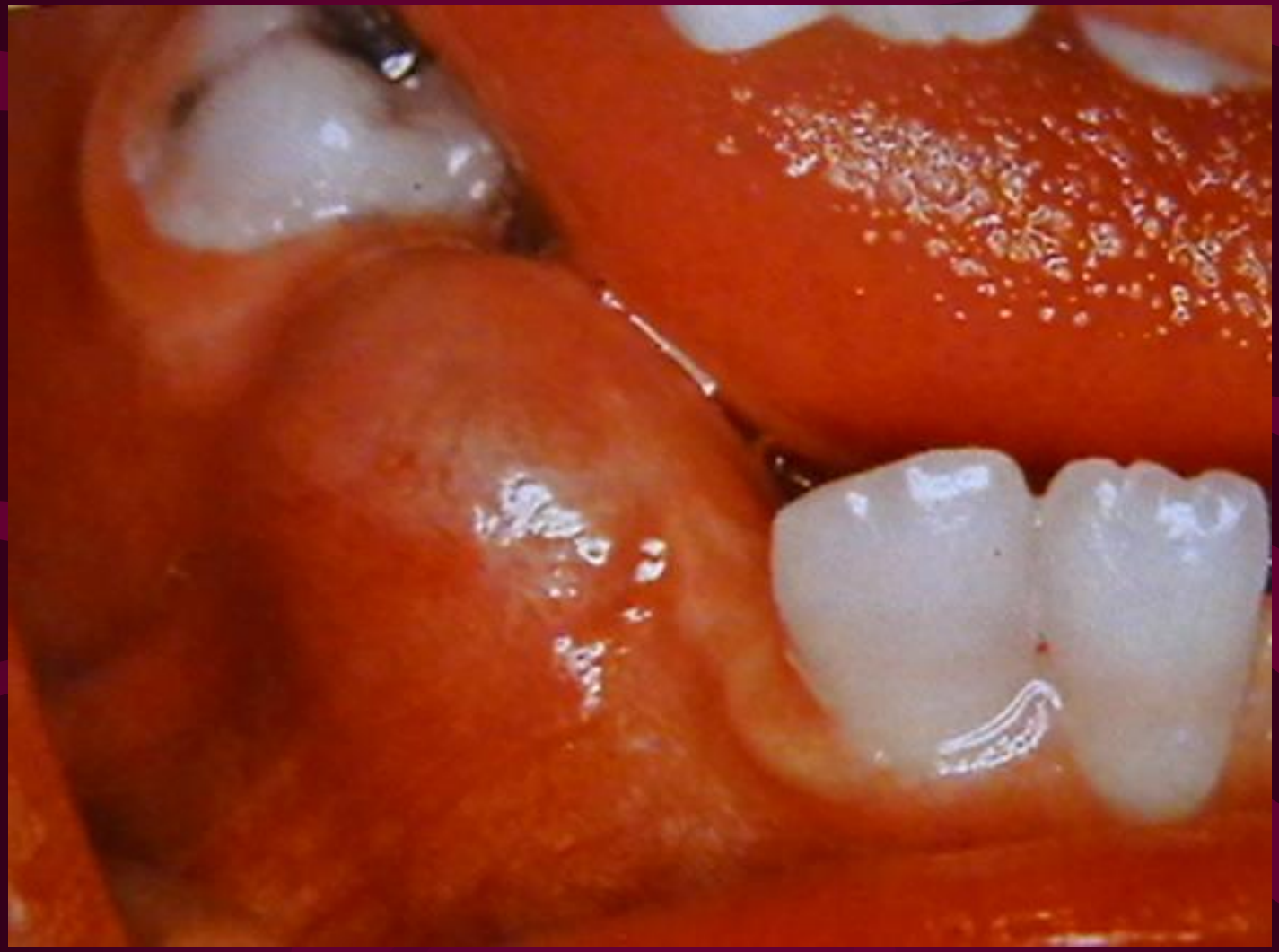
- Possible sequelae brought about by continued enlargement of the cyst are…

    - Expansion of bone with subsequent facial asymmetry,
    - extreme displacement of teeth,
    - severe root resorption of adjacent teeth and
    - pain

- Cystic involvement of an unerupted mandibular third molar may result in a " hollowing –out" of the entire ramus extending up to the coronoid process and condyle as well as in expansion of the cortical plate due to the pressure exerted by the lesion.

- Associated with this reaction may be displacement of the third molar to such an extent that it sometimes comes to lie compressed against the inferior border of the mandible.

- In the case of a cyst associated with a maxillary cuspid, expansion of the anterior maxilla often occurs and may superficially resemble an acute sinusitis or cellulitis.



Dentigerous cyst associated with unerupted permanent first premolar

RADIOGRAPHIC FEATURES:

- Radiographic examination of the jaw involved by a dentigerous cyst will reveal a radiolucent area associated in some fashion with an unerupted tooth crown. The impacted or otherwise unerupted tooth crown may be surrounded symmetrically by this radiolucency.

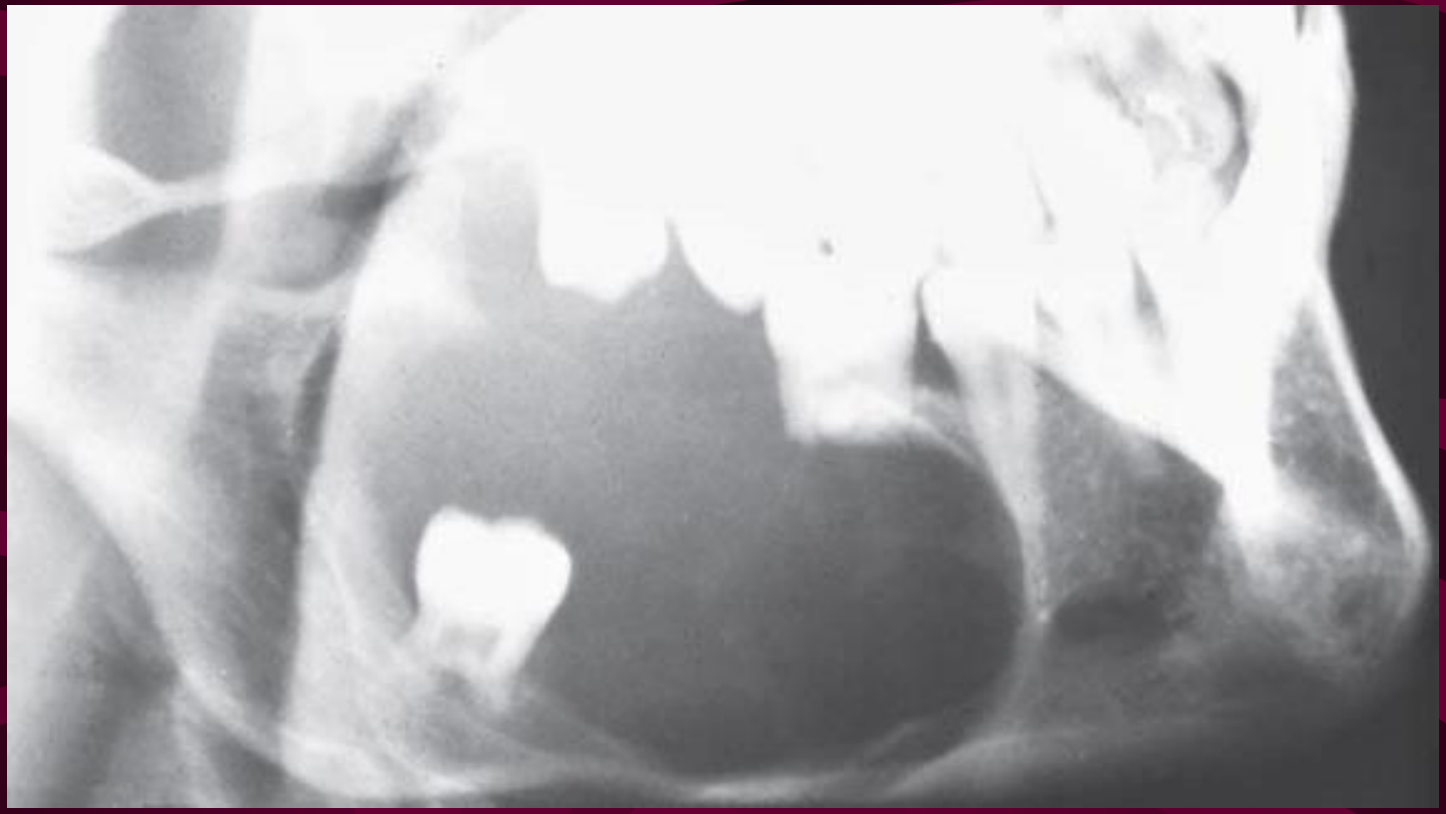
- The dentigerous cyst is usually a smooth, unilocular lesion, but occasionally one with a multilocular appearance may occur. In actuality, the various compartments are all united by the continuous cystic membrane.

- Sometimes the radiolucent area is surrounded by a thin sclerotic line representing bony reaction

Three radiographic variations of the dentigerous cyst may be observed.

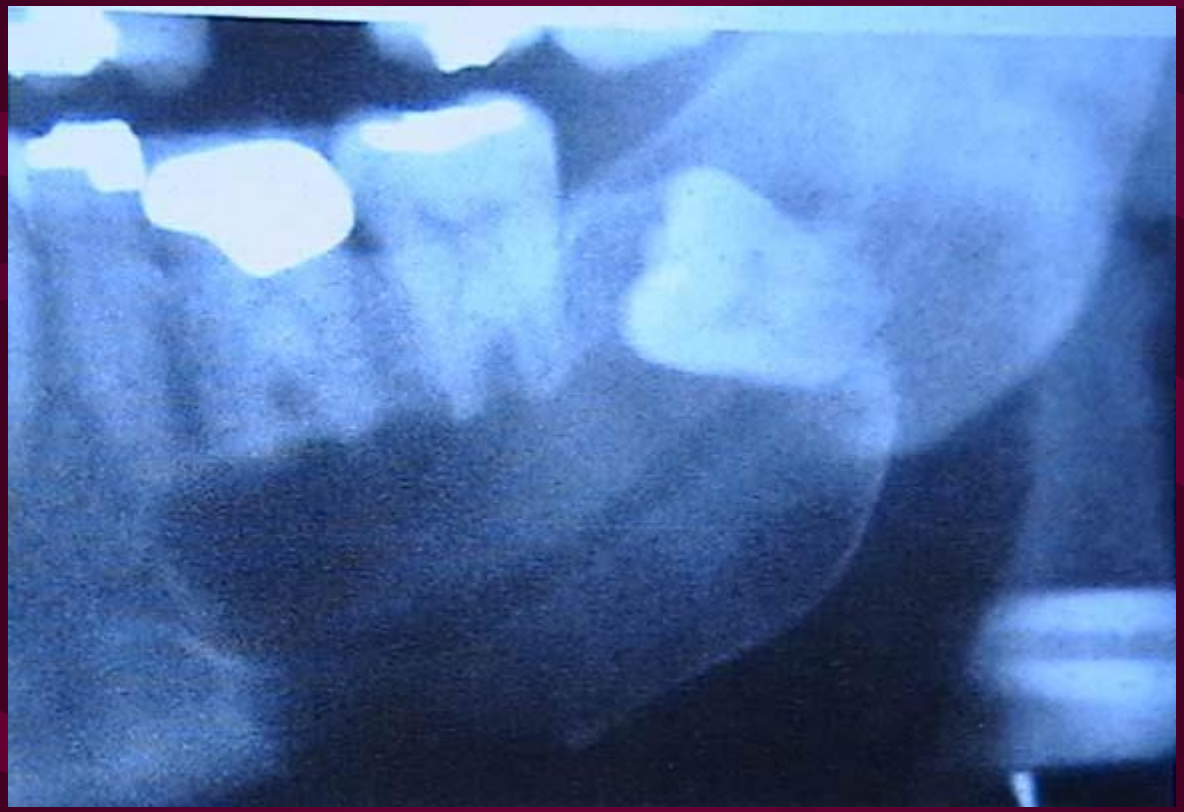
1. CENTRAL VARIETY : crown is enveloped symmetrically. In this instances, pressure is applied to the crown of the tooth and may push it away from its direction of eruption.

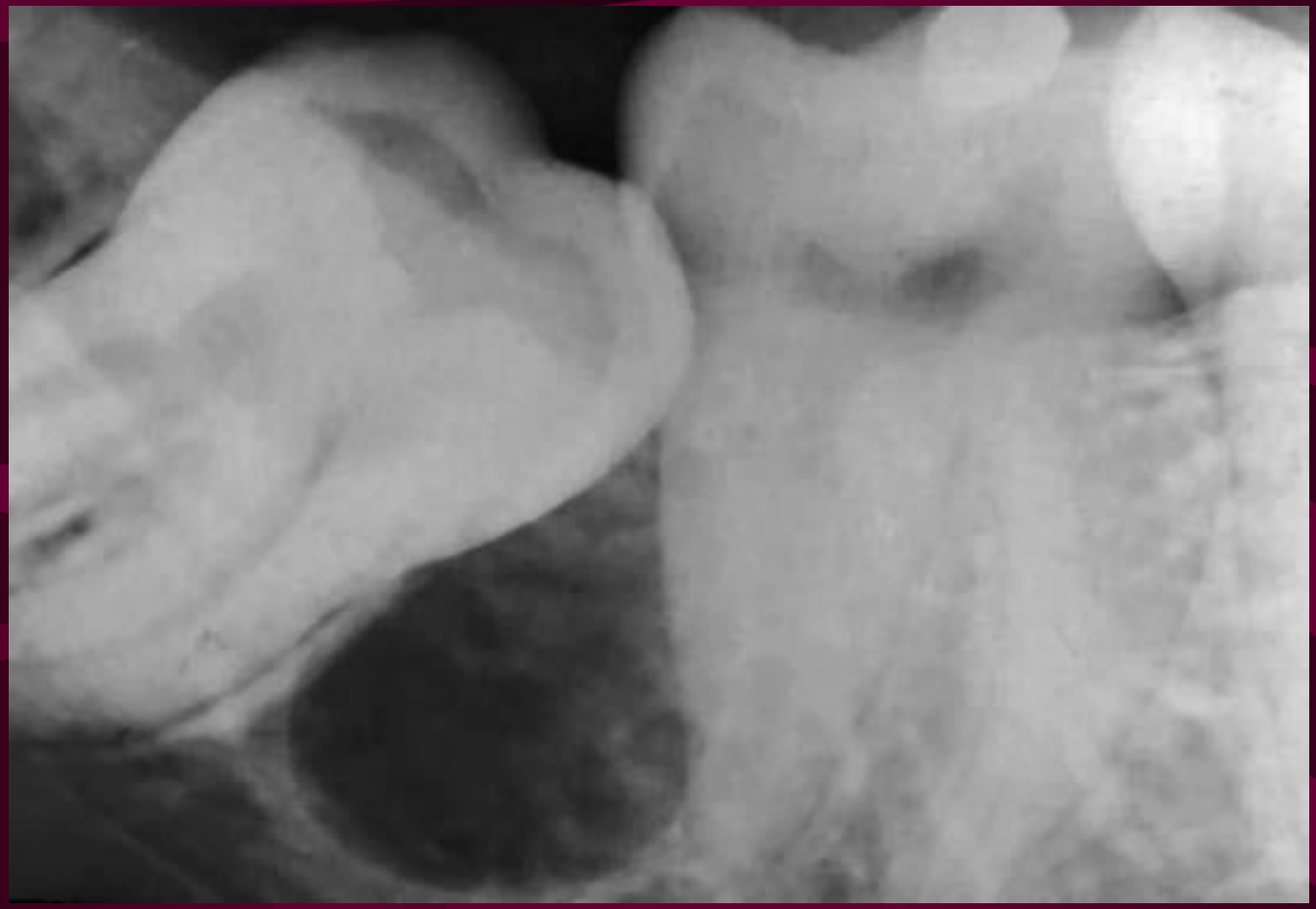
   In this way mandibular third molars may be found at the lower border of mandible or in the ascending ramus and a maxillary canine may be forced in to maxillary sinus as far as the floor of the orbit.



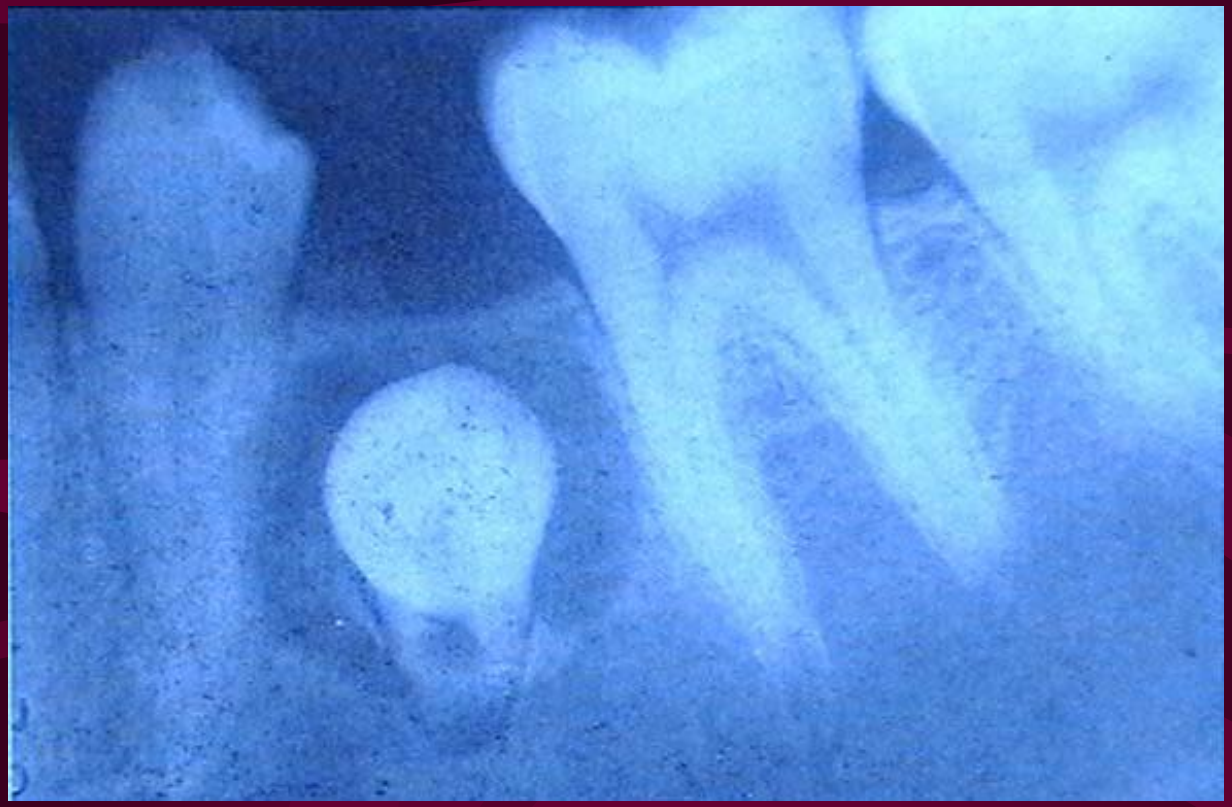
Radiograph of a CENTRAL TYPE of dentigerous Cyst surrounding crown of an impacted mandibular molar. Note resorption of the root of the first mandibular molar.

2. LATERAL DENTIGEROUS CYST is radiographic apperance which results from dilatation of follicle on one aspect of crown. This type is commonly seen when an impacted third molar is partially erupted so that its one aspect is exposed.

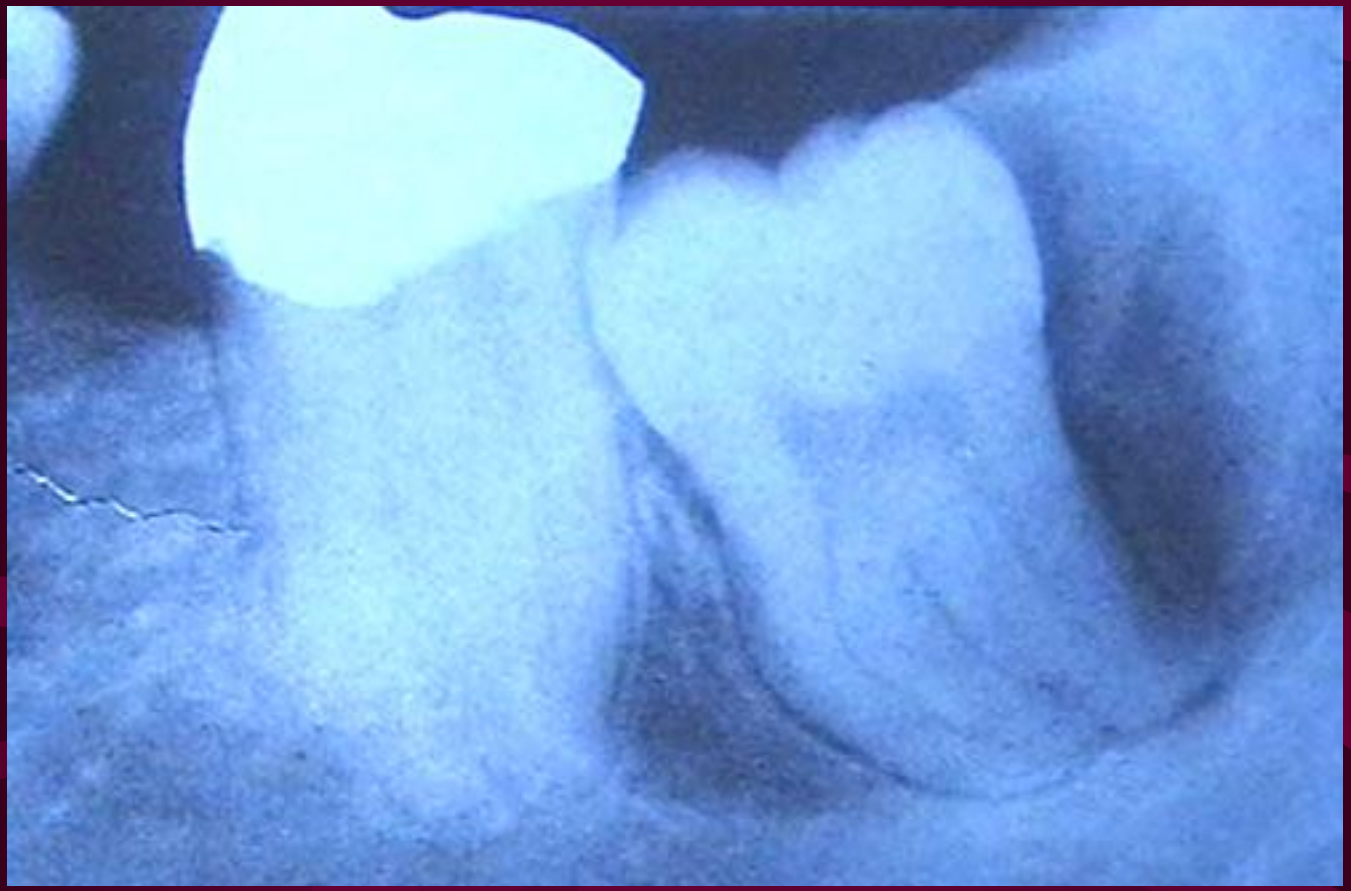




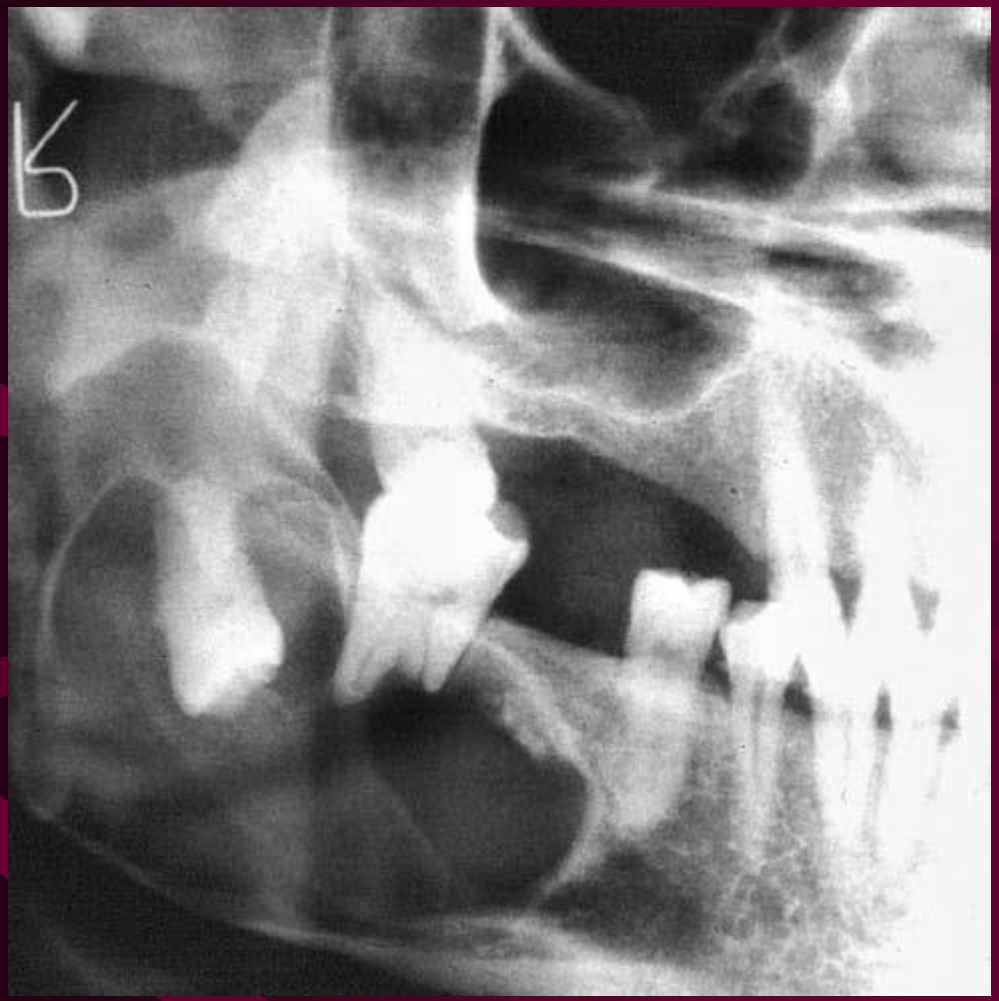
Radiograph of a lateral type of dentigerous cyst.



The **CIRCUMFERENTIAL DENTIGEROUS CYST** is that in which the entire tooth appears to be enveloped by cyst.

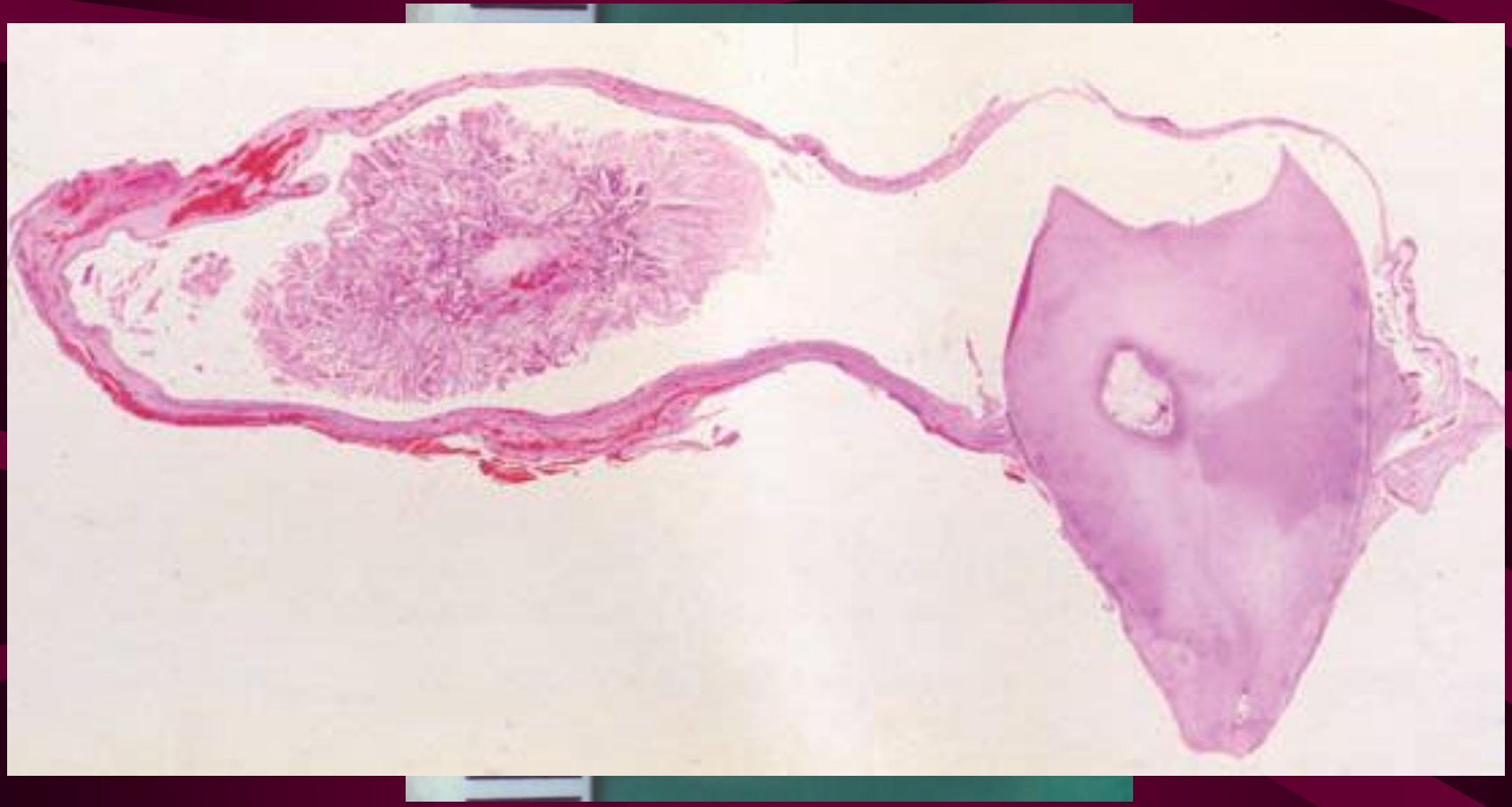


DENTIGEROUS CYST: circumferential variety showing cyst extension along the mesial and distal roots of the unerupted tooth



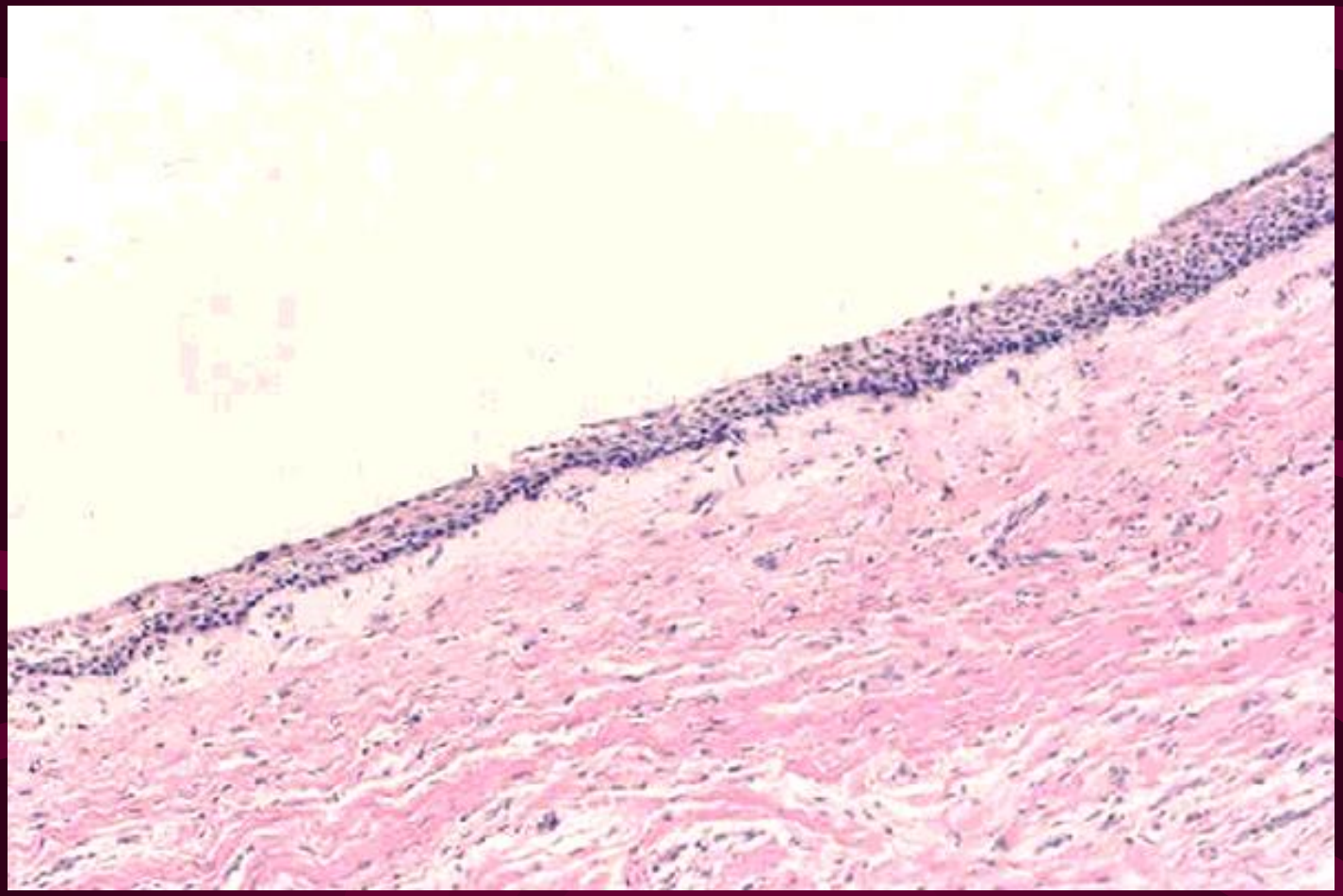
Radiograph of a circumferential type dentigerous cyst associated with a mandibular third molar. The tooth of origin is displaced and the cyst wall has resorbed part of the root of the adjacent molar.

HISTOLOGIC FEATURES:

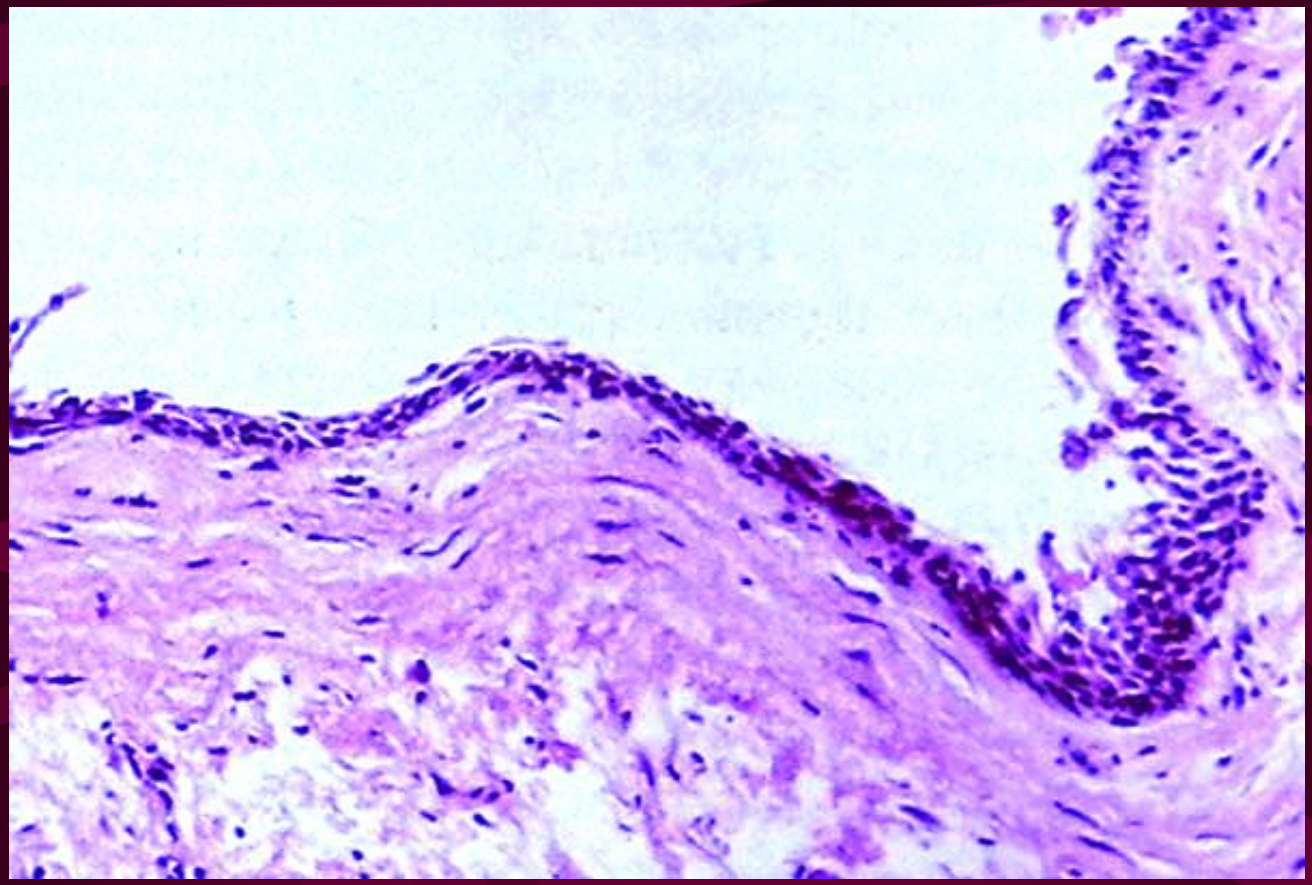


(a) Gross specimen of a dentigerous cyst opened in the laboratory. The cyst encloses the crown of the tooth and is attached to its neck. (b) Macroscopic section of a dentigerous cyst showing attachment of its lining to the cervical margin of the tooth, enclosing its crown.

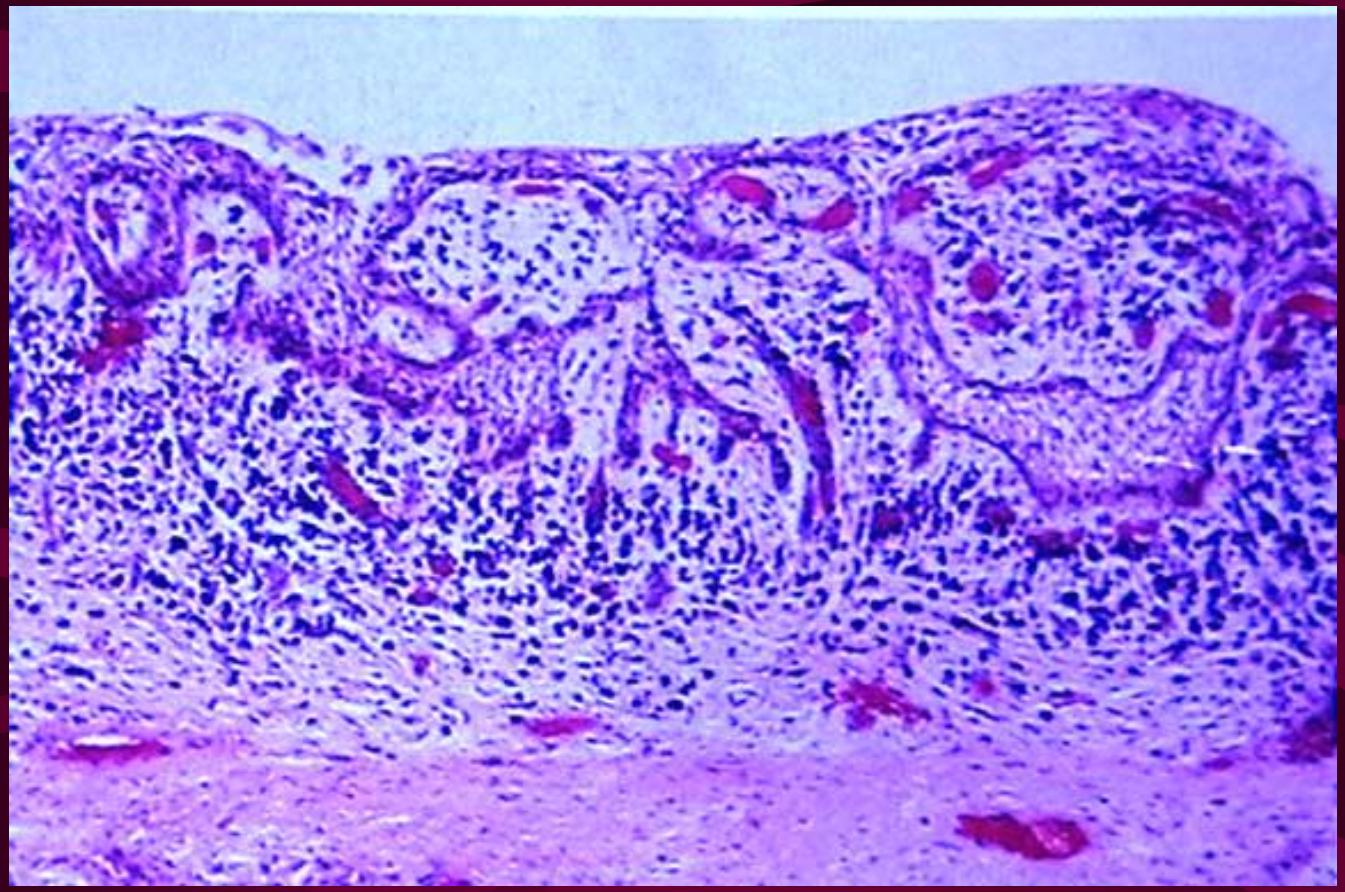
- It is usually composed of a thin connective tissue wall with a thin layer of stratified squamous epithelium lining the lumen.
- Rete peg formation is generally absent except in cases that are secondarily infected.



DENTIGEROUS CYST: The cyst is lined with a thin layer of stratified squamous epithelium with absence of rete pegs covering loose fibrous tissue capsule with scattered inflammatory cells.



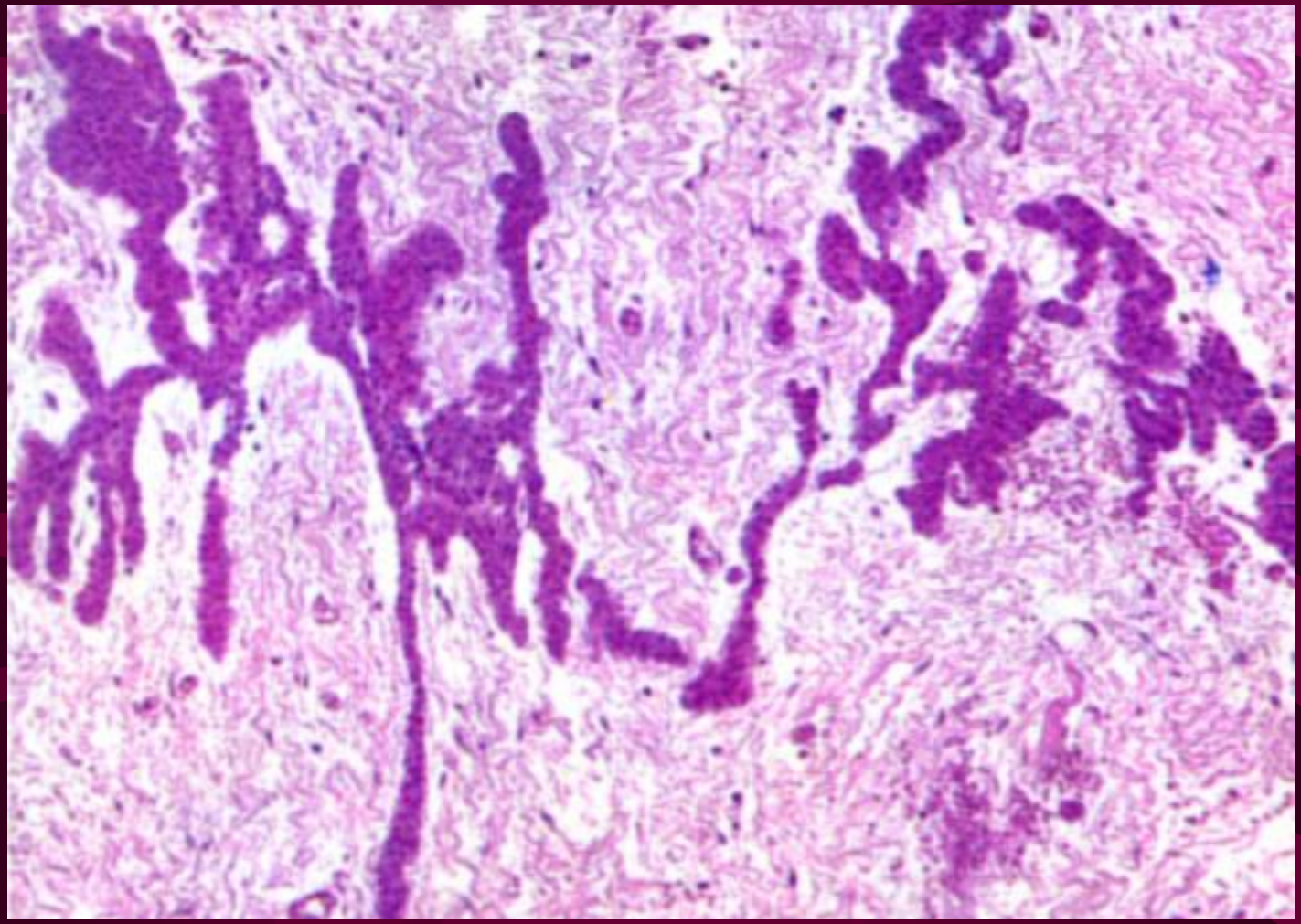
DENTIGEROUS CYST: Thin, stratified squamous epithelial lining with absence of rete peg formation covering loose fibrous connective tissue.



INFALMMED DENTIGEROUS CYST
showing proliferating epithelial lining

- The connective tissue wall is frequently quite thickened and composed of a very loose fibrous connective tissue or of a sparsely collagenized myxomatous tissue, each of which has been sometimes mistakenly diagnosed as either an odontogenic fibroma or an odontogenic myxoma.

- An additional feature of the connective tissue walls of both normal dental follicles and dentigerous cysts is the presence of varying numbers of islands of odontogenic epithelium.



Rests of odontogenic epithelium in connective tissue wall of dentigerous cyst

- Inflammatory cell infiltration of the connective tissue is common although the cause for this is not always apparent.
- An additional finding, especially in cysts which exhibit inflammation , is the presence of RUSTON BODIES within the lining epithelium.
- The content of the cyst lumen is usually a thin, watery yellow fluid, occasionally blood tinged.

- Gorlin described pleuripotentialities of the cyst epithelium in mandibular dentigerous cysts.

- He described…….
    - mucus secreting cells in the lining stratified squamous epithelium,
    - respiratory epithelial lining,
    - sebaceous cells in the connective tissue wall, and
    - lymphoid follicles with germinal centers.

TREATMENT:

- The treatment of the dentigerous cyst is usually dictated by the size of the lesion.
  - Smaller lesions can be surgically removed in their entirely with the difficulty.
  - The larger cysts which involve serious loss of bone and thin the bone dangerously are often treated by insertion of a surgical drain or marsupialization .

- Recurrence is relatively uncommon unless there has been fragmentation of the cyst lining with the remnants allowed to remain.

POTENTIAL COMPLICATIONS:

1. The development of an AMELOBLASTOMA either from the epithelium or from rests of odontogenic epithelium in the wall of the cyst.

2. the development of EPIDERMOID CARCINOMA from the same two sources of epithelium; and

3. the development of a MUCOEPIDERMOID CARCINOMA, basically a malignant salivary gland tumor, from the lining epithelium of the dentigerous cyst which contains mucous-secreting cells, or at least cells with this potential , most commonly seen in dentigerous cysts associated with impacted mandibular third molars.

