ODONTOGENIC CYSTS

By
Dr. Vandana Reddy
Professor
Dept of Oral & Maxillofacial Pathology & Oral Microbiology,
Subharti Dental College & Hospital
Swami Vivekanand Subharti University
Meerut, UP
A cyst is a pathological cavity having fluid, semifluid or gaseous contents and which is not created by the accumulation of pus. It is frequently but not always lined by epithelium (Kramer, 1974)
CYST

Wall
Lumen
Lining
Classification

1) Cysts of the jaws
   - Epithelial
   - Non-Epithelial
     - Developmental
     - Inflammatory

2) Cysts associated with the maxillary antrum

3) Cysts of the soft tissues of the mouth, face, and neck
CYSTS OF JAWS

1. Cysts of The Jaws:
   A. Epithelial:
      1. Developmental:
         A) Odontogenic
            i) Gingival Cyst of Infants
            ii) Odontogenic Keratocyst (Neoplasm)
            iii) Dentigerous Cyst
            iv) Eruption Cyst
            v) Lateral Periodontal Cyst
            vi) Gingival Cyst Of Adults
            vii) Botryoid Odontogenic Cyst
            viii) Glandular Odontogenic Cyst
            ix) Calcifying Odontogenic Cyst (Neoplasm)
         B) Non-Odontogenic
            i) Naso Palatine Duct Cyst
            ii) Naso Labial Cyst
            iii) Midpalatal Raphe Cyst of Infants
            iv) Median Palatine, Median Alveolar
            v) Median Mandibular Cyst
            vi) Globulo Maxillary Cyst
      2. Inflammatory:
         i) Radicular Cyst, Apical and Lateral
         ii) Residual Cyst
         iii) Parodontal Cyst & Mandibular Infected Buccal Cyst
         iv) Inflammatory Collateral Cyst
      B. Non Epithelial: (Pseudo cysts)
         i) Solitary Bone Cyst
         ii) Aneurysmal Bone Cyst

Cysts of Jaws Continued to page 40
II Cyst Associated With Maxillary Antrum:

i) Benign Mucosal Cyst of The Maxillary Antrum
ii) Post Operative Maxillary Cyst

III. Cyst of The Soft Tissues Of Mouth, Face And Neck:

i) Dermoid And Epidermoid Cyst
ii) Lymphoepithelial Cyst (Brachial Cyst)
iii) Thyroglossal Duct Cyst
iv) Anterior Medial Lingual Cyst (Intra Lingual Cyst Of Foregut Origin)
v) Oral Cyst With Gastric Or Intestinal Epithelium
vi) Cystic Hygroma
vii) Nasopharyngeal Cyst
viii) Thymic Cyst
ix) Cyst of Salivary Glands- Mucous Extravasation Cyst, Mucous Retention Cyst, Ranula, Polycystic Disease Of The Parotid.
x) Parasitic Cyst - Hydatid Cyst, Cysticercus Cellulosae Trichinosis
ETIOPATHOGENESIS OF ORIGIN OF ODONTOGENIC CYSTS

• By definition epithelial lining of these cysts originates from residues of tooth forming organ (3 kinds of residue)
  1) epithelial rests of serres persisting after dissolution of dental lamina (okc, gingival cyst, lateral periodontal cyst)
• Reduced enamel epithelium which is derived from enamel organ & covers fully formed crown of unerupted tooth (dentigerous cyst, eruption cyst, inflammatory paradental cyst)