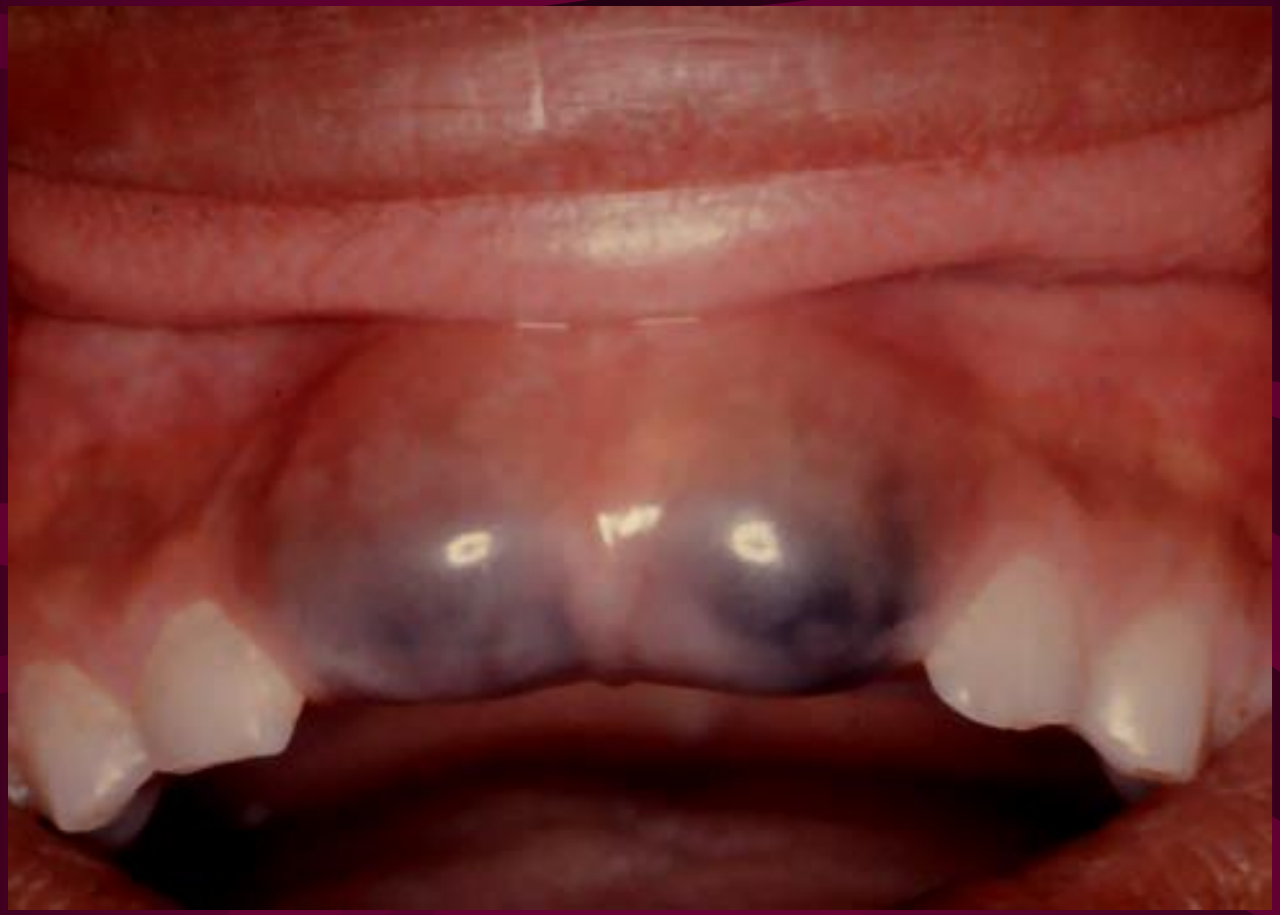
ERUPTION CYST

- It is defined as an odontogenic cyst with the histologic features of a dentigerous cyst that surrounds a tooth crown that has erupted through bone but not soft tissue and is clinically visible as a soft fluctuant mass on the alveolar surface.

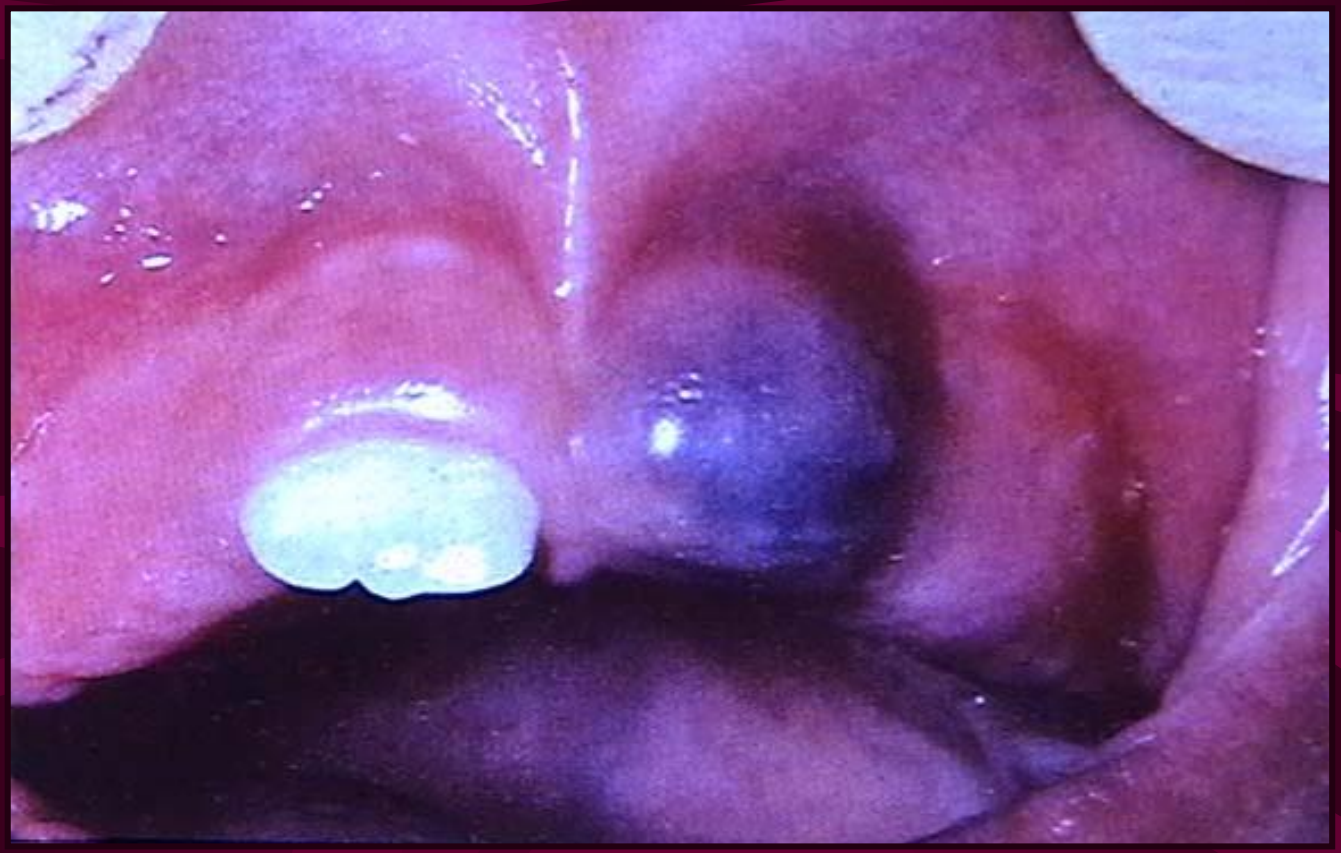
- The pathogenesis of this cyst is similar to dentigerous cyst but the difference is that the tooth in this case is impeded in the soft tissue of gingiva rather than in bone.

CLINICAL FEATURES:

- They are found in children of different ages and occasionally in adults if there is delayed eruption.
- The teeth anterior to first molar is involved frequently.
- Clinically, the lesion appears as a circumscribed, fluctuant, often translucent swelling of the alveolar ridge over the site of the erupting tooth.
- When the circumcoronal cystic cavity contains blood, the swelling appears purple or deep blue ; hence the term "ERUPTION HEMATOMA". The cause for the development of this from of dentigerous cyst is not known.



Eruption cysts involving the maxillary permanent incisors.



ERUPTION CYST: circumscribed, fluctuant, often translucent swelling of the alveolar ridge over the site of the erupting maxillary central incisor of left side.

RADIOGRAPHIC FEATURES:

The cyst may show a soft tissue shadow since the cyst is confined within it and there is usually no bone involvement.

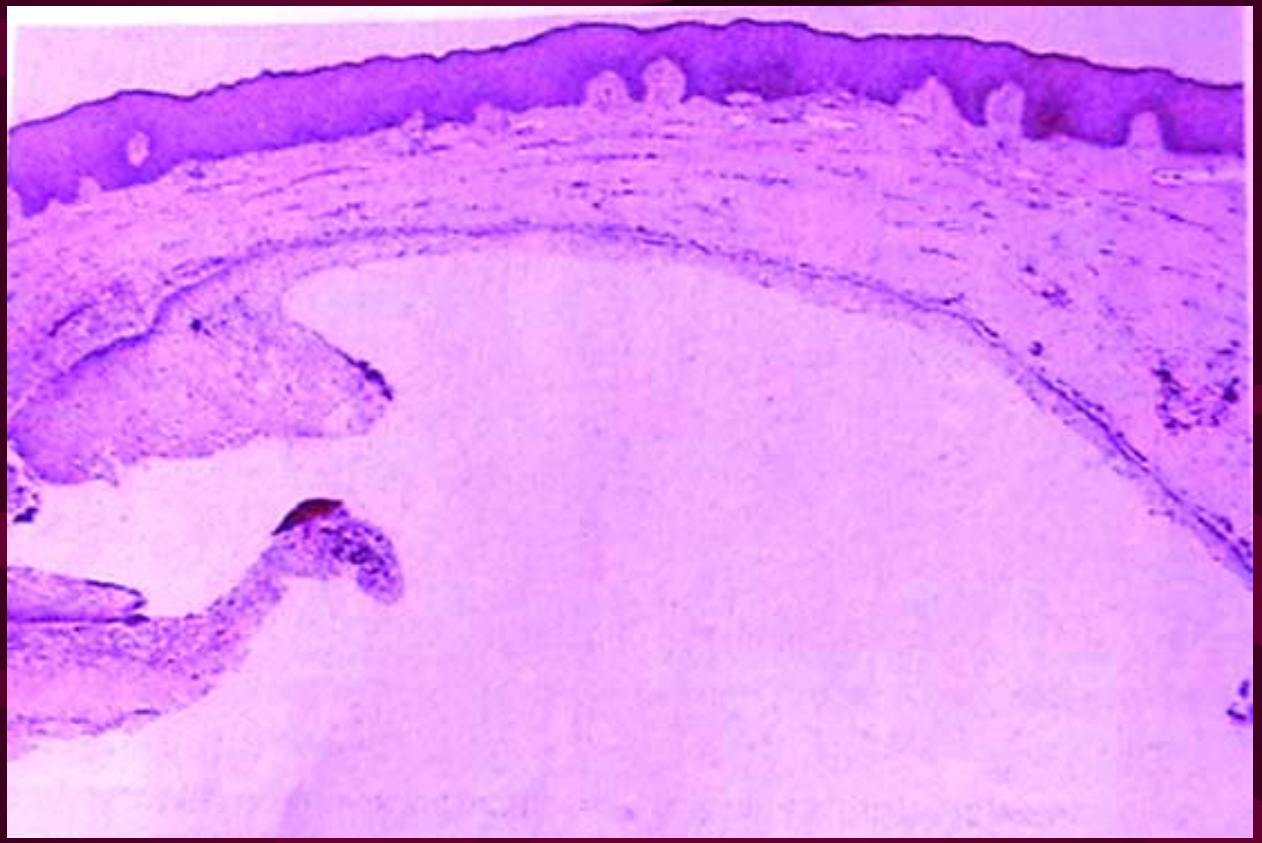
HISTOLOGIC FEATURES:

- The superficial aspect is covered by the keratinized stratified squamous epithelium of the overlying gingiva. This is separated from the cyst by a strip of dense connective tissue of varying thickness which usually shows a mild chronic inflammatory cell infiltrate.

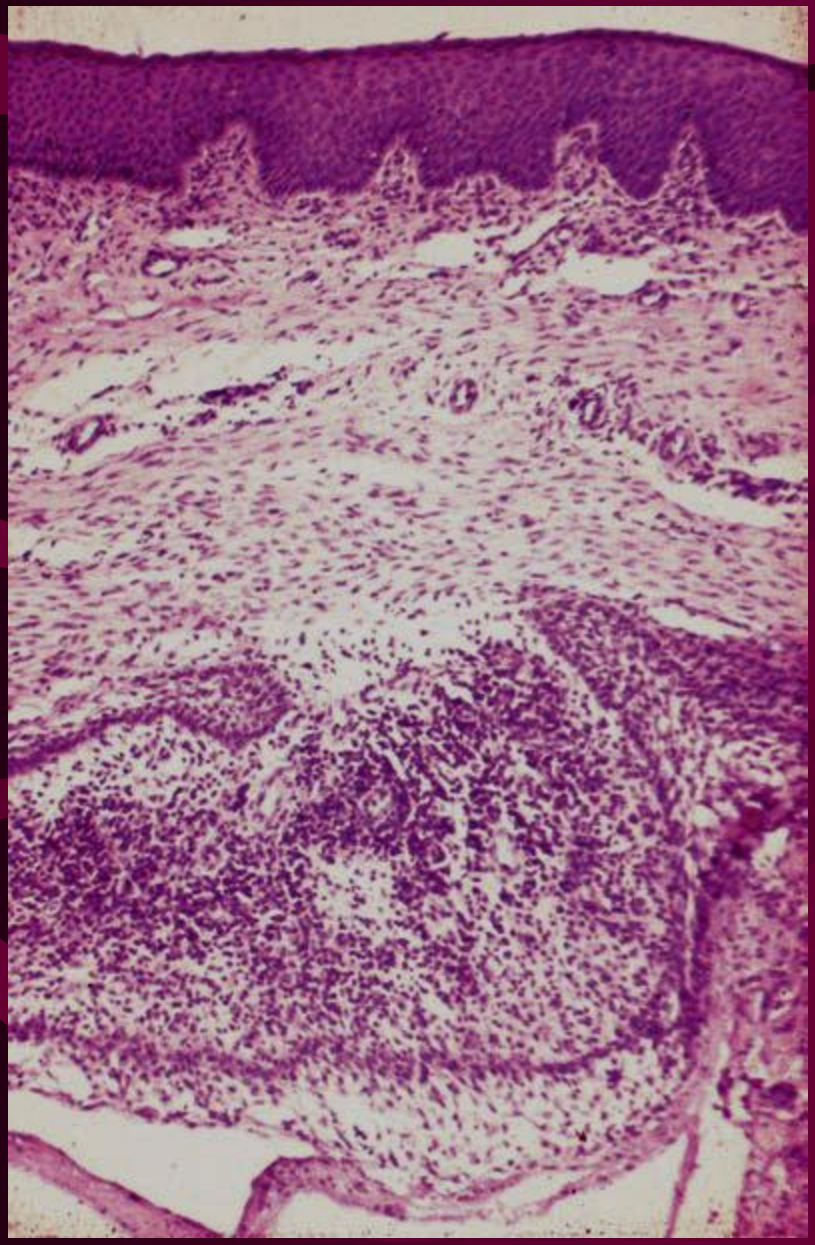
- The follicular connective tissue is more densely cellular, less collagenous and has a basophilic hue, presumably because of a higher content of acid mucopolysaccharide in the ground substance.

- Odontogenic epithelial cell nests may be present in the connective tissue.

- In noninflammed cysts, the epithelial lining of the cysts is characteristically of reduced enamel epithelial origin, consisting of two or three cell layers of squamous epithelium with a few foci where it may be a little thicker. The adjacent corium is hyperemic and there may be presence of a chronic inflammatory cell infiltrate.



Eruption cyst: a low power photomicrograph showing cystic epithelial below the mucosal surface.



Histological features of an eruption cyst. The surface epithelium is at the top and the cyst lining at the bottom of the photomicrograph. The intense chronic inflammatory cell infiltrate is a response to masticatory trauma.

TREATMENT:

- No treatment is necessary as the cyst often ruptures spontaneously.
- Surgically exposing the crown of the tooth may aid in the eruption process

ODONTOGENIC KERATOCYST

(KERATOCYSTIC ODONTOGENIC TUMOR – KCOT)

- The term “Keratocyst” was first used by PHILIPSEN IN 1956, while PINDBORG AND HANSEN in 1963 described the essential features of this type of the cyst.

- There is a general agreement at present that it is a cyst with very well-defined histologic criteria and one which possesses one clinical feature warranting its recognition and separation as a distinctive entity: the exceedingly high recurrence rate.

- Recently, WHO has reclassified OKC as Keratocystic Odontogenic Tumor – a benign cystic neoplasm.

OKC versus KCOT

Gene involvement – abnormal PTCH (9q22)

Aggressive clinical behaviour

Histopathology – high proliferative capacity of epithelium, mitotic activity, presence of dysplastic features

The **ORIGIN** of this cyst has not been definitively established, but it has been suggested that OKC develops from

1. **Dental lamina** which still possess marked growth potential
2. From **proliferation of basal cells** as basal cell hamartoma, a residue or remnant of oral epithelium

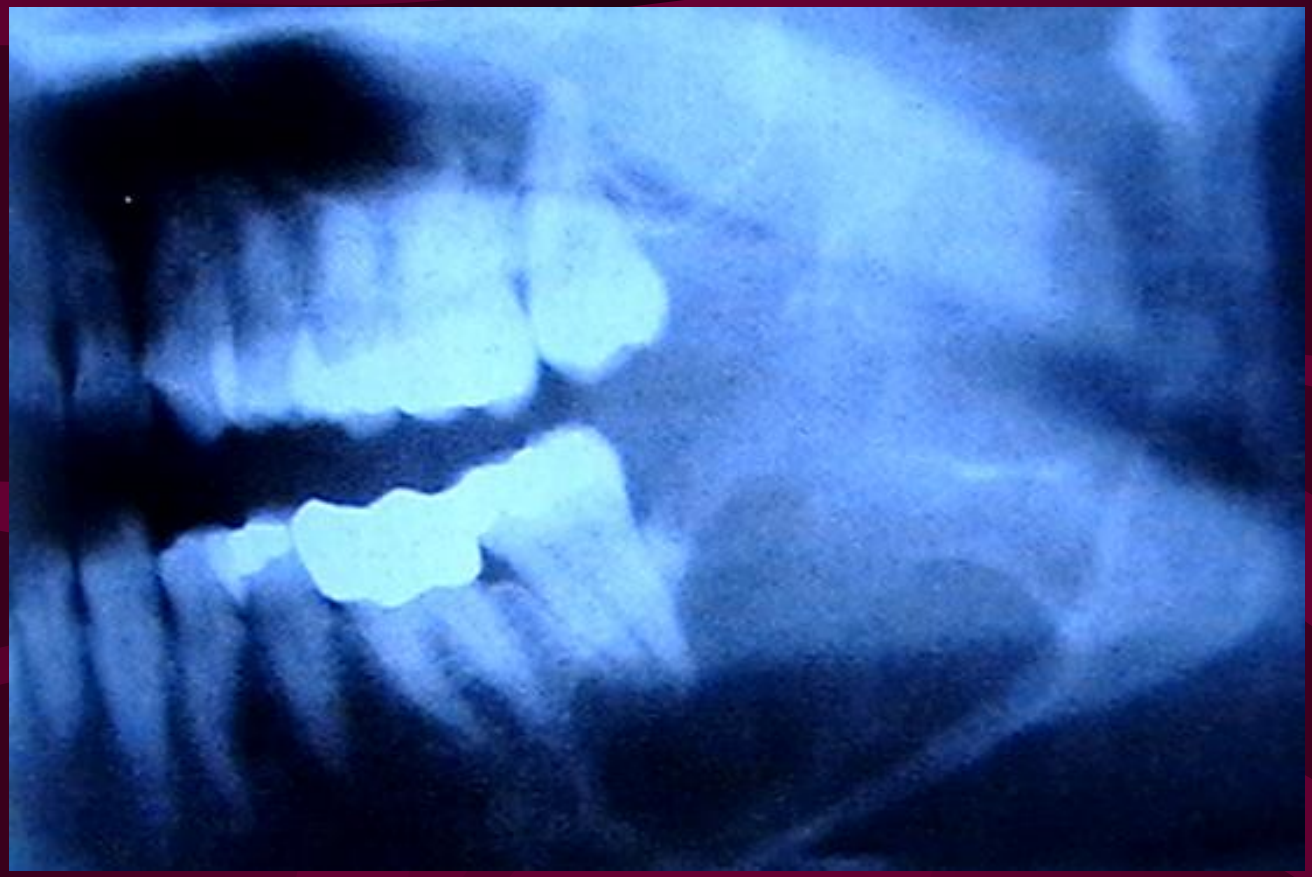
CLINICAL FEATURES:

- Rare under 10 years of age, peak incidence is in the **2nd and 3rd decade.**
- **Male**s predilection
- **Mandible** is invariably affected more frequently than the maxilla.
- In mandible, majority of the cysts occur in the **ramus third molar** area followed by **1st and 2nd molar** followed by **anterior mandible**.
- In the maxilla, the most common site is the third molar area followed by cuspid region.
- **Multiple OKC** occur with some frequency, and in some instances, these are associated with **jaw cyst basal cell nevus bifid rib syndrome.**
- Pain, soft tissue swelling and expansion of bone, drainaige and various neurologic manifestation such parasthesia of the lip or teeth are more commonly reported symptoms.

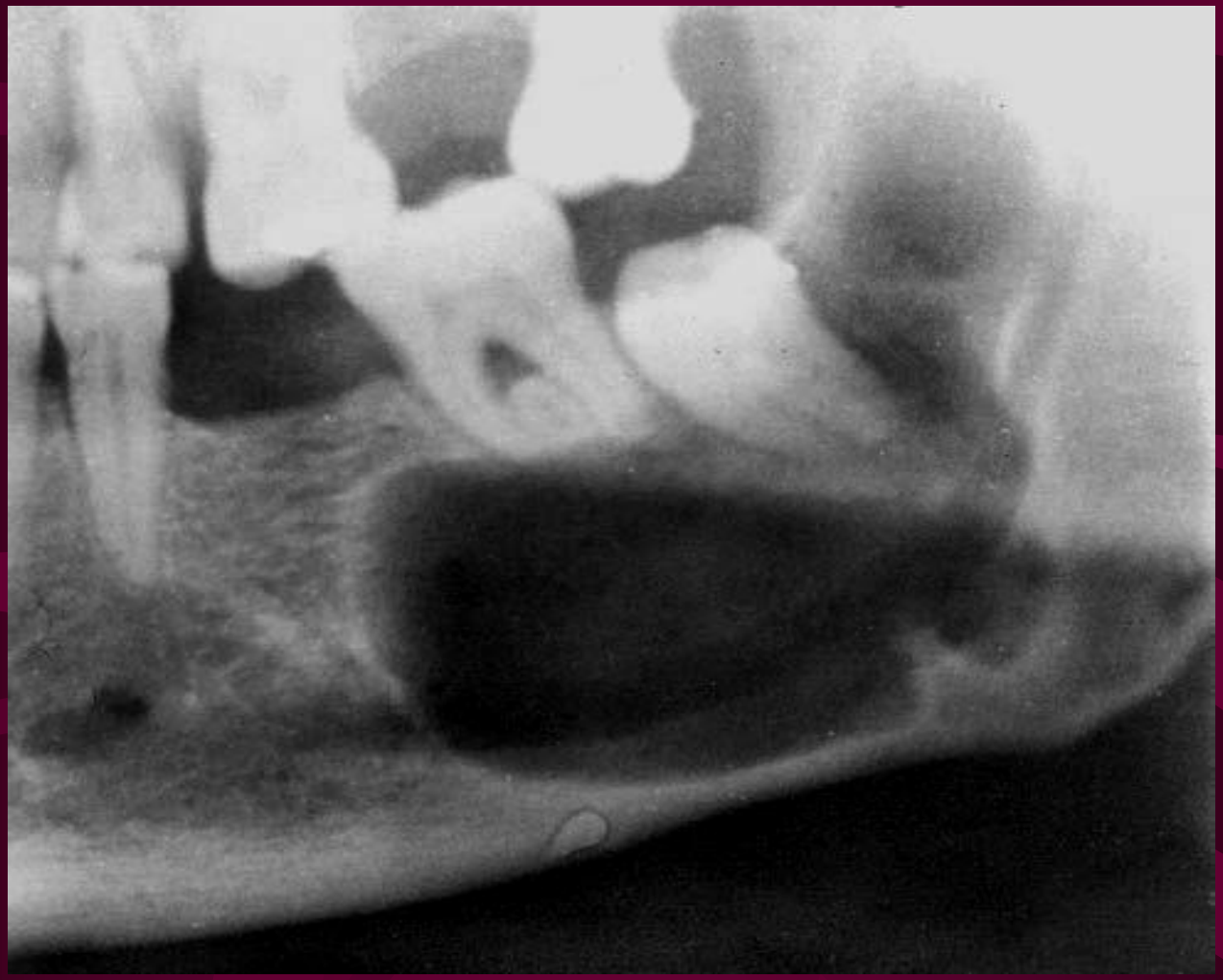
RADIOGRAPHIC FEATURES:

- The lesion may appear as either a unilocular or multilocalar radiolucency, frequently with a thin sclerotic border representing reactive bone. This border may be smooth or scalloped, but is generally sharply demarcated.

- Proximity to the roots of adjacent normal teeth sometimes causes resorption of these roots, although displacement is more common, sometimes these cysts displace the neurovascular bundle.



ODONTOGENIC KERATOCYST: a large, multilocular cyst involving most of the ascending ramus



Radiograph of an odontogenic keratocyst with scalloped margins.

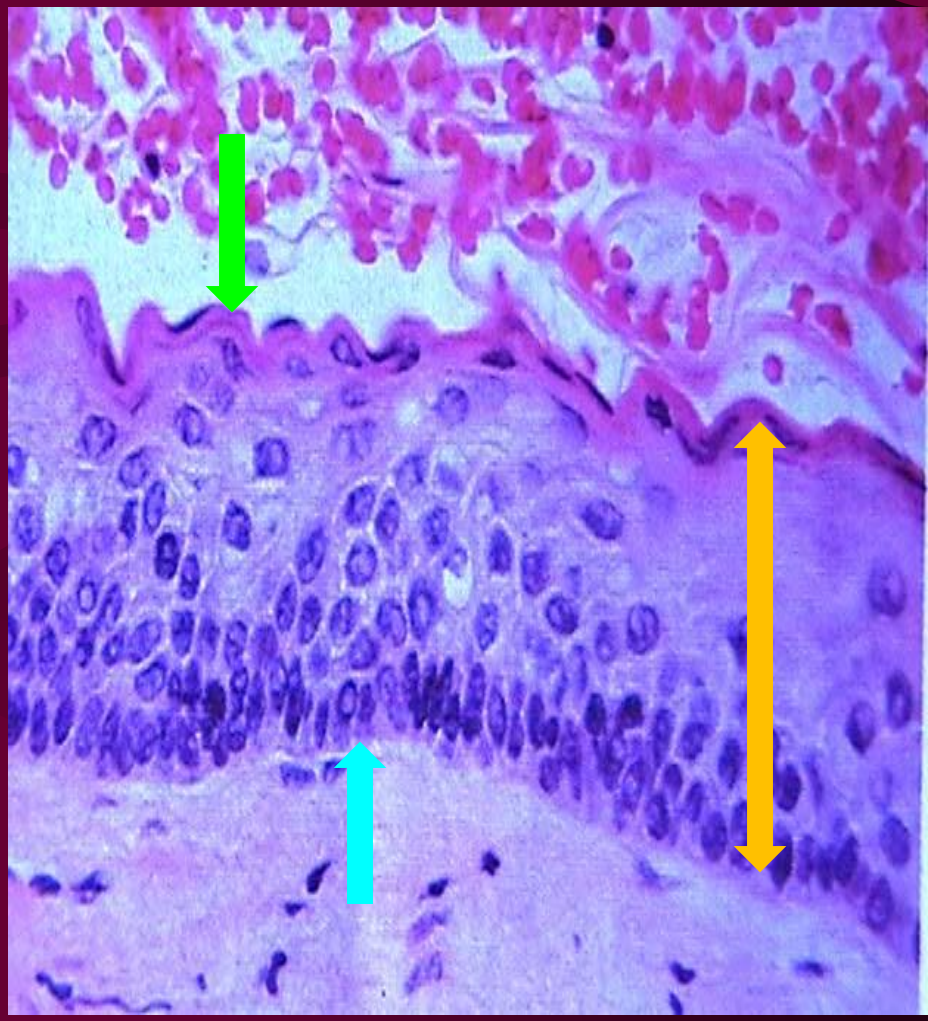
HISTOPATHOLOGY:

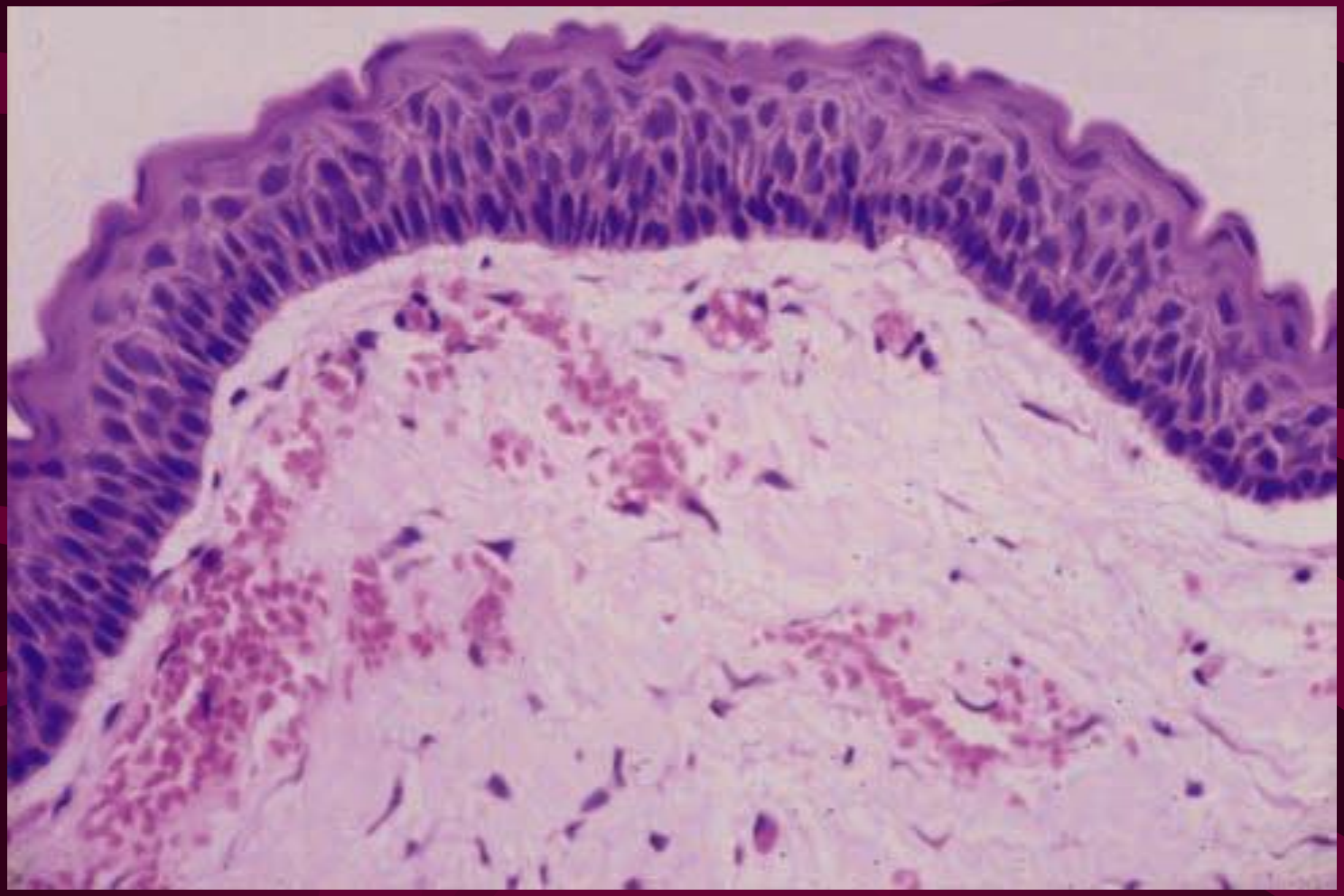
Odontogenic keratocyst is characterized by

1. A parakeratinized surface which is typically CORRUGATED

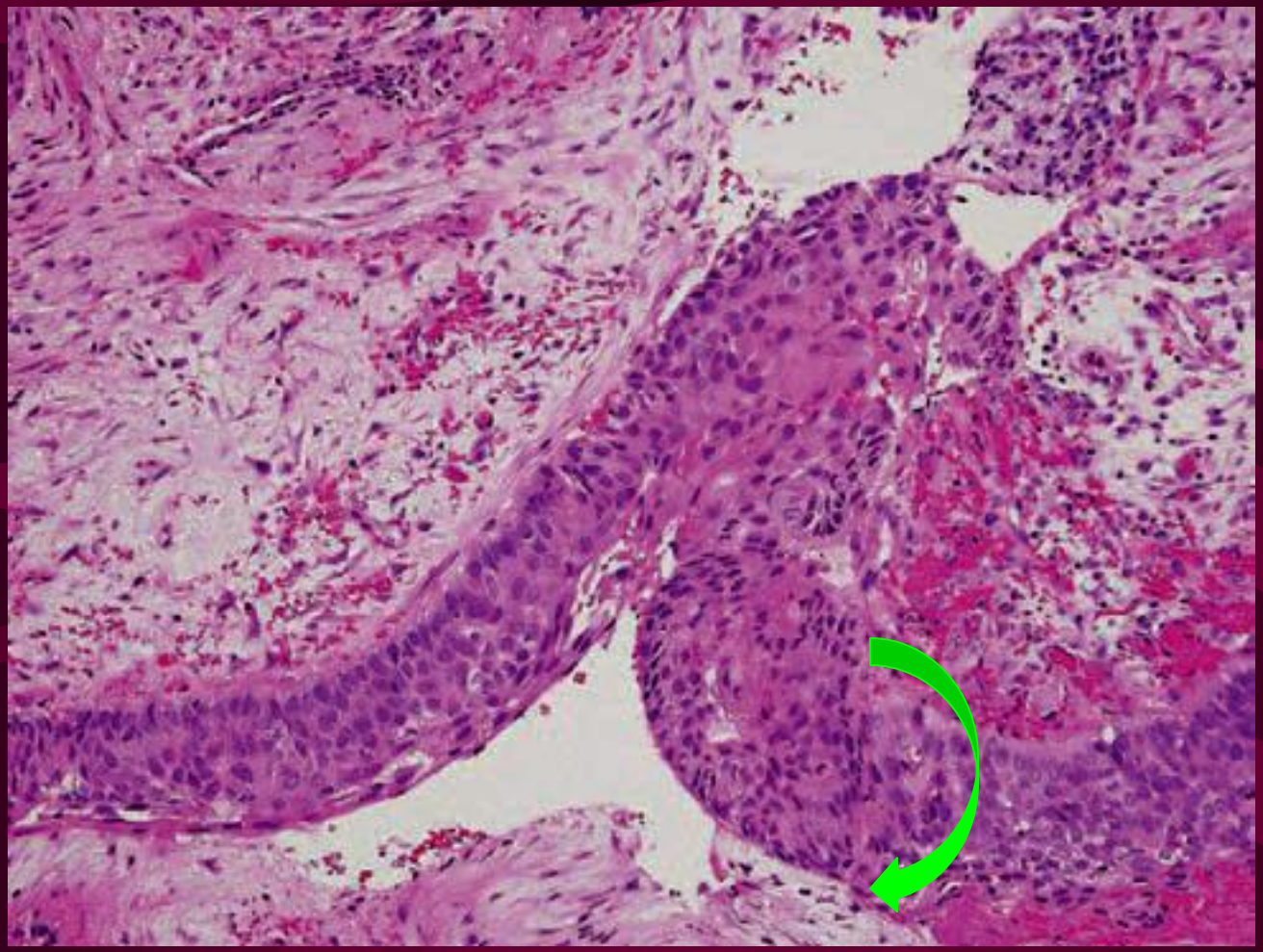
2. A remarkable uniformity of thickness of the epithelium, usually ranging from 6 TO 10 CELL THICK, and

3. A prominent palisaded, polarized basal layer of cells often described as having a PICKET FENCE OR TOMBSTONE appearance





ODONTOGENIC KERATOCYST: A uniform thickness of parakeratinized epithelium which exhibits corrugated surface with prominent, palisaded basal cell layer



Odontogenic keratocyst with dysplastic changes in part.

- The orthokeratinzed variant of OKC have been demonstrated, known as **ORTHOKERATINIZED ODONTOGENIC CYST** which has orthokeratinized epithelial lining with prominent granular cell layer.
- OOC is now considered as a different entity because of its different behaviour.

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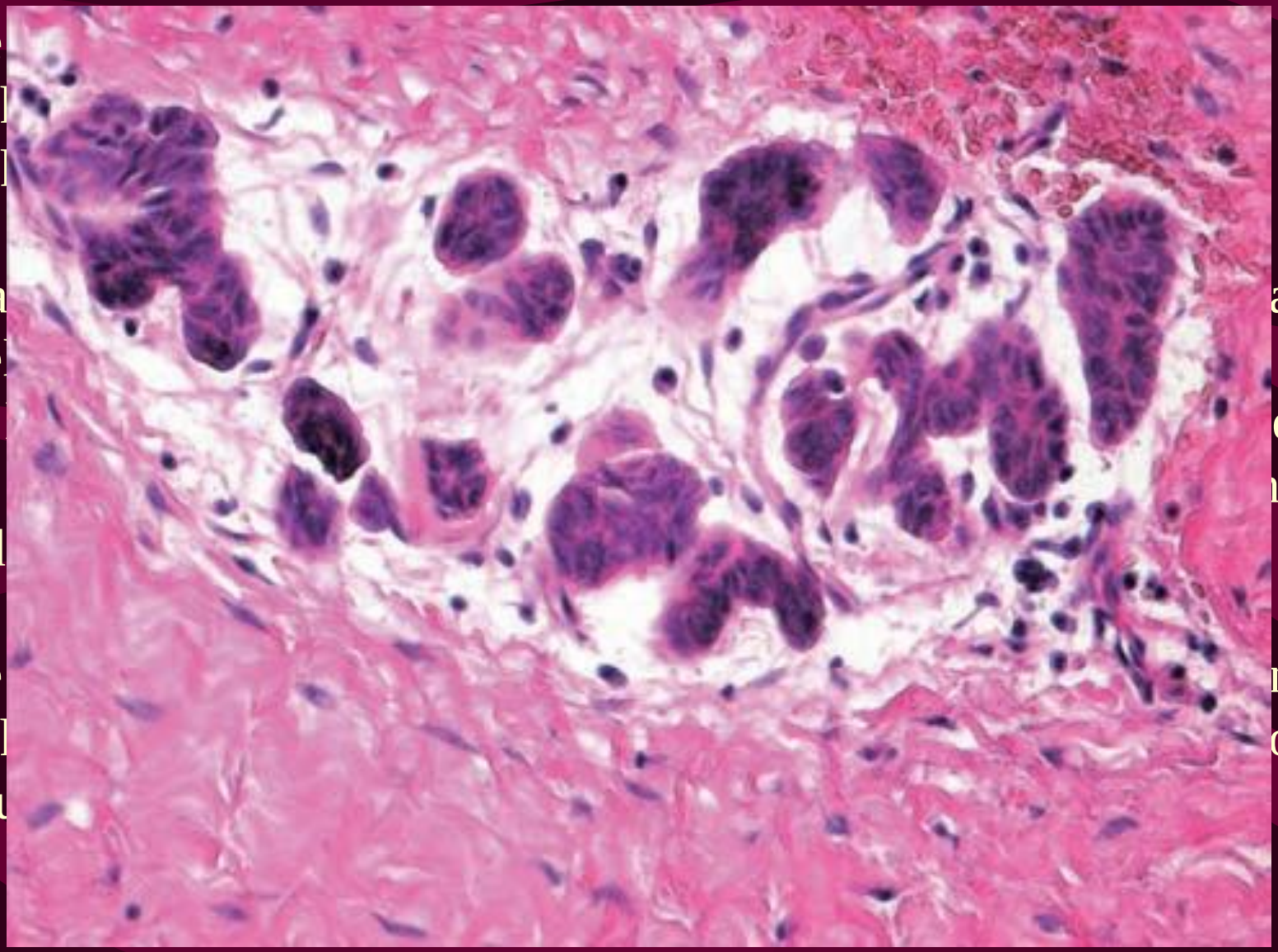

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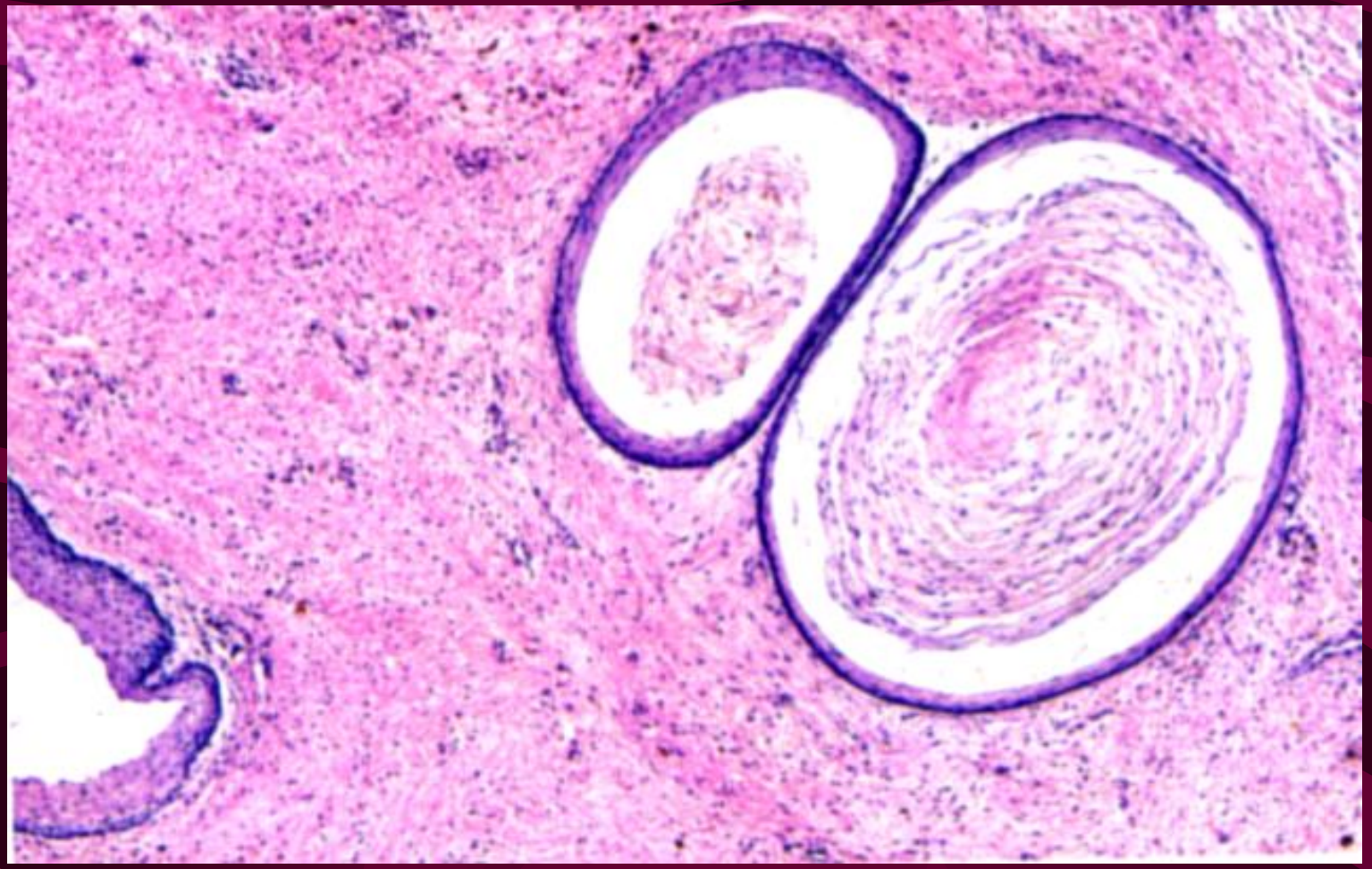


Satellite microcysts in the wall of an odontogenic keratocyst.

- The LUMEN OF THE KERATOCYST may be filled with a thin straw colored fluid or with a thicker creamy material

- CONTENTS:
  - A great deal of keratin
  - Cholesterol
  - Hyaline bodies at sites of inflammation

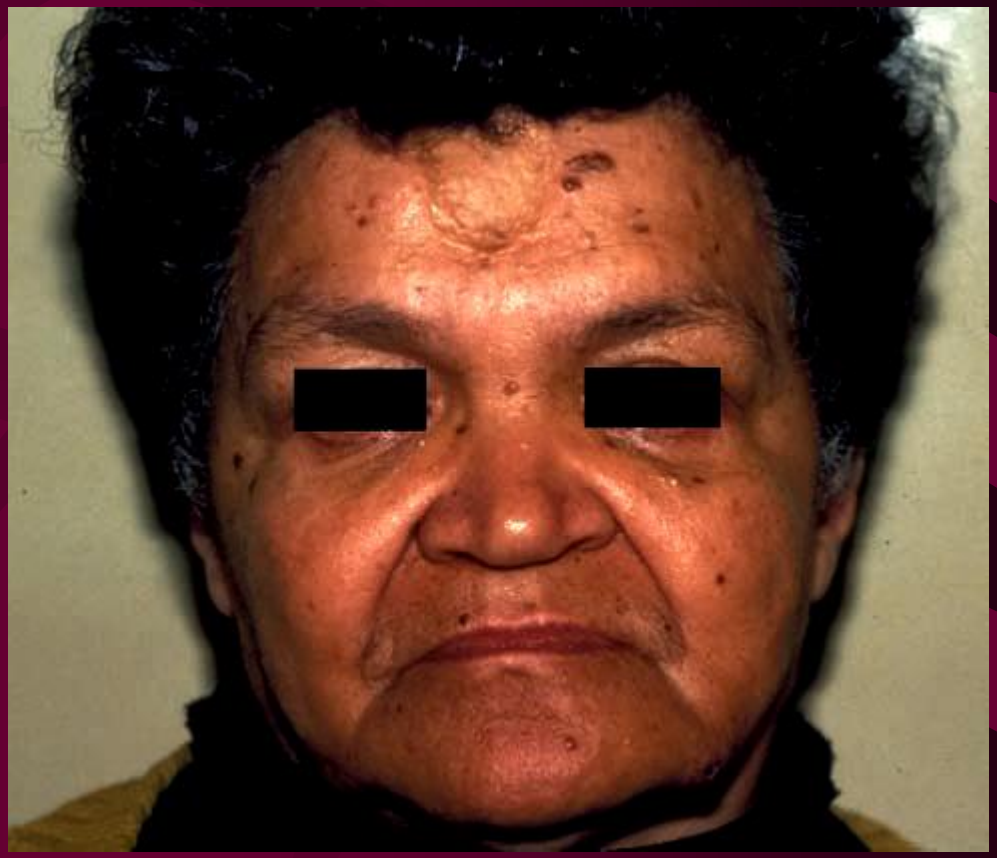
- The electrophoretic measurement of fluid from these cysts showed a very low content of soluble protein compared with patients own serum

TREATMENT:

- Surgical enucleation.
- A high recurrence is noted with OKC.

JAW CYST BASAL CELL NEVUS BIFID RIB SYNDROME (GORLIN AND GOLTS SYNDROME)

Multiple OKCs
Basal cell carcinomas of skin
Bifid rib
Multiple epidermoid cysts



LATERAL PERIODONTAL CYST

It is an uncommon but well recognized type of odontogenic cyst.

ETIOPATHOGENESIS

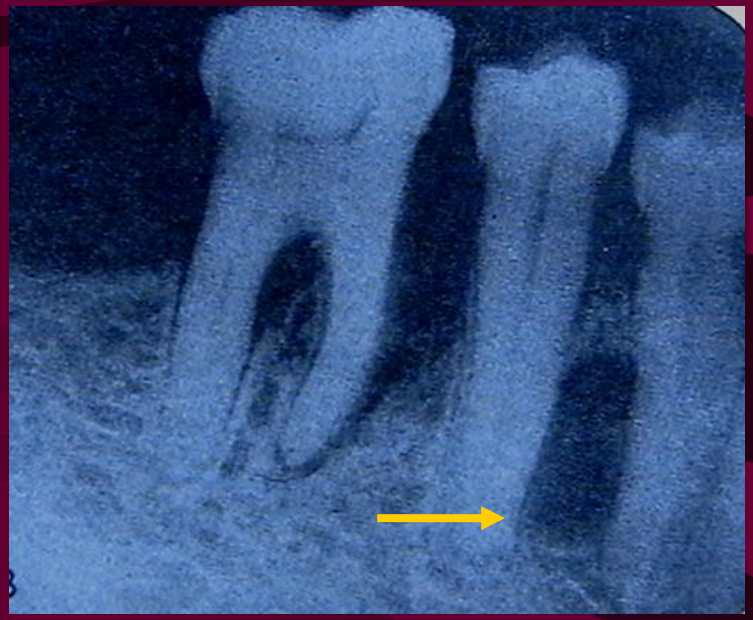
1. Origin initially **as a dentigerous cysts** developing along the lateral surface of the crown and, as the tooth erupts, the cyst assumes a position in approximation to the lateral surface of the root;
2. Origin from **proliferation of rests of Malassez** in the periodontal ligament although the stimulus for this proliferation is unknown;
3. Origin simply **as a primordial cyst of a supernumerary tooth** germ,
4. Origin **from proliferation and cystic transformation of rests of dental lamina,** which are in a post functional state and there fore have only a limited growth potential that is in accordance with the usual small size of the cysts.

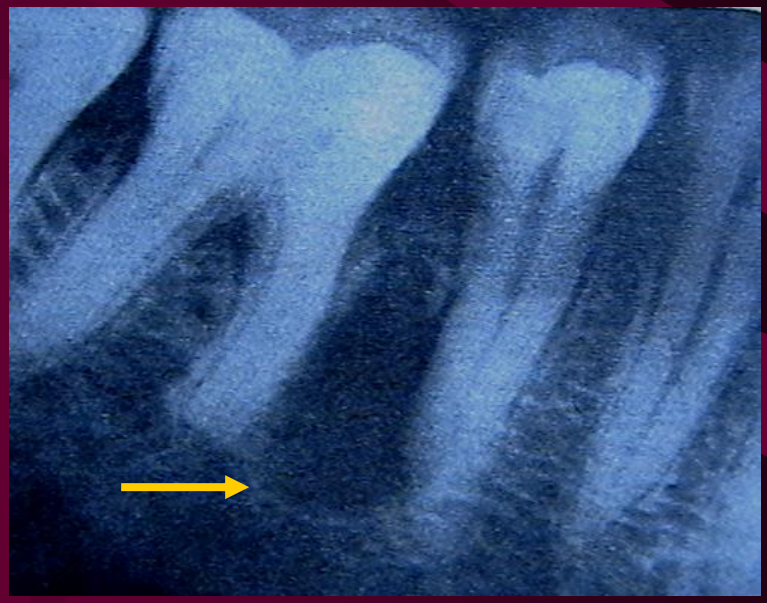
CLINICAL FEATURES:

- Adults
- Males
- Mandibular bicuspid/cuspid/incisor area, Maxillary lateral incisor area.
- Majority of the cases have presented no clinical signs or symptoms and have been discovered during routine radiographic examination of the teeth
- A slight mass may be the symptom.
- Associated tooth is vital, unless otherwise infected.

RADIOGRAPHIC FEATURES:

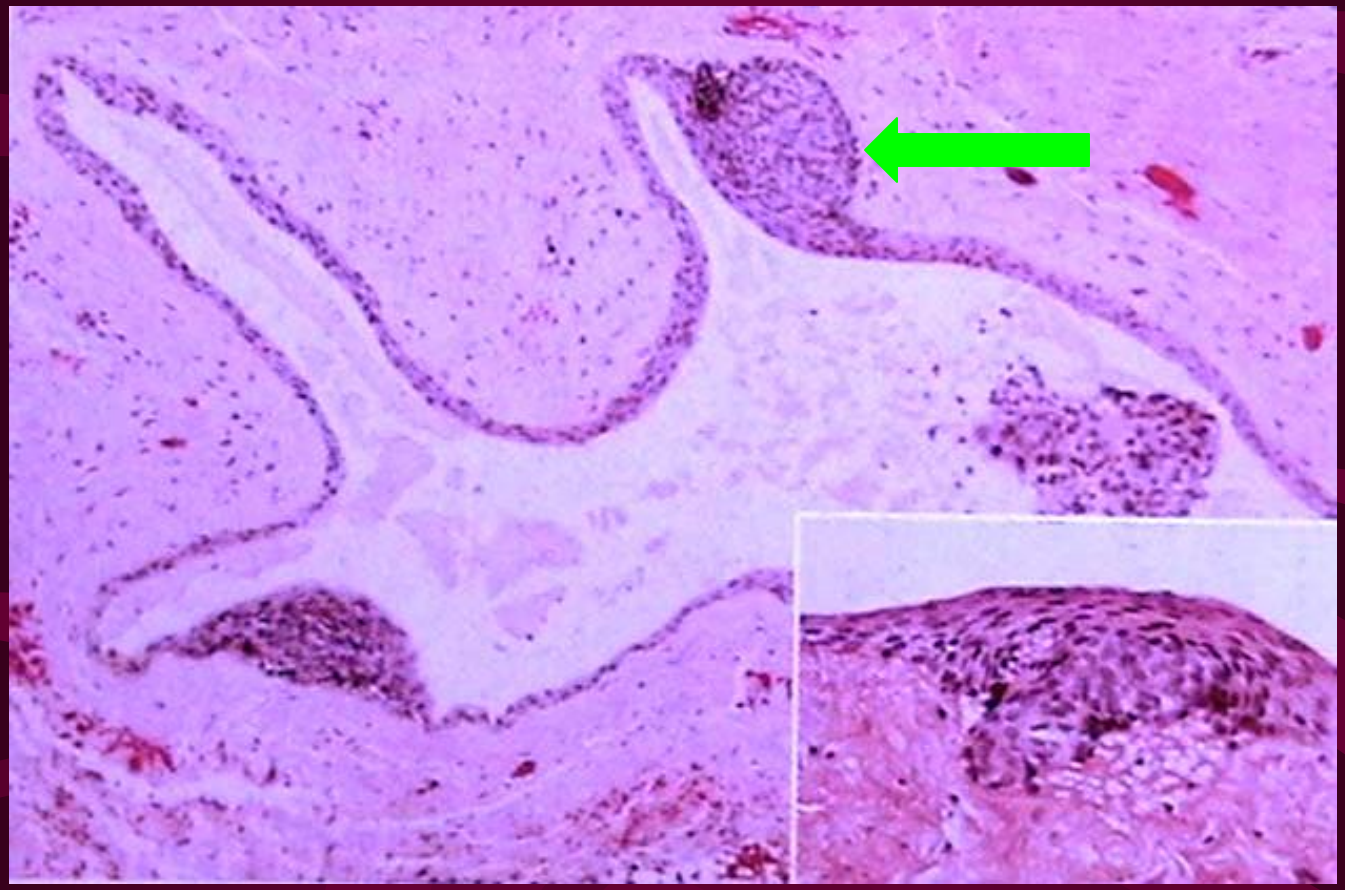
- In periapical radiograph, it is seen as a radiolucent area in apposition to the lateral surface of a tooth root.
- The lesion is usually small, seldom over 1 cm in diameter, and may or may not be well circumscribed.
- The border is definitive and sometimes surrounded by a thin layer of sclerotic border.



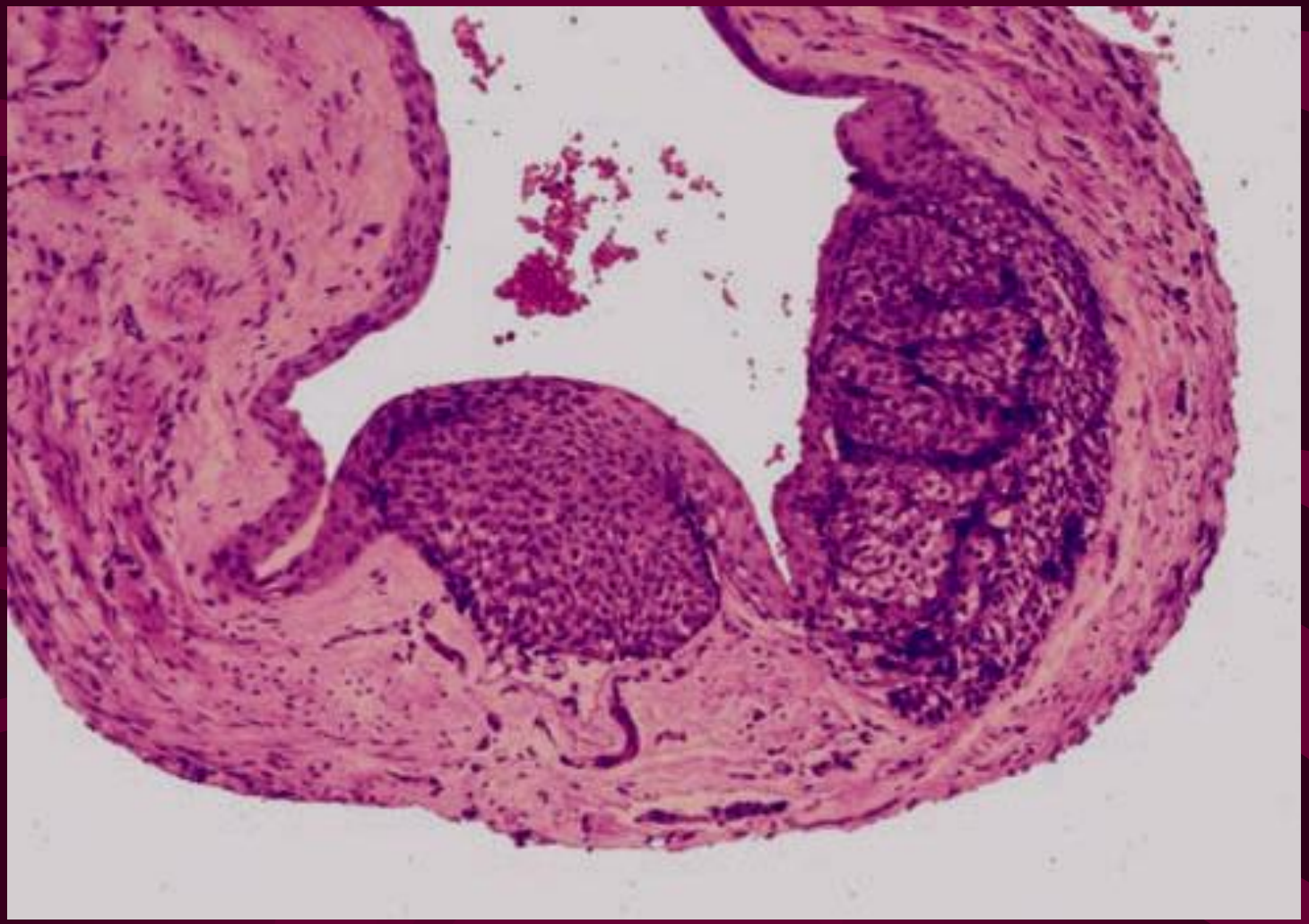


HISTOLOGIC FEATURES:

- The cyst is comprised essentially of a hollow sac with a connective tissue wall lined on the inner surface by a layer of epithelium which may range from a single flat layer of cells to one that is several cells thick, a thin stratified squamous type.
- Cuboidal or even columnar cells may be found composing the lining.
- Many of the lining cells have a clear vacuolated, glycogen rich cytoplasm.
- Focal thickened plaques of proliferating lining cells often project into lumen in areas. these are more prominent in botryoid odontogenic cysts.
- Rests of dental lamina are sometimes found in connective tissue and are frequently composed of glycogen rich clear cells.
- Papillary in-foldings of the lateral periodontal cyst wall are sometimes seen and inflammatory cells may be present.



LATERAL PEROIODONTAL CYSTS: Photomicrograph showing thin epithelial lining with focal nodular thickenings (inset)



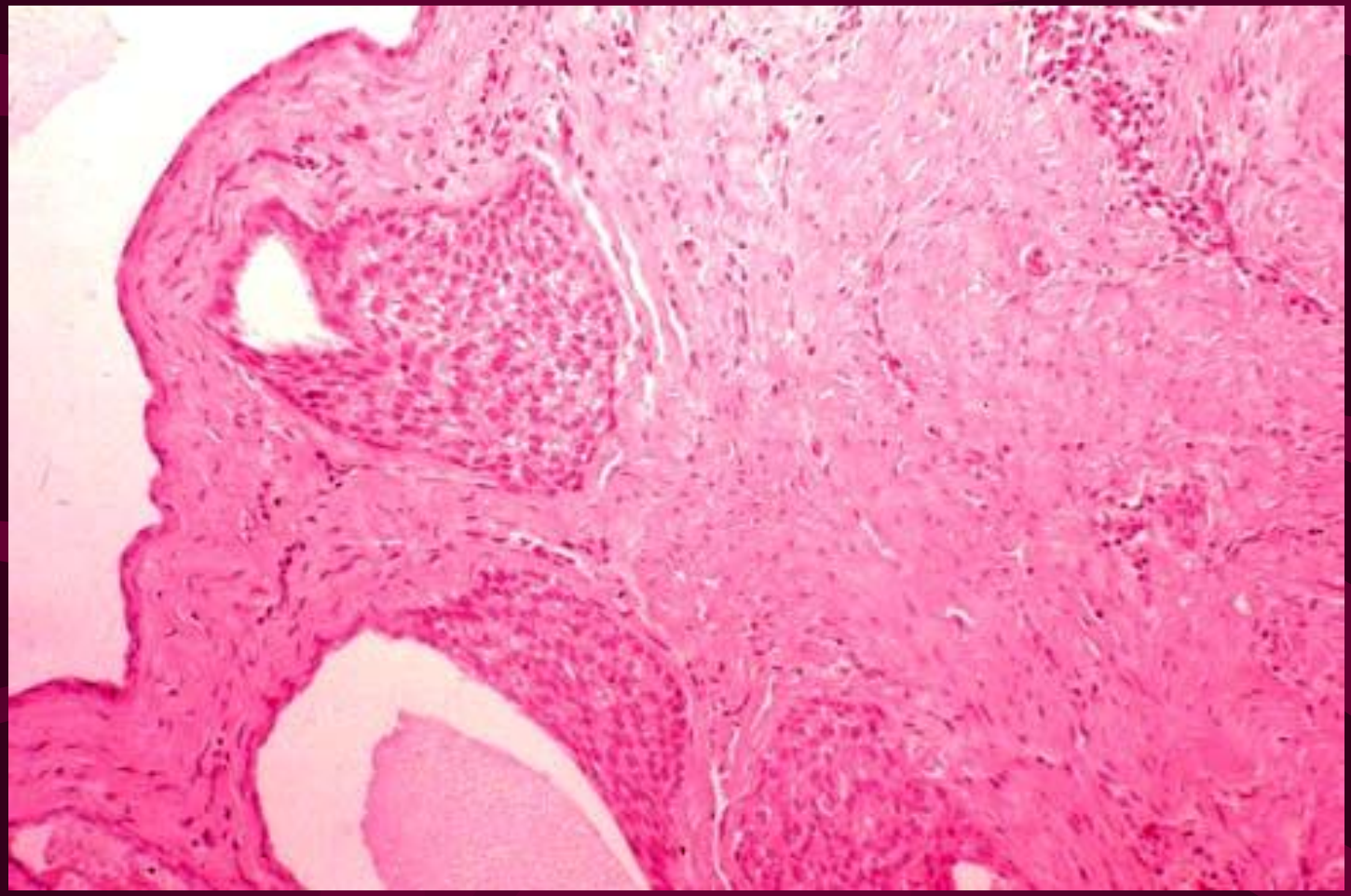
Lateral periodontal cyst which in part has a thin, nonkeratinised stratified squamous epithelial lining resembling reduced enamel epithelium. Two epithelial plaques are seen.

BOTRYOID ODONTOGENIC CYST

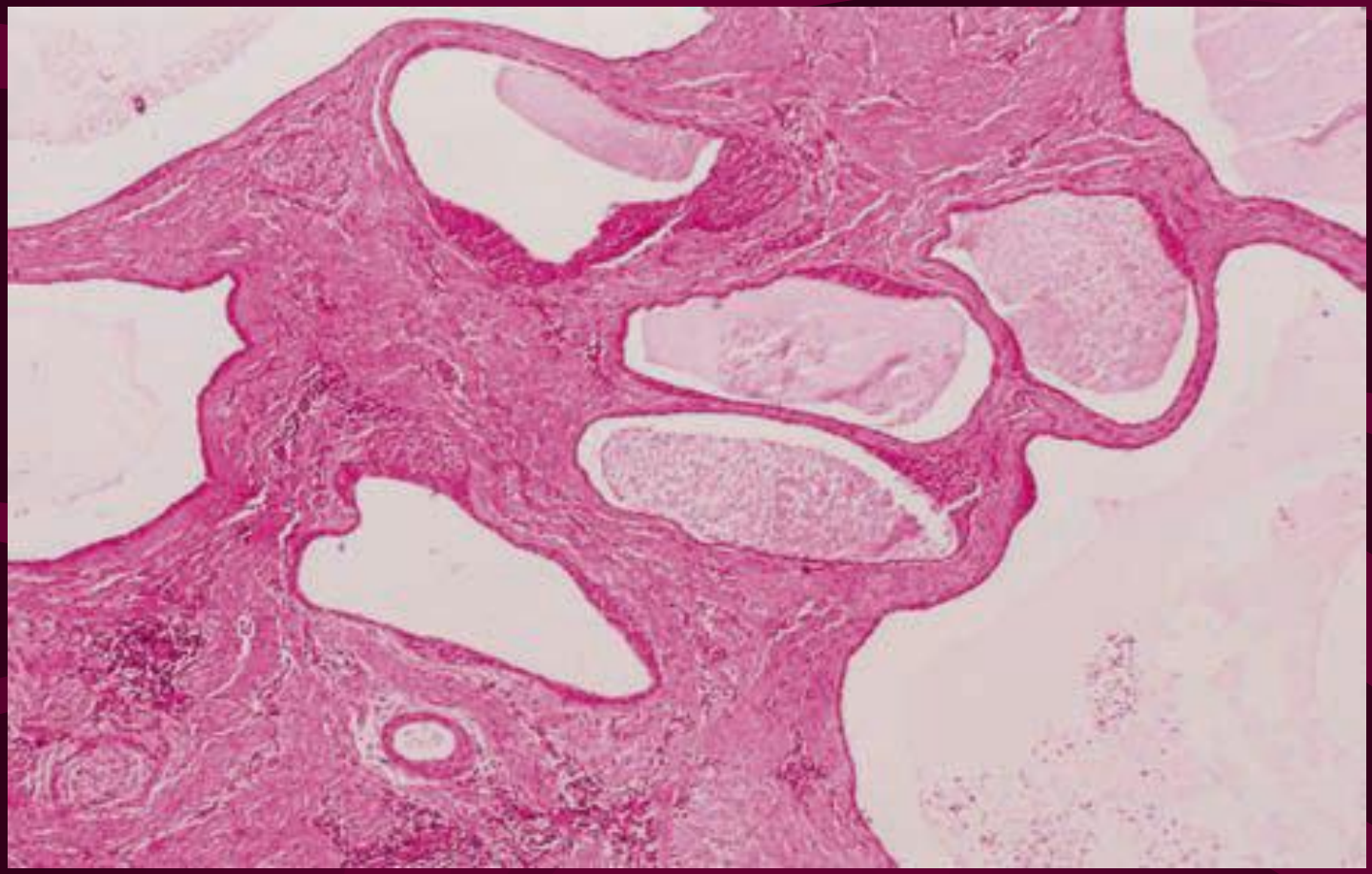
- This unusual form of cyst was reported in 1973 by Weathers and Waldron.
- They described two cases of cysts which had a multilocular pattern apparent radiographically, histologically and even clinically at the time of surgical removal.
- Wysocki suggested that this is simply a polycystic variant of the lateral periodontal cyst developing through cystic transformation of multiple islands of dental lamina rests.
- The clinical features of the two cysts are identical.
- Radiographically botryoid odontogenic cysts appear as multilocular radiolucency because of polycystic nature of the cyst.

The name botryoid odontogenic cyst reflects the gross similarity to that of CLUSTER OF GRAPES.

- **Histological features** of the both the cysts are identical with some exceptions:
    - The focal thickened plaques of proliferating lining cells often project into the lumen are more prominent in botryoid odontogenic cyst.
    - Rests of odontogenic islands in the connective tissue are more numerous in botryoid cyst.



‘Pinched off’ plaques forming further microcysts.



Botryoid odontogenic cyst developing from a lateral periodontal cyst. There are numerous daughter microcysts, many of which also show epithelial plaques. These plaques may be ‘pinched off’ to form granddaughter cysts.

CALCIFYING ODONTOGENIC CYST (COC)

- A unique odontogenic lesion was first described in 1962 by Gorlin and his co-workers under the term “calcifying odontogenic cyst”. The lesion is unusual in that it has some features of a cyst but also has many characteristics of a solid neoplasm.

CLINICAL & HISTOLOGICAL FEATURES:

- The three cystic variants of this lesion were described by Praetorius and his co-workers as:
  1. Type 1 cystic COC
     1. Type A: simple, unicystic type
     2. Type B: odontome producing type
     3. Type C: ameloblastomatous proliferating type
  2. Type 2 Neoplastic COC

- The lesions are not always a cyst; sometimes it was a solid lesion. Furthermore the lesion could present centrally within the jaws or as an extraosseous gingival lesion.

- The various investigators suggested the term “calcifying ghost cell odontogenic tumor” or “cystic calcifying odontogenic tumor”. However, neither of these term is approved.

- The issue of “cyst versus tumor” is not solved totally.

- The COC can be classified mainly into two type
    1. Cystic lesion
    2. Solid neoplastic lesion

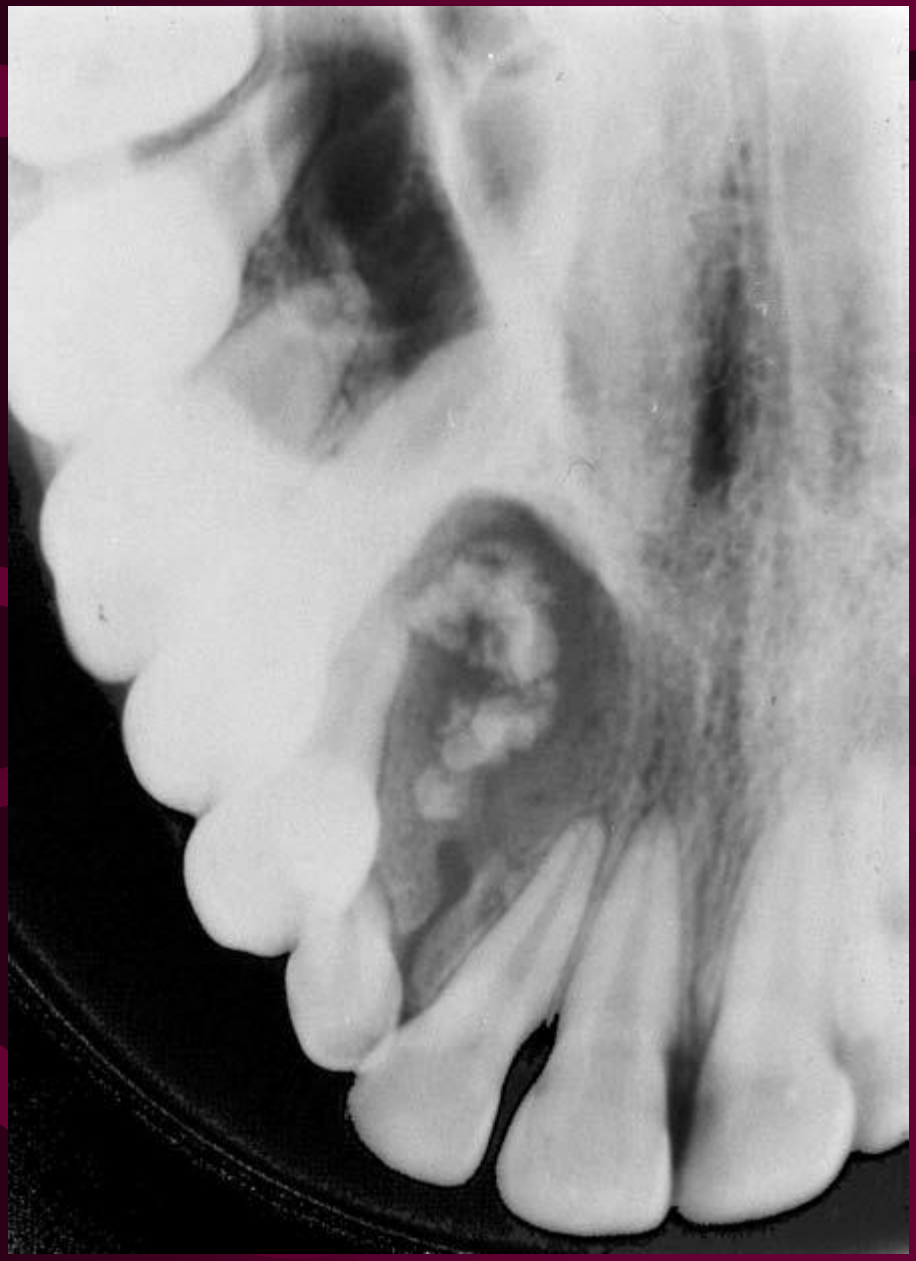
- A third malignant counterpart of the neoplastic lesion may be added.

CLINICAL FEATURES:

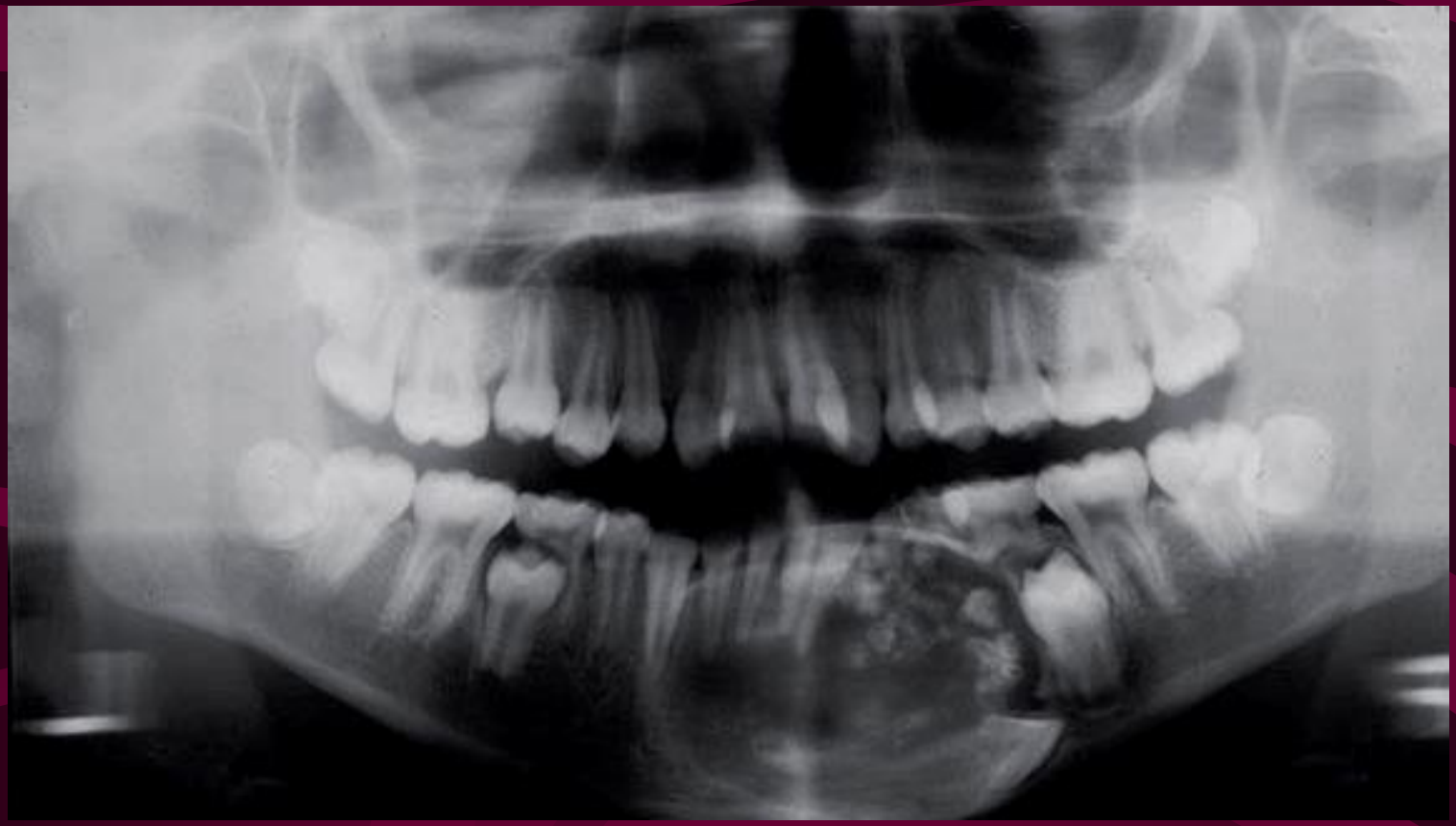
- COC is a rare cyst.
- Predilection for persons in second and third decade of life.
- Equal sex distribution.
- BUCHNER reported maxillary predilection in Asians and mandibular predilection in whites
- Central lesion manifested as a painless swelling
- Peripheral COC present as a painless swelling or nodules on the gingiva.

RADIOGRAPHIC FEATURES:

- COC that occurs centrally in the jaws may present as a painless expansile lesion or it is discovered in routine radiographic examination.
- The lesions may present as radiolucency or radiolucency with radio opaque foci, particularly in cases associated with odontoma.
- Radio opacities representing calcified masses appear as tiny flecks to large masses, depending upon the particular type of COC.
- Expansion is present in some cases.
- Dentinogenic ghost cell tumor is an expansile lesion



COC: A radiolucent lesion with radiopaque foci representing calcified masses.



Radiograph of a calcifying odontogenic cyst with well-demarcated margins extending from the right to the left premolar regions of the mandible. Numerous calcifications are present, some suggestive of small denticles.

HISTOLOGIC FEATURES:

- Cyst lining should show proliferation to the point that it resembles ameloblastoma (i.e. columnar cells over which are stellate and spindled cells in an arrangement that suggest stellate reticulum)

- Within the proliferation of epithelium, cells undergo the characteristic “ghost cell” keratinization.

- The COC is often encountered in association with an odontoma

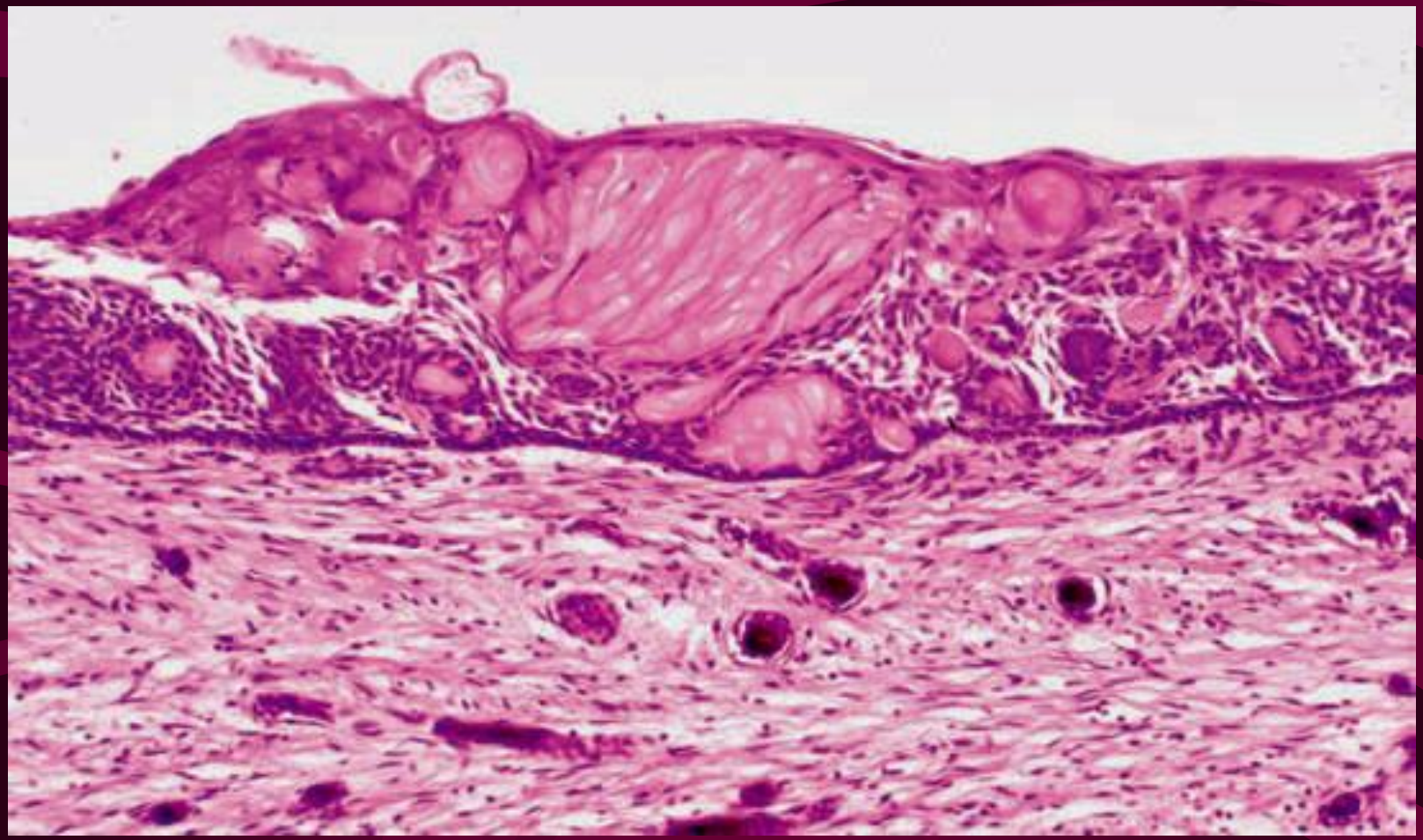
- Sometimes, amorphous, eosinophilic material may be identified in juxtaposition to the proliferative lining epithelium or intermixed with the ghost cells. This has been called “DENTINOID”. When this material is formed in abundance and the lesion may be termed a “DENTINOGENIC GHOST CELL TUMOR”.

- Dystrophic calcifications and ghost cells may be seen.
- The presence of ghost cells within the proliferating odontogenic epithelium is the essential characteristic for the diagnosis.
- The presence of ghost cell keratinization is not sufficient enough for the diagnosis nor is it pathognomonic.
- Ghost cell keratinization is observed in
    - Odontoma,
    - Amelaoblastoma,
    - Amelobastic fibro-odontoma, and in
    - Ameloblastic odontomas.

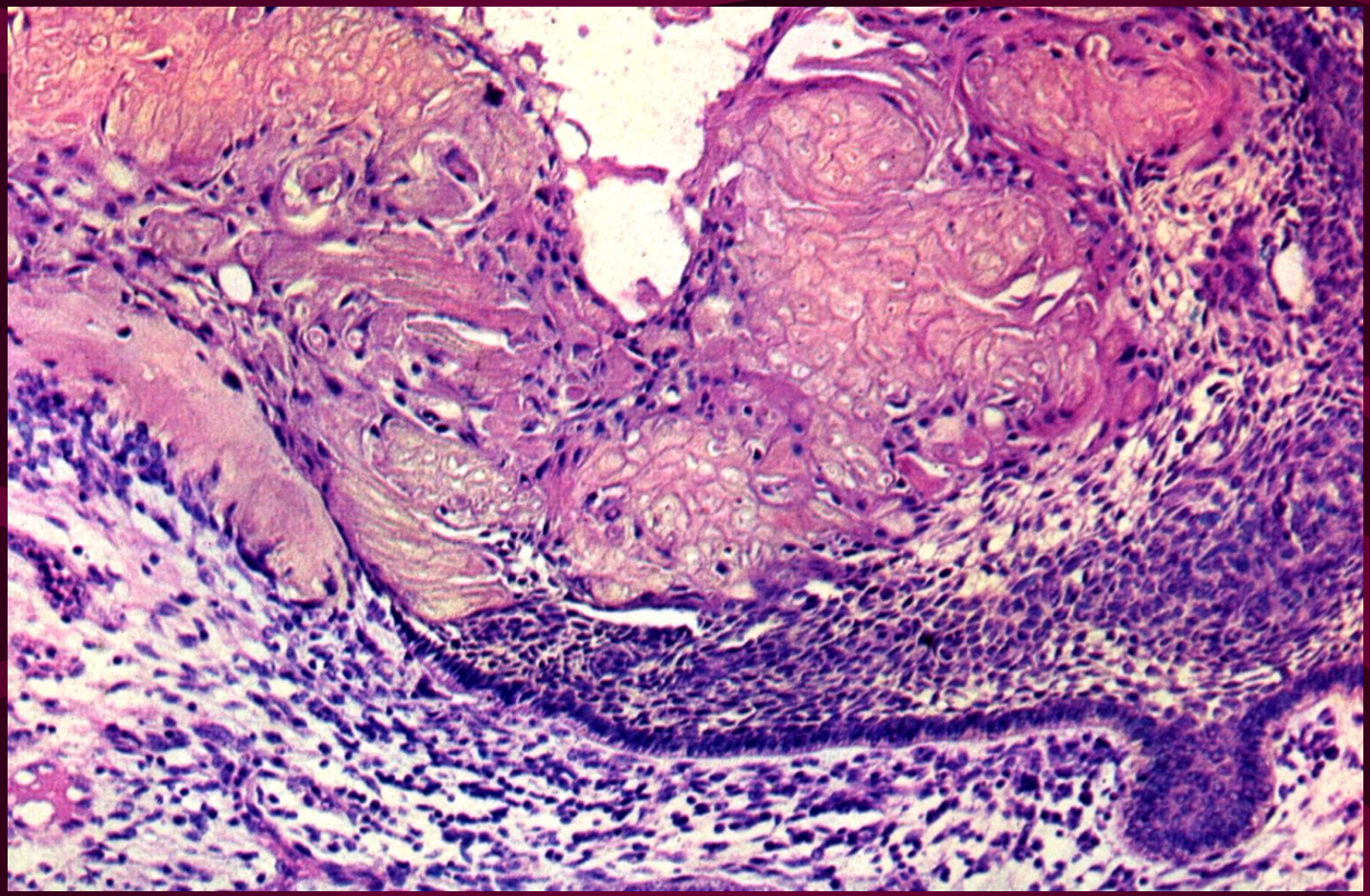
- The ghost cells are characterized by
  - The loss of nuclei,
  - Clear preservation of cellular outline,
  - Resistance to resorption,
  - Induction of foreign body granuloma, and
  - The potential to calcify.

- The ghost cells differ from the normal keratinocytes squames in that they are larger, often vacuolated, and the remnants of nuclear membrane are more prominent.

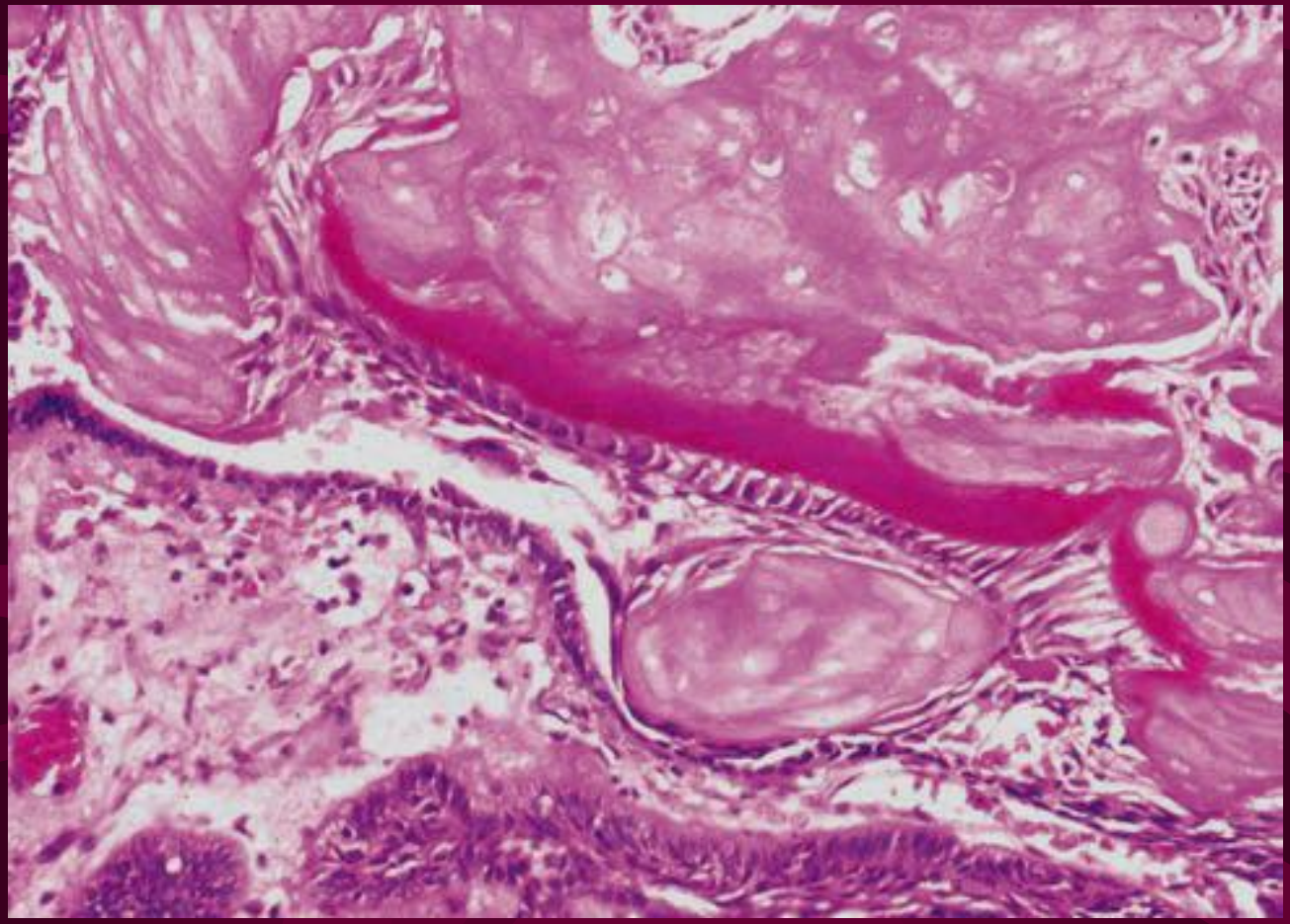
- It is more likely that COC is the oral counterpart of the intracranial craniopharyngioma because both the lesion demonstrate similar immunoreactivity to low and high molecular weight cytokeratins and involucrin, a protein that is characteristic of terminally differentiated keratinocytes.



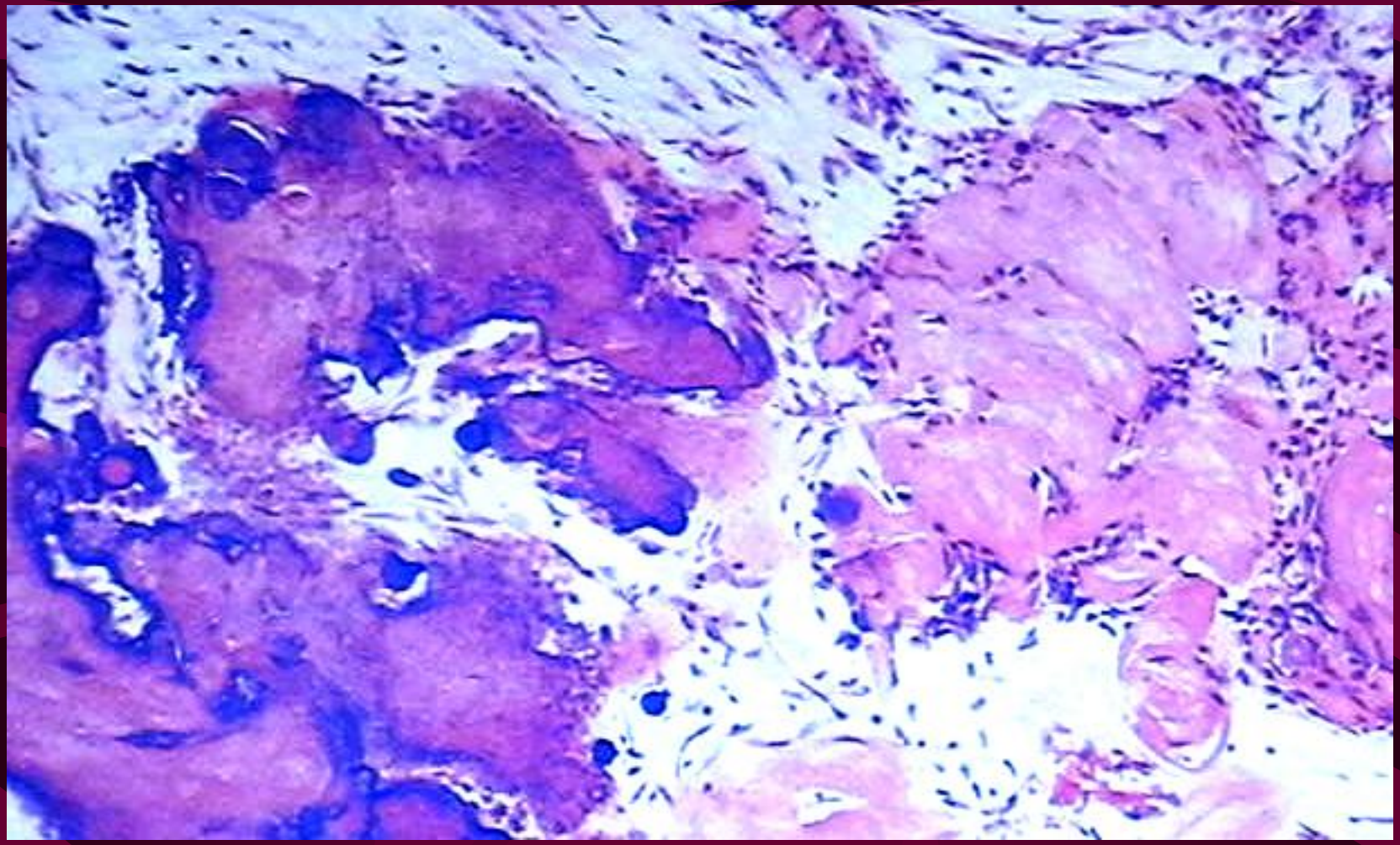
GHOST CELLS in the lining epithelium of calcifying odontogenic cysts



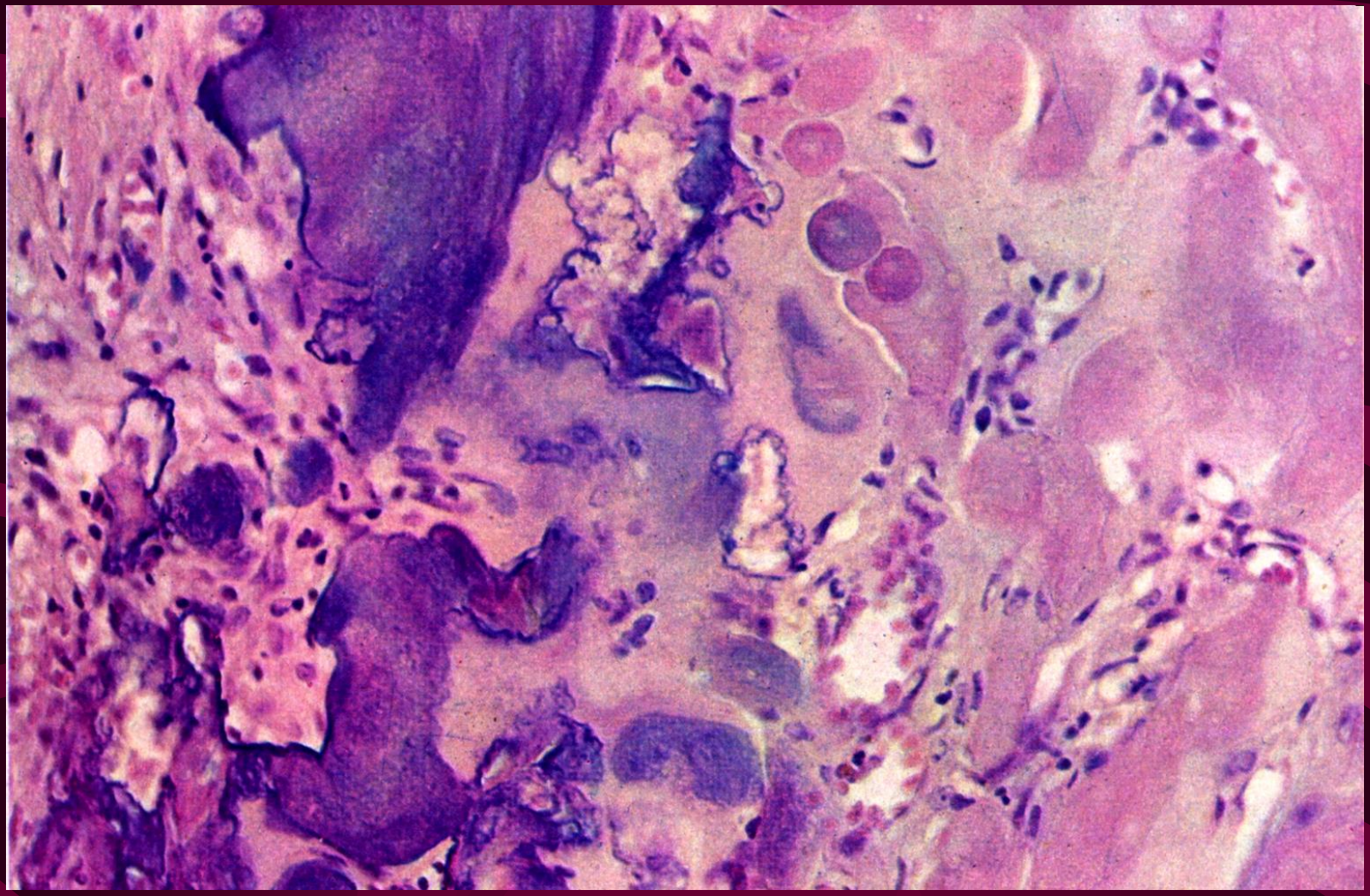
COC: the epithelium showing ghost cells



In this calcifying odontogenic cyst, there are sheets of ghost cells and a focal area in which there has been induction of a strip of dysplastic dentine (dentinoid).