• Rests of malassez formed by fragmentation of epithelial root sheath of Hertwig (Radicular cysts)
<table>
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<tr>
<th>Classification by etiology</th>
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<td><strong>Developmental</strong>: Unknown origin but are not the result of an inflammatory reaction</td>
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<td>Dentigerous cyst</td>
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<td>Eruption cyst</td>
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<td>Odontogenic keratocyst</td>
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<td>Gingival cyst of newborn</td>
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<td>Gingival cyst of adult</td>
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<td>Lateral periodontal cyst</td>
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<tr>
<td>Calcifying odontogenic cyst</td>
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<tr>
<td>Glandular odontogenic cyst</td>
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<td><strong>Inflammatory</strong>: Result of inflammation</td>
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<td>Periapical cyst</td>
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<td>Residual cyst</td>
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<td>Paradental cyst</td>
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<th>Classification by tissue of origin</th>
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<td><strong>Derived from rests of Malassez</strong></td>
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<td>Periapical cyst</td>
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<td>Residual cyst</td>
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<td><strong>Derived from reduced enamel epithelium</strong></td>
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<td><strong>Derived from dental lamina (rests of Serres)</strong></td>
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<tr>
<td>Odontogenic keratocyst</td>
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<td>Lateral periodontal cyst</td>
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<td>Glandular odontogenic cyst</td>
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<td><strong>Unclassified</strong></td>
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<td>Calcifying odontogenic cyst</td>
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# Incidence of Cysts of the Jaws

<table>
<thead>
<tr>
<th>Odontogenic Cysts</th>
<th>90%</th>
<th>Non-odontogenic Cysts</th>
<th>10%</th>
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<tbody>
<tr>
<td>Radicular cysts</td>
<td>60-75%</td>
<td>Nasopalatine cysts</td>
<td>5-10%</td>
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<tr>
<td>Dentigerous cyst</td>
<td>10-15%</td>
<td>Other non odontogenic &amp; primary bone cysts</td>
<td>1%</td>
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<tr>
<td>Odontogenic keratocyst</td>
<td>5-10%</td>
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<tr>
<td>Paradental cyst</td>
<td>3-5%</td>
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<td>Gingival cyst</td>
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<tr>
<td><strong>Lateral periodontal cyst</strong></td>
<td><strong>&lt;1%</strong></td>
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DENTIGEROUS CYST (FOLLICULAR CYST)

• It is developmental odontogenic cyst of epithelial origin
DENTIGEROUS CYST (FOLLICULAR CYST)

- Defined as odontogenic cyst that surrounds crown of an impacted tooth; caused by fluid accumulation between REE & enamel surface, resulting in a cyst in which crown is located within the lumen
• Estimated -20% of all jaw cysts
• Estimated about 10% of impacted teeth form dentigerous cyst
Pathogenesis

Intrafollicular origin

- At early stages of tooth development
- Degeneration of stellate reticulum
- Fluid accumulation between IEE & OEE
- Cyst formation with enamel hypoplasia
Extrafollicular theory

• After completion of crown

↓

• Impacted tooth exerts pressure due to eruptive force on its dental follicle

↓

• This obstructs venous flow
- Induces rapid transudation of serum across capillary walls

  ↓

- Increased hydrostatic pressure exerted by pooling of fluid between tooth and REE

  ↓

- Causes separation of crown from follicle
DENTIGEROUS CYST
CLINICAL FEATURES

- **Age & gender**: II & III decade of life, M:F = 3:2 predilection

- **Site**: mandibular & maxillary III molar and maxillary cuspid
Mostly solitary, bilateral & multiple cysts are found in association with Cleidocranial dysplasia & Maroteaux Lamy syndrome.
• **Symptoms:** Painless but may be painful if it gets infected
• When expands rapidly to compress sensory nerve- produces pain-referred to other sites
• **Signs:** They expand laterally, so it causes buccal expansion of cortical plates—facial asymmetry, displacement of teeth, resorption of adjacent teeth.
Cystic involvement of unerupted mandibular III molars- hollowing of entire ramus extending to coronoid process and condyle and displacement of III molar to such an extent that it lies compressed against inferior border of mandible
• In case of cyst associated with maxillary cuspid, expansion of anterior maxilla occurs
Radiographically

- Unilocular radiolucent area
- Well-defined and often sclerotic border
- Multilocular appearance due to persistence of bone trabeculae within the radiolucency.
- Dentigerous cyst is suspected if follicular space is > 5 mm
DENTIGEROUS CYST
Cyst-to-crown relationship

Ø Central variety - In it crown is enveloped symmetrically

Ø Lateral variety - Cyst on one aspect of crown (when mand III molar is partially erupted)

Ø Circumferential variant - Entire tooth appears to be enveloped by cyst
Histopathology

Thin epithelial lining, which is reduced enamel epithelium, consists of 2-4 cell layers of flat or cuboidal cells.