Calcifications in calcifying odontogenic cysts



Calcifications in calcifying odontogenic cysts

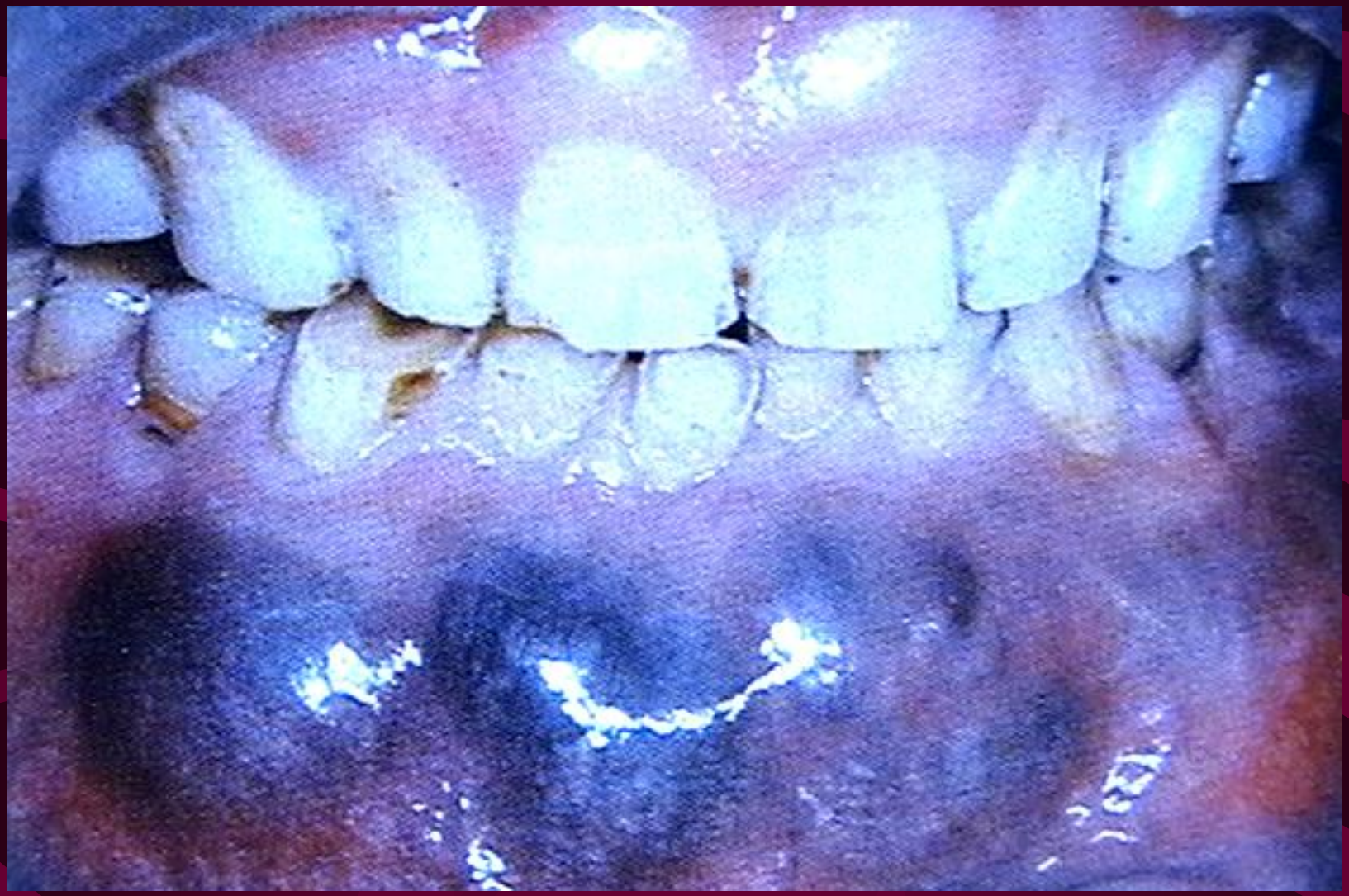
TREATMENT: surgical removal.

GLANDULAR ODONTOGENIC CYST (GOC)

It is a rare and recently recognized cyst that have aggressive behavior.

CLINICAL FEATURES:

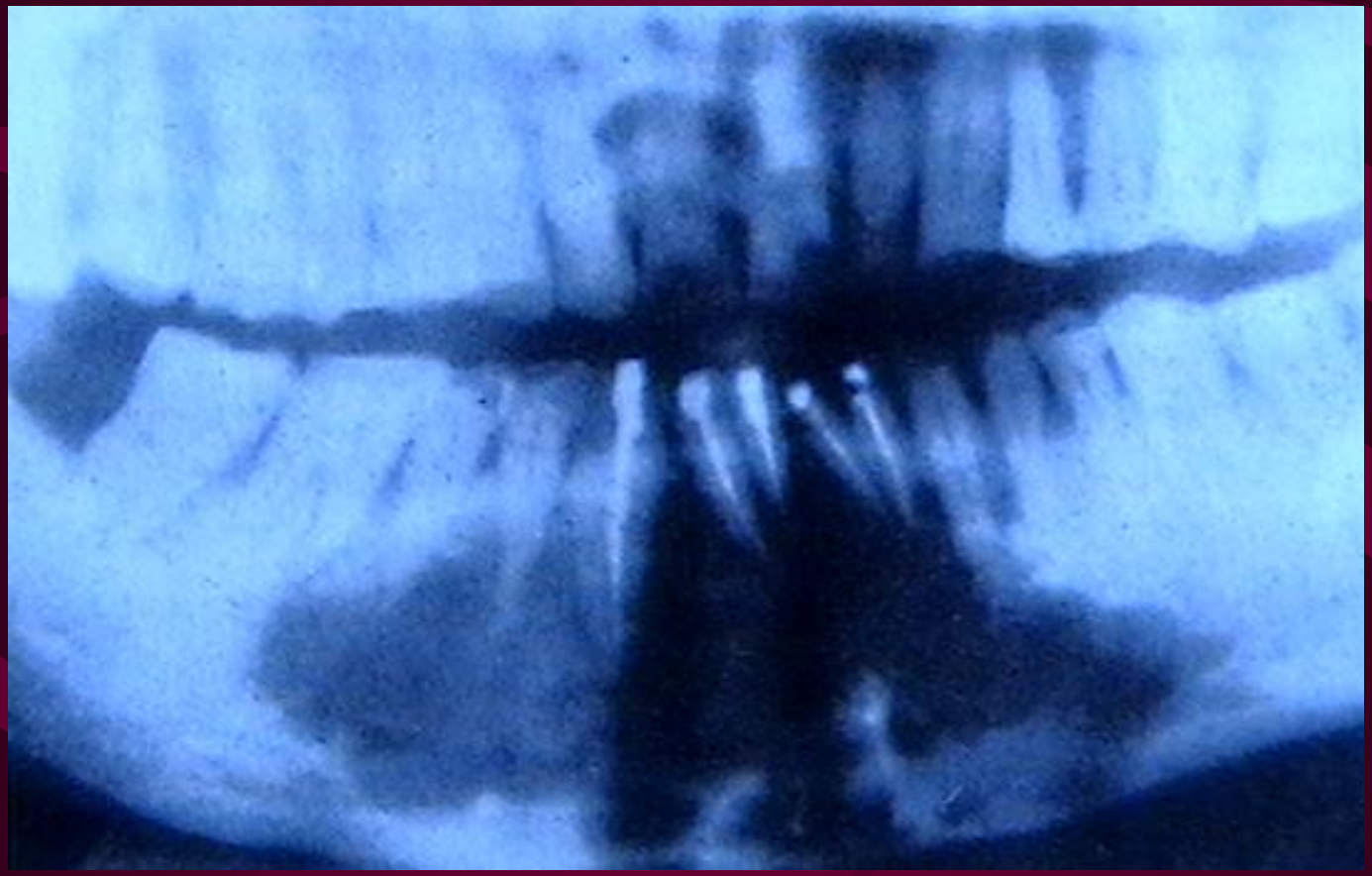
- Middle aged adults
- Mandibular predominance (85% of cases), the cyst has strong predilection for the anterior region of the jaws, and many mandibular lesions will cross the midline.
- Small cyst may be asymptomatic, but large cysts often produce clinical expansion, which sometimes can be associated with pain or paresthesia.



GLANDULAR ODONTOGENIC CYST: A large expansile lesion of anterior mandible.

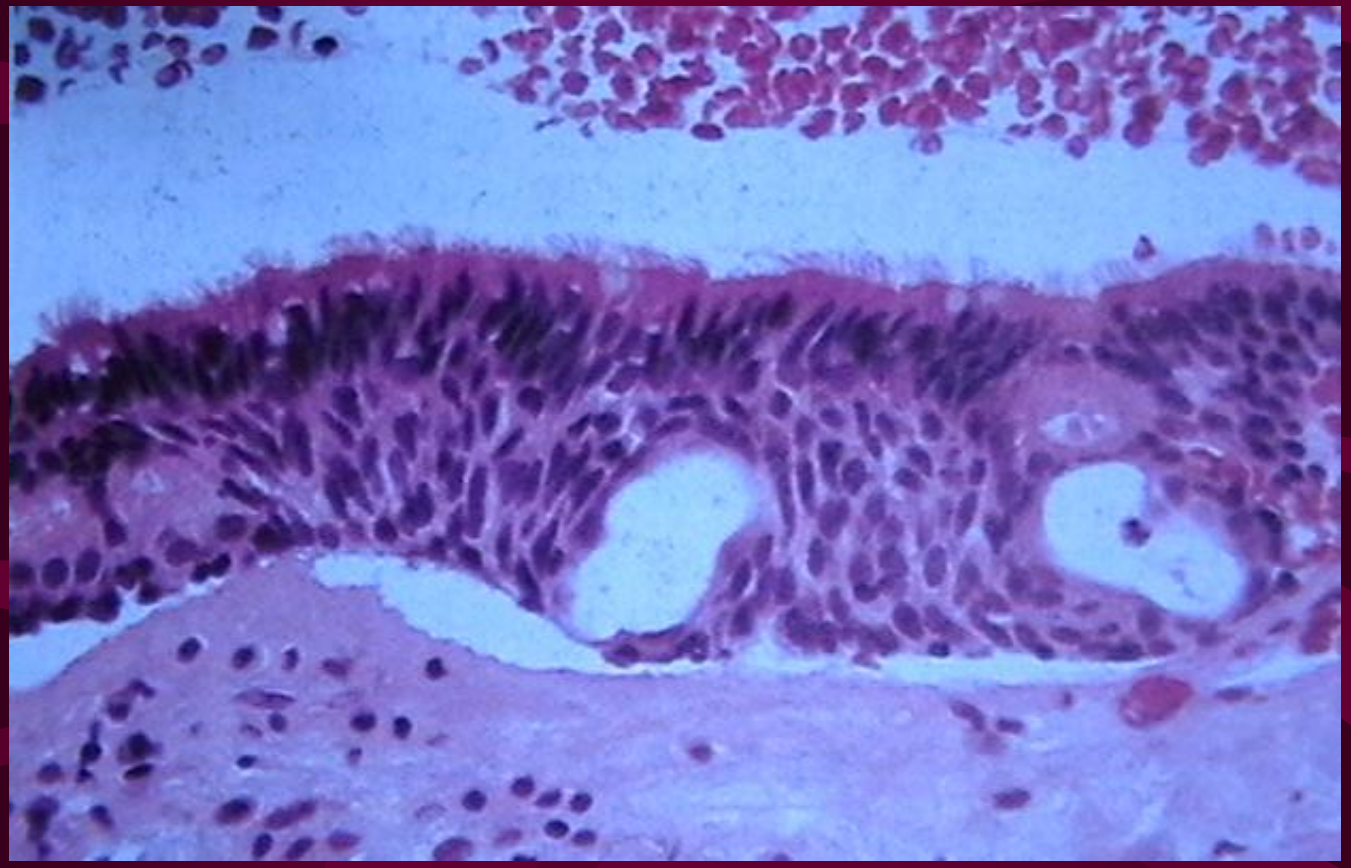
RADIOGRAPHIC FEATURES:

- GOC presents as a unilocular or more commonly, a multilocular radiolucency.
- The margins of the radiolucency are usually well defined with a sclerotic rim.



HISTOLOGIC FEATURES:

- The cyst is lined by squamous epithelium of varying thickness with flat interface between epithelium and CT.
- The epithelial cells may be cuboidal to columnar and have an irregular and sometimes papillary surface.
- The fibrous cyst wall is usually devoid of any inflammatory cell infiltrate.
- The mucous cells may or may not be present within the epithelium.
- In focal areas, the epithelial lining cells may form spherical nodules, similar to those seen in lateral periodontal cysts.



GLANDULAR ODONTOGENIC CYST: the cyst is lined by stratified squamous epithelium that exhibits surface columnar cells with cilia. Small microcysts and clusters of mucous cells are present.

TREATMENT:

- Enucleation or Curretage.
- Recurrence is observed in 30% or more cases.

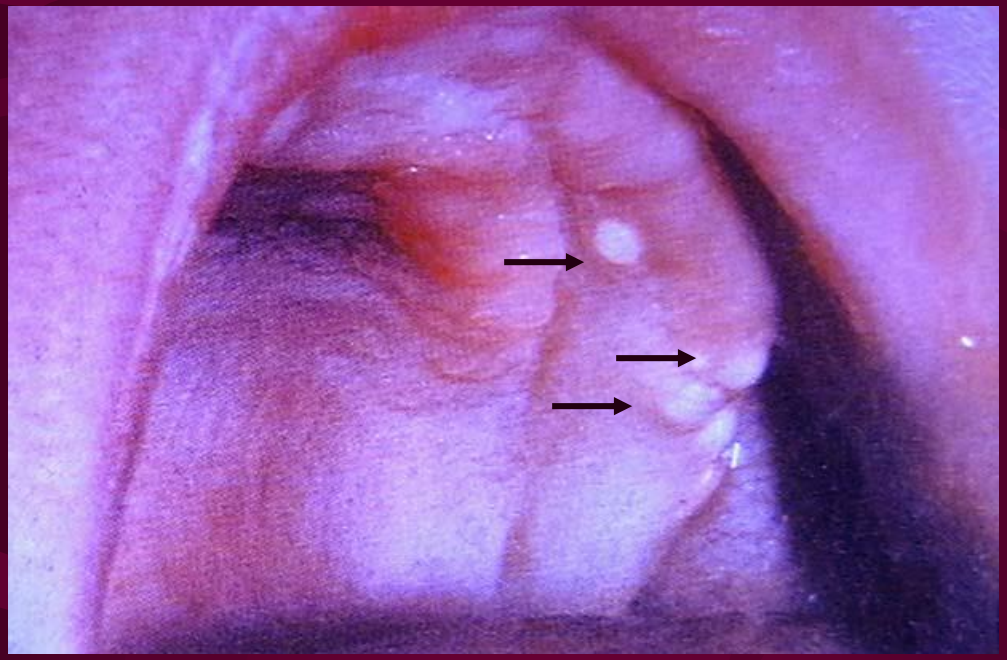
GINGIVAL CYST OF NEW BORN

- Gingival cyst of new born are small, superficial, keratin-filled cysts that are found on the alveolar mucosa of infants.
- These cysts arise from remnants of the dental lamina.
- They are common lesion, have been reported in half of all new born. However, as they spontaneously rupture into the oral cavity, the lesions seldom are noticed or sampled for biopsy.

CLINICAL FEATURES:

These are multiple, occasionally solitary, nodules on the alveolar ridge of new born or infants, which represent cysts originating from remnants of the dental lamina.

The cysts appear as small usually multiple whitish nodules on the mucosa overlying the alveolar processes of neonates.



- Sometimes it appears blanched from internal pressure.
- The individual cysts are usually no more than 2-3 mm in diameter.
- The maxillary alveolus is more commonly involved than the mandibular.

HISTOPATHOLOGICAL FEATURES:

- A thin flattened epithelial lining with a parakeratotic surface with lumen containing desquamated keratin, occasionally containing inflammatory cells.
- Dystrophic calcification and hyaline bodies of Rushton are also sometimes found in this lesions.

TREATMENT:

- Usually no treatment is indicated for gingival cysts of the new born because the lesions spontaneously involutes as a result of the rupture of the cysts and resultant contact with oral mucosal surface.

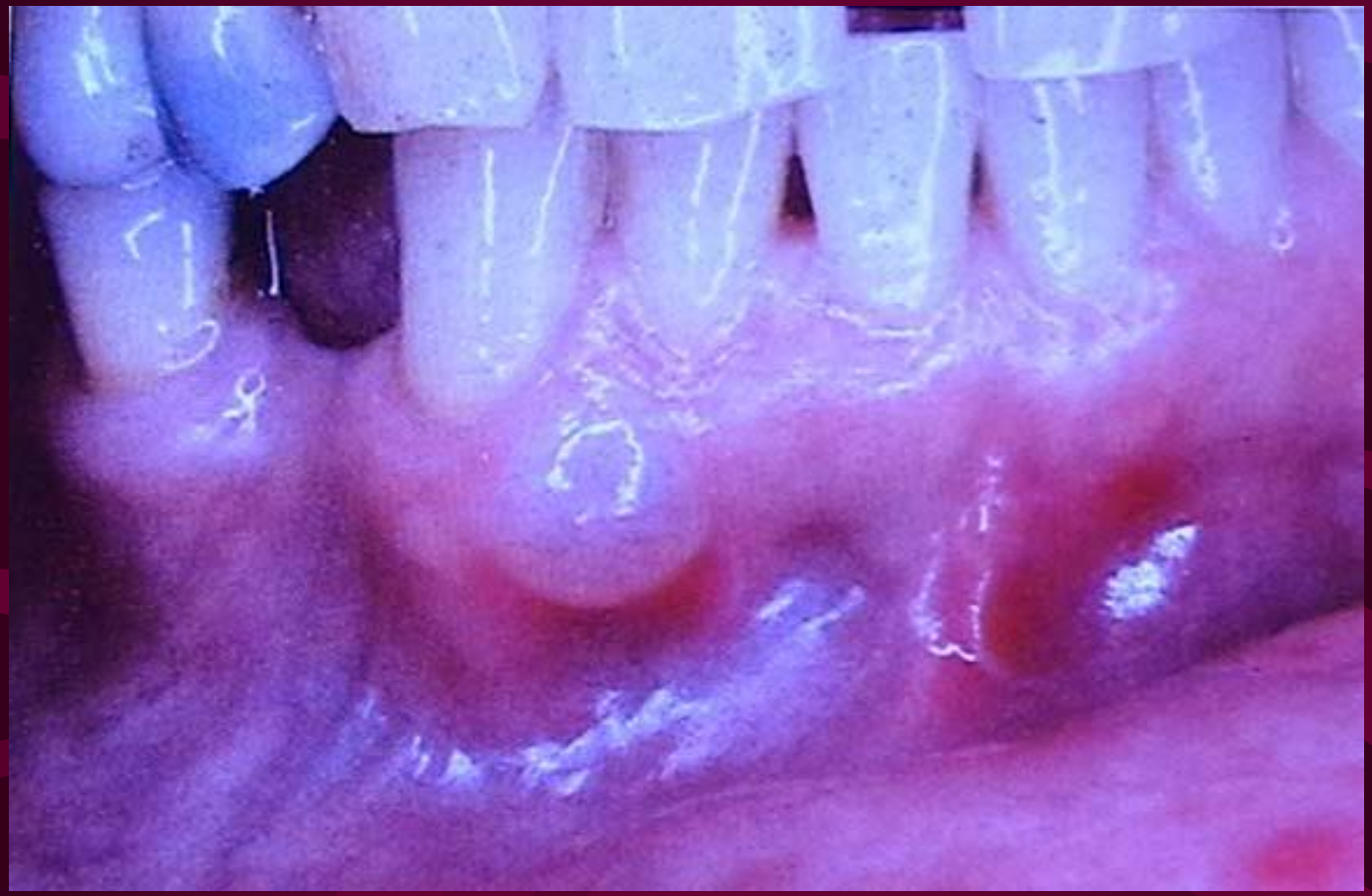
- The lesions are rarely seen after 3 months of age.

GINGIVAL CYST OF ADULT

- The gingival cyst of adult is an uncommon lesion.
- It is considered to represent the soft tissue counterpart of the lateral periodontal cyst, being derived from rests of the dental lamina (rest of Serres).
- The diagnosis of gingival cyst of the adult should be restricted to lesion with same histopathologic features as those of the lateral periodontal cyst.

CLINICAL FEATURES:

- Fifth to sixth decades.
- No gender predilection.
- A striking predilection to occur in the mandibular canine and premolar area. They are almost invariably located on facial gingiva or alveolar mucosa.
- Clinically, the cysts appear as painless, domelike swelling, usually less than 0.5 cm in diameter, although rarely they may be some what larger.
- They are often bluish or bluish gray.



Gingival cyst of adult: photograph showing tense, fluid filed swelling on the facial gingiva.

RADIOGRAPHIC FEARUES:

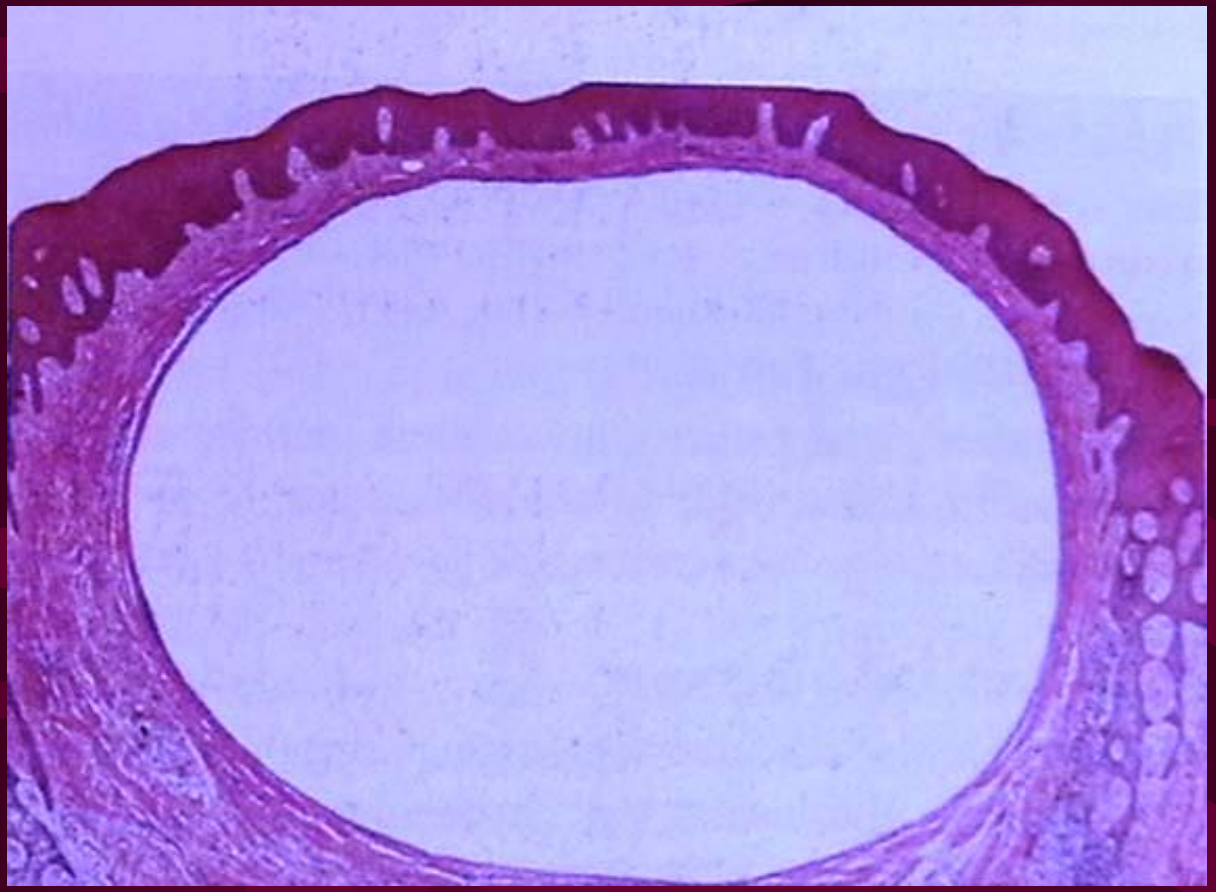
- The cyst may demonstrate a superficial “cupping out” of the alveolar bone, which is usually not detected on a radiograph but is apparent when the cyst is excised.

- If more bone is missing, one could argue that the lesion may be a lateral periodontal cyst that has eroded the cortical bone rather than a gingival cyst that originated in the mucosa.

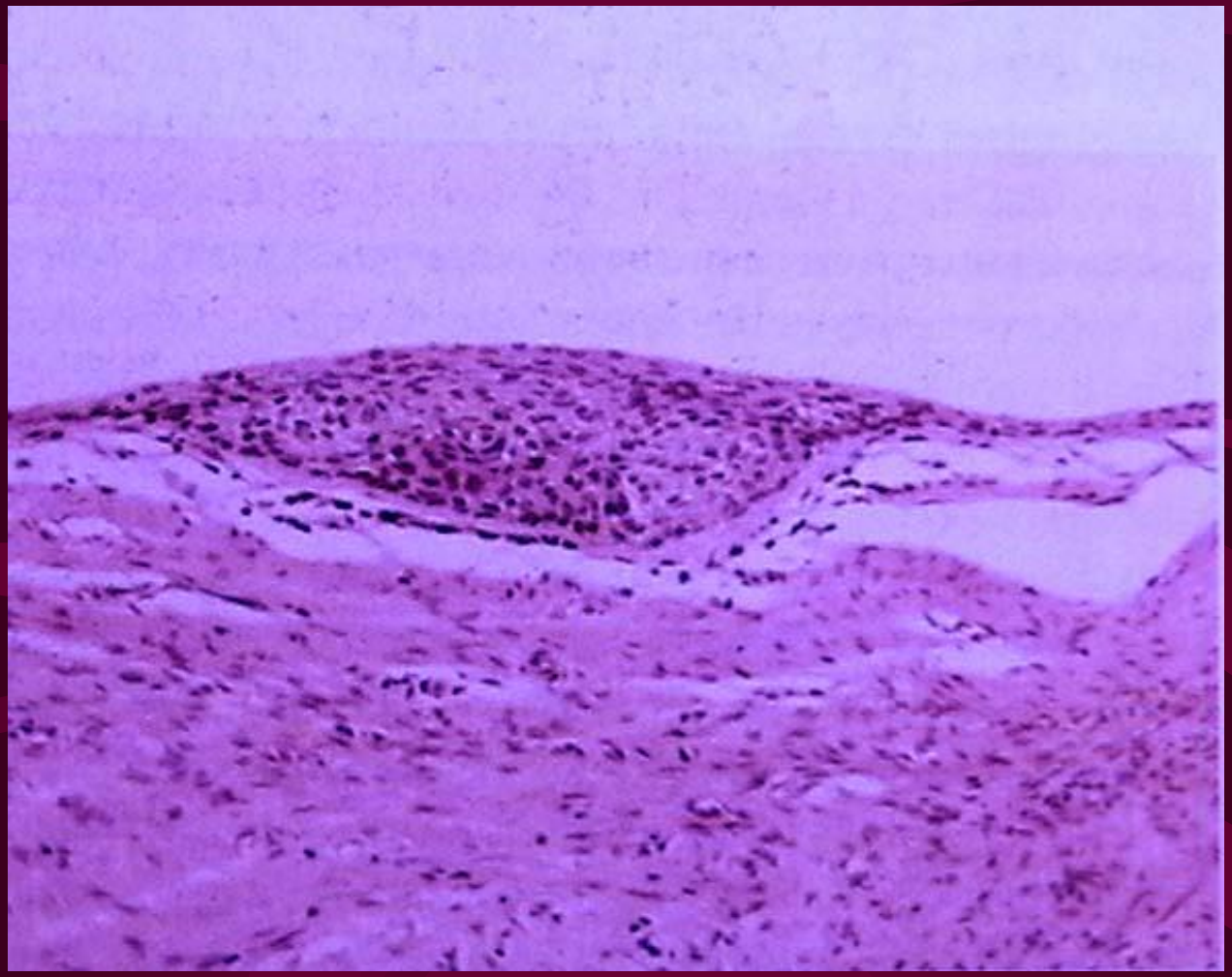
HISTOPATHOLOGIC FEATURES :

- A thin flattened epithelial lining with or without focal plaques that contain clear cells.

- Small nests of these glycogen rich clear cells, which represent rests of the dental lamina, also may be seen in the connective tissue.



Low power photomicrograph of gingival cyst of adult showing a thin walled cyst in the gingival soft tissue.



High power photomicrograph showing a plaque like thickening of the epithelial lining of gingival cyst of adult.

TREATMENT: simple surgical excision.

B. INFLAMMATORY CYSTS

PERIAPICAL CYST (RADICULAR CYST ; APICAL PERIODONTAL CYST)

- Radicular cyst is the most common odontogenic cyst.
- It arises as a common sequel of periapical granuloma.

PATHOGENESIS:

- The initial reaction leading to cyst formation is proliferation of epithelial rests in periapical granuloma.
- The sources of the epithelium usually epithelial rest of Malassez but it may also derived from
  - crevicular epithelial cells of periodontal pocket,
  - maxillary sinus lining when periapical lesion communicate with sinus wall or
  - epithelial lining from fistulous tract.
- The inflammation in periapical area appears to increase the production of keratinocyte growth factors by periodontal stromal cells leading to increase proliferation of normally quiescent epithelial in the area.

- As proliferation continues epithelial mass increase in size by division of peripheral cells thus the cells in central portion of mass become separated further & further form their source of nutrition the capillaries & tissue fluid of the connective tissue.

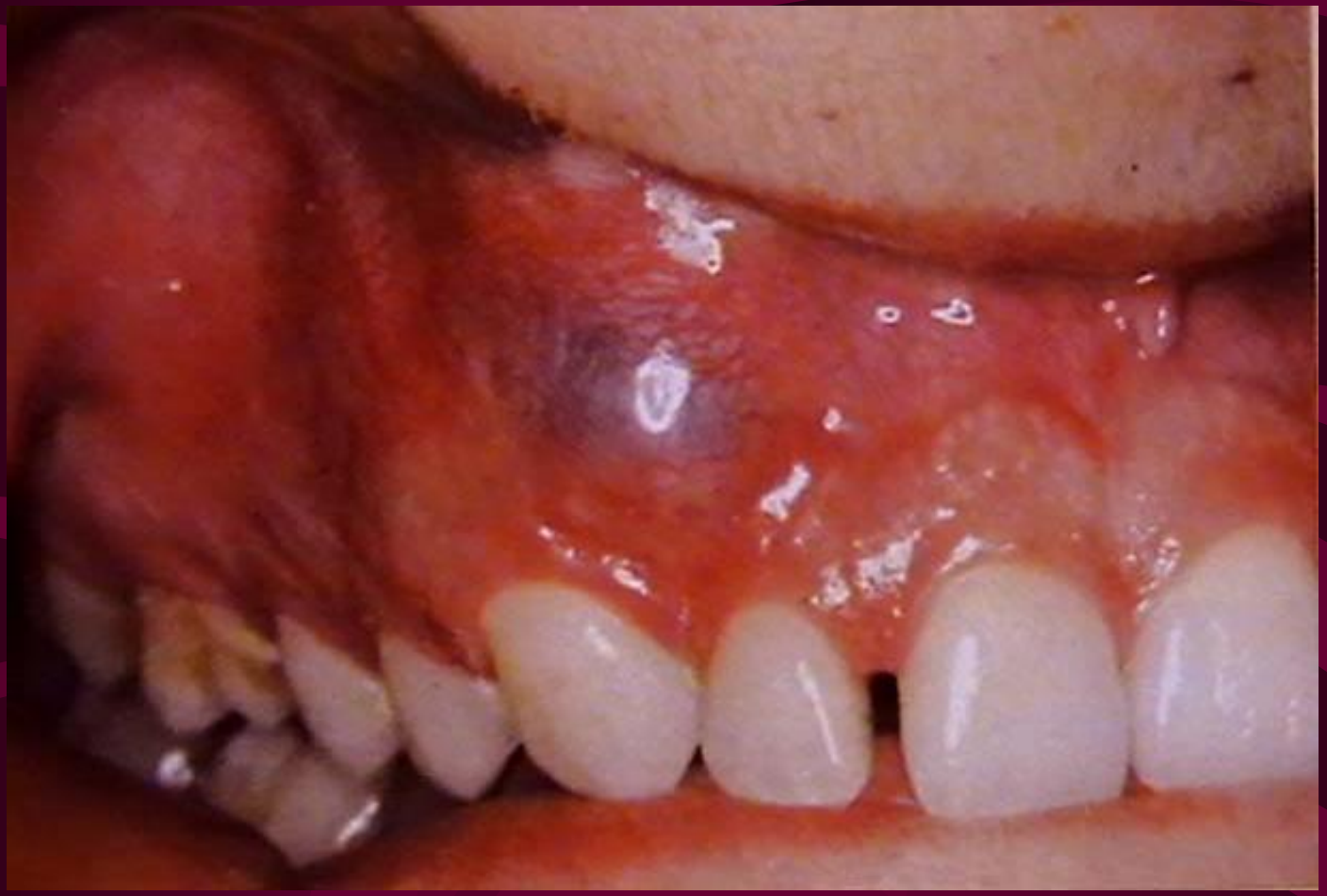
- The cells in center of mass eventually degenerate become necrotic & liquefy. This creates an epithelium-lined cavity filled with fluid - the periapical cyst.

- The mechanism of cyst growth – As the epithelial cells desquamates in cyst lumen the protein content of cyst lumen increases. Fluid from surrounding area enters in the cyst lumen in attempt to equal osmotic pressure & enlargement of cyst occurs.

CLINICAL FEATURES:

- The majority of cases are asymptomatic. The tooth is seldom painful or sensitive to percussion.

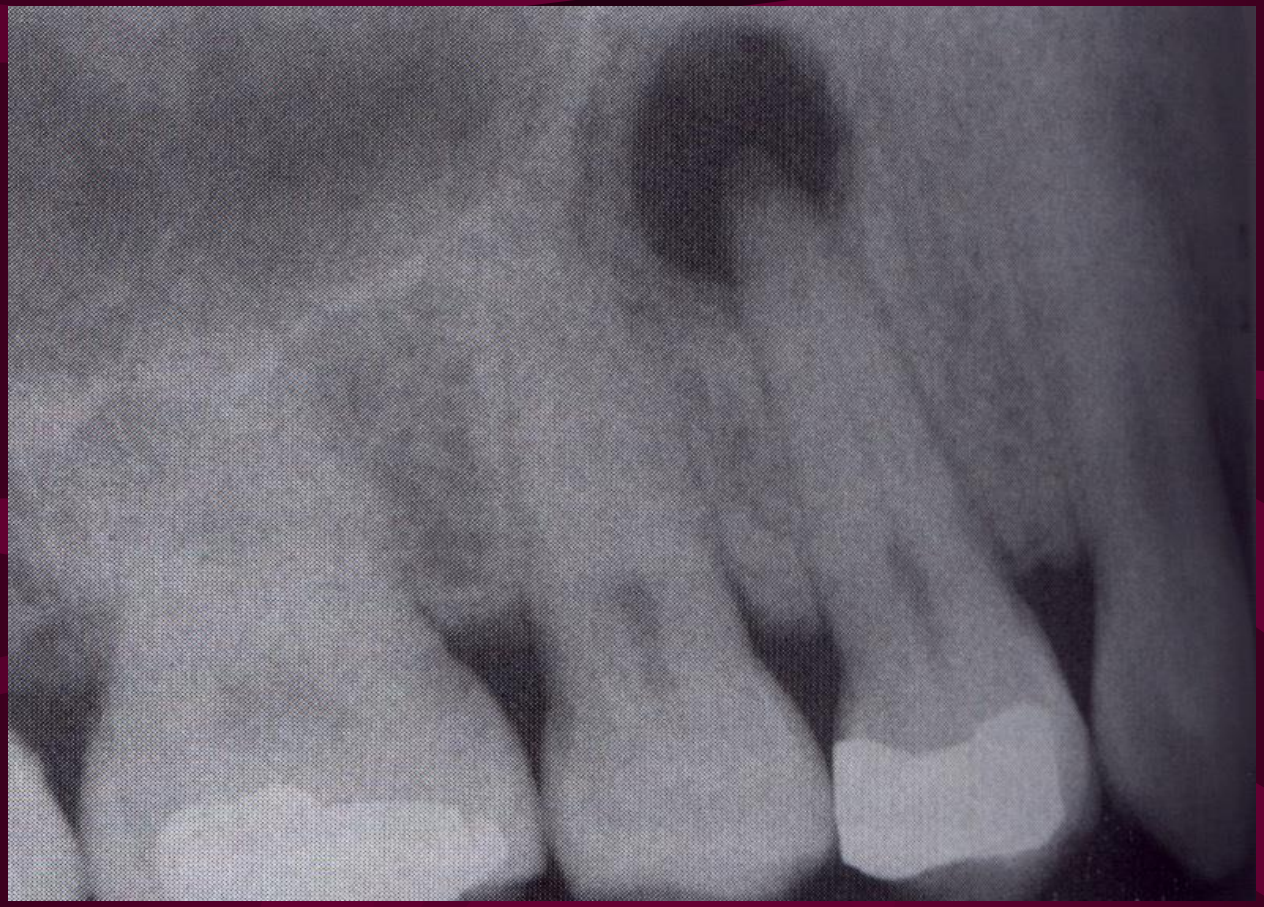
- The cyst is rarely of large size to produce expansion of bone



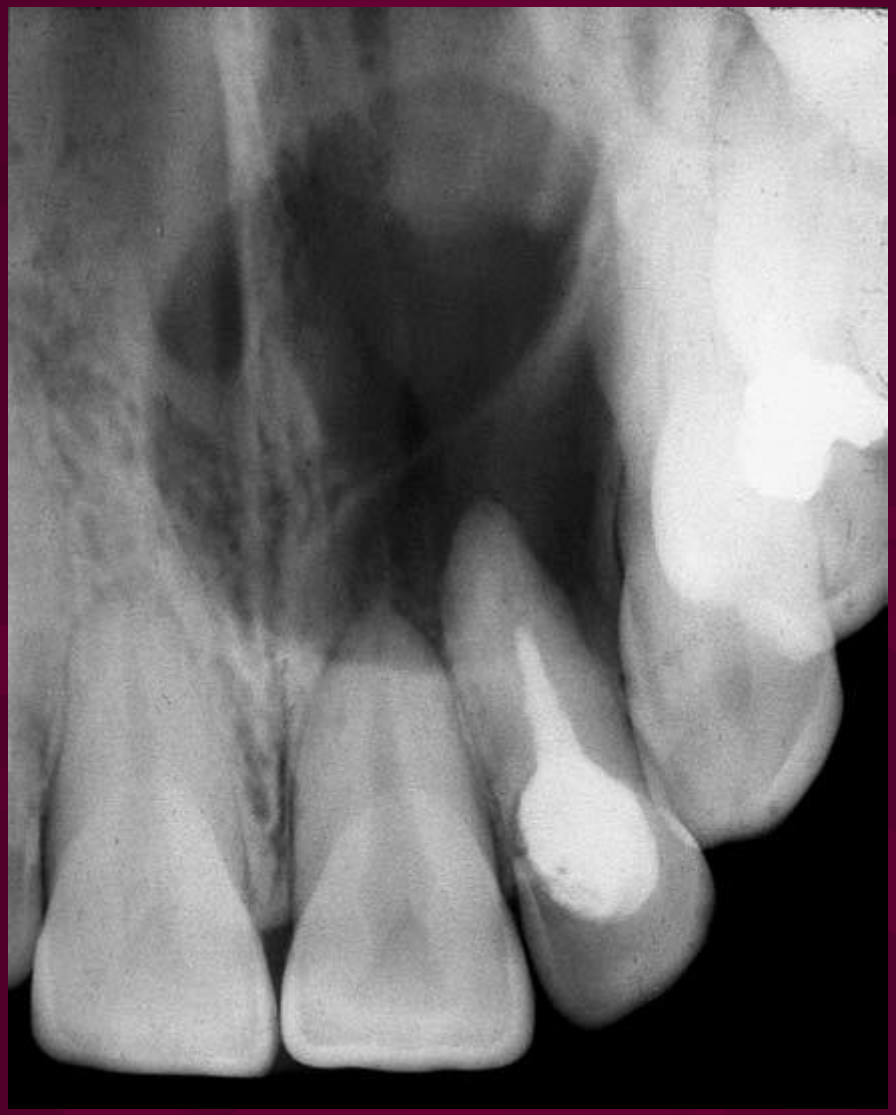
RADICULAR CYST: a smooth rounded, bluish swelling in relation with maxillary lateral incisor.

RADIOGRAPHIC FEATURES:

- In most cases it is identical to periapical granuloma.
- It is impossible to distinguish b/w periapical granuloma & a cyst by radiograph only.
- The cyst may be of greater size because of longer duration



RADICULAR CYST: a unilocular radiolucency in relation with the apex of maxillary first premolar.



Radiograph of a radicular cyst. The lesion is a welldefined radiolucency associated with the apex of a non-vital root filled tooth.

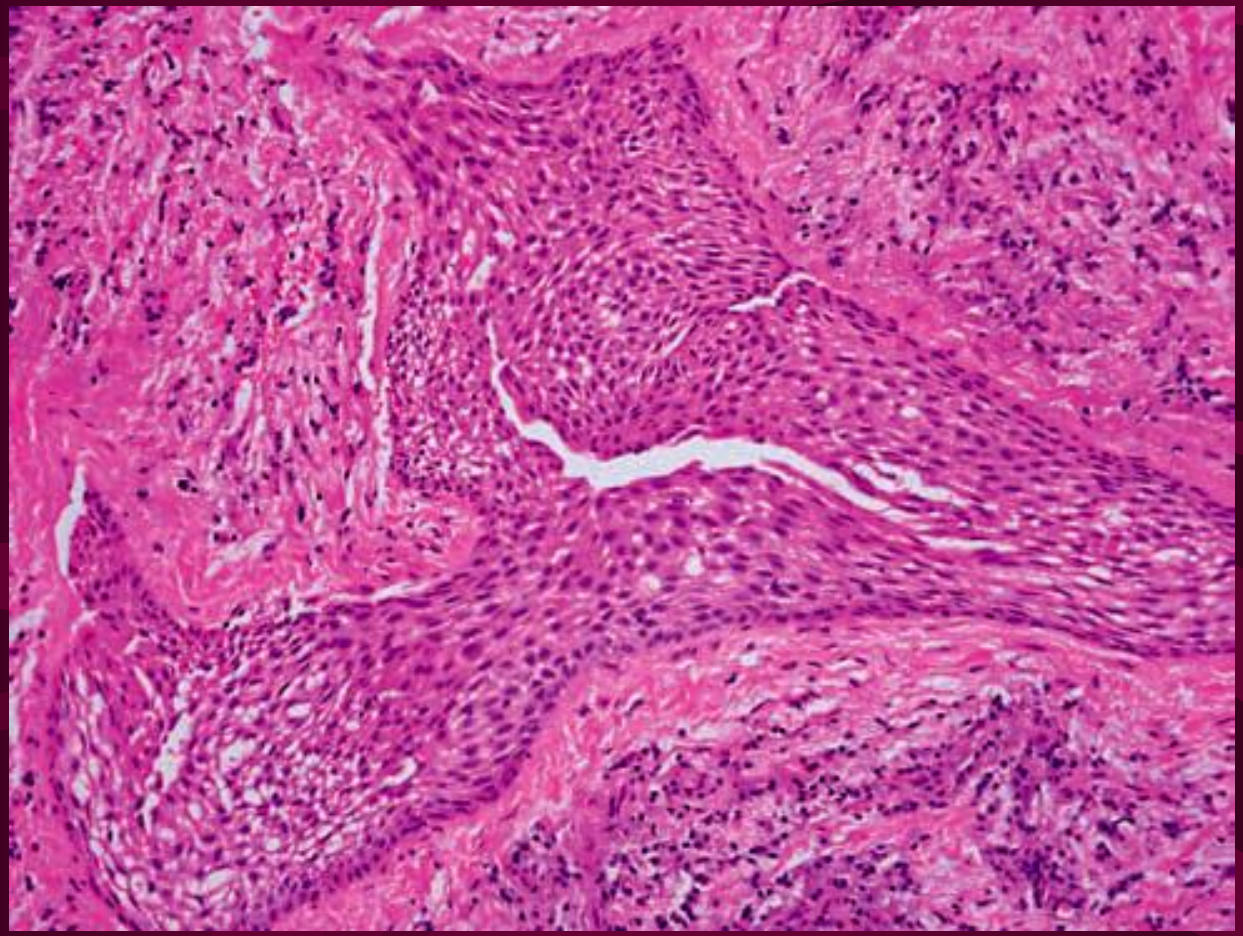
HISTOLOGICAL FEATURES:

- The epithelial lining is usually stratified squamous. Rarely when periapical lesion communicates with maxillary sinus the epithelial lining may be pseudo-stratifies ciliated columnar type.

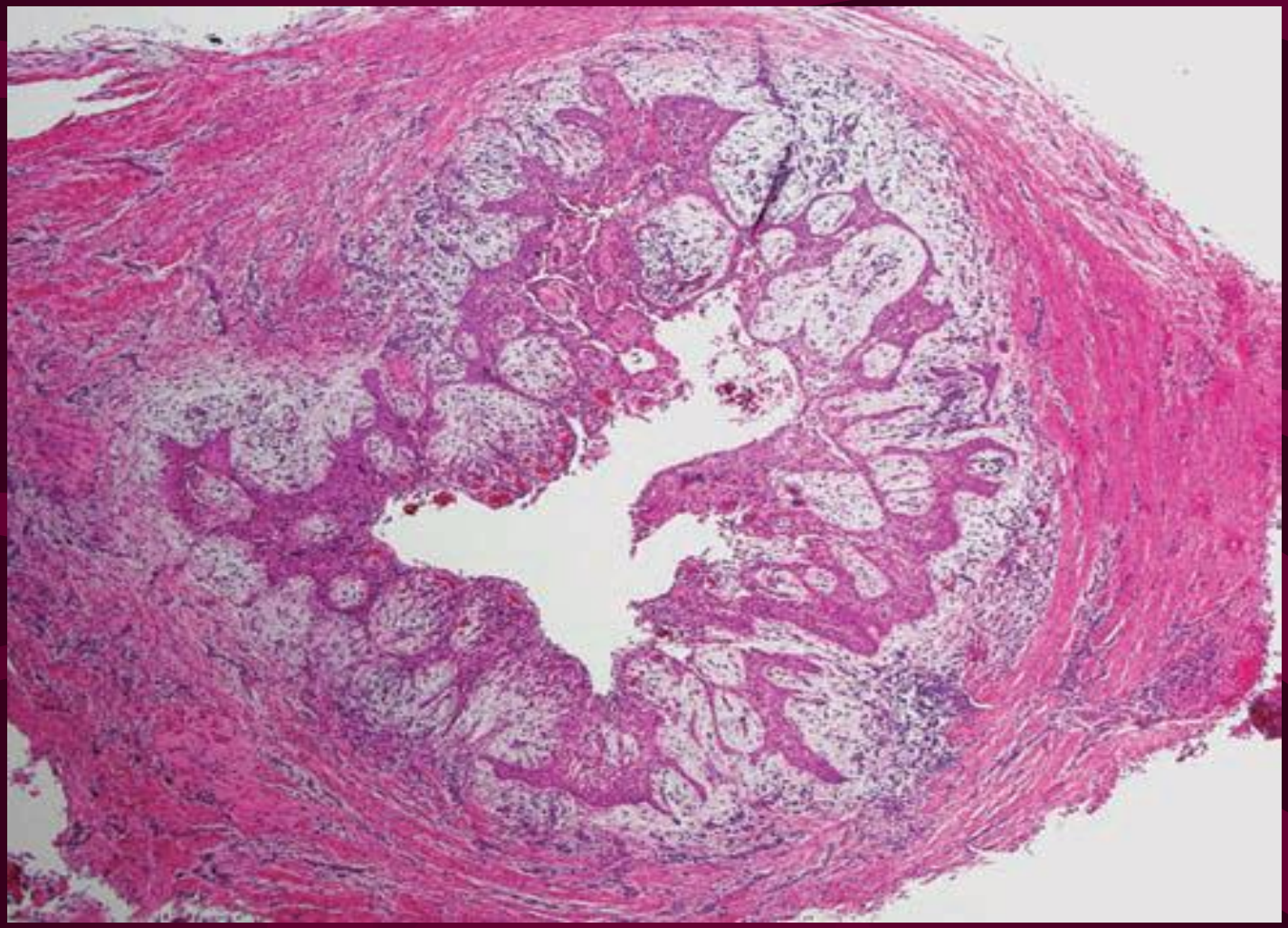
- The epithelial lining varies in thickness from few cells thick to many cells layer thick.

- The epithelial connective tissue (C.T.) interface is usually flat. Rete peg formation may occur in areas of inflammation.

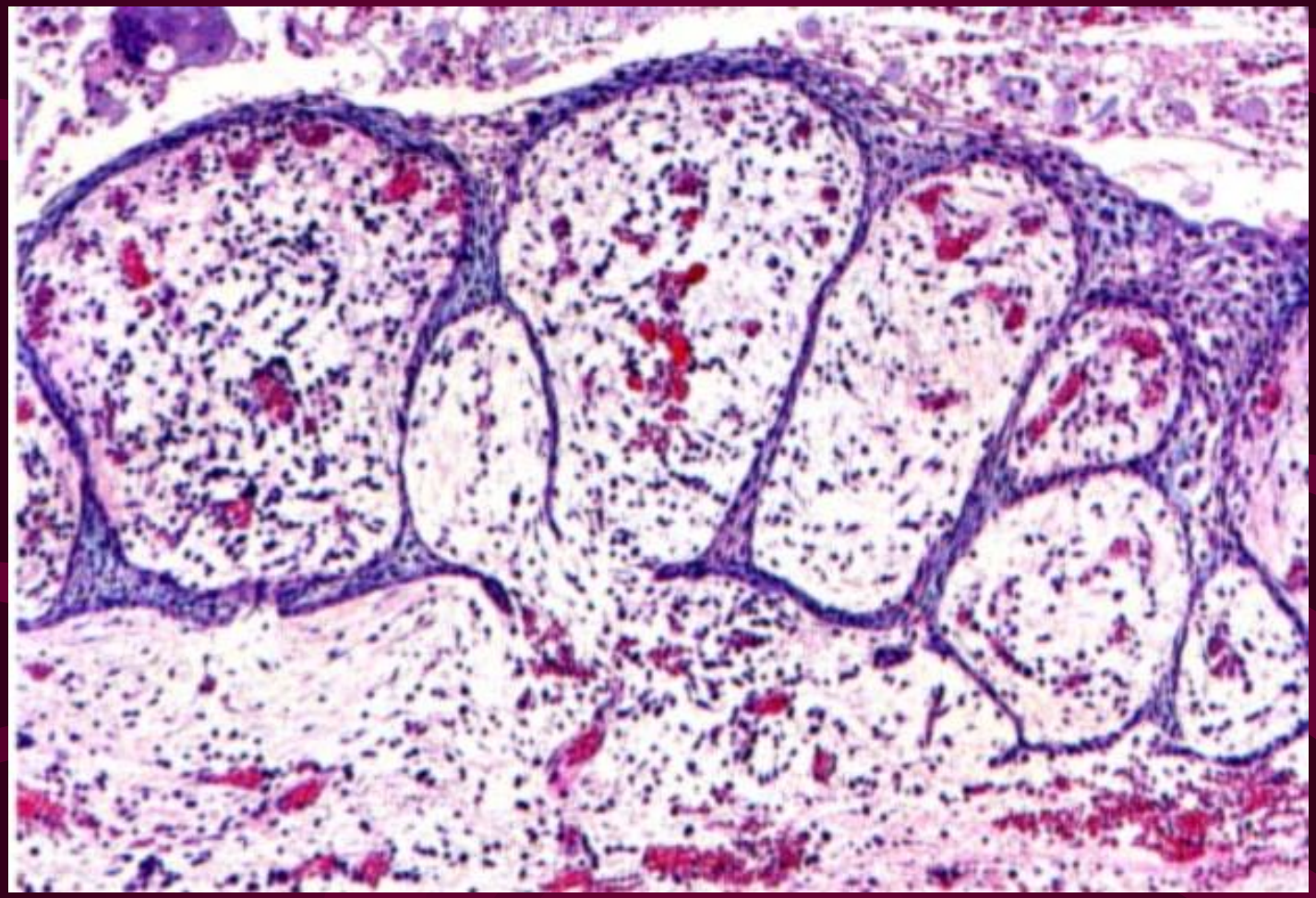
- Many times epithelial lining is discontinuous, frequently missing over areas of intense inflammation.