Retipec formation absent unless secondarily infected.
Histopathology

- Composed of connective tissue wall made of loose fibrous tissue.
- Presence of islands of odontogenic epithelium within connective tissue wall
COMPLICATIONS

1. Ameloblastoma
2. Epidermoid carcinoma (due to keratin metaplasia in long standing cyst lining)
3. Mucoepidermoid carcinoma (due to mucous secreting cells as a result of metaplasia)
TREATMENT AND PROGNOSIS

• Enucleation, with removal of the unerupted tooth.
• Large dentigerous - marsupialization.
• Prognosis for most dentigerous cysts is excellent.
• Recurrence seldom is noted - high if the lesion is an OKC.
Differential Diagnosis:

- Odontogenic keratocyst
- Unicystic ameloblastoma
- CEOT (Pindborg tumor)
- AOT
- Eruption cyst
the lining of a dentigerous cyst might undergo neoplastic transformation to an ameloblastoma.
Rarely, a squamous cell carcinoma may arise in the lining of a dentigerous cyst.

Likely that some intraosseous mucoepidermoid carcinomas develop from mucous cells in the lining of a dentigerous cyst.
Unicystic ameloblastoma (mural ameloblastoma)

- A number of workers have referred to the occurrence, in part of a dentigerous cyst lining, of a mural nodule of proliferating epithelium which closely resembles a plexiform ameloblastoma.
ODONTOGENIC CYSTS ACCORDING TO LOCATION
ODONTOGENIC KERATOCYST

- It is developmental odontogenic cyst of epithelial origin. Named keratocyst because cyst epithelium produces so much keratin that it fills cyst lumen

- Philipsen (1956)
- Primordial cyst-Robinson
- WHO - Keratocystic odontogenic tumor
• Pathogenesis: originate from cell rests of the dental lamina

• Proliferation of basal cells of overlying epithelium which are off shoots of basal cells (In III molar region & ascending ramus of mandible)
Types:

- OKC
- OOC
• Reclassification of OKC to tumor

• Based on

• **Behavior:** KCOT is locally destructive and recurrence rate is very high
• **Histopathology:** Basal cell epithelial layer shows proliferation and budding into underlying connective tissue in the form of daughter cysts and mitotic figures are frequently found in suprabasal layers of lesional epithelium

• **Genetics:** PTCH (Patched) a tumor suppressor gene is involved in both syndrome associated and sporadic KOT's
PRIMORDIAL CYST

- Cyst which arises by breakdown of stellate reticulum of enamel organ before any hard tissue is formed and hence which may be one of the normal series or a supernumerary
So found in place of tooth rather than directly associated with it. It may originate from enamel organ of supernumerary tooth/ from remnants of dental lamina
PRIMORDIAL CYST
CLINICAL FEATURES

✓ Age & Gender: II & III decade of life M:F=1.44:1
✓ Site: Mand > Max
✓ Mand - ramus III molar area followed by I & II molar area and then anterior mandible
✓ In maxilla - III molar area followed by cuspid region
✓ Symptoms: Asymptomatic unless they become secondarily infected. Occasionally paresthesia of lower lip

✓ Signs: can lead to pathologic fracture. In maxilla causes-buccal expansion, sometimes form around unerupted tooth
• Multiple OKC found in Gorlin-Goltz syndrome, Marfan syndrome, Ehler’s Danlos syndrome, Noonan’s syndrome
• Radiographic features: Unilocular with smooth borders/ multilocular
• Bone expand in anterior posterior direction
Radiological types:

- **Envelopmental type**: It is a variety of keratocyst which embraces an adjacent unerupted teeth
- **Replacement**: Those which forms in place of normal teeth
• **Extraneous:** Those in ascending ramus away from teeth