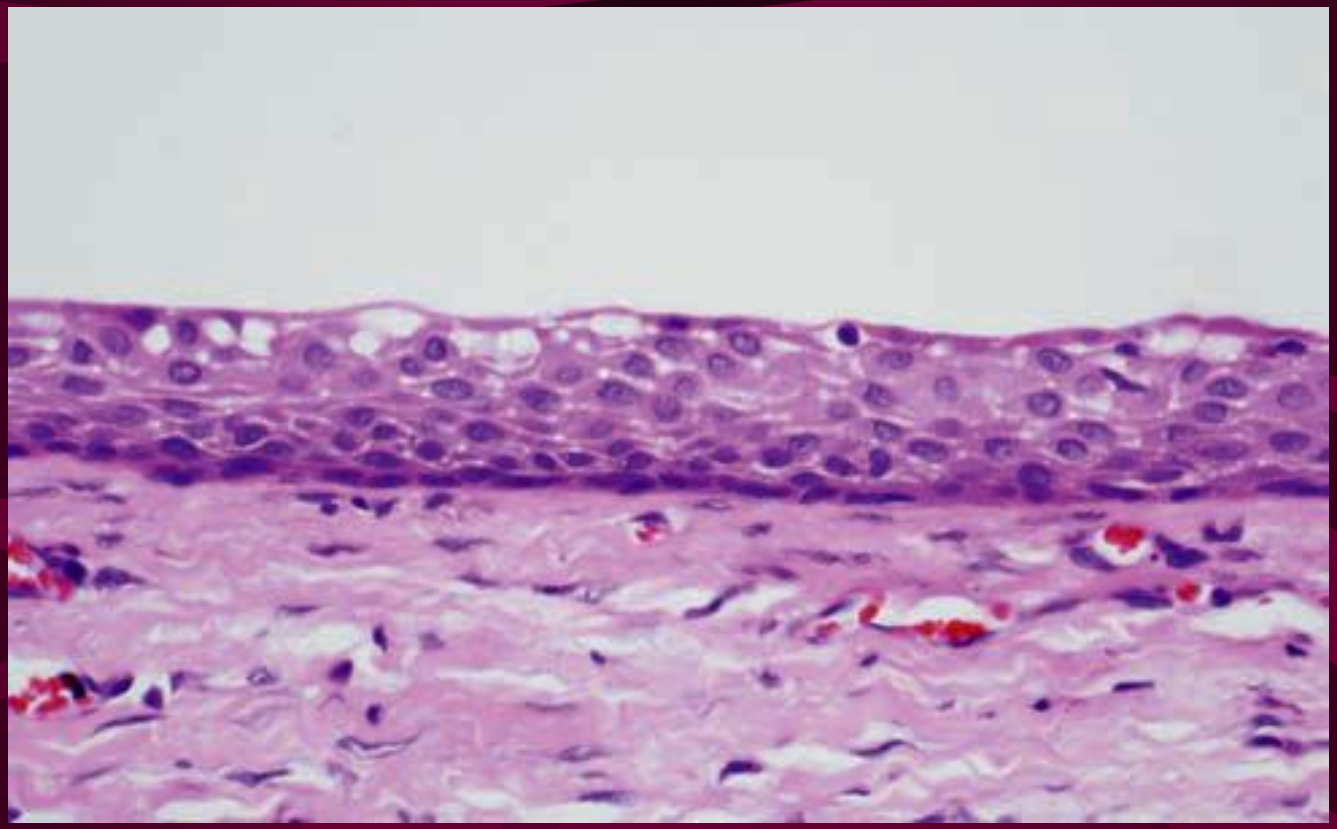
Sheet of epithelial cells in a periapical lesion. A distinct cleft has formed and this may initiate a radicular cyst (H & E).



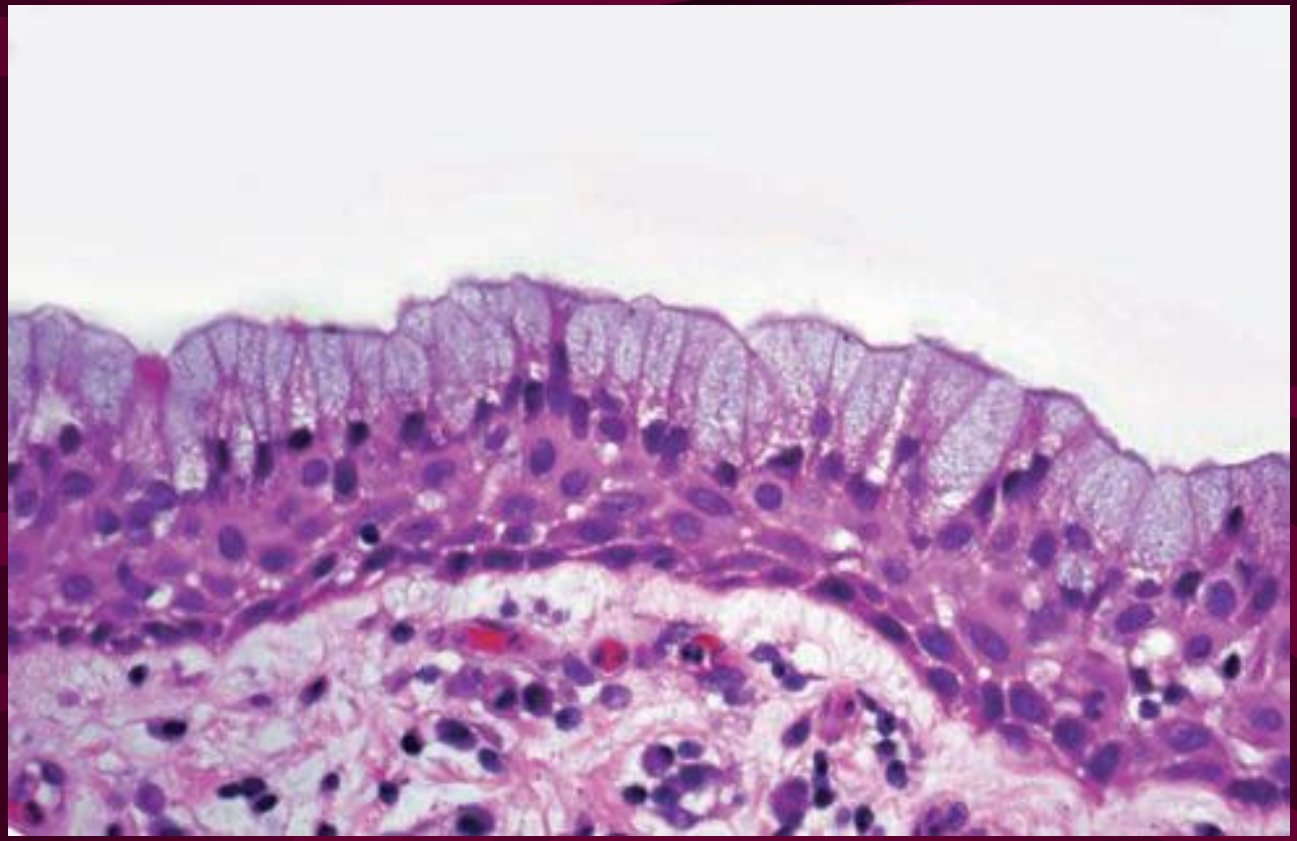
This small cyst is lined by proliferating epithelium



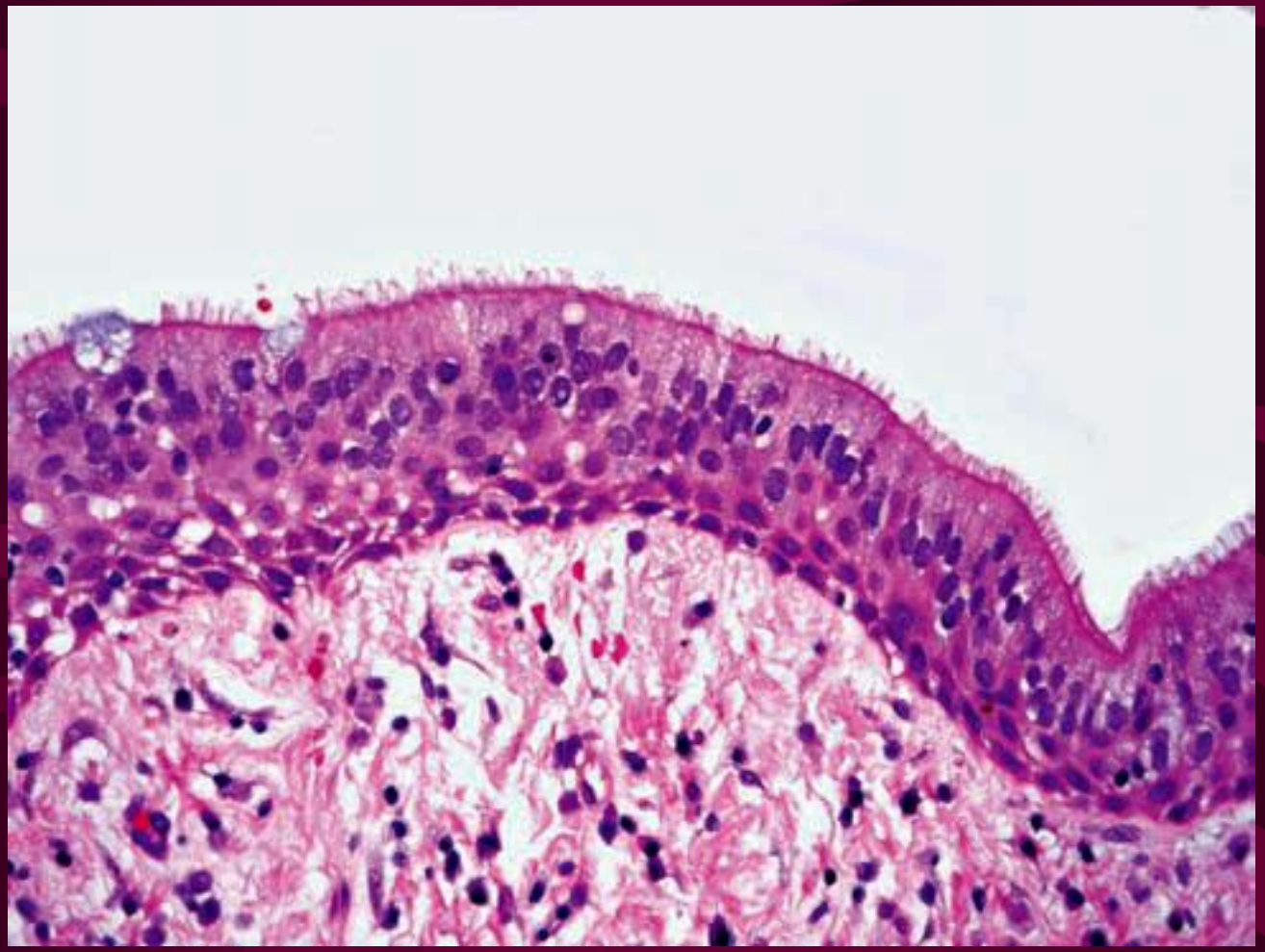
RADICULAR CYST: photomicrograph showing proliferating, nonkeratinized stratified squamous epithelial lining showing ARCADING. The underlying connective tissue is infiltrated with inflammatory cells



Quiescent epithelium lining a mature, long-standing radicular cyst



Mucous cells in the surface layer of the stratified squamous epithelial lining of a radicular cyst

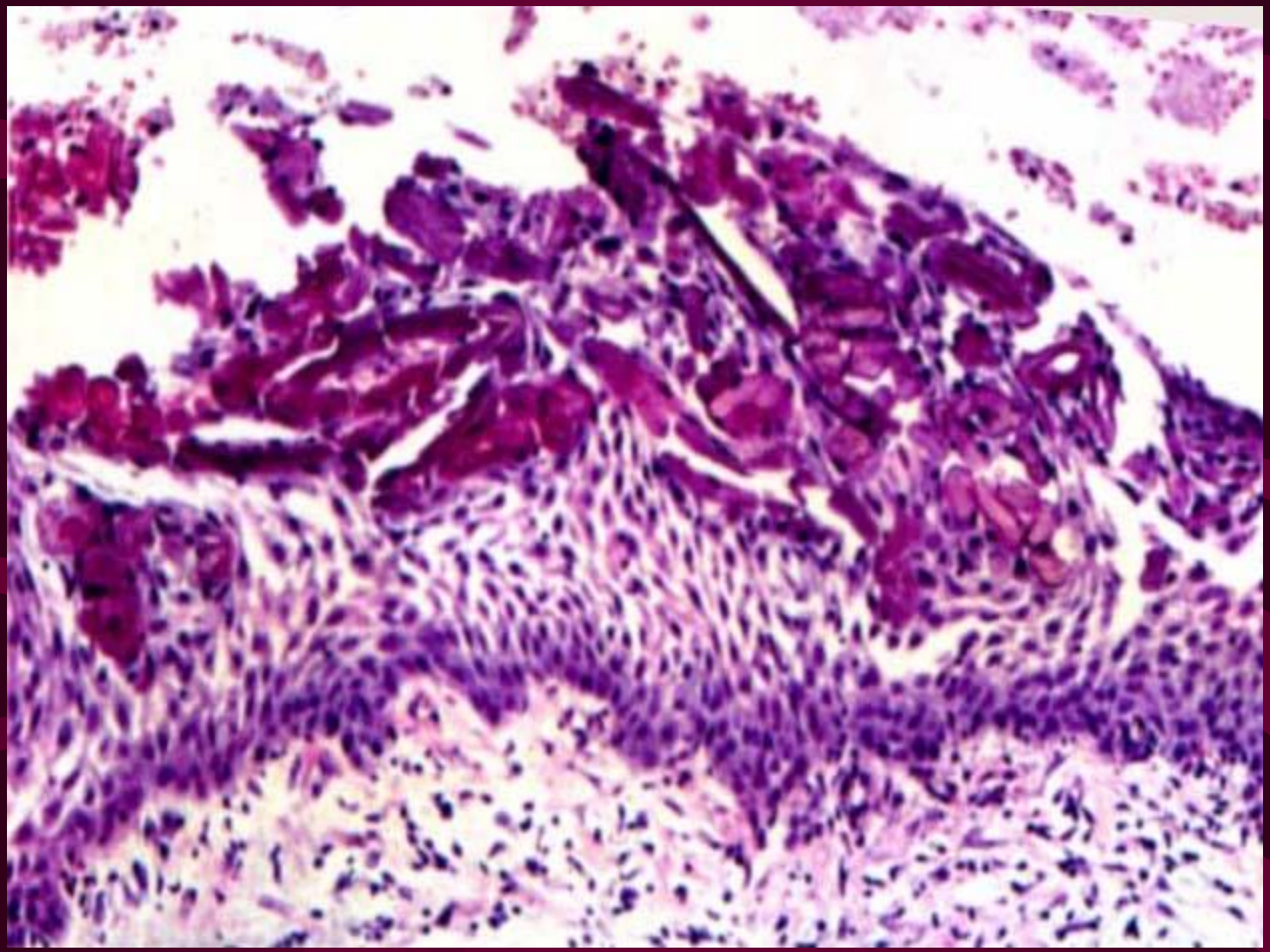


Ciliated epithelium in a radicular cyst

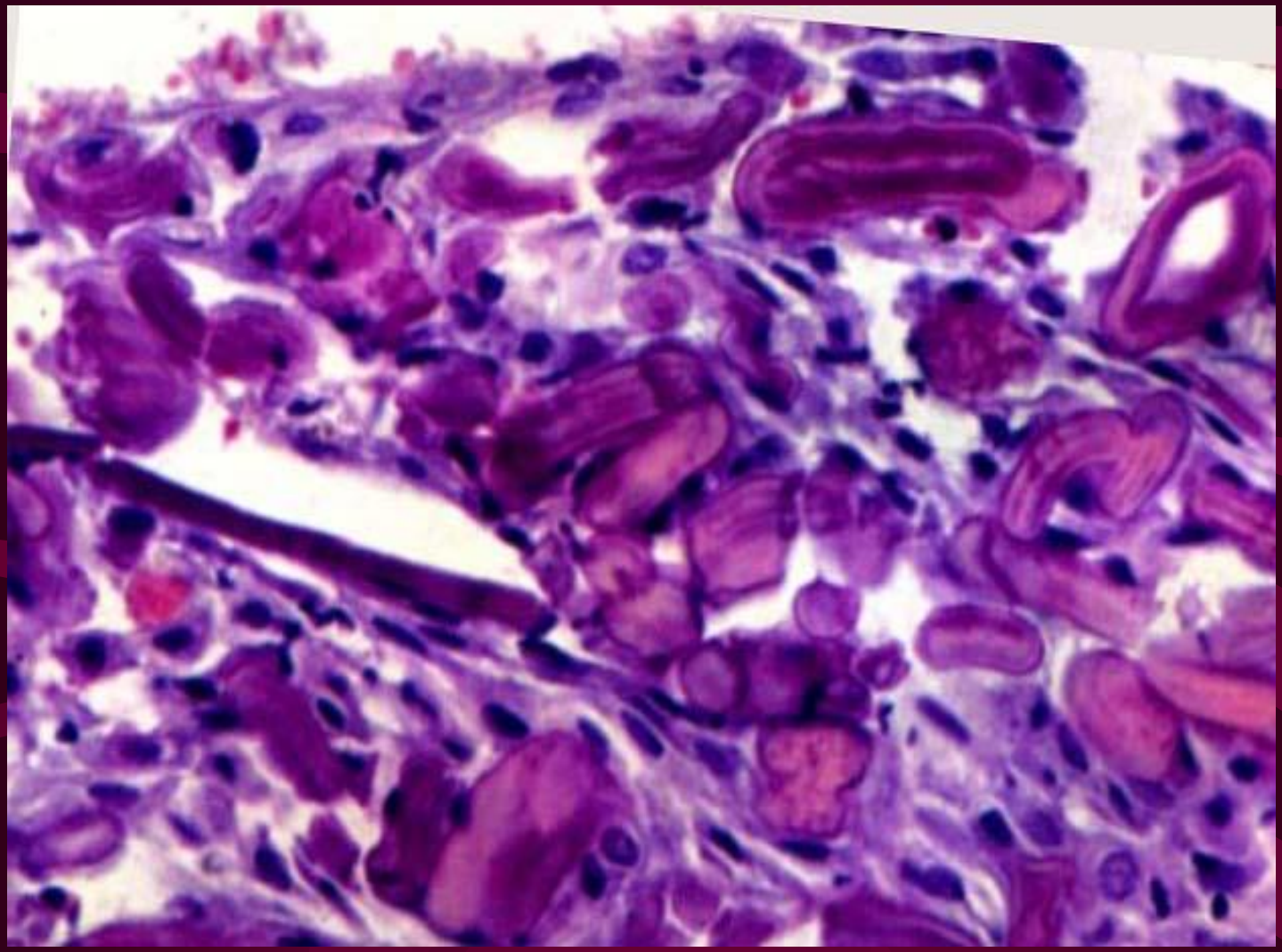
- An interesting finding is the hyaline body or Rushton body found in 2.6 – 9.5% of cysts.

- These hyaline bodies are tiny linear or arc – shaped bodies which are amphorphous, eosinophilic & brittle in nature.

- The etiology pathogenesis & significance of Rushton bodies are not known but it is said that they are hematogenous in origin.



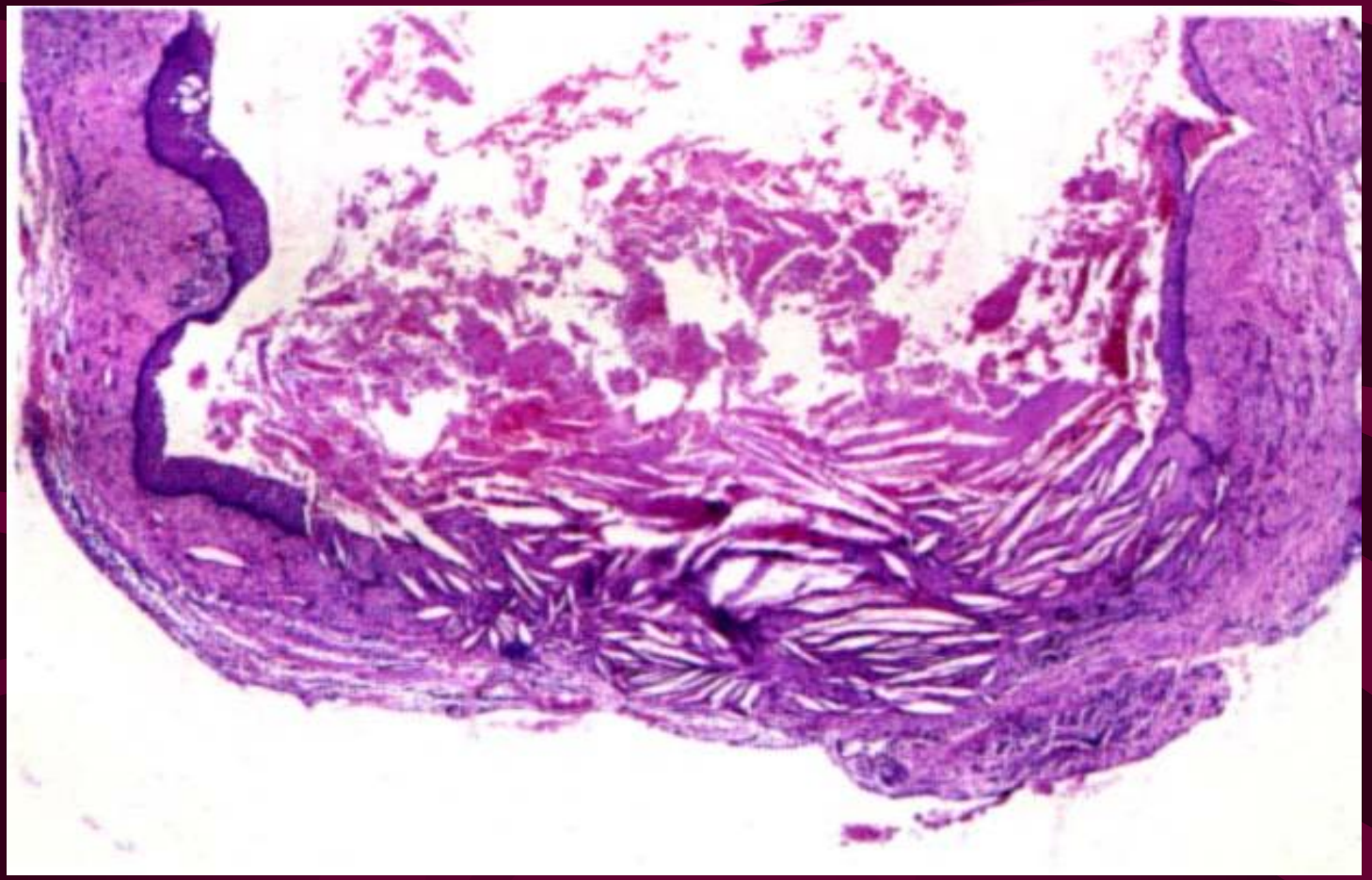
Low power Photomicrograph showing amorphous, eosinophillic tiny, linear, arc shaped hyaline bodies in the epithelium of radicular cyst



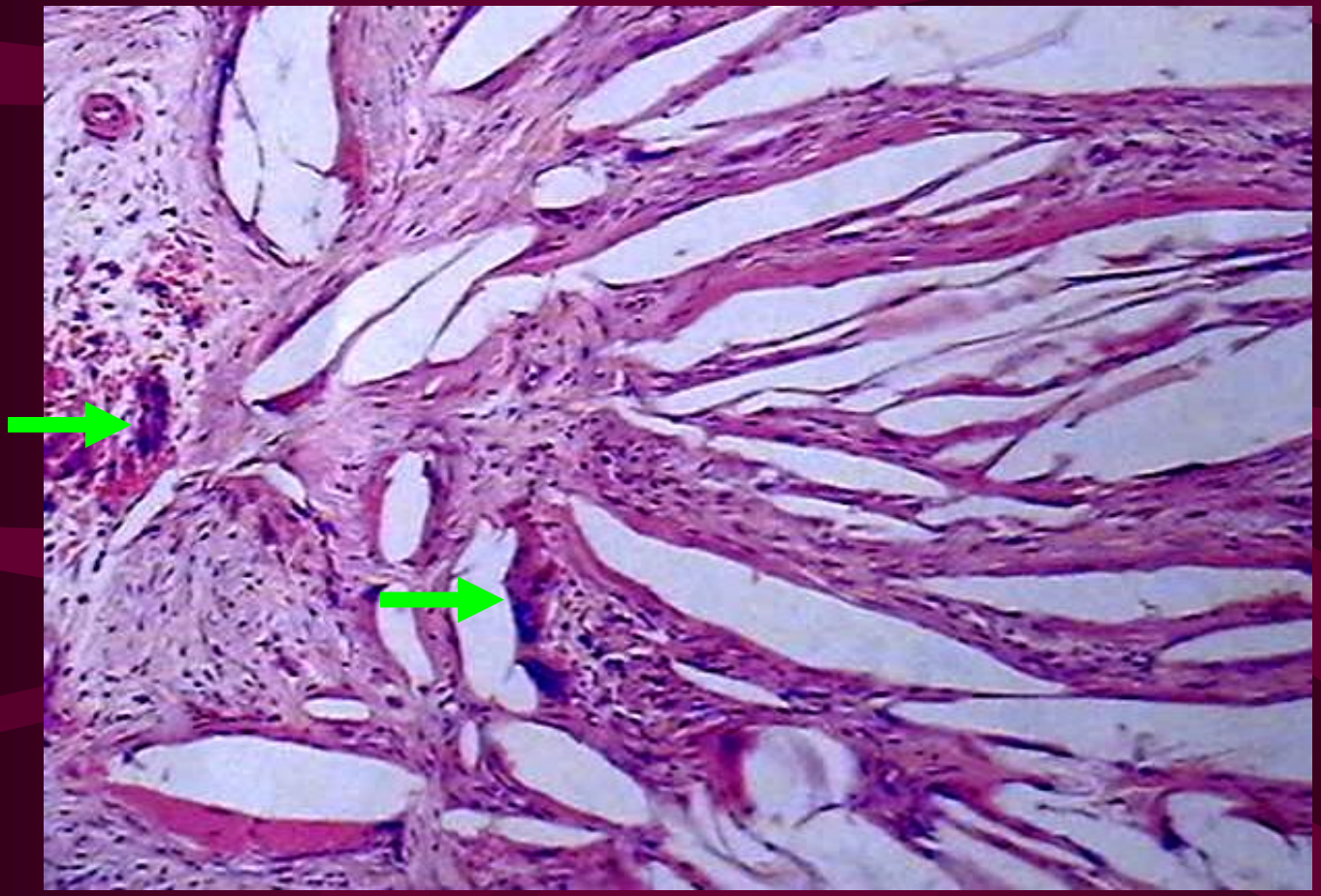
High power Photomicrograph showing amorphous, eosinophillic tiny, linear, arc shaped, double refractile hyaline bodies in the epithelium of radicular cyst

- In some lesions collections of cholesterol slits with multinucleated giant cells are found in C.T. wall.
- This mass of cholesterol erodes through the lining epithelial & extruded into the cyst lumen.
- In some lesions collection of LIPID LEADEN MACROPHAGES (FOAM CELLS) or macrophages containing hemosiderin pigment are present.

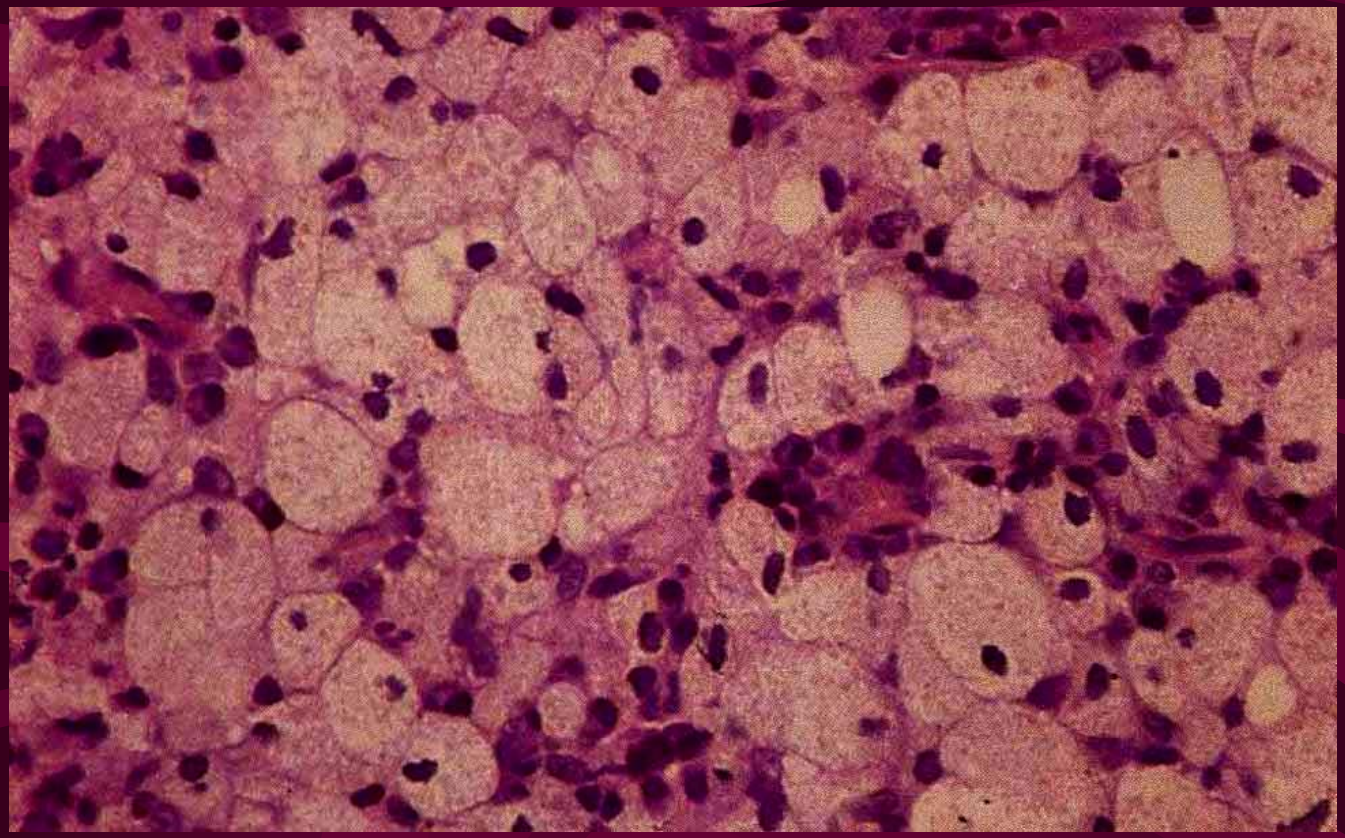
- The C.T. wall is composed of parallel bundles of collagen fibers.
- A characteristic feature is universal occurrence of an inflammatory infiltrate in the C.T. immediately adjacent to the epithelial. The infiltrate made up of lymphocyte & plasma cells with some PMN.



RADICULAR CYST: Cholesterol clefts in the epithelium of odontogenic cyst which extrudes in the cyst lumen.



RADICULAR CYST: cholesterol clefts in the CT wall along with giant cells (arrows)



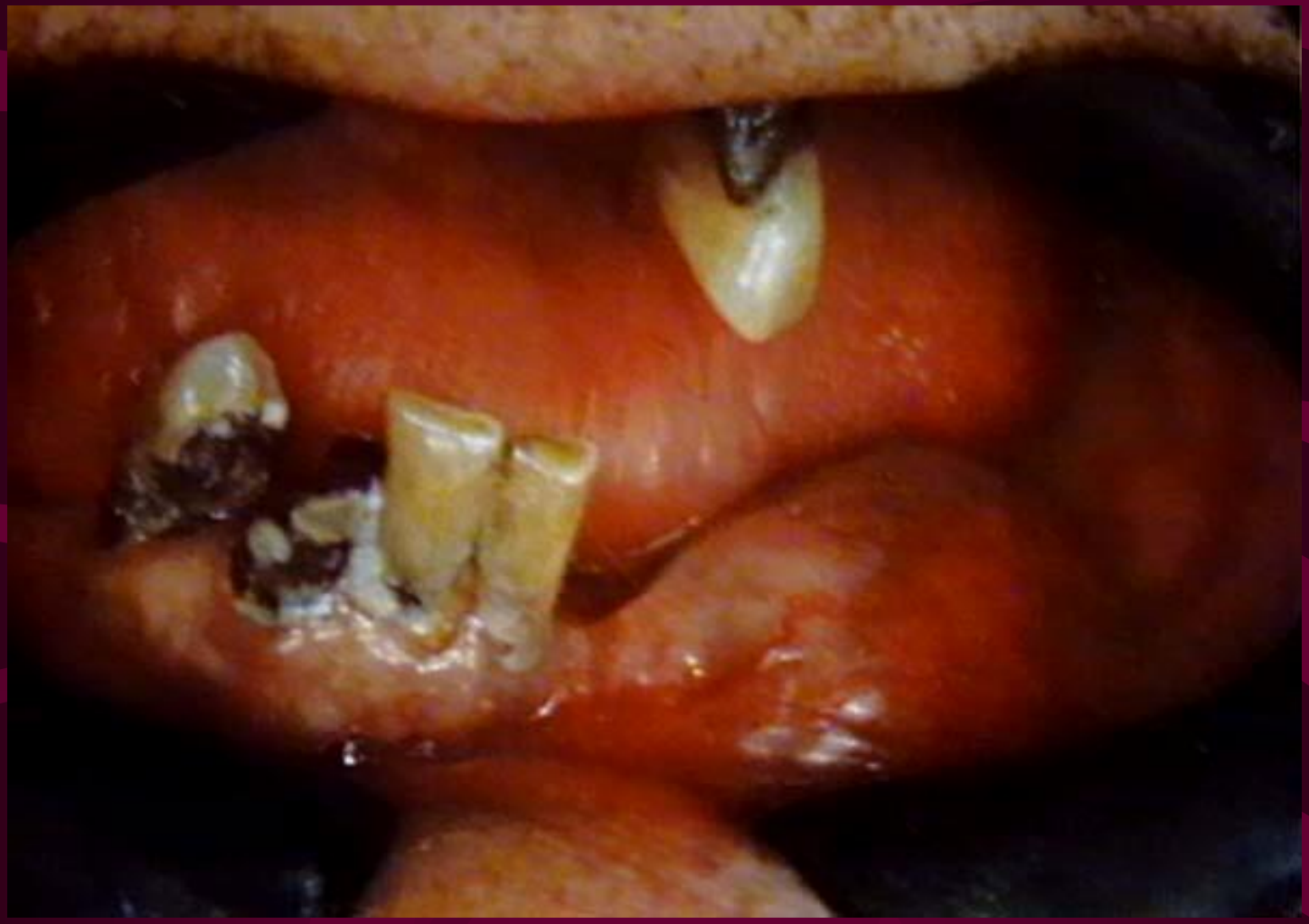
RADICULAR CYST: Lipid laded macrophages (FOAM CELLS)

TREATMENT & PROGNOSIS:

- Extraction of involved tooth & curettage of periapical area is the treatment of choice.
- The recurrence does not occur if surgical removal is thorough.
- It may persist as residual cyst if there is inadequate surgical removal.
- It does not have tendency for ameloblastomatous transformation.
- Epidermoid carcinoma may develop from the lining epithelium but rare.
- If untreated Radicular cyst slowly ↑ in size.

RASIDUAL CYST

- These are actually retained periapical cysts from teeth that have been removed.
- It can develop in a dental granuloma that is let after an extraction.
- The residual cyst may be found in any of the tooth bearing areas of the mandible or maxilla.
- These cysts are found on routine radiographic examination.
- They become symptomatic when secondarily infected.
- Usually, residual cysts do not expand the bone.
- The histology of the lining is nondescript stratified squamous epithelium
- Treatment: surgical curettage.



Residual cyst in lower anterior region of left side.

PARADENTAL CYST

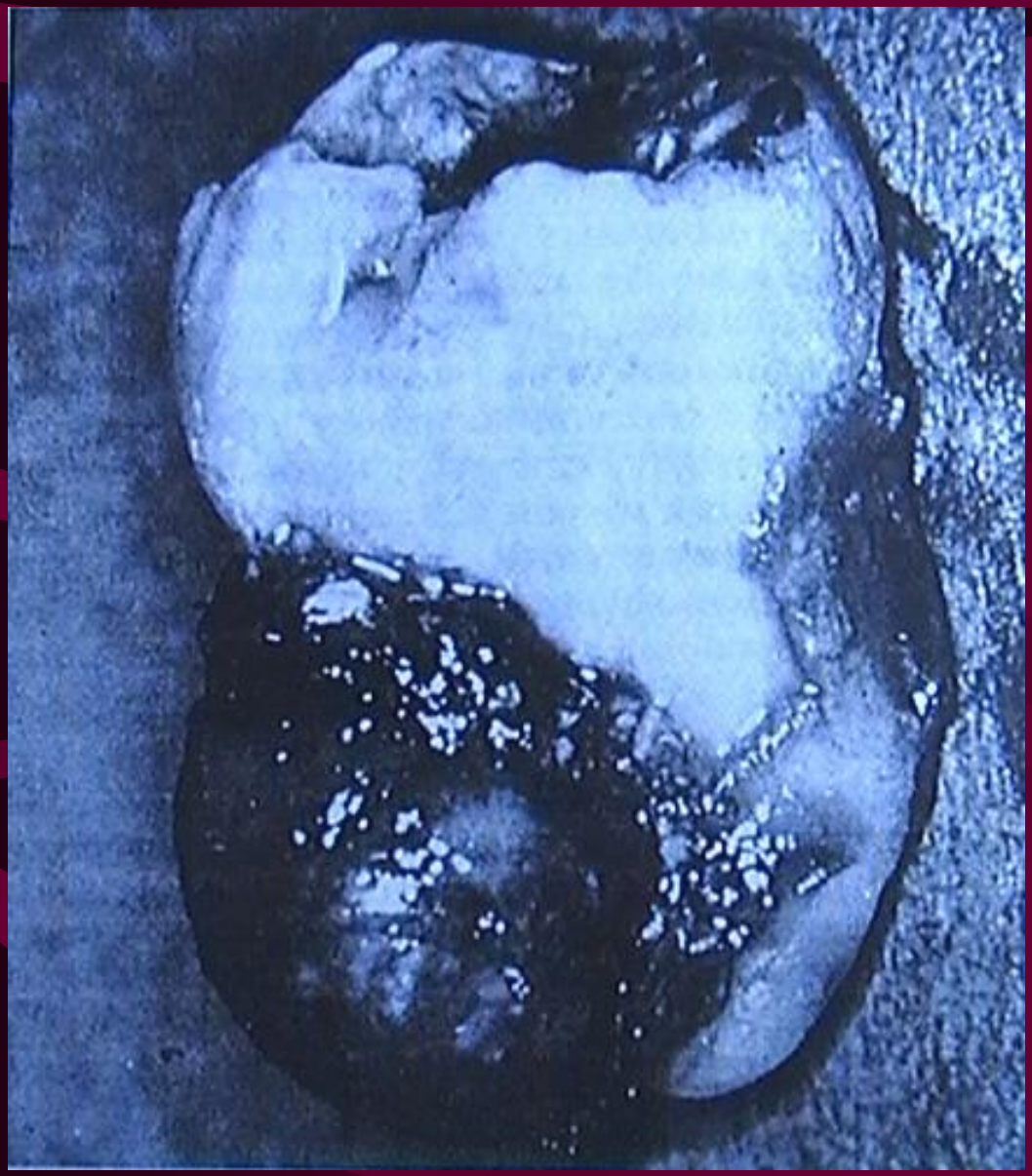
- A cyst of uncertain origin found primarily on the distal or facial aspect of a vital mandibular third molar.
- It is an inflammatory cysts which develops on the lateral surface of tooth root. Some authors refers this cyst as an inflammatory collateral or periordontal cyst.

PATHOGENESIS:

- From reduced enamel epithelium; the cyst formation occurs as a result of unilateral expansion of dental follicle secondary to inflammatory destruction of periodontium.
- It may be a variant of dentigerous cyst
- It may be derived from an occluded periodontal pocket.

CLINICAL FEATURES:

- Third decade
- Equal gender distribution
- Cysts are located distally and distobucally to the third molar
- Involved teeth are vital.
- Occasionally seen bilaterally
- Radiographically, the cyst exhibits variable picture. There is nonwidening of periodontal ligament space and the lesion is superimposed on buccal surface.



PARADENTAL CYST:
Gross specimen showing involvement distal and buccal surfaces of an mandibular third molar tooth

HISTOLOGIC FEATURES:

- The cyst is lined by hyperplastic, nonkeratinized stratified squamous epithelium.
- An intense inflammatory cell infiltrate is present associated with the hyperplastic epithelium and in the fibrous capsule adjacent to the epithelium.
- Histologically the paradental cyst cannot be differentiated from the radicular cyst.

NONODONTOGENIC CYSTS: DEVELOPMENTAL CYSTS

DEVELOPMENTAL OR FISSURAL CYSTS

- These have been considered arising along the lines of fusion of various bones or embryonic processes. These are true cysts (i.e., pathologic cavities lined by epithelium, usually containing fluid or semisolid material), the epithelium being derived from epithelial cells which are entrapped between embryonic processes of bones at union lines

- These fissural cysts may be classified as follows:
  1. Median anterior maxillary cyst (Naso-palatine Duct cyst),
  2. Median palatal cyst
  3. Globulomaxillary cysts
  4. Median mandibular cysts.
  5. Nasoalveolar cyst

MEDIAN ANTERIOR MAXILLARY CYST (NASOPALATINE DUCT CYST, INCISIVE CANAL CYST)

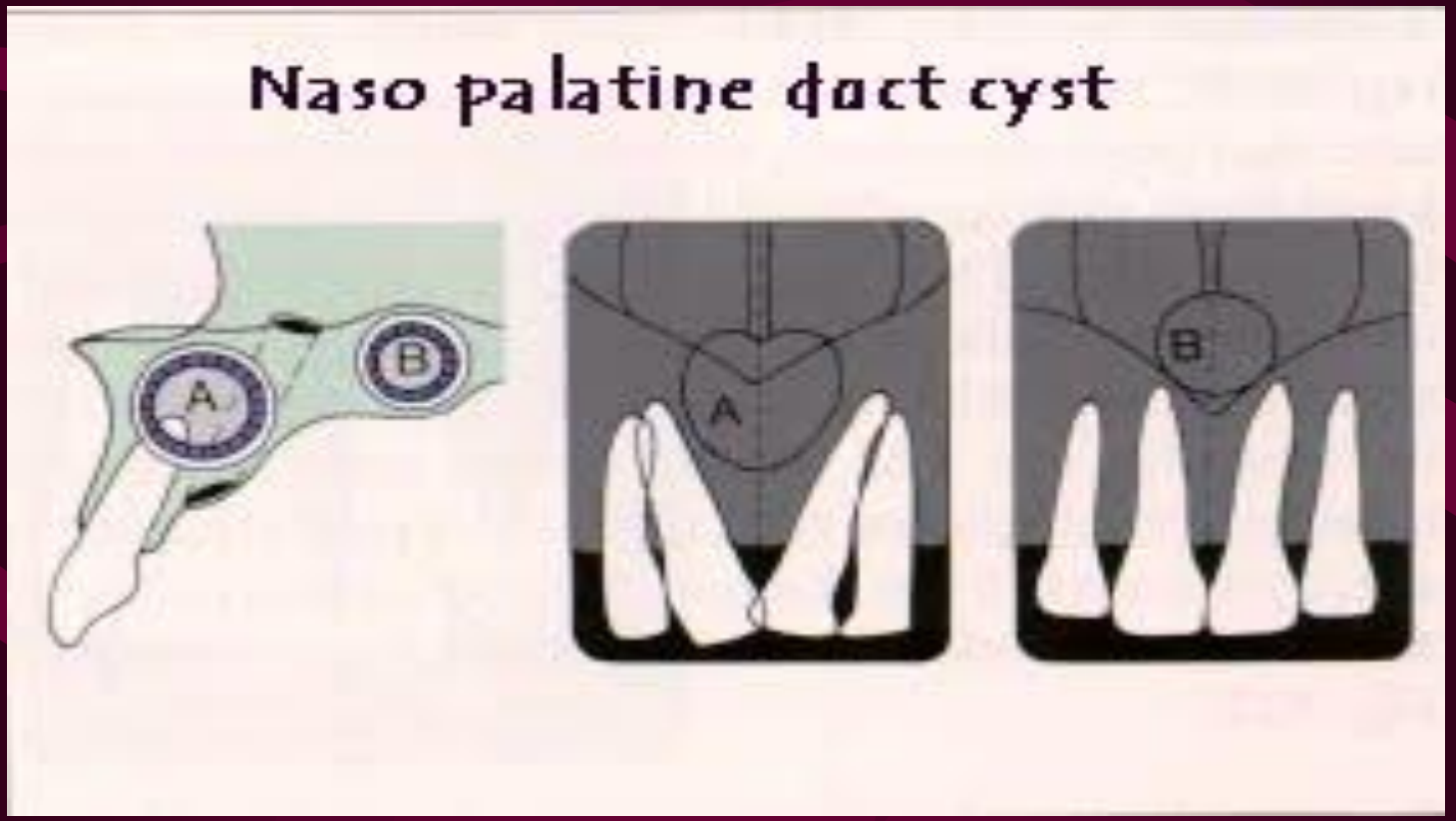
- It is the most common type of maxillary developmental cyst.

- This canal joins the nasal and oral cavities and is formed when the palatal processes fuse with the premaxilla, leaving a passageway on each side of the nasal septum. As these paired ducts and the canals approach the oral cavity, they fuse, then exit through a common opening in the palatal bone just posterior the palatine papilla.

- Nasopalatine ducts ordinarily undergo progressive degeneration; however, the persistence of epithelial remnants may later become the source of epithelial that gives rise to the cyst, from either
    - spontaneous proliferation or
    - proliferation following trauma e.g.
        - removable dentures,
        - bacterial infection, or
        - mucous retention.
    - Genetic factors have also been suggested.

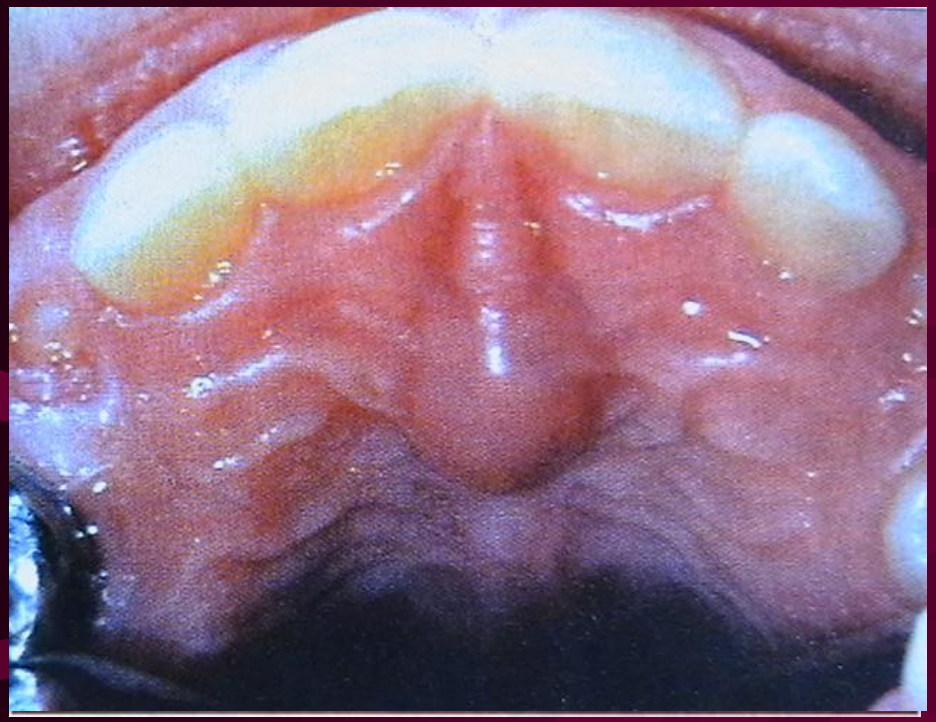
- The mucous glands present among the proliferating epithelium can contribute to secondary cyst formation by secreting mucin within the enclosed structure.

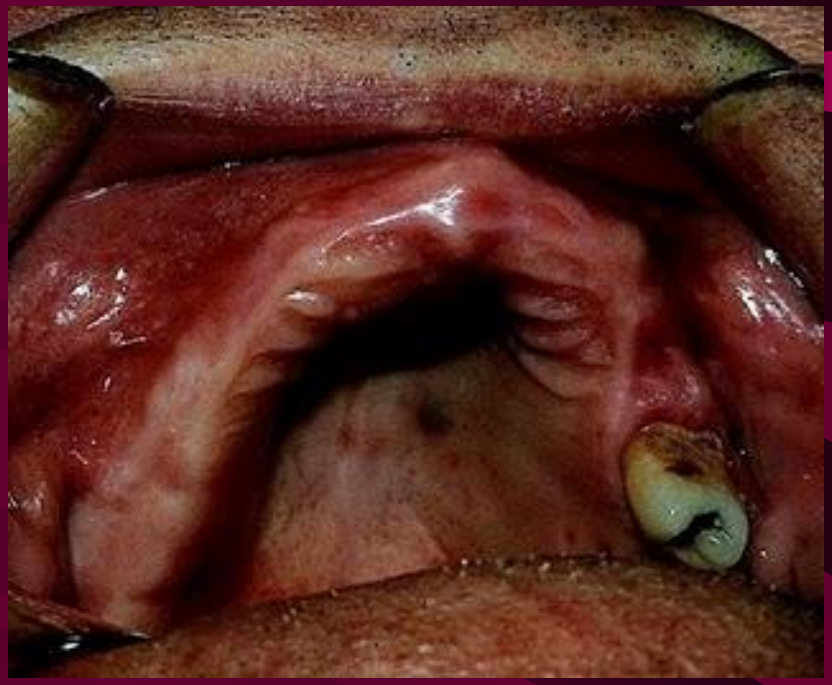
- Nasopalatine duct cyst can form within the incisive canal, which is located in the palatine bone and behind the alveolar process of the maxillary central incisors, or in the soft tissue of the palate that overlies the foramen, called the cyst of the incisive papillae



CLINICAL FEATURES:

- It can occur at an age even in the fetus, although their clinical discovery is most frequently in the forth to sixth decades of life.
- Nearly 40% of the patients are asymptomatic.



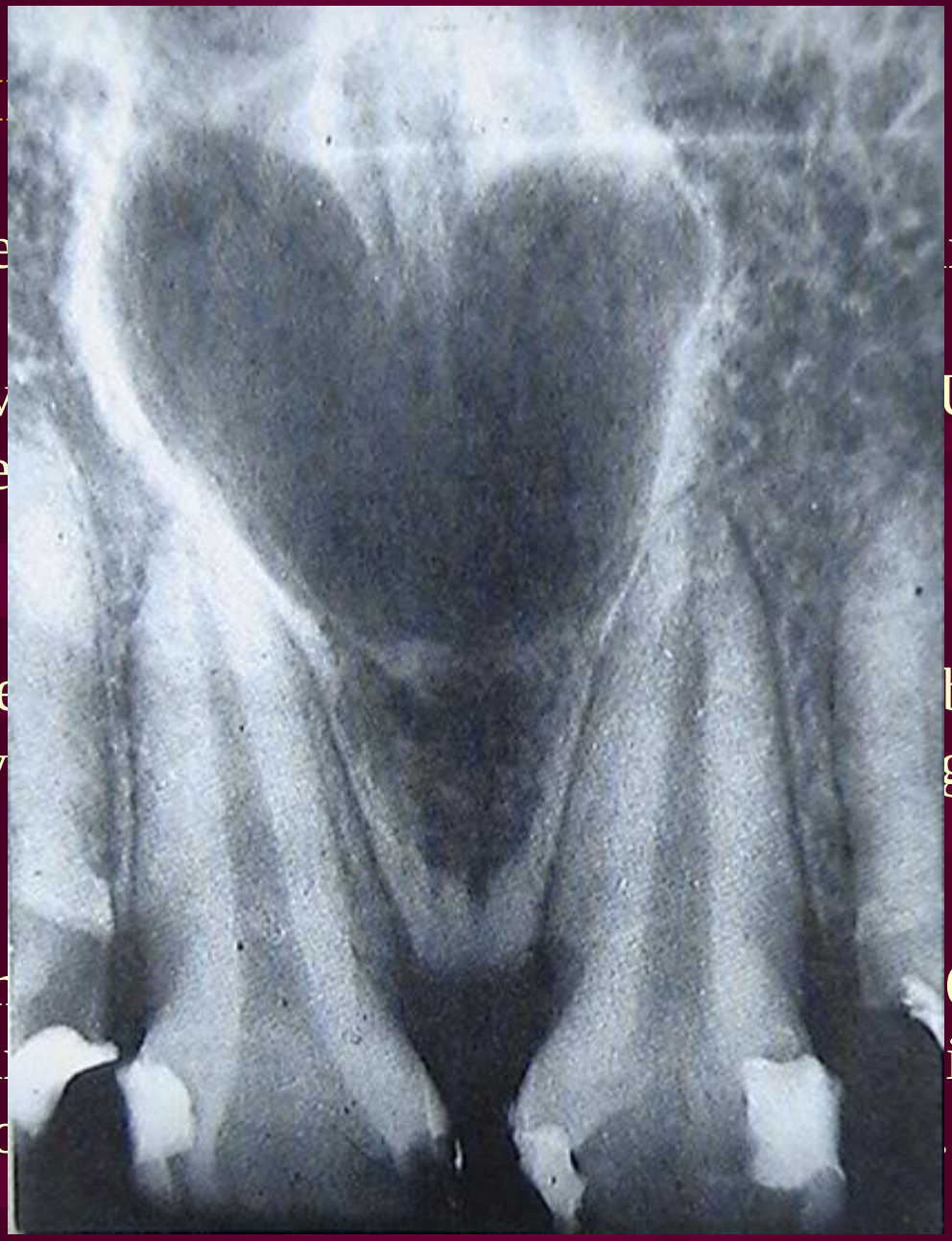


NASOPALATINE DUCT CYST

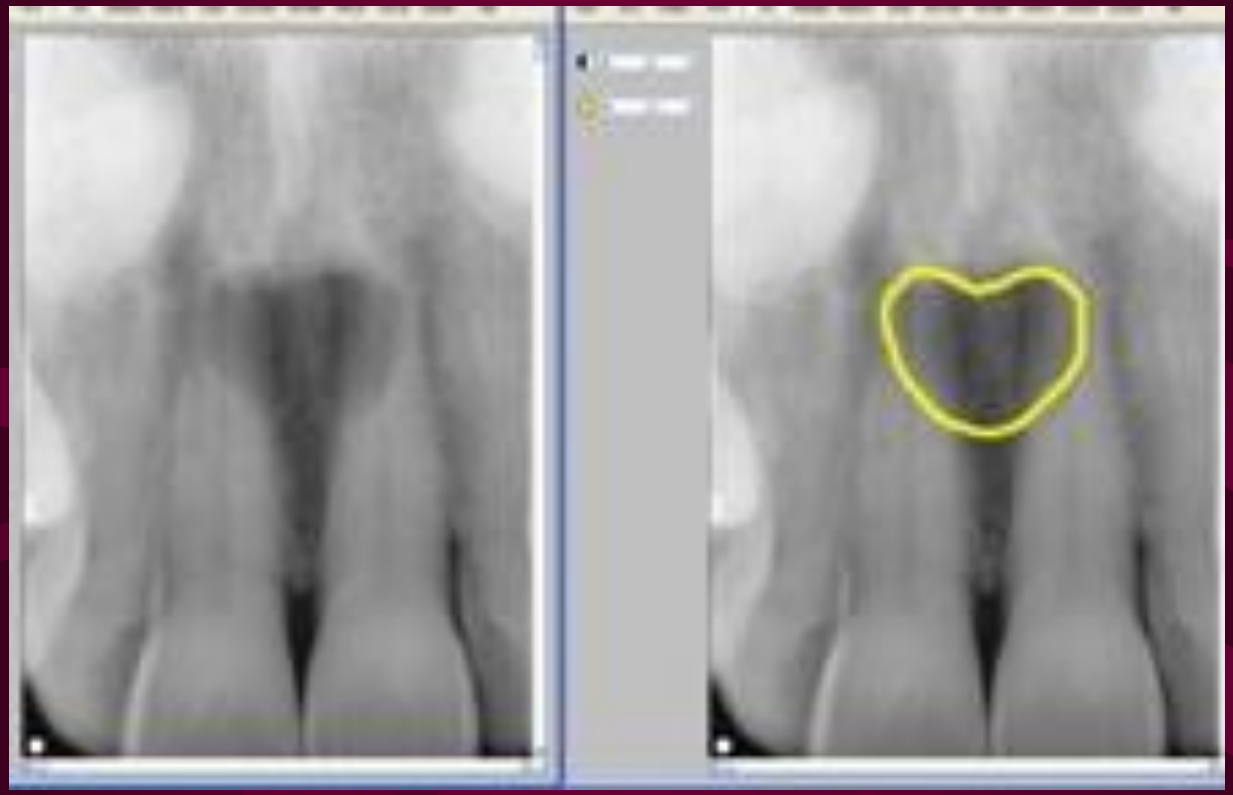
- Sometimes the cyst become infected by some unknown mechanism, producing pain and swelling, and open by a tiny fistula on or near the palatine papilla. In such cases a tiny drop of watery fluid or pus may be elicited by pressure in the area.

- An uncommon variant of these cysts occurs as a swelling within the palatine papilla and has been described as arising from epithelial nests in the incisive foramen rather than in the bone. It is usually not visible in radiographs. These are called cysts of the palatine papilla.

RADIOGRAPH



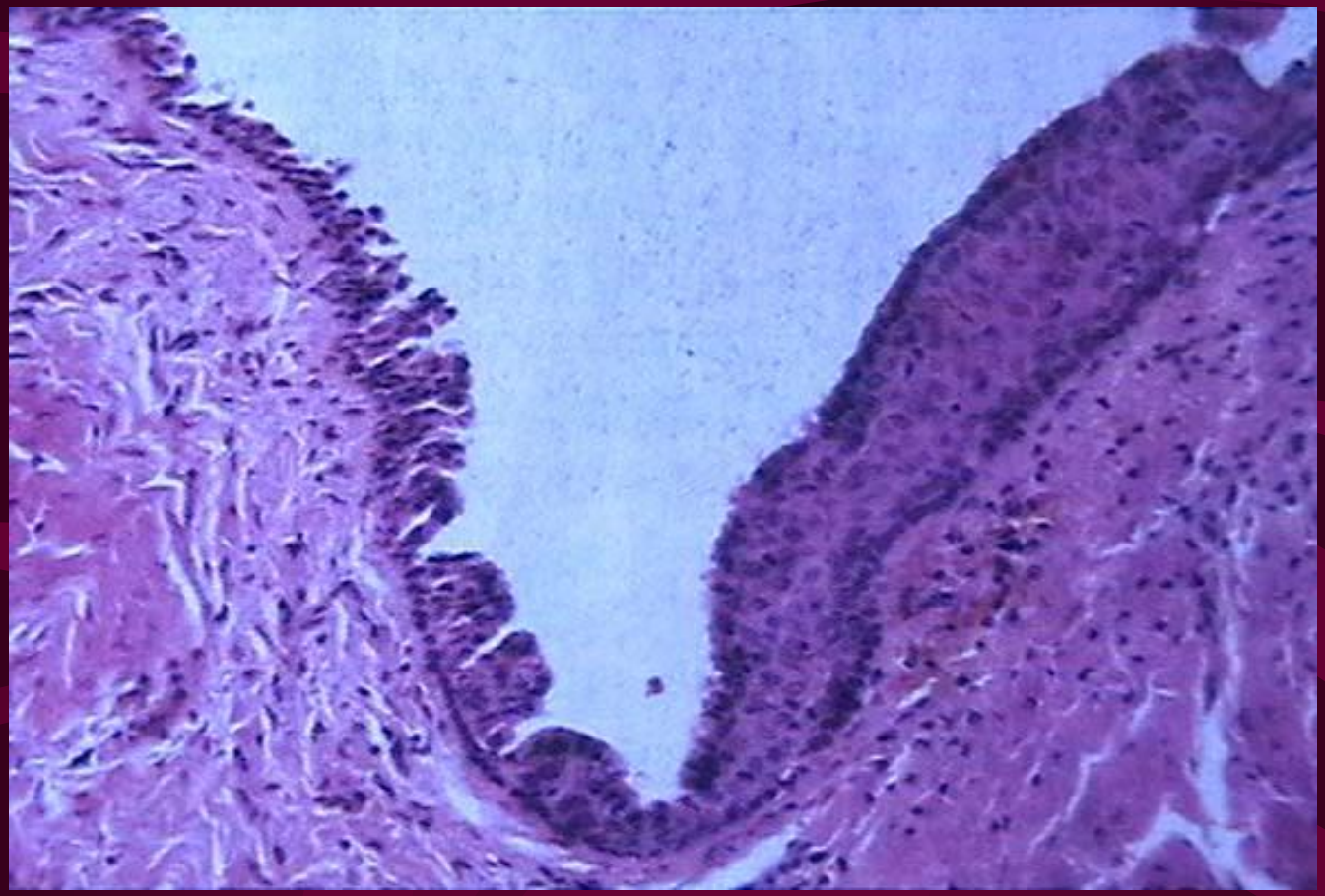
- Often discove nation.
- A round, ov UCENT AREA, usually bilate is noted on the radiographs.
- The area appe bove the roots of the maxillary g some apparent separation or
- Diameter of r **6mm to 6cm**, so small cysts a incisive foramen which is of nc



HISTOLOGIC FEATURES:

- Median anterior maxillary cysts are lined by stratified squamous epithelium, pseudostratified ciliated columnar or cuboidal epithelium, or any combination of these.

- The variable type of epithelium emphasizes the origin of the cysts from the nasopalatine duct, this duct itself being composed of the same types of epithelium:
    1. respiratory epithelium in its nasal portion and
    2. squamous in its oral portion.



NASOPALATINE DUCT: Photomicrograph of cyst lining showing pseudostratified ciliated columnar epithelium (nasal portion) and stratified epithelium (oral portion)

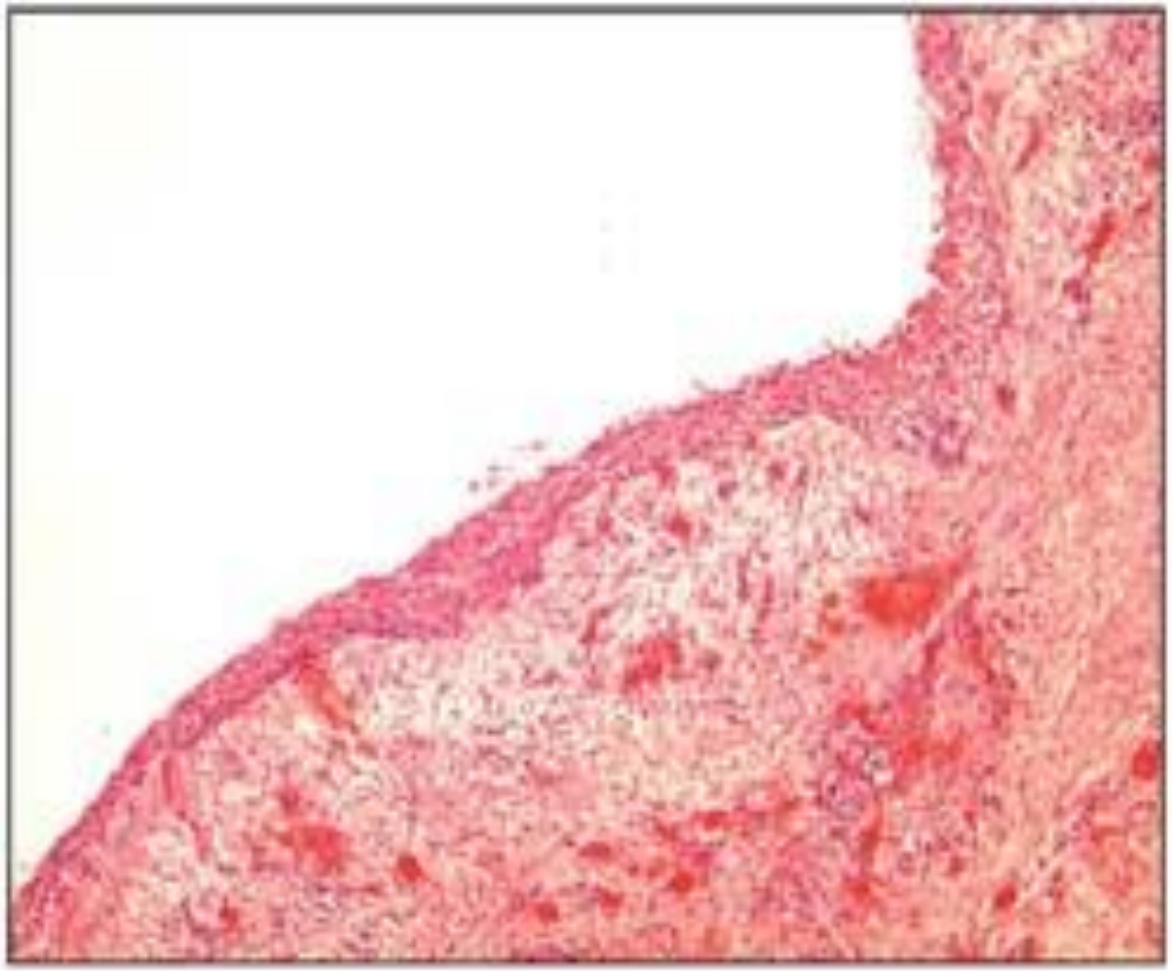
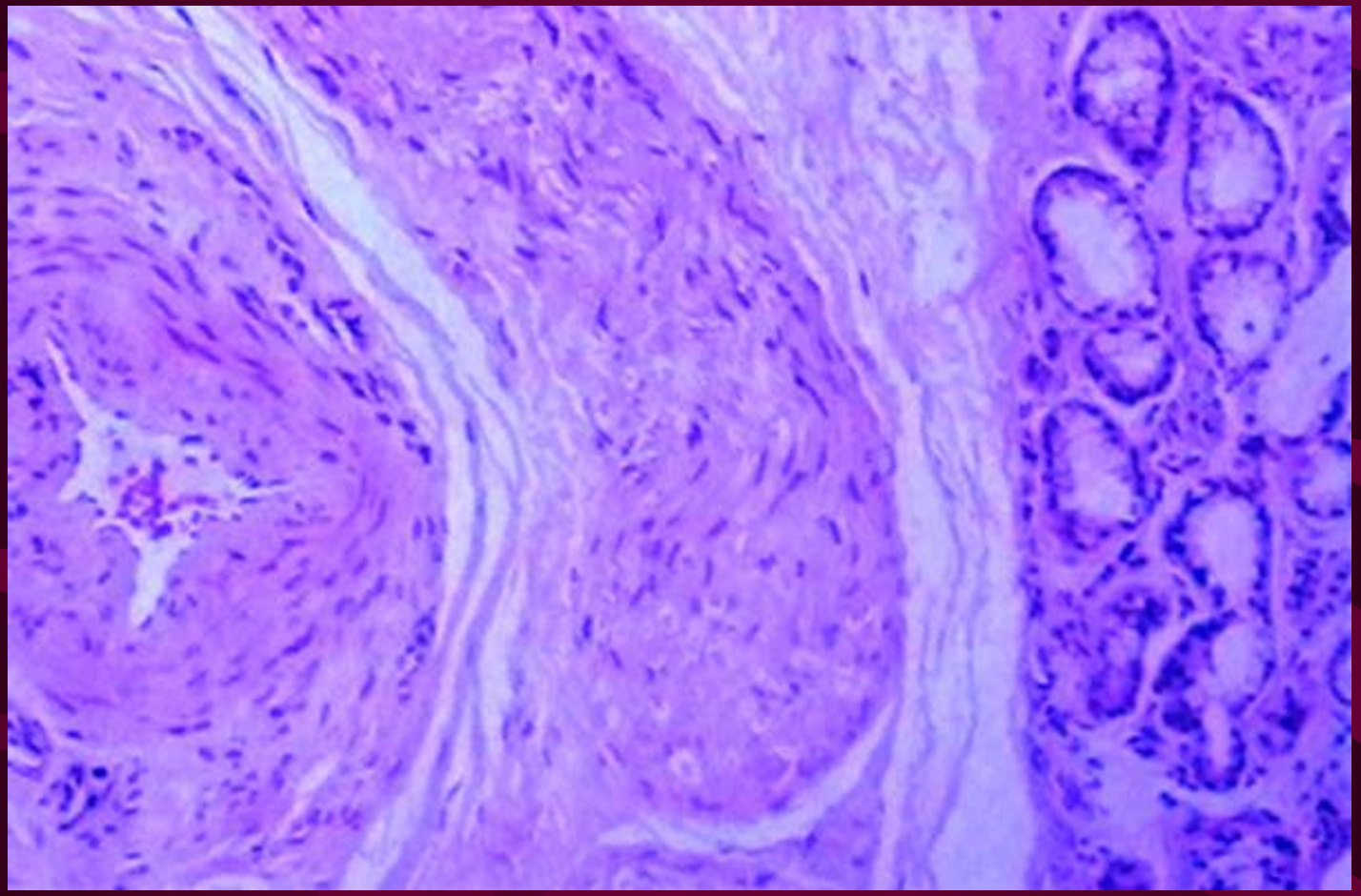


Fig. 9. A photomicrograph reveals the cyst's stratified squamous epithelial lining (H&E stain; magnification 200x).

- Cyst arises in the superior aspect of the canal near nasal cavity is more likely to be respiratory epithelium (pseudostratified ciliated columnar epithelium) and cysts arising in the inferior position near the oral cavity are more likely to exhibit stratified squamous epithelium.

- The connective tissue wall of this cyst frequently shows inflammatory cell infiltration.

- Collection of mucous glands as well as several large blood vessels and nerves are also present.



Large vessels, mucous glands and nerves in the wall of nasopalatine duct cyst.

TREATMENT:

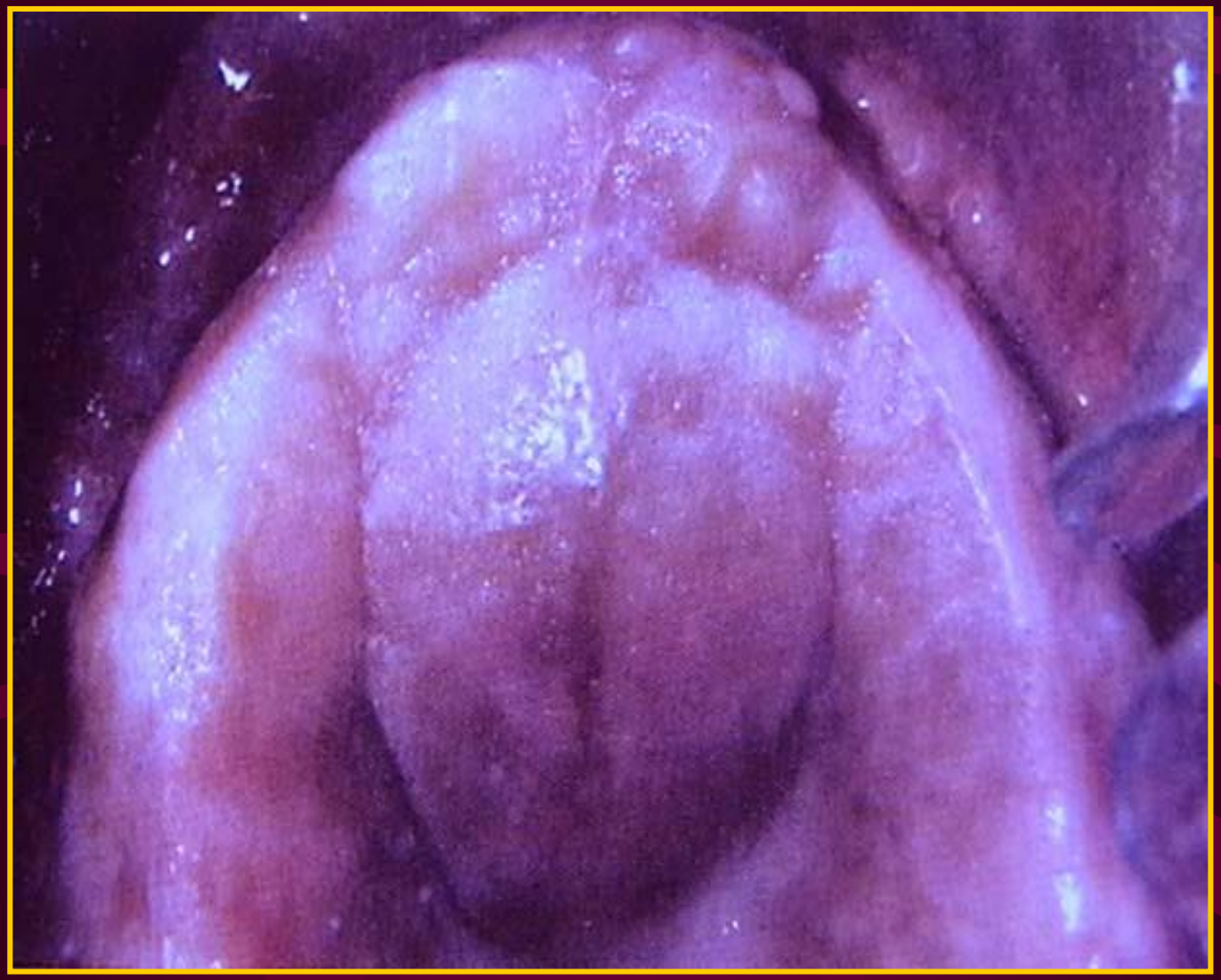
- Surgical excision in symptomatic patients.
- Surgical excision of asymptomatic nasopalatine duct cysts in dentulous patients is unnecessary.
- In edentulous patients, failure to remove the cyst prior to construction of a prosthetic appliance not uncommonly leads to acute infection, followed by perforation of the mucosa and suppurative driange.

MEDIAN PALATAL CYST

This cyst arises from epithelium entrapped along the line of fusion of the palatal processes of the maxilla.

CLINICAL FEATURES:

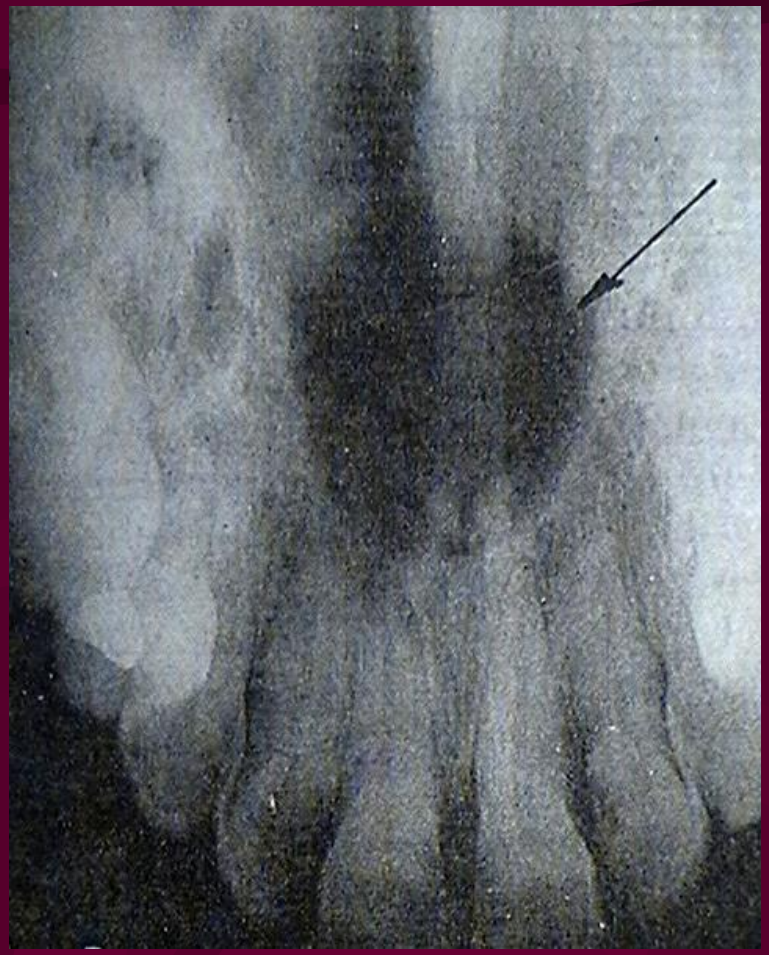
- It is located in the midline of the hard palate between the lateral palatal processes.
- Asymptomatic
- A definite palatal swelling may be a clinical symptom



MEDIAN PALATAL CYST: a large swelling posterior to the area of the incisive canal.

RADIOGRAPHIC FEATURES:

- a well circumscribed radiolucent area is seen opposite the bicuspid and molar region, frequently bordered by a sclerotic layer of bone.



Median palatal cyst: a large radiolucency in the midline of the palate

HISTOLOGIC FEATURES:

- The lining of cysts usually consists of stratified squamous epithelium overlying a relatively dense fibrous connective tissue band which may show chronic inflammatory cell infiltration.

- Occasionally, pseudostratified stratified ciliated columnar epithelial lining may be present

TREATMENT: surgical removal and thorough curettage.

GLOBULOMAXILLARY CYST

- It is found within the bone at the junction of the globular portion of the medial nasal processes and the maxillary process, the globulomaxillary fissure, usually between the maxillary lateral incisor and cuspid teeth.
- The WHO classification of cyst of the jaws (1992) considered this entity under the rubic “of debatable origin”

- Christ suggested odontogenic origin of the cysts based on the following facts:
    - Facial processes per se do not exist, and therefore, ectoderm does not become entrapped in the facial fissures of nasomaxillary complex
    - Furthermore, clinical and radiological apppearance being entirely compatible with a lateral periodotal, lateral dentigeorous or primordial cyst.
    - Nests of odontogenic epithelium are frequently found in the connective tissue wall of the cyst
    - Aisenberg and Inman reported a case of Ameloblastoma developing in the globulomaxillary cysts

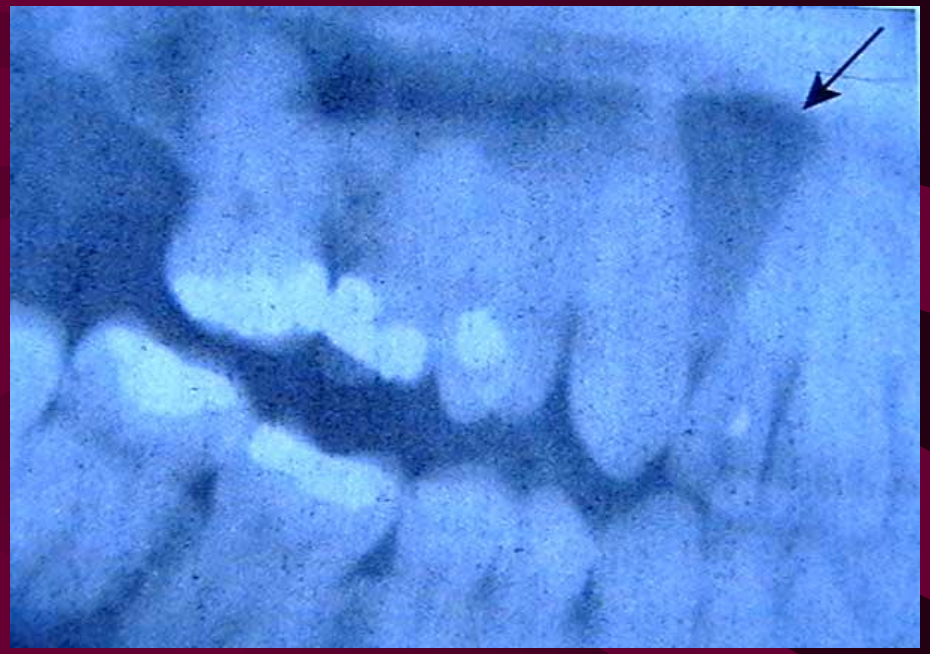
CLINICAL FEATURES:

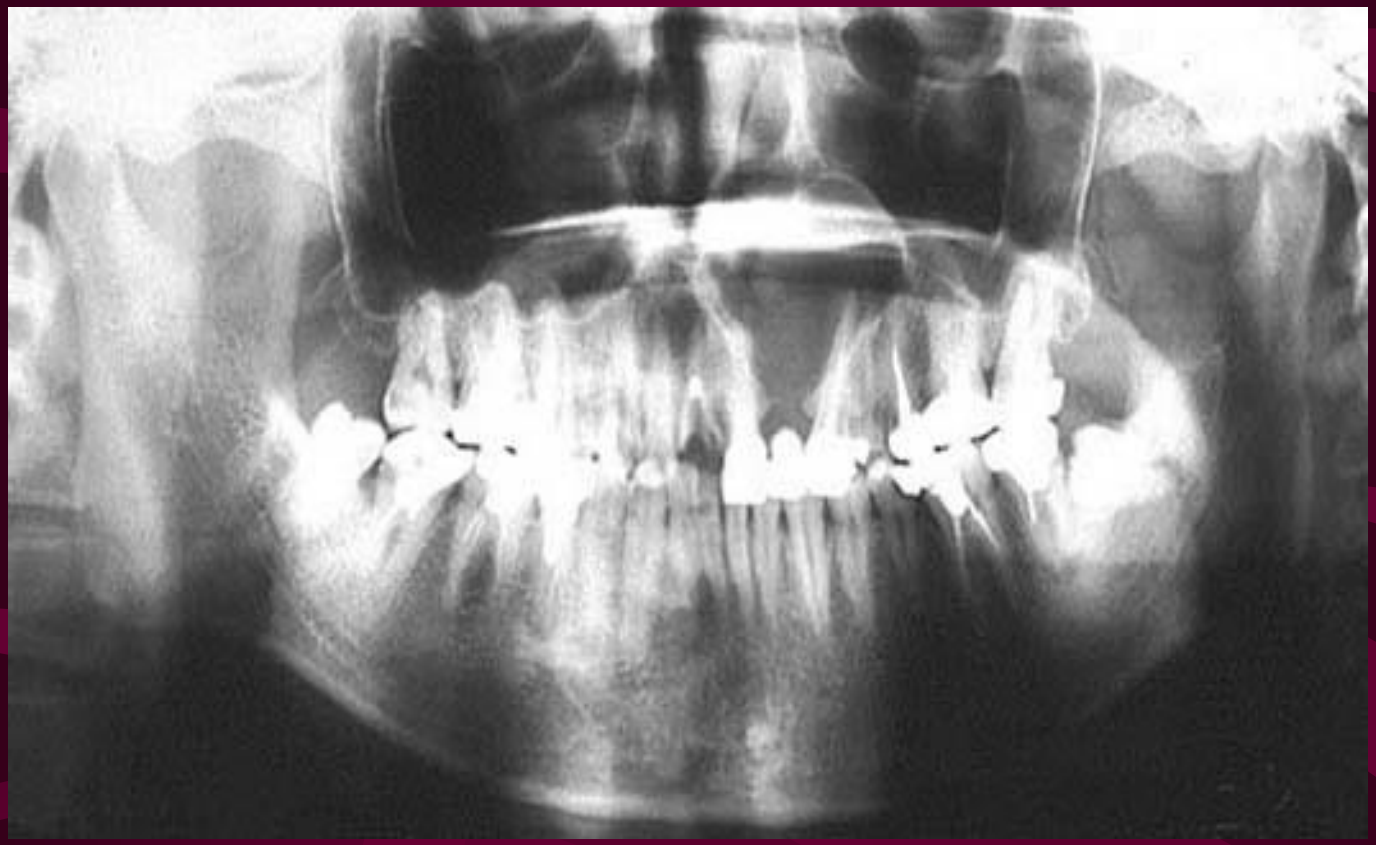
- Asymptomatic
- Discovered accidentally during routine radiographic examination
- Local discomfort or pain in the area may be present in case of secondary infection.

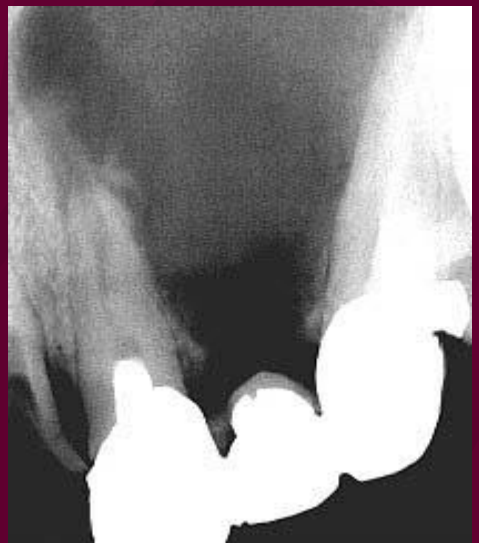
RADIOGRAPHIC FEATURES:

An INVERTED PEAR SHAPED radiolucent area between the roots of the lateral incisor and cuspid, usually causing divergence of the roots of these teeth.

The teeth associated with the cyst are vital.

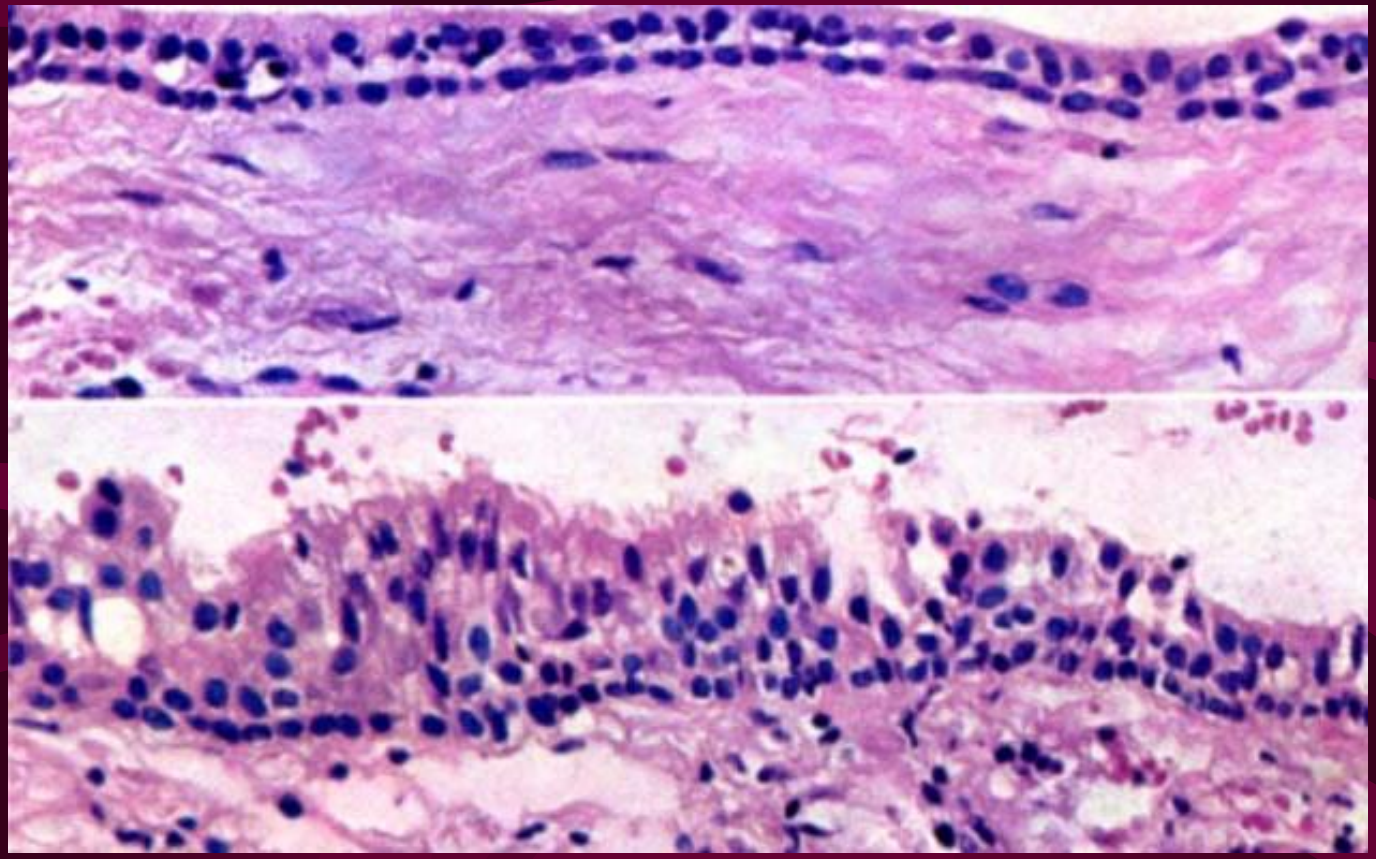






HISTOLOGIC FEATURES:

- The cyst is lined by either cuboidal, stratified squamous or ciliated columnar epithelium.
- The remainder of the wall is made up of fibrous connective tissue, usually showing inflammatory cell infiltration.
- Islands of odontogenic epithelium may be found rarely in connective tissue,



Photomicrographs showing cuboidal (upper) and ciliated columnar epithelial lining of globulomaxillary cyst

TREATMENT:

Surgical removal preserving the adjacent teeth.

MEDIAN MANDIBULAR CYST

It is of disputed origin:

1. Some authorities consider it a TRUE DEVELOPMENTAL CONDITION originating from proliferation of epithelial remnants entrapped in the median mandibular fissure during fusion of the bilateeral mandibular arches.
2. The lesion may represent some type of odontogenic cyst such as a primordial cyst originating from a supernumerary enamel organ in the anterior mandibular segment, particularly since the bones uniting at the mandibular symphysis originate deep within the mesenchyme and there by provided little opportunity for inclusion and subsequent proliferation of epithelial rests deep within the bone.
3. The lesion may represent a lateral periodontal cysts occurring in the midline, although the origin of this latter lesion is also obscure.

CLINICAL FEATURES:

- Mostly asymptomatic
- Discovered only during routine radiographic examination
- Obvious expansion of cortical plates of bone may present
- Associated teeth are vital.

RADIOGRAPHIC FEATURES:

- Unilocular, well circumscribed radiolucency, although it may also appear multilocular.

HISTOLOGIC FEATURES:

- A thin, stratified squamous epithelium, often with many folds and projections, lining a central lumen.
- The cyst may be lined by pseudostratified ciliated columnar epithelium.

TREATMENT:

- Conservative surgical excision with preservation of the associated teeth, if possible, is the treatment of choice

NASOALVEOLAR CYSTS

- It is a rare fissural cyst that may involve bone secondarily.

There are 2 theories: the first theory considered nasolabial cyst to arise from remnants of epithelium at the site of fusion of the maxillary, medial nasal & lateral nasal processes.

It is now suggested that the second theory is the most propable theory which consider nasolabial cyst to arise from remnants of misplaced epithelium of nasolacrimal duct.

CLINICAL FEATURES:

Female to male ratio is 4:1 .

Nasolaial cyst is a rare develpmental cyst arises in the soft tissue of upper lip lateral to midline, just below the ala of nose.

Because the cyst is a soft tissue cyst so there is not radiographic pict

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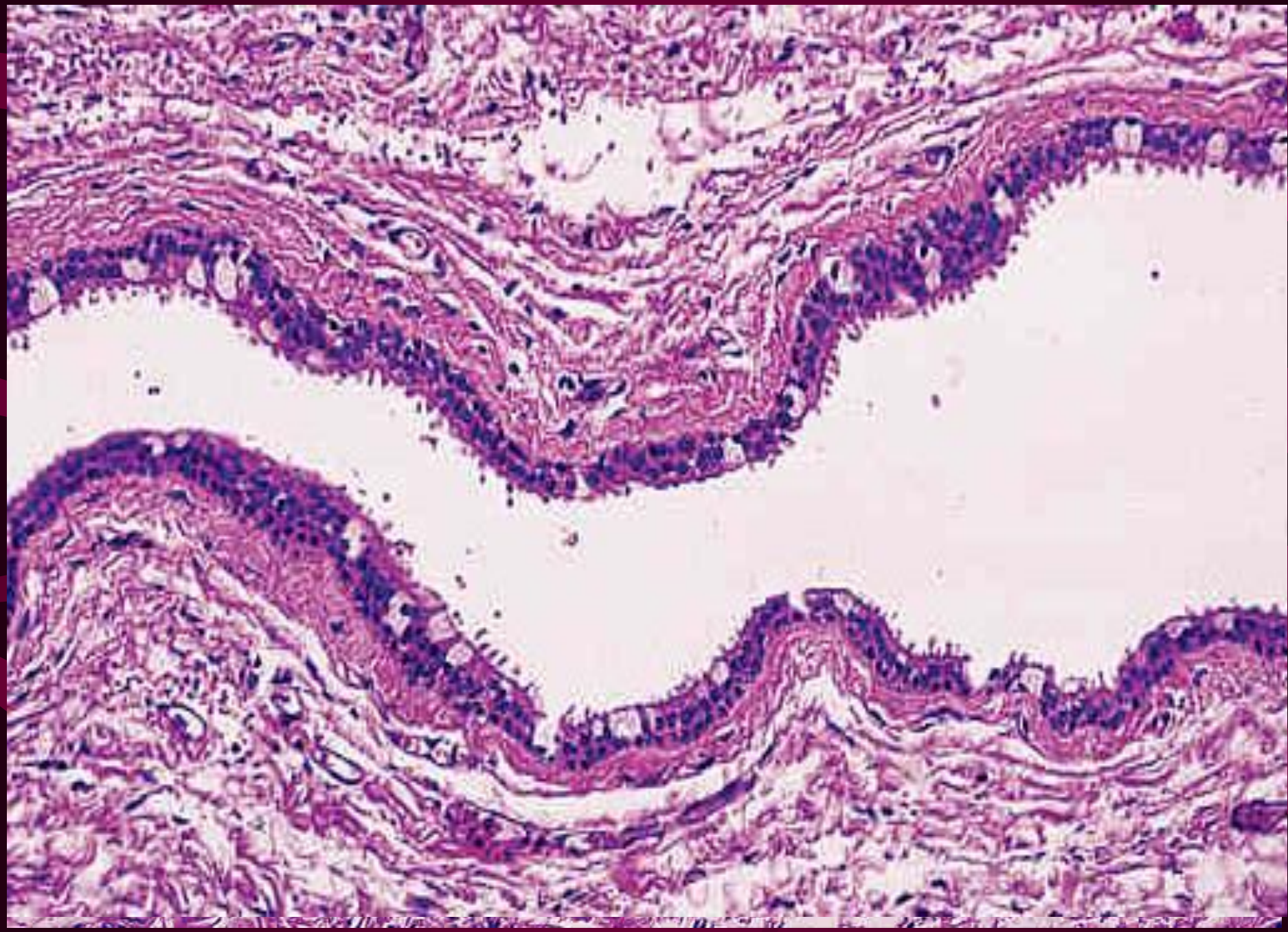


TREATMENT: Surgical excision

NONEPITHELIAL CYSTS (PSEUDOCYSTS)

TRAUMATIC BONE CYST

(SOLITORY BONE CYST; HEMORRHAGIC CYST; EXTRAVASATION CYST SIMPLE BONE CYST; IDIOPATHIC BONE CAVITY)

ETIOLOGY:

- It is unknown, although various theories have been proposed.
- Origin from INTRAMEDULLARY HEMORRHAGE following traumatic injury.
- Hemorrhage occurring within the medullary spaces of bone after trauma heals in most cases by organization of the clot and eventual formation of connective tissue and new bone.

- According TRAUMATIC THEORY, it is suggested that after injury to an area of spongy bone containing hemopoietic marrow enclosed by a layer of dense cortical bone there is failure of organization of the blood clot and, for some unexplained reason, subsequent degeneration of the clot that eventually produces an empty cavity within the bone.

- In the development of the lesion, the trabeculae of bone in the involved area become necrotic after degeneration of the clot and the bone marrow.

- The lesion then appears to increase in size by a steady expansion produced by a progressive infiltrating edema on the basis of restriction of venous drainage.

- This expansion tends to cease when the cyst like lesion reaches the cortical layer of bone.

- It is not unusual, for the patient to be unable to recall any traumatic injury to the jaw. This may indicate that an injury so mild that the patient would not be aware of it or remember it is sufficient to cause this lesion to develop.

OTHER THEORIES OF ORIGIN:

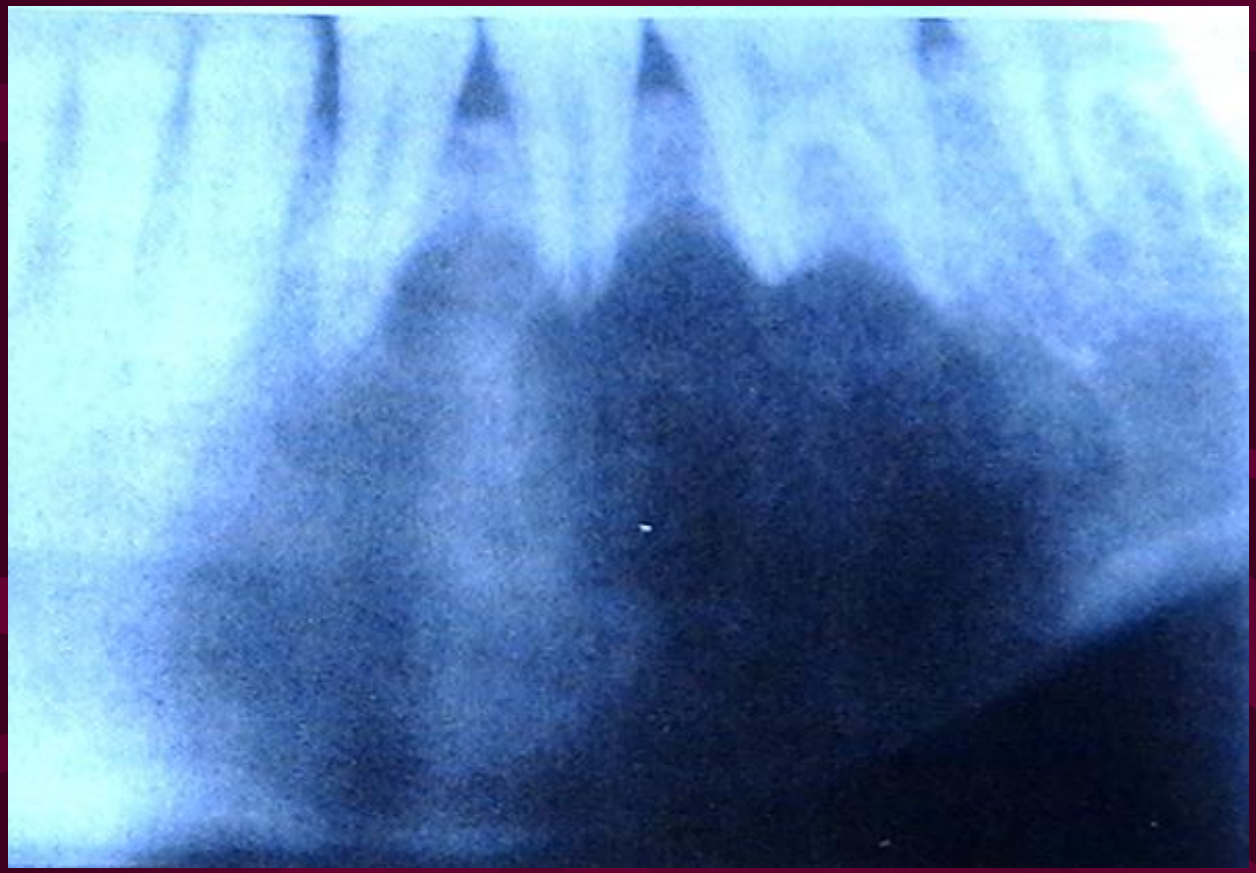
- Origin from bone tumors that have undergone cystic degeneration
- As a result of faulty calcium metabolism such as that induced by parathyroid disease.
- Origin from necrosis of fatty marrow due to ischemia,
- The end result of a low grade chronic infection, and
- As a result of osteoclasis resulting from a disturbed circulation caused by trauma creating an unequal balance of steoclastts and repari of bone.