• **Collateral:** Those adjacent to root of teeth (LPC DD)
Aspiration

- Thin straw colored fluid with thick creamy material. Toller-soluble protein estimation <3.5g/100 ml where as non-keratinized (5-11g/100ml)
- Exfoliative cytology (PAP, H& E)
HISTOPATHOLOGICAL FEATURES

• Lining epithelium is composed of parakeratinized surface which is typically corrugated, rippled/ wrinkled
• Remarkable uniformity of thickness of epithelium ranging from 6-10 cells thick (with no rete ridges)
• Prominent palisaded, polarized basal layer of cells described as having a picket fence / tombstone appearance
• Nuclei of basal cells are darkly stained
• In presence of inflammation epithelium loses its keratinized surface—may thicken & develop rete processes/ may ulcerate

• Connective tissue wall shws small islands of epithelium forming small duplicate daughter cysts/ small satellite cysts
Orthokeratinized odontogenic cyst:

- It is always found in a dentigerous association around mandibular III molar. Thin uniform lining epithelium covered with orthokeratin & show a prominent granular layer & cuboidal to flattened basal layer (no hyperchromatic basal layer)
• Recurrence: 13-60%
• Reasons for it are:
• Occurrence of satellite cyst, which is bud-like projection of basal cell layer into connective tissue which is retained during enucleation procedure
• Lining is very thin & fragile when cyst is large and difficult to enucleate than a cyst with thick wall
• Enucleation in one piece may be more difficult with cysts which have a scalloped margins than with mother contour

• Complications: SCC, Ameloblastoma
Palisaded Basal Layer of OKC
Differential Diagnosis:

- Dentigerous cyst
- Ameloblastoma
- Odontogenic myxoma
- Adenomatoid odontogenic tumor
- Ameloblastic fibroma
TREATMENT

• Surgical removal with thorough curettage
• Recurrence rate low
• High recurrence if represents an OKC
Ramus third molar, followed by 1st & 2nd molar
Jaw cyst Basal Cell Nevus Bifid Rib Syndrome

1. Cutaneous anomalies (BCC, Dermal cysts, palmer & plantar keratosis)

2. Dental & Osseous anomalies (Multiple OKC’s, mild mandibular prognathism, rib anomalies)
3. Ophthalmologic abnormalities - hypertelorism with wide nasal bridge

4. Neurologic abnormalities - mental retardation

5. Sexual abnormalities - hypogonadism in males, ovarian tumors
ERUPTION CYST (ERUPTION HEMATOMA)

• It is defined as an odontogenic cyst with histologic features of a dentigerous cyst that surrounds tooth crown that has erupted through bone but not soft tissues and is clinically visible as a soft fluctuant mass on alveolar ridges.
• It is a dentigerous cyst occurring in soft tissues
• Mastication will induce hemorrhage in eruption cyst—Eruption hematoma
Pathogenesis

- Presence of dense fibrous tissue in overlying gingiva should be responsible
CLINICAL FEATURES

- **Age:** Children
- **Site:** Deciduous teeth and permanent teeth frequently anterior to I permanent molar
- **Signs:** appears as circumscribed, fluctuant swelling of alveolar ridge over site of erupting tooth
CLINICAL FEATURES

• Eruption hematoma: when circumcoronal cystic cavity contains blood, swelling appears purple/blue
Histologic features:

- Superficial aspect is covered by keratinizing SSE of overlying gingiva. This is separated from cyst by strip of dense connective tissue of varying thickness.
Eruption hematoma
LATERAL PERIODONTAL CYST (BOTRYOID ODONTOGENIC CYST)

• It is slow growing, non expansile developmental odontogenic cyst occurring on lateral root surface of an erupted tooth.
• **Pathogenesis**: Proliferation & cystic transformation of rests of dental lamina (post functional)
• proliferation of rests of malassez in PDL
3. Dentigerous cyst developing along lateral surface of crown and as tooth erupts assumes position in approximation to lateral surface of root

- **Gingival cyst & LPC** - common histogenesis, post functional dental lamina rests (extraosseous & intraosseous manifestations of same lesion)
• Botryoid odontogenic cyst: Name reflects gross similarity of cystic cavities to that of cluster of grapes
• Multilocular pattern, radiographically, histologically & clinically (at time of surgical removal)

• Pathogenesis: cystic transformation of multiple islands of dental lamina rests
Clinical and Radiographic Features

- **Age & sex:** 22-85 yrs, (mean is 50 yrs) male predilection
- **Site:** Lateral surface of roots of vital teeth in mandibular canine and premolar region, followed by anterior region of maxilla
• **Symptoms:** Gingival swelling may occur on facial aspect, in gingival cyst (overlying mucosa is blue) in LPC-normal

• **Signs:** mass overlying mucosa, associated with vital teeth
Radiographic features: Radiolucent area in association to lateral surface of a tooth root

Lesion is small, seldom over 1 cm in diameter

BOTRYOID ODONTOGENIC CYST appears multilocular
Radiographically
Histopathologic Features

• Thin, non keratinized SSE (1-5 cell layers thick) similar to REE

• Focal thickened plaques of proliferated lining cells in botryoid
Thin epithelial lining with focal thickenings
Cuboidal lining containing clear cells

Focal thickening plaques
Dental lamina cyst of New born/
Gingival cyst of New Born. Epstein
Pearls. Bohn’s Nodules

They are multiple, occasionally, solitary, superficial raised nodules on edentulous alveolar ridges of infants that resolve without treatment.

Pathogenesis: Derived from rests of dental lamina & consists of keratin-producing epithelial lining.
Eponyms Epstein Pearl/Bohn’s nodules but their location and etiology differs

Epstein pearls: Cystic, keratin filled nodules found along midpalatine raphe

Pathogenesis: Derived from entrapped epithelial remnants along line of fusion
**Bohn's nodules:** Keratin-filled cysts scattered over palate, along junction of hard and soft palate

**Pathogenesis:** Derived from palatal salivary gland structures
Clinical features:

- New born infants (rarely after 3 months of age)

- Small, discrete with swellings of alveolar ridge, appearing belched as though from internal pressure (similar to predeciduous dentition)
Histological features:

- Thin epithelial lining which lacks rete processes and lumen filled with desquamative keratin
Clinical Features
Histopathologic Features

- thin, flattened epithelial lining with a parakeratotic surface. The lumen contains keratinaceous debris.
Treatment and Prognosis

- spontaneously involute
- Rare after 3 months of age.
GINGIVAL CYST OF THE ADULT

• It is a small developmental odontogenic cyst of gingival soft tissues (in free/attached gingiva)

Pathogenesis:
• Remnants of dental lamina, traumatic implantation of epithelium
Clinical Features

- Age & gender: 5-6 decade of life, males
- Site: More in mandible premolar and canine region, max. incisor, canine, premolar
- Appearance: Small well circumscribed painless swelling of gingiva not more than 1 cm in diameter
• **Radiographic features:** If enlarges cause superficial erosion of cortical plate of bone

• **Histological features:** Thin epithelium resembling reduced enamel epithelium with one-three layers of flat to cuboidal cells
GINGIVAL CYST OF ADULT
GINGIVAL CYST OF ADULT
Differential Diagnosis:
- parulis
- pyogenic granuloma
- peripheral ossifying fibroma
- peripheral giant cell granuloma
- irritation fibroma
- peripheral ameloblastoma
- traumatic neuroma
Treatment and Prognosis

• simple surgical excision.