CLINICAL FEATURES:

- Young persons
- Second decade of life
- Males predominance with a male: female ratio of 3:2
- Mandible is more commonly involved, especially incisor region.
- Enlargement may be a symptom but mostly discovered during routine radiographic examination.
- Associated teeth are vital
- When bone is opened surgically, it is found to contain either a small amount of straw colored fluid, shreds of necrotic blood clot, fragments of fibrous connective tissue or nothing.

RADIOGRAPHIC FEATURES:

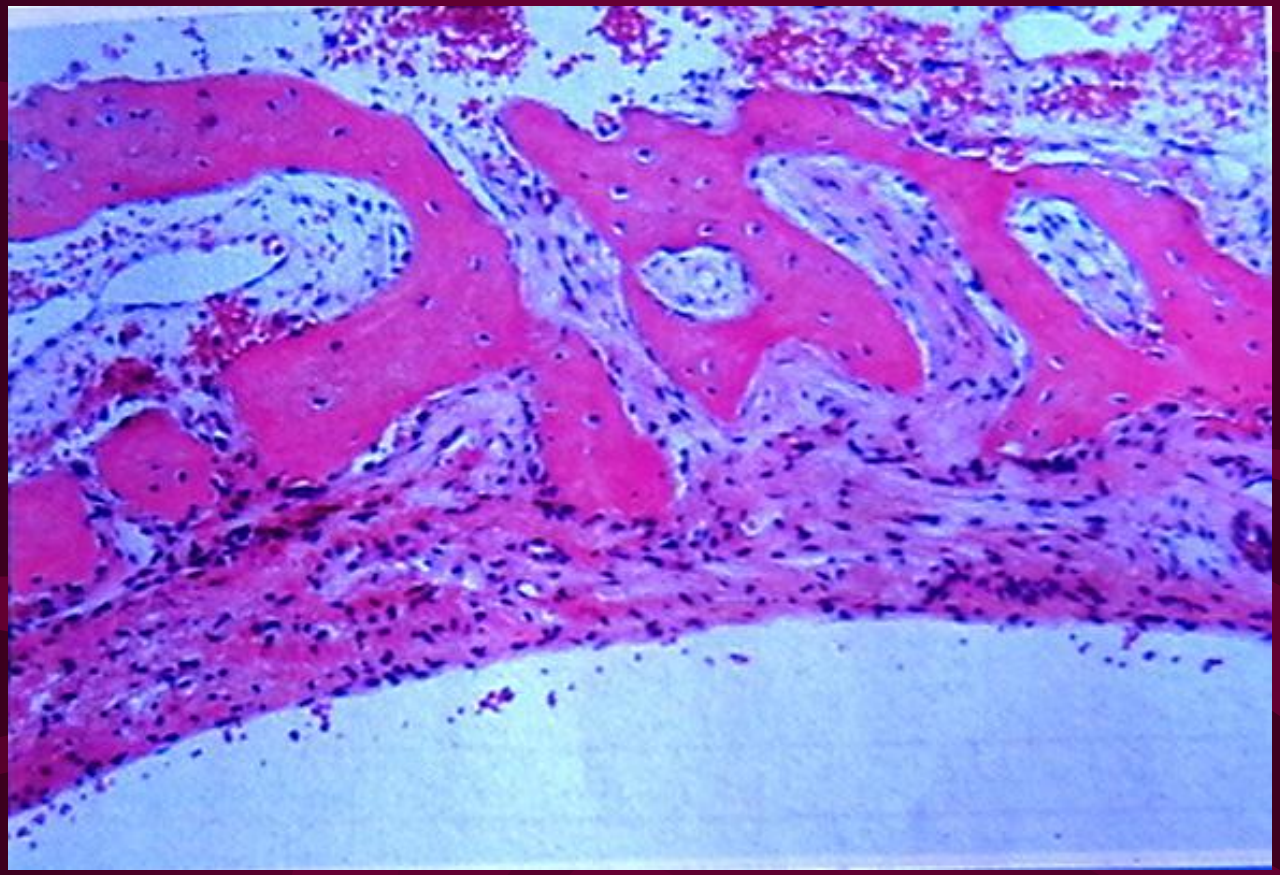
- Smoothly outlined radiolucent area of variable size, sometimes with a thin sclerotic border depending upon the duration of the lesion.
- When the radiolucency involves the roots of the teeth, the cavity may have a LOBULATED OR SCALLOPED APPEARANCE extending between the roots of these teeth.
- Seldom is there any displacement of teeth, and , in many cases, the lamina dura will appear intact.
- The traumatic bone cyst is usually located above the mandibular canal.



Radiograph showing lobulated or scalloped radiolucency with a smooth outline and a thin sclerotic border.

HISTOLOGIC FEATURES:

- Histologic examination of solitary bone cyst may reveal a thin connective tissue membrane lining the cavity but no other significant features.
- An extensive osteophytic reaction on the outer surface of the cortical plate may be seen.



Photomicrograph of bone wall of simple bone cyst. A thin, vascular connective tissue membrane is adjacent to the bone and no epithelial lining is identified.

TREATMENT :

- Surgical Curettage
- Intralesional steroid injection can be given.

ANEURYSMAL BONE CYST:

It is an interesting solitary bone lesion which was separated as a distinct entity in 1942 by Jaffe and Lichtenstein.

CLINICAL FEATURES:

- It is generally a lesion of young persons, predominantly occurring under the age of 20 years.
- No sex predilection.
- Mostly it affects long bones and vertebral column (more than 50% of cases)
- Lesions are also seen frequently in the clavicle, rib, innominate bone, skull and bones of the hands and feet.
- History of traumatic injury is present
- The lesions are usually tender or painful particularly upon motion and this soreness may limit movement of the affected bone.
- Swelling over the area of bone involvement is also common.

- Gross findings at the time of operation are characteristic.
- Upon entering the lesion, excessive bleeding is encountered, the blood “WELLING UP” from the tissue.
- The tissue has been described as resembling a BLOOD SOAKED SPONGE with large pores representing the cavernous spaces of the lesion.

ORAL MANIFESTATIONS:

- ABC occur with some frequency in jaws.
- Age rang:6-69 years
- Oral lesions has a predilection for occurrence in females.

RADIOGRAPHIC FEATURES:

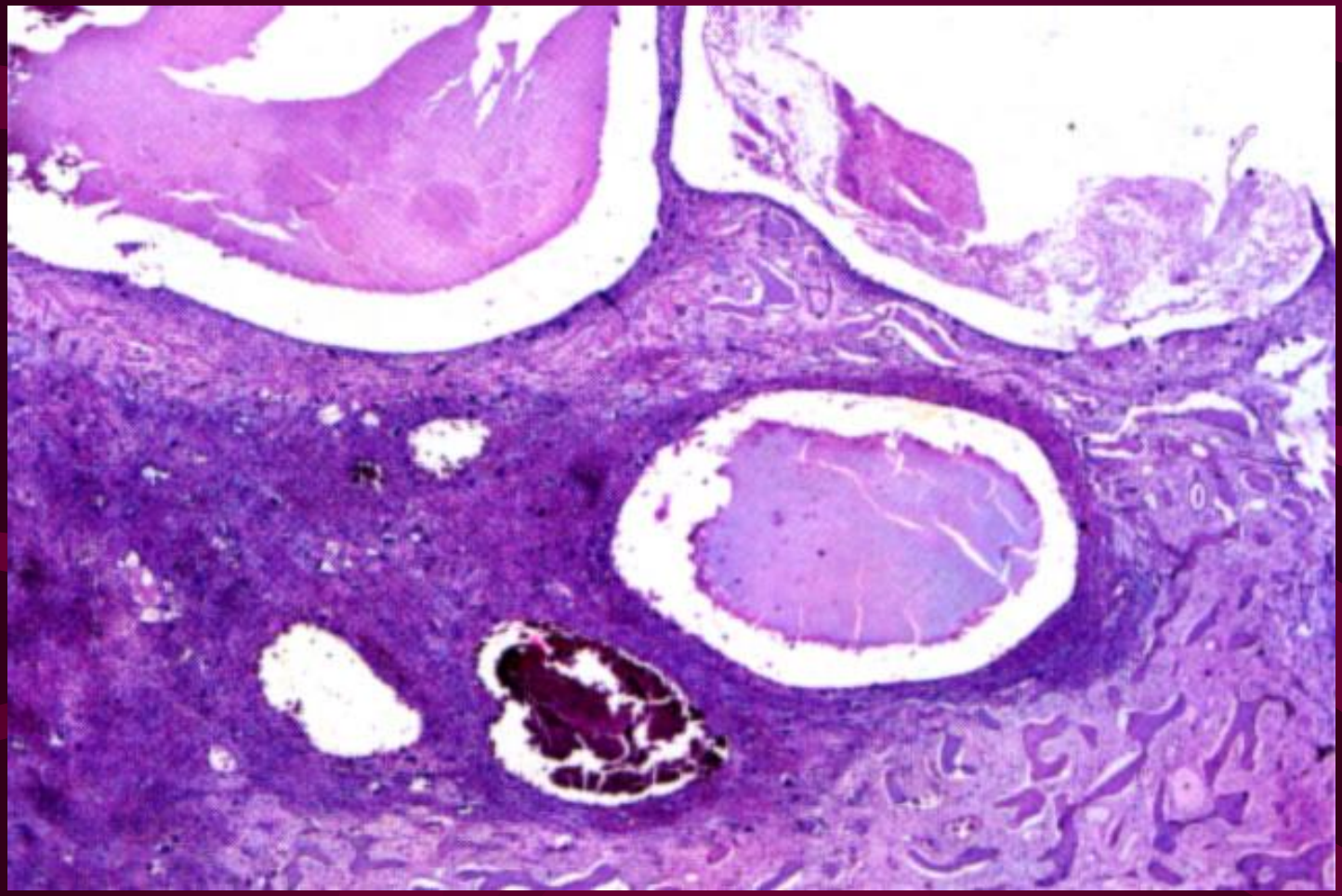
- Expansion of bone with a cystic with honeycomb or soap bubble appearance in many cases, and is eccentrically ballooned.
- The cortical bone may be destroyed, and a periosteal reaction may be evident.

HISTOLOGIC FEATURES:

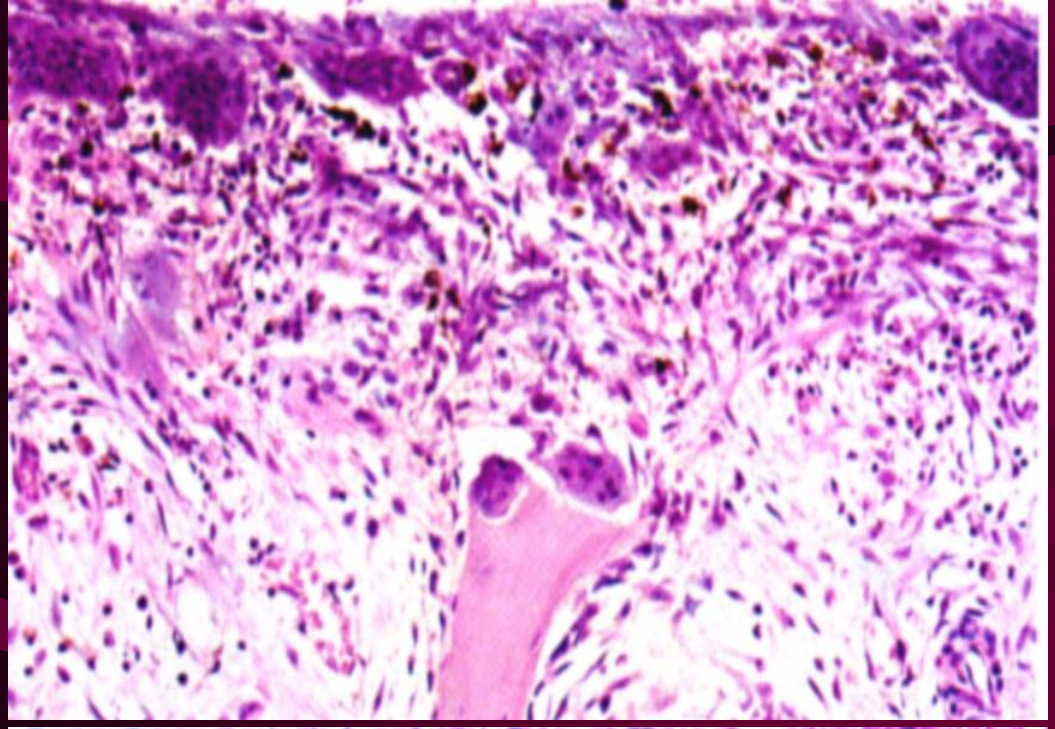
- Microscopically, ABC is characterized by spaces of varying size, filled with unclotted blood surrounded by cellular fibroblastic tissue containing multinucleated giant cells and trabeculae of bone.

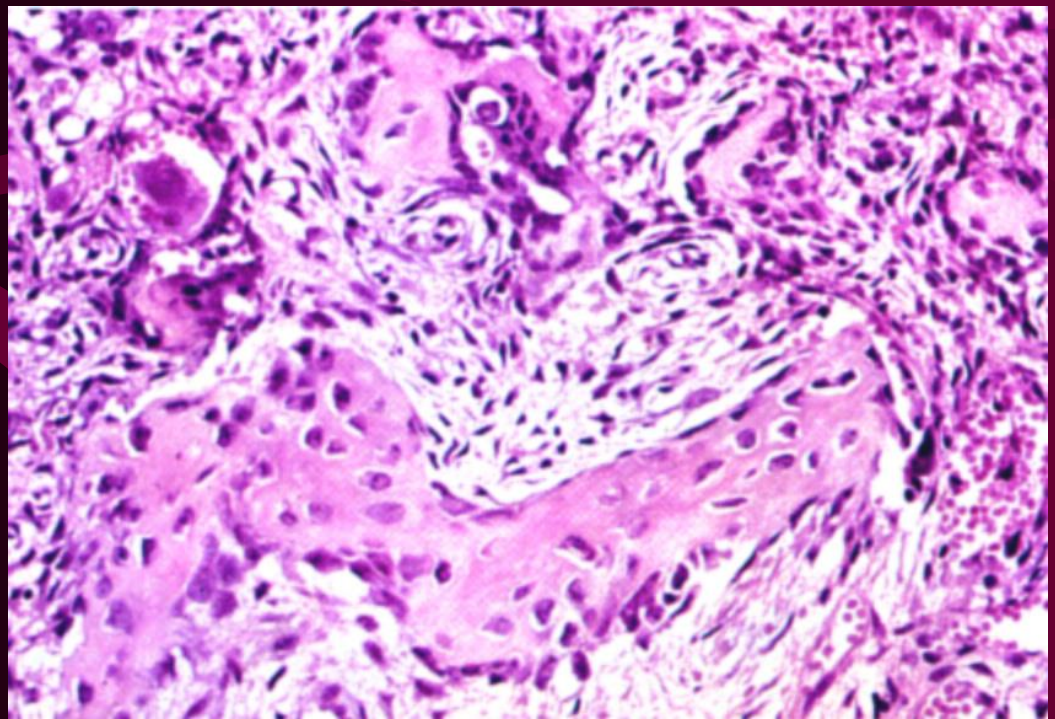
- On occasion, the wall contains an unusual lace like pattern of calcification that is uncommon in other intraosseous lesion.

- The blood filled spaces are not lined by endothelium.



ABC showing spaces of varying size, filled with blood surrounded by cellular fibroblastic tissue





ABC: cellular fibroblastic tissue containing multinucleated giant cells and trabeculae of bone.

PATHOGENESIS: various hypothesis have been proposed

1. LICHTENSTEIN has proposed that the aneurysmal bone cyst arises as a result of a persistent local alteration in hemodynamics, leading to increased venous pressure and subsequent development of a dilated and engorged vascular bed in the transformed bone area.

   Resorption of bone then occurs, to which the giant cells are related, and this is replaced by connective tissue, osteoid and new bone.

2. An alternative explanation is that the lesion represents an exuberant attempt at repair of a hematoma of bone, similar to the central giant cell granuloma.

- But in ABC it is proposed that the hematoma maintains a circulatory connection with the damaged vessel. This would produce a slow flow of blood through the lesion and ac count for the clinical “welling” of blood when the lesion is entered.

3. BIESECKER proposed a new hypothesis that a primary lesion of bone initiates an osseous, arteriovenous fistula & via its hemodnamic forces creates the secondary reactive lesion of bone, the aneurysmal bone cyst.

TREATMENT :

Surgical curettage or excision is the treatment of choice.

STATIC BONE CAVITY OR DEFECT OF MANDIBLE (STAFNE CYST OR DEFECT; DEVELOPMENTAL LINGUAL MANDIBULAR SALIVARY GLAND DEPRESSION)

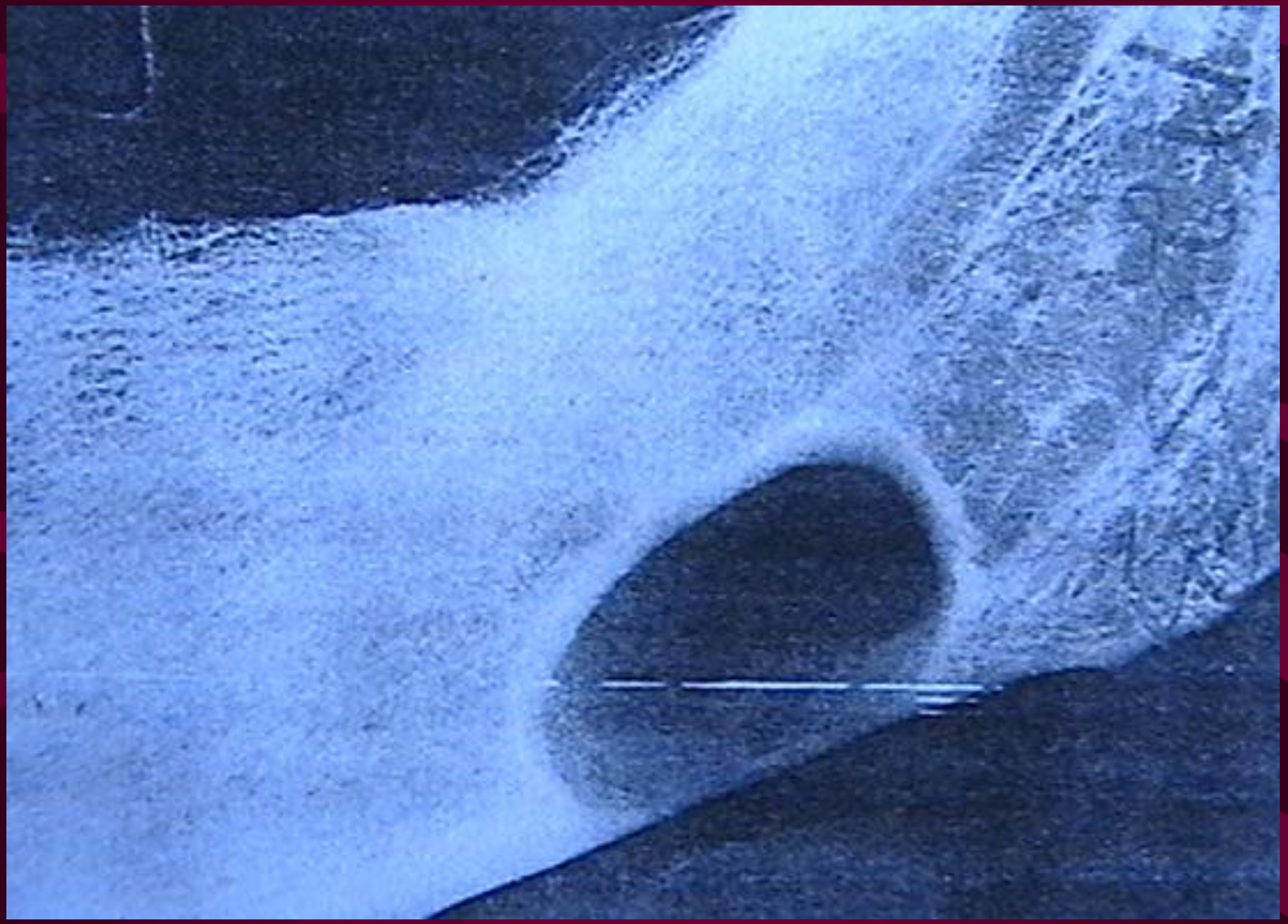
- It is a well circumscribed depression on the lingual surface of the body of the mandible.
- It may represent either actual entrapment of salivary gland tissue within the mandible during embryonic development or more frequently, an indentation on the lingual surface of the mandible with a portion of the submaxillary gland lying within the defect.
- Most authorities now agree that this entity is a congenital defect, although it has rarely been observed in children and its precise anatomic nature is still uncertain.
- More common in males
- Asymptomatic lesion.

Developmental salivary gland depression of the mandible.

RADIOGRAPHIC FEATURES:

- It appears as an ovoid radiolucency generally situated between the mandibular canal and the inferior border of the mandible, commonly in the second or third molar area or just anterior the angle.

- It is occasionally bilateral.



ovoid radiolucency generally situated between the mandibular canal and the inferior border of the mandible

TREATMENT: as it is a developmental defect, it requires no treatment.

B. CYSTS OF MAXILLARY ANTRUM

1. Sinus mucocele (surgical ciliated cyst)

2. Retention cyst of maxillary sinus

SINUS MUCOCELE (SURGICAL CILIATED CYST):

- These usually refer to lesions characterized by the accumulation of mucin, completely encases by epithelium
- They usually occur on 2 occasions:

    1. After trauma or surgery to sinus (surgical ciliated cyst) i.e. difficulty extraction of maxillary tooth or Caldwell Luc operation.
    2. From an ostial obstruction, which lead to a block in the normal drainage of the mucin.

- These cysts are enlarged in size as the intraluminal pressure increases and can distend the wall of the sinus and erode through the bone, thus clinically mimicking malignancy of antral region.

CLINICAL AND RADIOLOGRAPHIC FEATURES:

- The cyst are characterized by enlargement leading to the expansion of the bone.
- Usually asymptomatic
- Radiographically, sinus appear cloudy. The enlarging lesion can result in thinning of the walls of the sinus, eventually leading to erosion of the sinus wall.
- The surgical ciliated cyst of maxilla is usually spherical in shape.

HISTOLOGICAL FEATURES:

- These are the true cysts lined by pseudo stratified ciliated columnar epithelium, squamous epithelium, or metaplastic squamous epithelium

TREATMENT: surgical removal

RETENTION CYST OF MAXILLARY SINUS:

PATHOGENESIS:

- It arises from partial blockage of a duct of seromucous glands or from an invagination of the respiratory epithelium.
- The mucin is surrounded by epithelium and thus extravasation does not occur.

CLINICAL AND RADIOGRAPHIC FEATURES:

- Most retention cysts of maxillary sinus are located around the ostium or within antral polyps.
- They are usually small, not evident clinically, and discovered during histologic examination of antral polyps.
- They rarely reach a size large enough to produce detectable radiographic changes.

HISTOLOGIC FEATURES:

- They exhibit focal dilatation of a duct associated with the seromucous glands of the sinus lining.
- The lumen of the duct is filled with thick mucous, often intermixed with chronic inflammatory cells

C. CYSTS OF SOFT TISSUES (ORAL AND PARAORAL):

1. Dermoid cysts
2. Epidermoid cysts
3. Branchial cleft cyst
4. Thyorglossal cyst
5. Cystic hygroma
6. Cysts of salivary glands
    - Mucocele
    - Mucous extravasation cysts
7. Heterotopic gastrointestinal cysts

DERMOID CYSTS:

The origin of this cyst is probably by sequestration of skin and subsequent implantation of it along the lines of embryonic closure.

CLINICAL FEATURES:

- Mostly occurs on the face, neck or scalp.
- In addition to the skin, dermoid cysts can be intracranial, intraspinal, or perispinal.
- No racial predilection
- No gender predilection

- Patient of all ages are affected. However, intracranial or perispinal dermoid cysts are most often found in infants, children, or young adolescents.
- Intraabdominal dermoid cysts occur in females of 15-40 years age.
- Most dermoid cysts occurring in floor of the mouth occur in individuals of 15 to 30 years.

Dermoid cysts of floor of the mouth showing swelling below the mandible.

- Dermoid cyst that are congenital and localized on the neck, head, or trunk are usually visible at birth. Occasionally, they occur on neck or in a midline region.

- When on the head, the cysts are often adherent to periosteum.

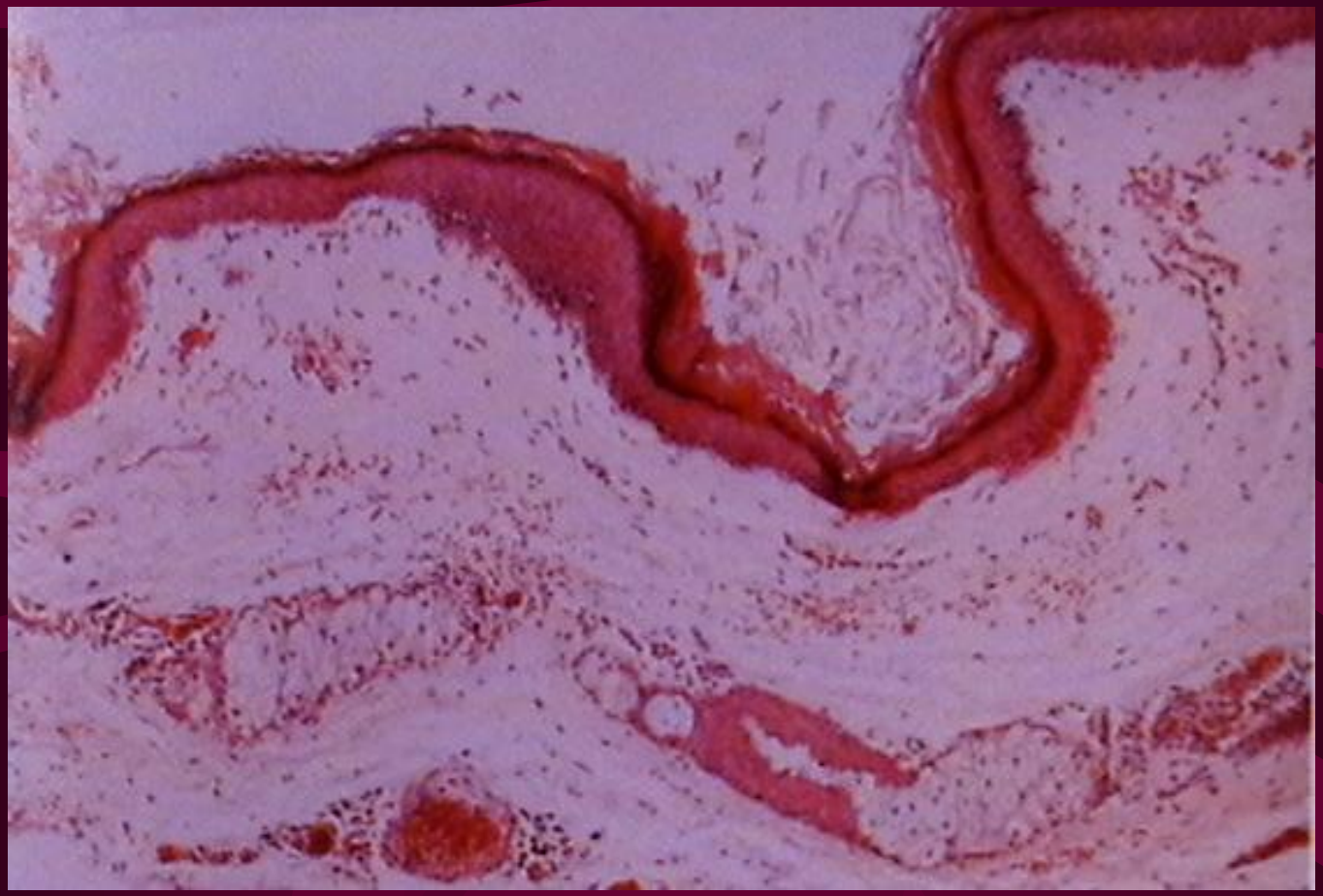
- The usual diameter is 1-4 cm.

- Three subclasses of congenital mouth cysts are described in the literature:

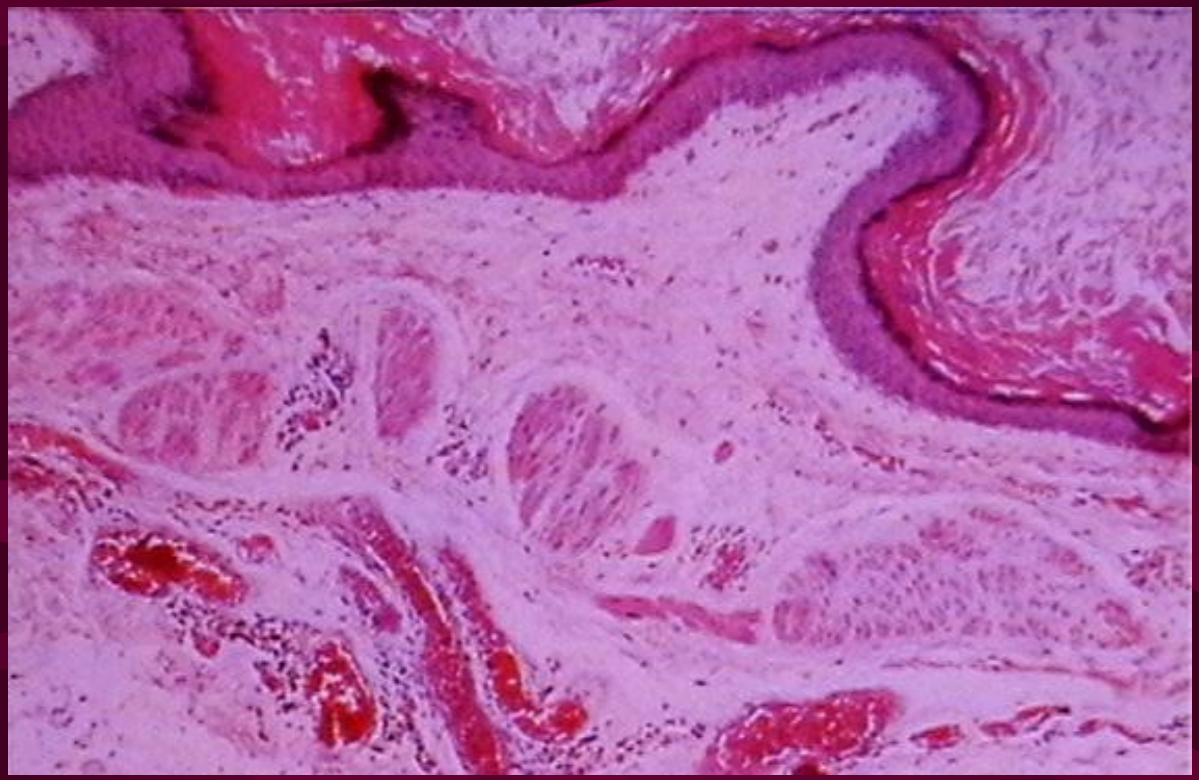
    1. Epidermoid (simple) cysts
    2. Dermoid (complex) cysts and
    3. Teratoid (complex) cysts.

HISTOLOGIC FEATURES:

- These cysts are lined by an epidermis that possesses various epidermal appendages. As a rule, these appendages are fully mature.
- Hair follicle containing hair that project into the lumen of the cyst are often present.
- The dermis of dermoid cysts usually contains sebaceous glands, eccrine glands, and in may patients, apocrine glands.
- Occasionally, the lining epithelium may proliferate as papillary boundaries extend externally or inward toward the lumen of the cyst. This proliferation may have some superficial resemblance to epiedermal carcinomatous proliferation.



DERMOID CYSTS



DERMOID CYSTS

TREATMENT:

SURGICAL EXCISION

EPIDERMOID CYSTS (EPIDERMAL INCLUSION CYST; EPIDERMAL CYST):

These are the result of implantation of epidermal elements and its subsequent cystic transformation.

ETIOLOGY:

1. Sequestration and implantation of epidermal rest during embryonal period,
2. Occlusion of the pilosebaceous unit,
3. Iatrogenic or surgical implantation of epithelium into the jaw mesenchume.
4. HPV infection
5. Eccrine duct occlusion

- The last two are additional factors in the development of palmoplantar epidermoid cysts.
- Epidermoid cysts result from the proliferation of epidermal cells within a circumscribed space of the dermis.

CLINICAL FEATURES:

- These cysts are indolent in nature, slow to progress and remains asymptomatic until or unless secondarily infected.
- Male preponderance.
- 3^{rd} and 4^{th} decades.
- The most common complaint is discharge of foul smelling cheese like material
- Pain and tenderness if the cyst is secondarily infected.
- These cysts appear as firm, round, mobile, flesh colored to yellow or white subcutaneous nodules of variable size.
- A central pore or punctum is present from which a thick cheesy material can be expressed.
- The cyst may be pigmented in individuals with dark complexion.

- In the uncommon event of malignancy…
  - Rapid growth,
  - Friablity,
  - Bleeding … are reported.

- Occurance of secondary malignancy has been reported…
  - Basal cell carcinoma,
  - Bowen disease,
  - Squamous cell carcinoma
  - Mycosis fungoides

- This cyst is mainly reported from sites of …
    - face,
    - trunk,
    - neck,
    - extremities, and
    - scalp.
- While the facial involvement is also frequent in Gardner syndrome, the extremities tend to be affected more than the trunk.
- The ocular and oral mucosae can also be affect, and the cysts have been reported…..
    - on the palpebral conjuctiva,
    - on the lips,
    - on the buccal mucosa, u
    - under the tongue, and
    - even on the uvula.
- The cysts are also found on anterior fontanelle.

- Certain hereditory syndromes have epidermoid cysts as part of their features.

- Examples includes
    - Gradner syndrome
    - Basal cell nevus syndrome
    - Pachyonychia congenita

HISTOLOGIC FEATURES:

- The cystic lining is comprised of stratified squamous epithelium with glandular differentiation and is filled with desquamated keratin disposed in a laminar pattern.
- Dystrophic calcification and reactive foreign body reaction are seen associated with the cystic lining is noticed not infrequently.
- Pigmented epidermoid cysts may demonstrate melanin pigment in the wall

- Palmoplantar epidermoid cysts demonstrate characteristic histologic changes which includes…
    - Intracytoplasmic eosinophilic inclusion bodies in the cyst wall,
    - Vacuolated cells and cells with condensed keratohyalin granules in granular layer,
    - elongated rete ridges, and
    - vacuolated structures and parakeratotic nuclei in the keratinous mass.
- Structures resembling eccrine ducts are also observed in some lesions

TREATMENT:

- Surgical removal.
- The cysts occasionally recur.
- An unusual complication reported from an oral epidermoid cyst was sialadenitis due to pressure on the submandibular salivary duct.

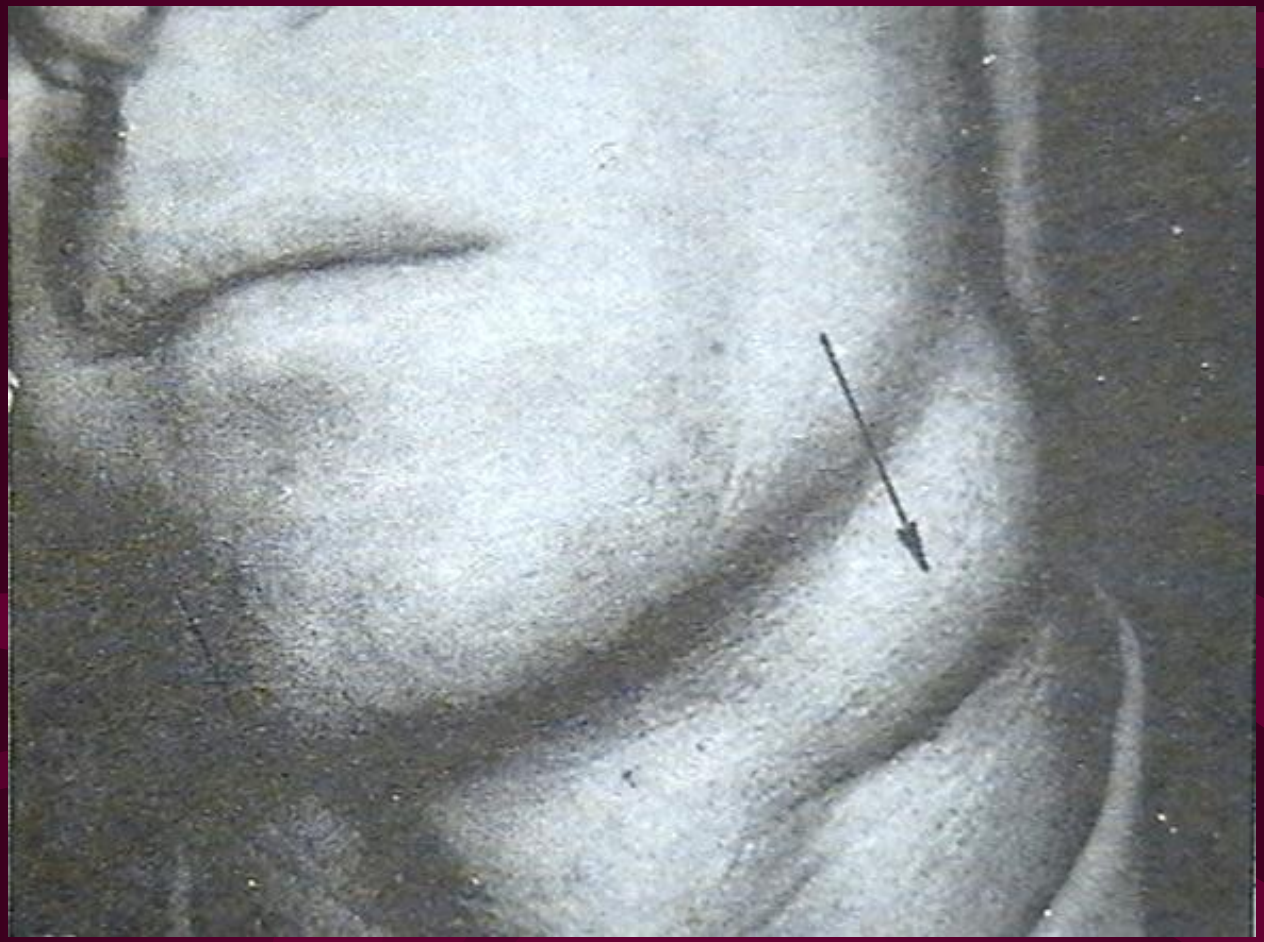
BENIGN CERVICAL LYMPHOEPITHELIAL CYST (BRANCHIAL CLEFT CYST)

- It is a cyst which occurs on the lateral aspect of the neck and has been described classically as originating from remnants of branchial arches or pahryngeal pouches.
- This cyst originates through cystic transformation of epithelium entrapped in cervical lymph nodes.
- The source of this epithelium is unknown, but it is probably of salivary gland origin, a distinct embryologic possibility.

CLINICAL FEATURES:

- Young adults
- Slow growing and may have a duration of weeks to many years.
- It is an asymptomatic, circumscribed movable mass on the lateral aspect of the upper neck, usually close to the anterior border of the sternocleidomastoid muscle.
- Most of the cyst occurs on neck, folowed by angle of mandible, submandibular area and preauricular and parotid areas.

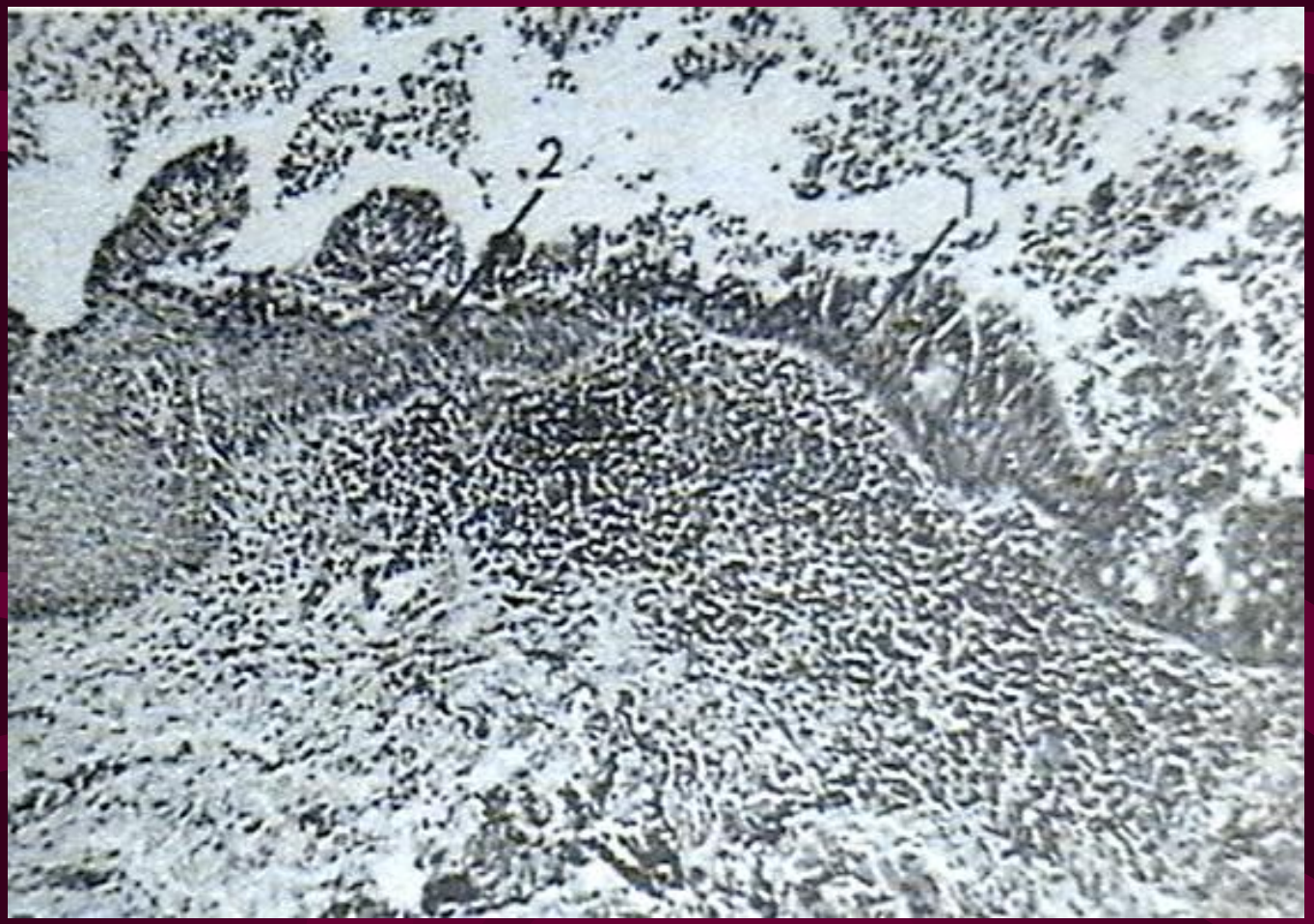
BENIGN CERVICAL LYMPHOEPITHELIAL CYST: Swelling in the neck beneath the body of the mandible and associated with sternomastoid muscle on right side.



Benign cervical lymphoepithelial cyst: Swelling in the neck beneath the body of the mandible and associated with sternomastoid muscle on left side

HISTOLOGIC FEATURES:

- The cyst is lined by stratified squamous epithelium, but may contain some pseudostratified columnar epithelium
- The wall of the cyst generally exhibits lymphoid tissue with a typical lymph node pattern.
- A variable amounts of connective tissue is also present in the wall.
- The cyst itself may contain a thin watery fluid or a thick, gelatinous mucoid mater.



Benign cervical lymphoepithelial cyst: the cyst is lined by pseudostratified columnar epithelium (1) and stratified squamous epithelium (2)

TREATMENT:

- Thorough Surgical Removal
- The development of carcinoma from the epithelium lining the branchial cleft cyst has been reported by Lollins and Edgerton.

THYROGLOSSAL TRACT CYSTS:

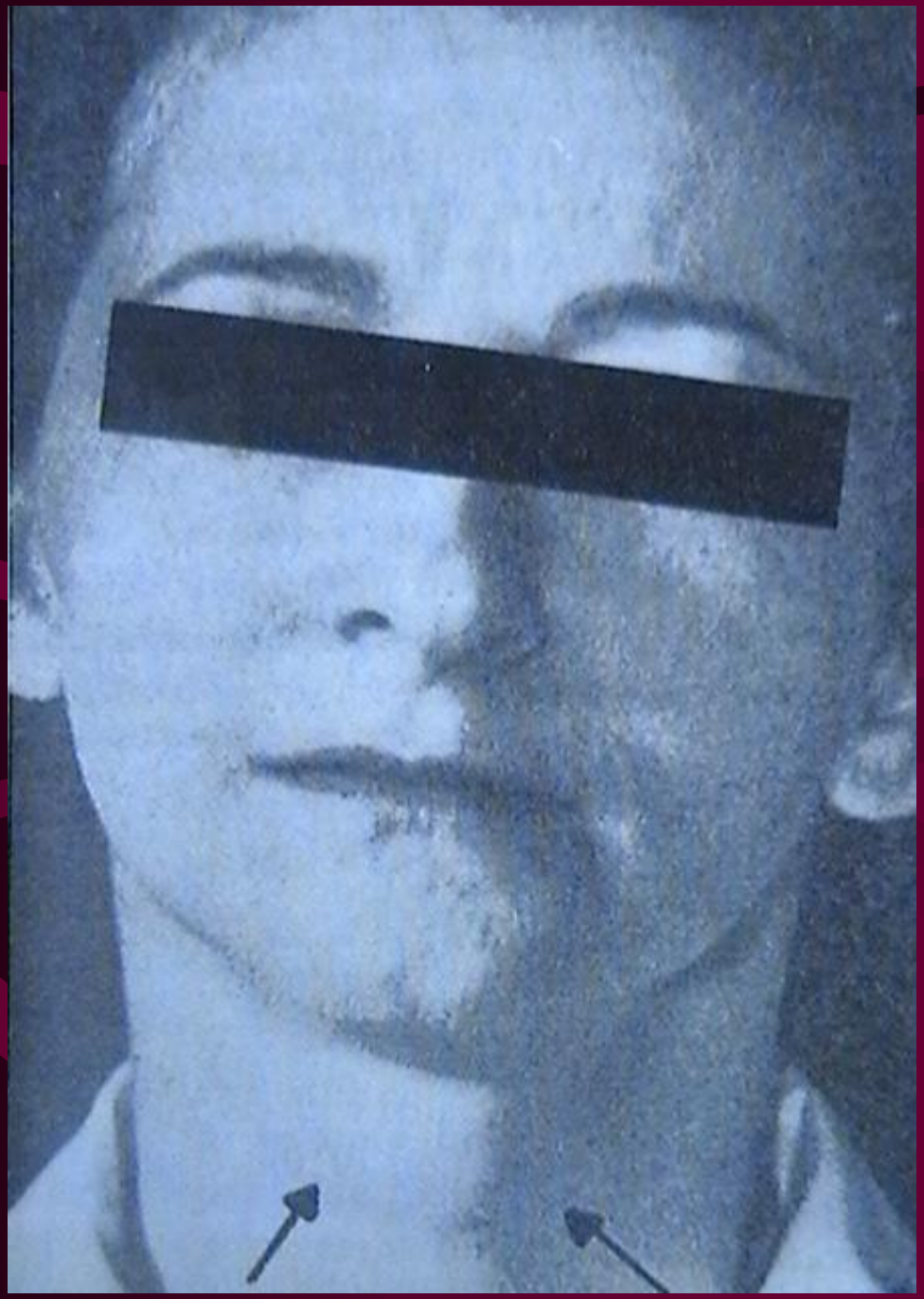
- It is an uncommon developmental cyst which may form anywhere along the embryonic thyroglossal tract between the foramen caecum of the tongue and the thyroid glands

- It apparently arises from remnants of this tract that do not become obliterated.

- The reason for the appearance of the cyst is unknown, but it may be triggered by infection of the lymphoid tissue in the area of the remnants of the thyroglossal tract through drainage from an upper respiratory tract infection

CLINICAL FEATURES:

- Occurs usually in young persons.
- It appears clinically as a firm, cystic midline mass, varying in size from a few millimeters to sever centimeters.
- The swelling develops slowly and asymptomatic unless it occupies a position high in the tract, near the tongue. In such cases, dysphagia may be present.
- Occasionally a fistula will form, leading from the cyst and opening on the skin or mucosal surface.



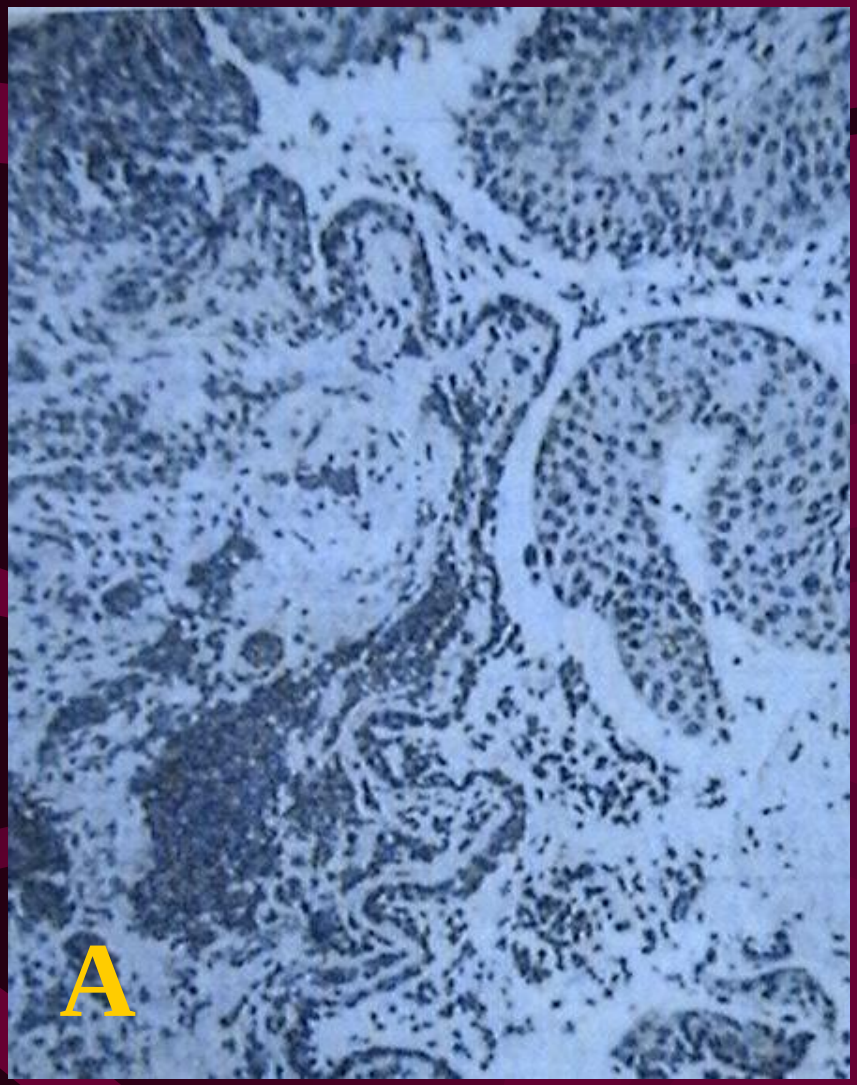
Thyroglossal tract cyst: a palpable, fluctuant , midline lesion

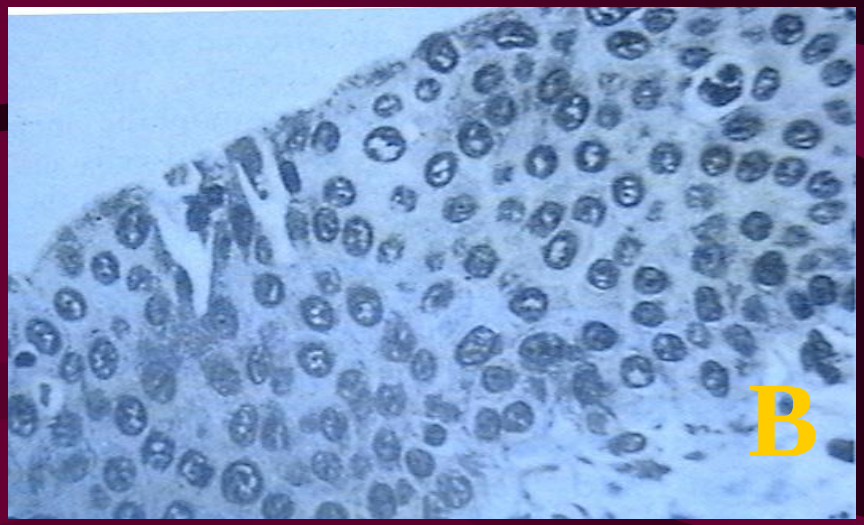
HISTOLOGICAL FEATURES:

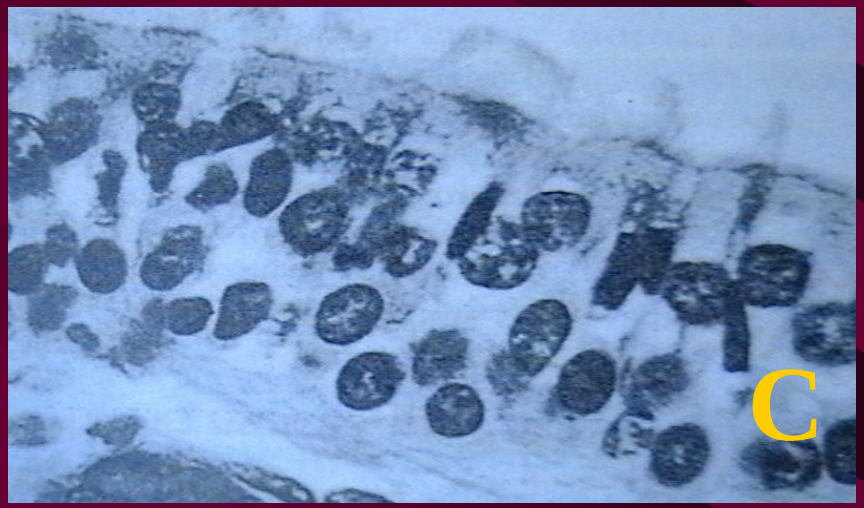
- The cyst may be lined by statified squamous epithelium, ciliated columanar epithelium, or intermediate transition type, since it is actually derived from cells originaating from the embryonic pharyngeal floor.

- The connective tissue wall of the cyst will frequently contain small patches of lymphoid tissue, thyroid tissue, and mucous glands.

- Nodular collections of sebaceous glands in association with thyroglossal ductlike structures of the tongue occasionally have been reported.







The epithelium lined cyst (A) composed of both stratified squamous epithelium (B) and pseudostratified, ciliated columnar epithelium (C)

TREATEMNT: COMPLETE SURGICAL EXCISION.

CYSTIC HYGROMA:

- It is a common and distinct entity that is not manifested in the oral cavity but occurs in the neck as a large, deep, diffuse swelling which has been discussed in detail by Bill and Summer and Paletta.

- It is a type of lymphangioma which is a b3enign hamartomatous hyperplasia of lymphatic vessels and divided into 5 types:

    1. Simple lymphangioma
    2. Cavernous lymphangioma.,
    3. Cellular or hypertrophic lymphangioma
    4. Diffuse systemic lymphangioma, and
    5. Cystic lymphangioma or cystic hygroma

CLINICAL FEATURES:

- Mostly the lesions develop at the end of the second year of life.
- The head and neck area is the predominant site.
- The most common head and neck location is the lateral neck, where this lesion typically contains large cystic spaces and is commonly called cystic lymphangioma or cystic hygroma.
- It presents as a large,m diffuse, swelling.

HISTOLOGIC FEATURES:

Histologically it consists of huge, macroscopic lymphatic spaces with surrounding fibrovascular tissues and smooth muscle.

TREATMENT: simple surgical excision is the treatment of choice.

Cysts of the salivary glands:

1. Mucocele

2. Salivary duct cyst (Mucous retention cyst)

ETIOLOGY AND PATHOGENESIS:

- Many authorities believed that this type of lesion resulted from obstruction of the duct of a minor or accessory salivary gland.

- Bhasker and coworkers have shown that if the salivary duct was severed so that a continuous pooling of saliva occurred in the tissues, a well demarcated cavity developed which was histologically identical with the mucocele.

- These investigators appear to indicate that traumatic severance of a salivary duct, such as that produced by
    - biting the lips or cheek or
    - pinching the lip by extraction forceps…..

  precedes the development of the retention phenomena.

- It is also possible that a chronic partial obstruction may be etiologic importance. Such a partial obstruction could result from a small piece of intraductal calculus or even from contraction of developing scar connective tissue around a duct after a traumatic injury.

- Thus, mucocele may be classified as
    1. An extravasation mucocele,
    2. A retention mucocele (or a true retention cyst)

- The extravasatiuon type is more common than retention type.

CLINICAL FEATURES:

- The retention phenomena involving accessory salivary gland structures occurs most frequently on the lower lip, but may also occur on the palate, cheek, tongue and floor of mouth.

- Clinically, the lesion may lie fairly deep in the tissue or be exceptionally superficial and depending upon the location, will present variable clinical appearance.

- The superficial lesion appears a raised circumscribed vesicle, several millimeters to a centimeter or more in diameter, with a bluish, translucent cast.

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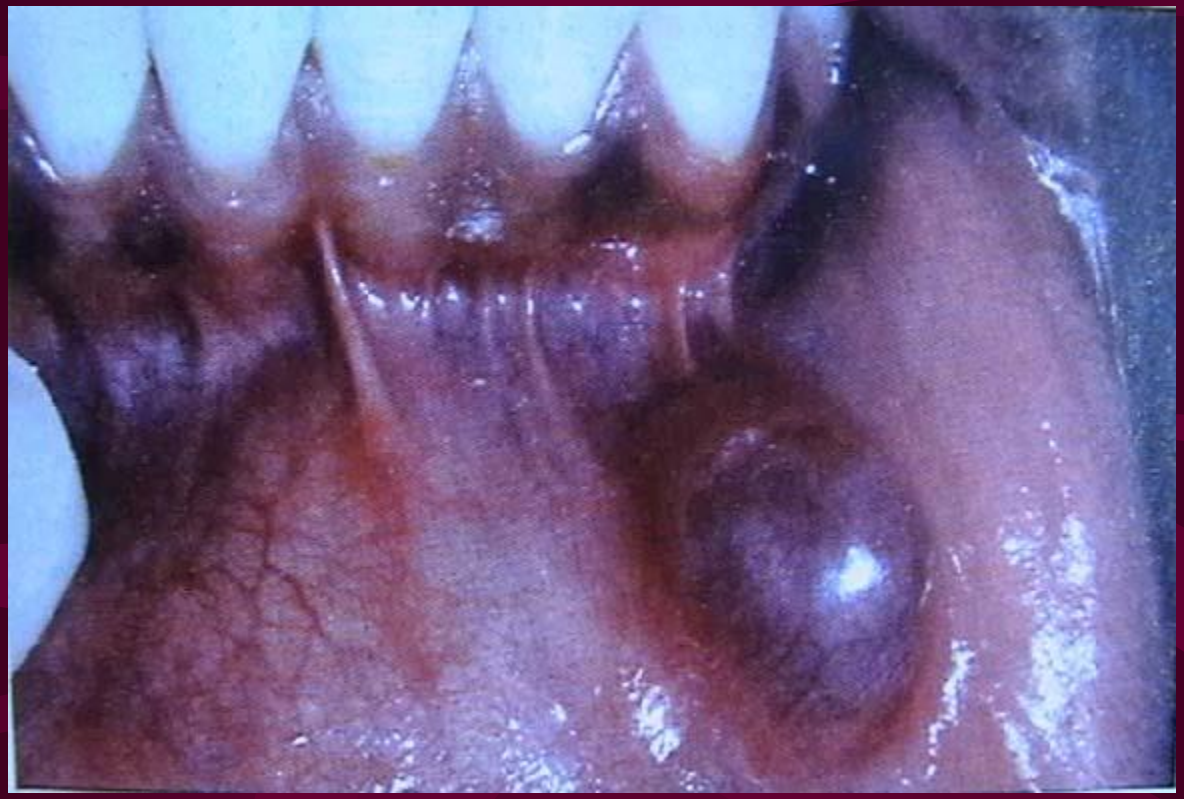


MUCOCELE: A BLUISH, FLUCTUANT SWELLING ON THE LOWER LIP

- The deeper lesion is manifested also as a swelling but because of the thickness of the overlying tissue, the color and surface appearance are those of normal mucosa.

- It is interesting that mucous retention phenomenon is restricted almost to lower lip.

- If the contents of the cyst are liberated, they usually are found to consist of a thick, mucinous material. Some lesion regress and enlarge periodically and may disappear after traumatic injury which results in their evacuation.

- they almost invariably recur

HISTOLOGIC FEATURES:

- The majority of mucoceles, consist of a circumscribed cavity in the connective tissue and submucosa, producing an obvious elevation of the mucosa with thinning of the epithelium as though it were stretched.

- The cavity itself is not lined by epithelium and is therefore, not a true cyst. Instead, its wall is made up of a lining of compressed fibrous connective tissue and fibroblasts.

- Sometimes, the connective tissue wall is made up of granulation tissue, and may show infiltration by abundant numbers of PMNs, lymphocytes and plasma cells.

- The lumen of the cyst is filled by an eosinophilic coagulum containing variable numbers of cells, chiefly leukocytes and mononuclear phagocytes.

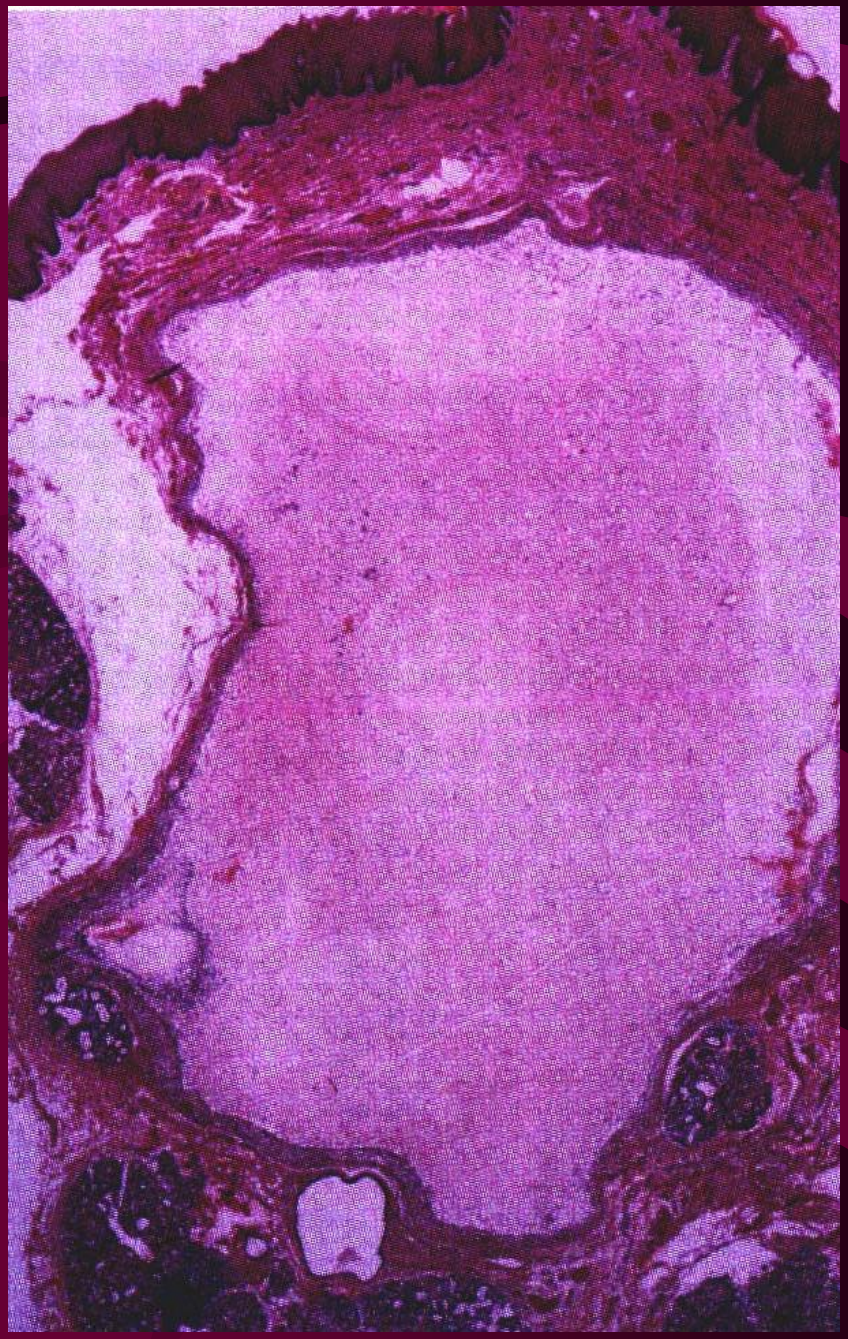
- Occasional mucoceles demonstrate an intact, flattened epithelial lining, which is simple represents the portion of the excretory duct bordering the line of severance if the severance is actually the manner in which these lesion s develop.

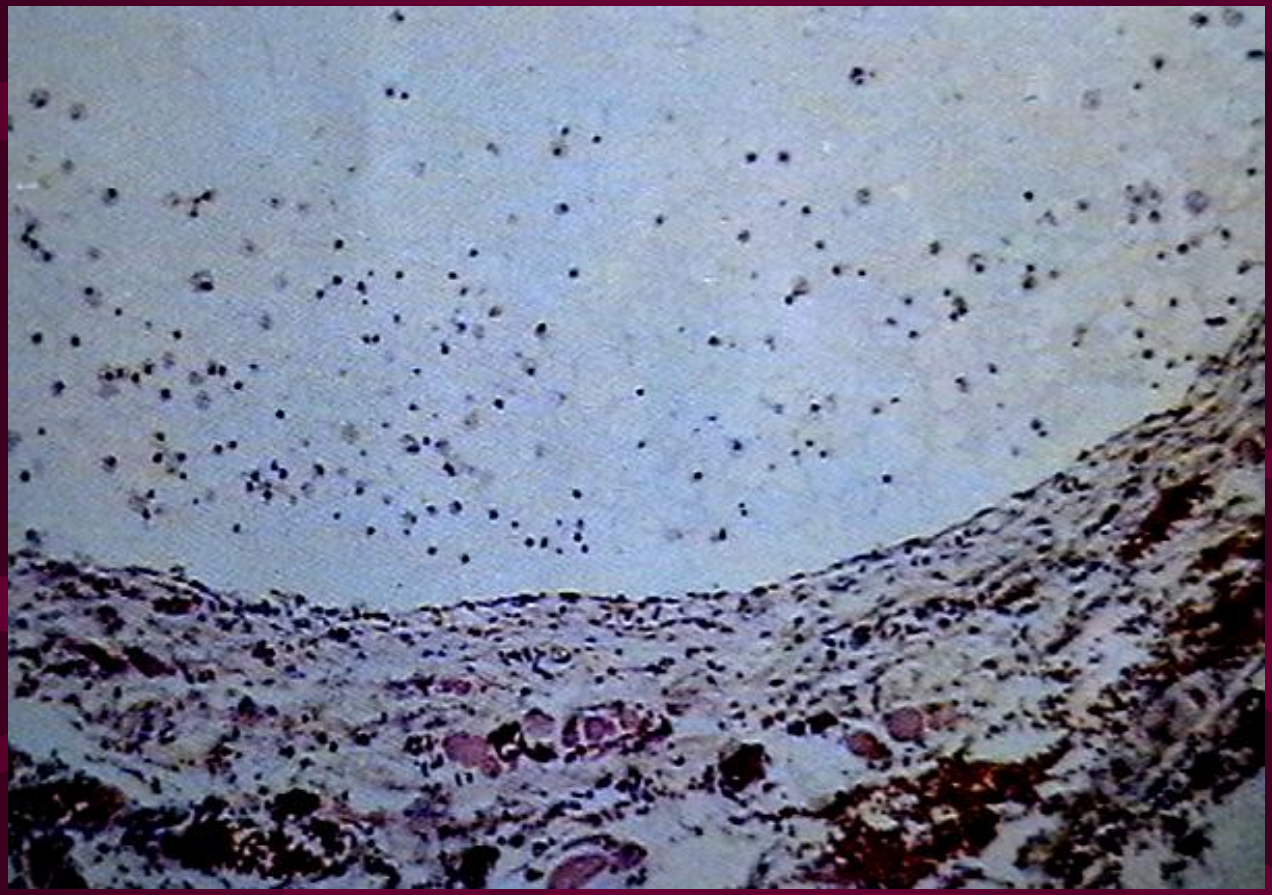
- the flattened epithelial lining has been referred to as epithelium of “feeder duct” . in other instances, the epithelial lined mucocele represents a lesion of the retention type.

- The salivary gland acini which lay adjacent to the area of the mucocele and are associated with the involved duct often show alteration with the involved duct often show alterations

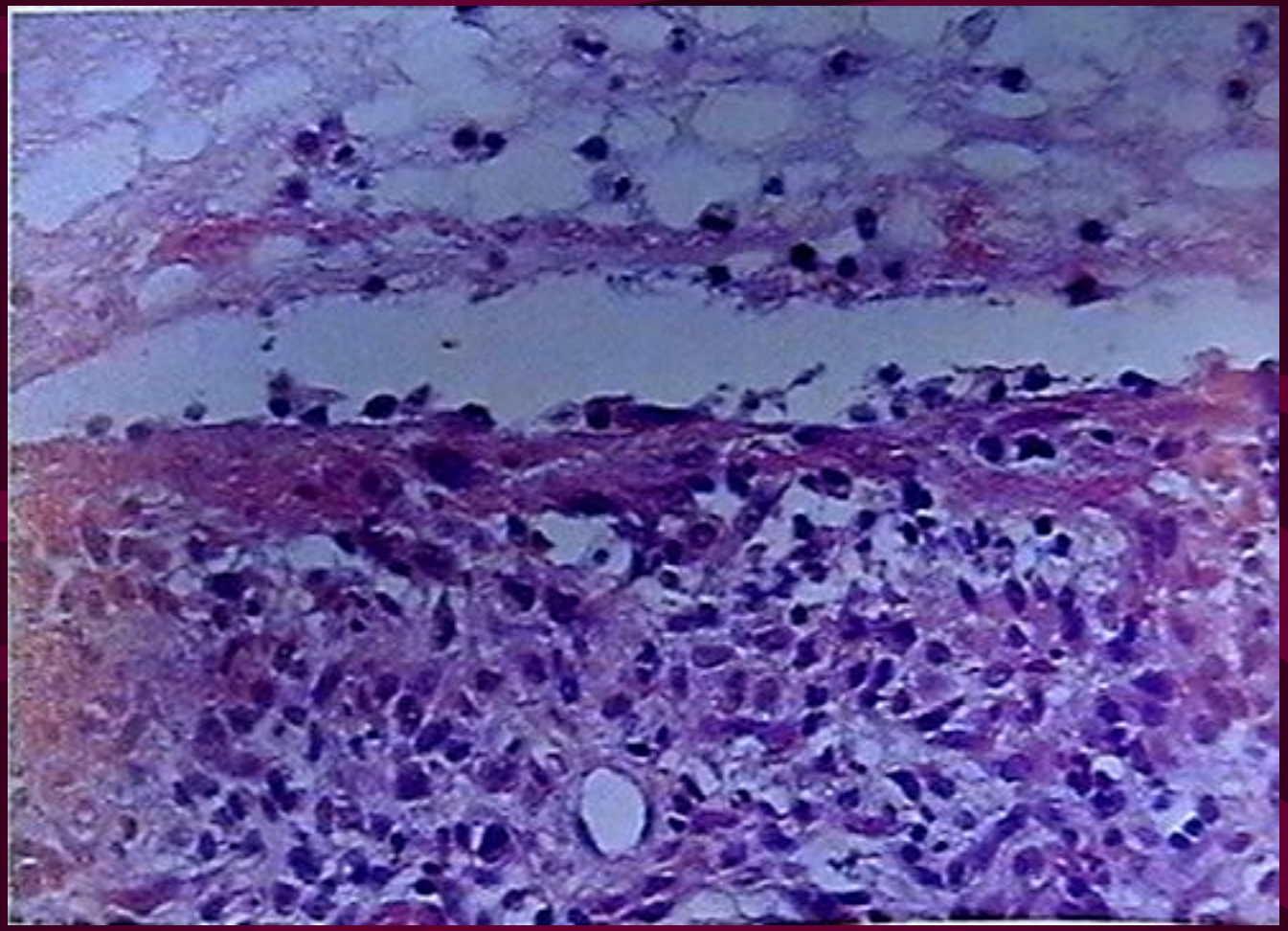
MUCOCELE:

mucin filled cyst like cavity beneath the mucosal surface. Minor salivary glands are present below and lateral to the spilled mucin

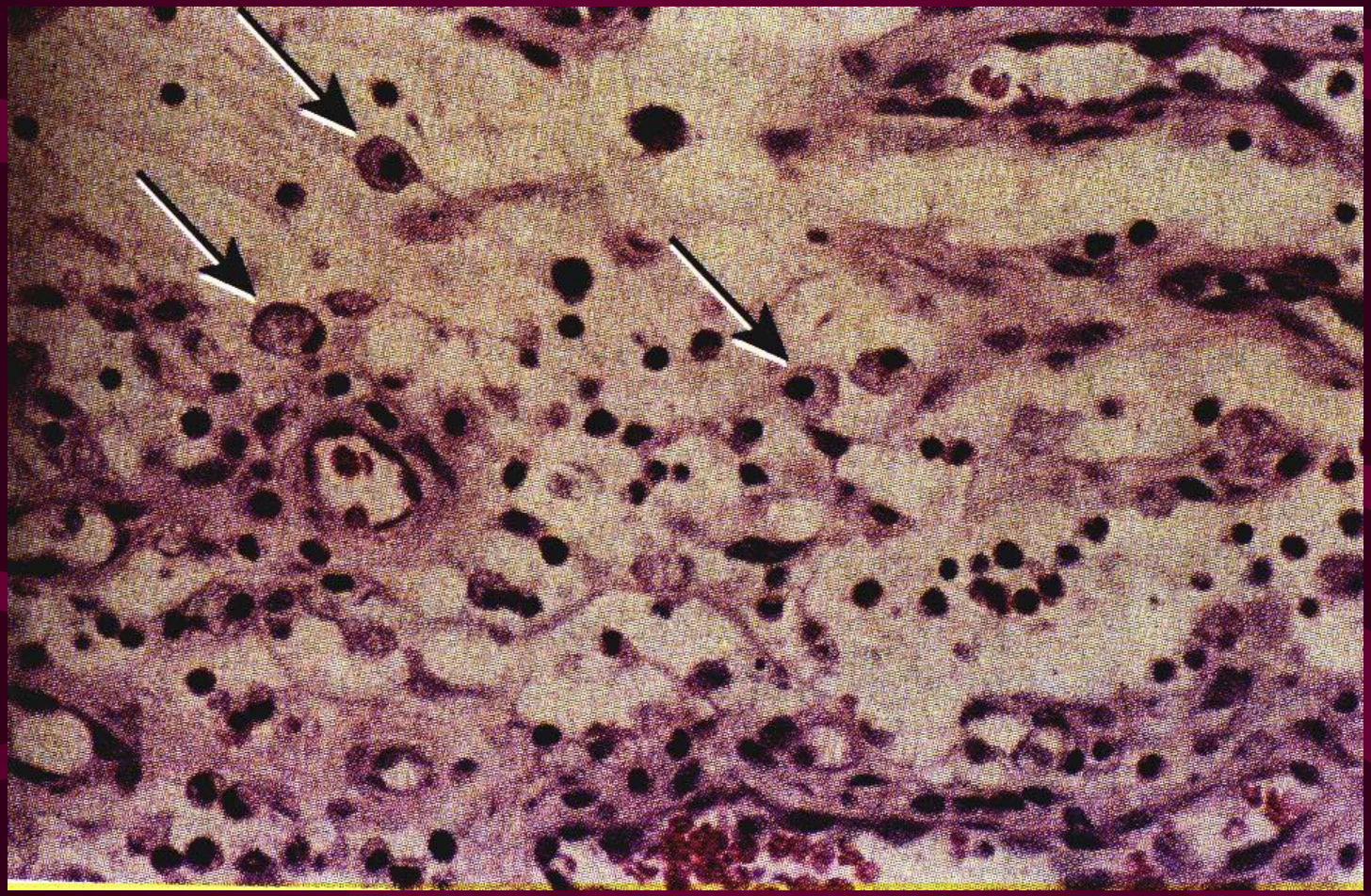




MUCOUS EXTRAVASATION CYST: cystic cavity lined by condensed fibroblasts and macrophages and within the cavity filled with mucinous fluid, there are polymorphonuclear leucocytes.



High power view showing condensed fibroblasts and macrophages.



MUCOCELE: high power view showing spilled mucin that is associated with granulation tissue containing foamy histiocytes

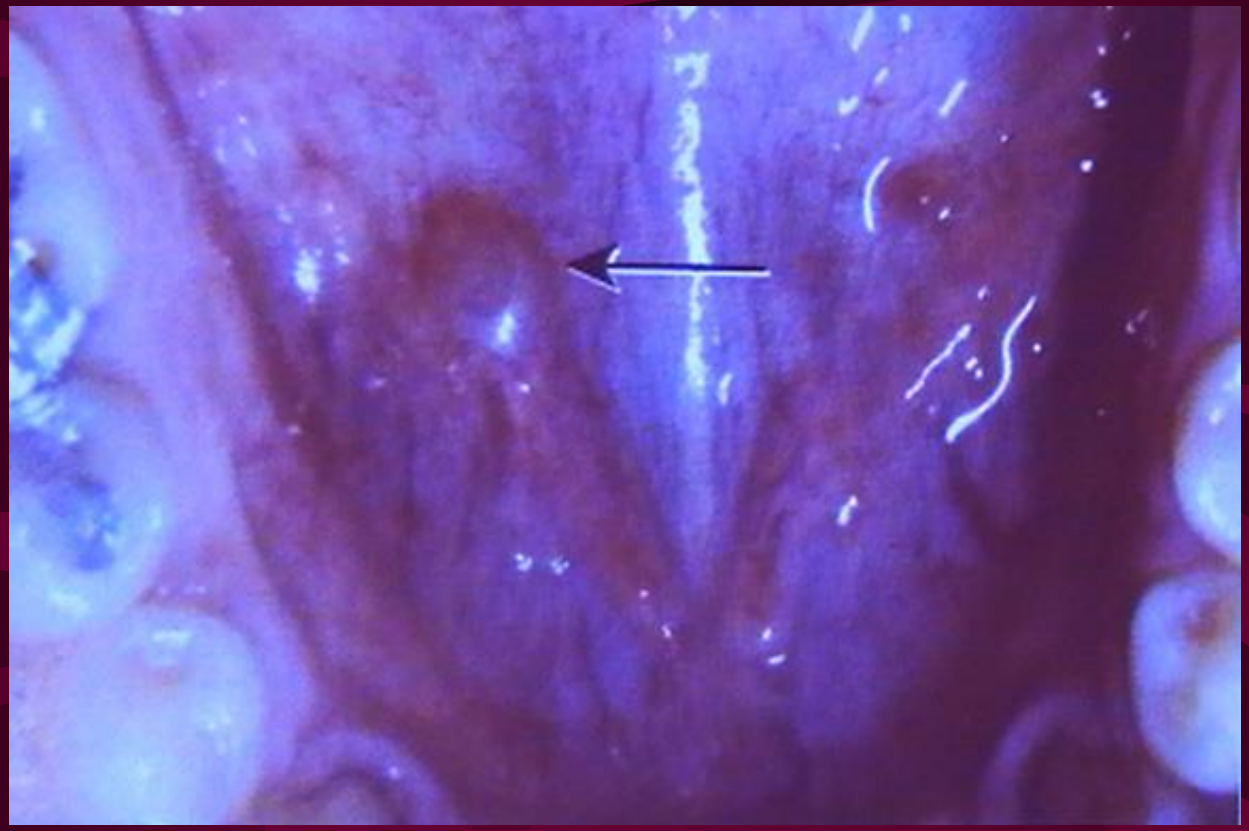
TREATMENT:
SURGICAL EXCITION

SALIVARY DUCT CYST (MUCOUS RETENTION CYST):

- It is an epithelium lined cavity that arises from salivary gland tissue.
- The cause of such cysts is uncertain.
- It may represent ductal dilation secondary to ductal obstruction which creates increased intraluminal pressure. Some authors refer to such lesions as mucus retention cysts.
- It may represetn true developmental salivary duct cysts that are sepreated from the adjacent normal salivary ducts.

CLINICAL FEATURES:

- In major glands, parotid glands are the most common site. In minor salivary glands, they usually develop in the floor of the mouth, buccal mucosa and lips
- They often look like mucocele and appear as bluish, fluctuant swelling that may appear bluish, depending on the depth of the cyst below the surface.
- Cysts in the floor of the mouth often arise adjacent to the submandibular duct and sometimes have an amber color.



Photograph of salivary duct cyst on the floor of the mouth arising adjacent to the Whartson’s duct and

- On rare occasions, patients have been observed to develop multiple mucus retention cysts that involve excretory ducts of many of the minor salivary glands throughout the mouth.

- The individual lesion soften presents as a painful nodules that demonstrate dilated ductal orifices on the mucosal surface.

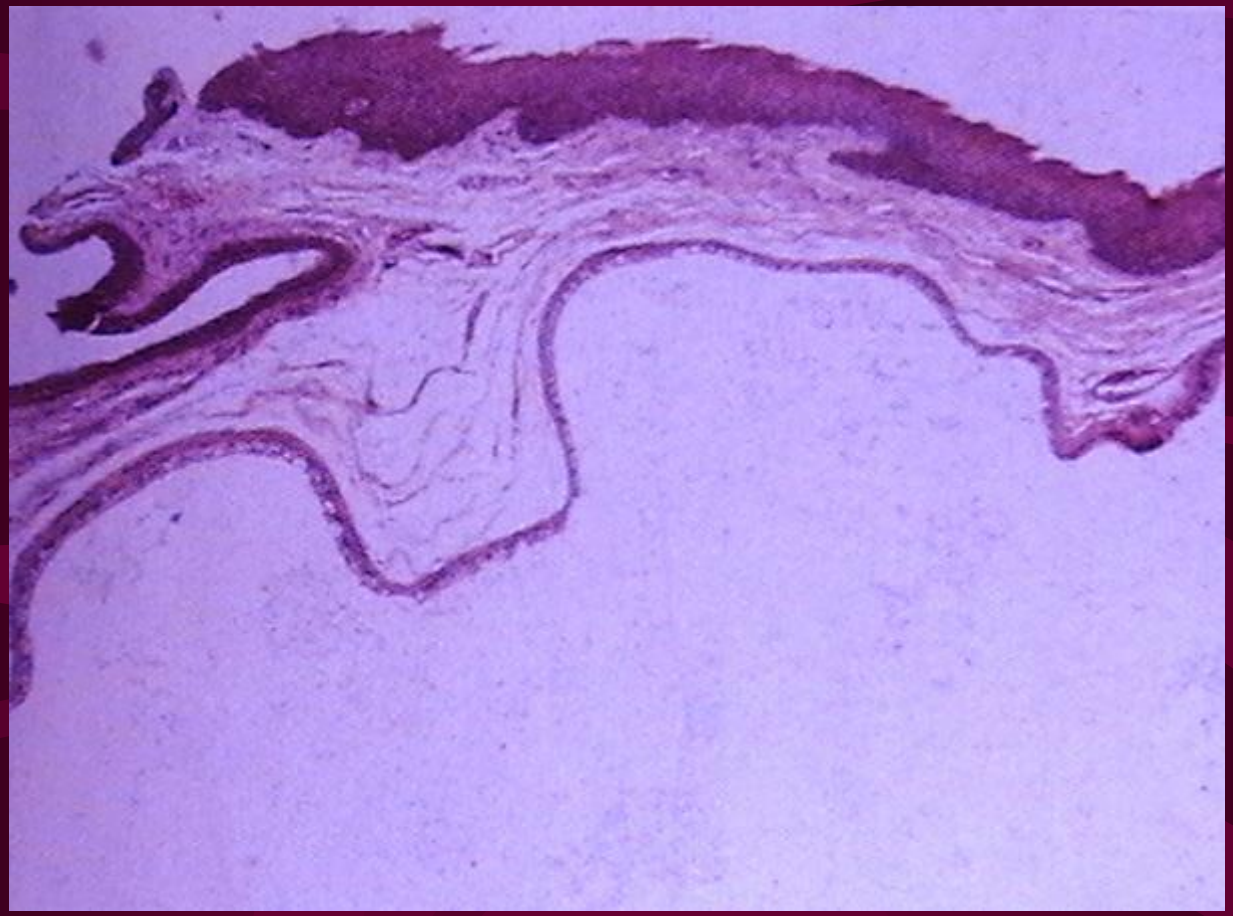
- Mucus or pus may be expressed from these dilated ducts.

HISTOLOGIC FEATURES:

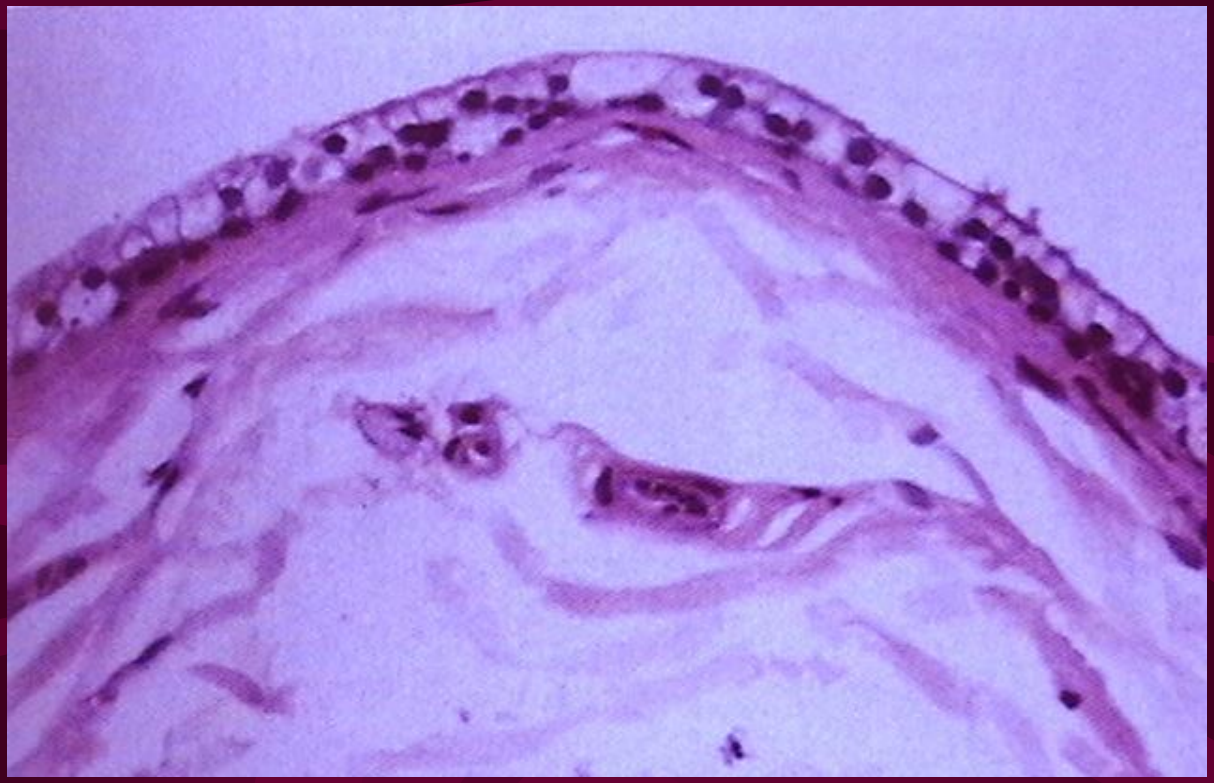
- The lining of the salivary duct cyst is variable and may consist of cuboidal, columnar, or atrophic squamous epithelium surrounding thin or mucoid secretions in the lumen.

- In some cases, the epithelium may undergo oncocytic metaplasia, often demonstrating papillary folds into the cystic lumen, somewhat reminiscent of a small Warthin tumor but without the prominent lymphoid stroma. If this proliferation is extensive enough, these lesions are sometimes diagnosed as PAPILLARY CYSTADENOMA.

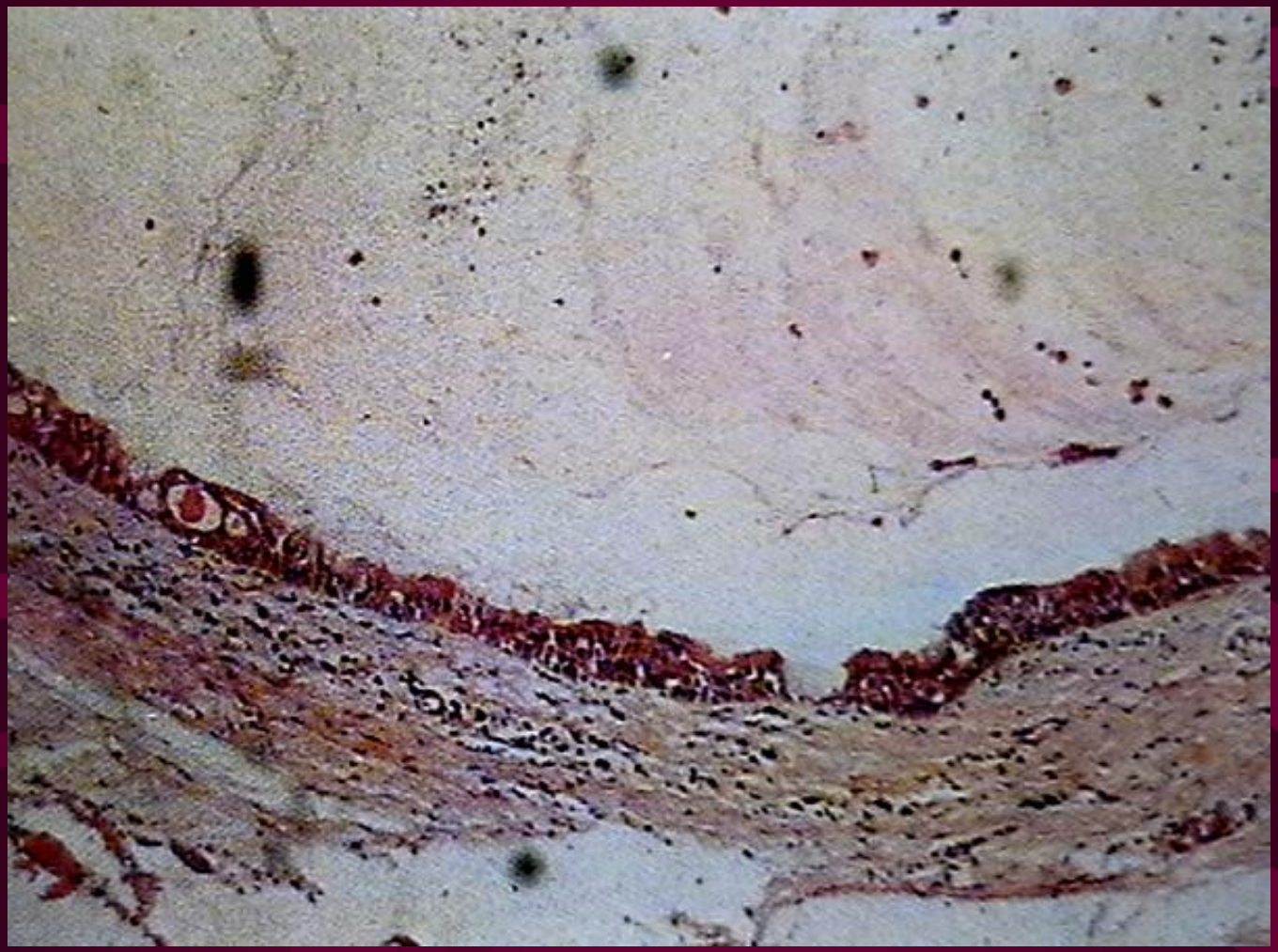
- The individual lesions of patients with multiple mucus retention cysts also show prominent oncocytic metaplasia of the epithelial lining.



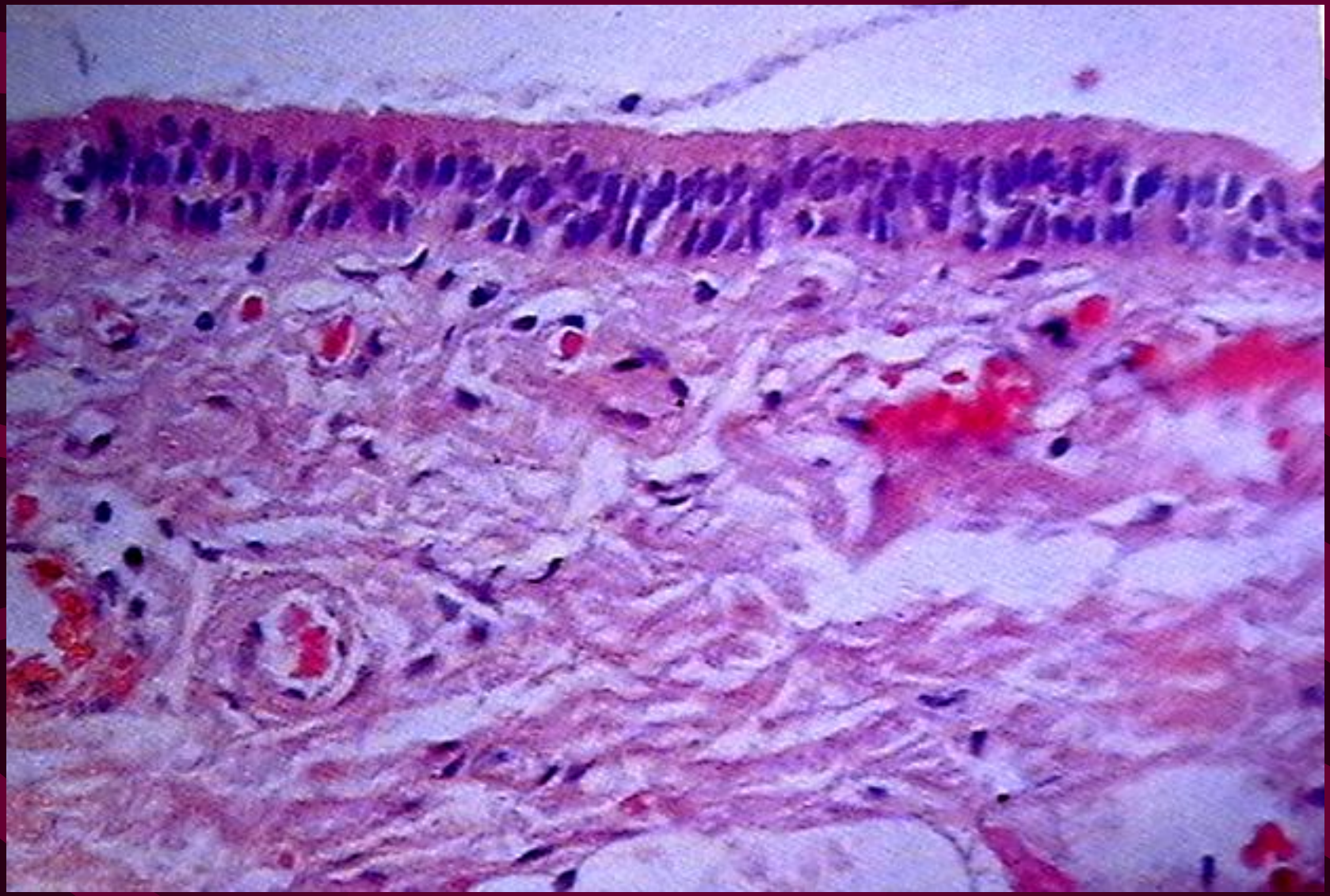
Salivary duct cyst: photomicrograph showing epithelium lined cystic cavity below the mucosal surface.



Salivary duct cyst: high power view of cystic lining demonstrating cuboidal to columnar epithelium with scatered mucin producing cells.



MUCOUS RETENTION CYST: an epithelial lining which is usually two layered ductal epithelium the cyst cavityis filled with mcin and inflammaory cells.



MUCOUS RETENTION CYST: high power view showing two layered ductal epithelium

HETEROTOPIC ORAL GASTROINTESTINAL CYST:

- These cysts arise from heterotopic islands, of gastric mucosa, which have been found in the
    - esophagus,
    - small intestine,
    - thoracic cysts,
    - omphalomesenteric cysts,
    - pancreas,
    - gall bladder, and
    - meckel’s cartilage.

CLINICAL FEATURES:

- This choristomatic cyst can be found in patients at any gage, although the majority have been infants or young children.
- It occurs predominantly in males
- The cyst presents as a small nodule entirely within the body of the tongue, either anterior or posterior, or in the floor of the mouth, in the neck, or adjacent to the submaxillary gland.
- It may be asymptomatic or may cause difficulty in eating or speaking. Some cyst communicate with the surface mucosa by a tube or duct like structure.

HISTOLOGIC FEATURES:

- This cyst is usually lined partly by stratified squamous epithelium and partly by gastric mucosa similar to that found in the body and fundus of the stomach, with both parietal and chief cells.
- Sometimes intestinal epithelium is found, including Paneth, goblet and argentaffin cells.
- A muscularis mucosa may be present

TREATMENT:
Surgical excision is the treatment of choice.