• The prognosis is excellent
CALCIFYING ODONTOGENIC CYST
(GORLIN CYST; DENTINOGENIC GHOST CELL TUMOR;
CALCIFYING GHOST CELL ODONTOGENIC CYST)

- It is oral analog of Calcifying epithelioma of Malherbe (now called Pilomatricoma)
Types

1) Cystic lesion (Type 1)
   A) Simple unicystic type
   B) Unicystic odontome producing type
   C) Unicystic Ameloblastomatous proliferating type
• Solid neoplastic lesion (Type 2)
• Malignant counterpart of neoplastic lesion

**Pathogenesis**
• Cyst develop denovo
• Tumors from wall of cyst
• Reduced enamel epithelium/ remnants of odontogenic epithelium
Clinical Features

• Age & gender: III decade to VII decade, more in women
• Site: $\frac{3}{4}$th centrally anterior to I molar
• Symptoms: Slow growing, painless swelling of jaws
• Signs: cortical plate may be destroyed
• Aspirate: Yields viscous, granular, yellow fluid
• **Radiographic features:**
  
  • Central lesions - unilocular/multilocular radiolucencies with well defined/ poorly defined borders
  
  • Radioluency may contain small foci of calcified material - white flecks/ smooth pebbles may be associated with unerupted tooth
Histopathologic Features

- Cyst lining similar to ameloblastoma (columnar cells over which are stellate reticulum like cells) within this cells undergo ‘ghost’ cell keratinization

- Ghost cells consist of enlarged, elongated epithelium.
- They are eosinophilic and although cell outlines are well-defined
**Ghost cells**

- Altered epithelial cells that are characterized by the loss of nuclei with preservation of the basic cell outline.

- The nature of the ghost cell is controversial. Coagulative necrosis; normal or aberrant keratinization of odontogenic epithelium.
• Ghost cells are also seen in odontoma, ameloblastoma, ameloblastic fibro-odontoma and ameloblastic odontomas

• Dystrophic calcification of ghost cells may be seen
• Juxtraposition to lining epithelium/intermixed with ghost cells Dentinoid can be seen.

• If in abundant, not cystic it is neoplasm-Dentinogenic Ghost cell tumor
Figure 15.41  Calcifying odontogenic cyst. The cyst lining shows ameloblastoma-like epithelial cells, with a columnar basal layer. Large eosinophilic ghost cells are present within the epitheliallining.

Figure 15.42  Calcifying odontogenic cyst. Eosinophilic denticoid material is present adjacent to a sheet of ghost cells.
GLANDULAR ODONTOGENIC CYST
(SIALO-ODONTOGENIC CYST/
MUCOEPIDERMOID ODONTOGENIC CYST)

- Mucoepidermoid-Because of presence of both secretary elements and SSE
- It shows glandular/ salivary features
- Pathogenesis: Rests of dental lamina
Radiographic Features

• Well defined with a multilocular pattern

• Histological features: Non keratinized SSE of varying thickness

• Epithelium has glandular/ pseudoglandular structures, with goblet mucous producing cells as well as intraepithelial crypts/ microcysts containing mucus
• In certain planes of section, these microcysts may be to open onto surface of epithelium through openings/ crypts giving epithelium a corrugated surface and

• Superficial layer of epithelial lining consists of columnar cells occasionally with cilia and epithelium has glandular pseudoglandular structure
Stratified squamous epithelium with surface ciliated columnar cells, microcysts & mucous cells present
INFLAMMATORY ODONTOGENIC CYSTS
PARADENTAL CYST

• Inflammatory periodontal cyst/ Collateral cyst

• Cyst of inflammatory origin occurring on lateral aspect of root of partially erupted mand III molar with an associated history of pericoronitis
Pathogenesis:

- Unilateral expansion of dental follicle secondary to inflammatory destruction of periodontium and alveolar bone.

- Initiated by pericoronitis at time of tooth eruption and considered rests of malassez & REE most likely source of cyst epithelium.
Clinical features:

- **Age & Gender:** III decade of life, males
- **Site:** III molar on buccal surface and covers the bifurcation
- **Signs:** Involved tooth is vital
Radiographic features:

- Well demarcated radiolucency distal to partially erupted tooth but often buccal superimposition
- Radiolucency may extend apically, but an intact PDL space confirms that lesion did not originate at apex
Paradental cyst attached to buccal aspect of vital molar

Enamel projection in buccal bifurcation area that had a cyst in this area
Histologic features:

- Lined by proliferating SSE of varying thickness. The fibrous capsule has intense chronic inflammatory cell infiltrate
RADICULAR CYST
(Periapical cyst, Root end cyst, Apical periodontal cyst)

- Most common odontogenic cyst
- Apex of erupted tooth involved
- Common sequela of periapical granuloma originating as a result of bacterial infection & necrosis of dental pulp, nearly always following carious involvement of tooth
PERIAPICAL CYST
RESIDUAL CYST

- A periodontal cyst which remains after or develops subsequent to extraction of a tooth
RESIDUAL CYST
Epithelial lining is derived from Epithelial rests of Malassez

The epithelium may be derived in some cases from
1. respiratory epithelium of maxillary sinus
2. Oral epithelium from fistulous tract
3. Oral epithelium from a periodontal pocket
**PATHOGENESIS**

- **Stimulus for proliferation is recognized to be inflammation in periapical granuloma**

Diagram:

1. Caries, trauma, periodontal disuse
2. Death of dental pulp
   - Necrotic debris is inflammatory stimulus
3. Apical bone inflammation
4. Dental granuloma formation
   - Composed of granulation tissue, scar, inflammatory cells
5. Stimulation of epithelial rests of Malassez
6. Epithelial proliferation
7. Periapical cyst formation
   - Cyst wall separates pulpal irritation from bone
MODE OF DEVELOPMENT

- Cyst formation occurs as a result of epithelial proliferation, separating the inflammatory stimulus (Necrotic pulp) from surrounding bone.

- Epithelial proliferation follows an irregular pattern of growth.
Epithelial mass increases in size by division of cells at the periphery.

Cells in the centre become separated from their source of nutrition - eventually degenerate, become necrotic and liquefy.

This creates an epithelial lined cavity filled with fluid - Apical periodontal cyst.
May form through proliferation of epithelium to line a pre-existing cavity formed through focal necrosis and degeneration of connective tissue in a periapical granuloma - uncommon.
CYST GROWTH

- Breakdown of cellular debris within the cyst lumen raises the protein concentration, producing an increase in osmotic pressure.
- Fluid transport takes place from the connective tissue side to the lumen.
- Fluid ingress assists in outward growth of the cyst
- With osteoclastic bone resorption the cyst expands
• Other bone resorbing factors such as prostaglandins, interleukins and proteinases, from inflammatory cells in the periphery permit additional cyst enlargement
CLINICAL FEATURES

• Majority asymptomatic

• Tooth seldom painful or tender on percussion

• Infrequently of such a size that it destroys much bone
CLINICAL FEATURES

• Rarely produces expansion of cortical plates
• It represents a chronic inflammatory process- develops over a prolonged period of time
• In some cases- cyst of long standing duration it may undergo an acute exacerbation of the inflammatory process and develop into an abscess that may proceed to a cellulitis or form a draining fistula
ROENTGENOGRAPHIC FEATURES

• Radiographically it cannot be differentiated from a periapical granuloma.

• It may be slightly larger in size due to its longer duration than the granuloma— but not always true.
ROENTGENOGRAPHIC FEATURES

- Round to ovoid radiolucency with a narrow radiopaque margin, contiguous with the lamina dura of the involved tooth
• The radiopaque line may not be apparent if the cyst is rapidly enlarging

• Range from few mm’s to several cm’s in diameter
• Majority< 1.5cm
• In long standing cysts, root resorption of the offending tooth and occasionally of adjacent teeth may be present
HISTOLOGIC FEATURES

• Epithelial lining is stratified squamous

• Occasionally pseudostratified ciliated columnar or respiratory type of epithelium

• Squamous epithelium seldom exhibits keratin formation
HISTOLOGIC FEATURES

- Thickness of epithelium may vary
- Epithelium shows arcading pattern
- Actual retie peg formation sometimes occurs
- Epithelial lining many times is discontinuous, missing over areas of intense inflammation
• Rushton body

• tiny linear or arc shaped hyaline bodies, generally associated with the lining epithelium, amorphous in structure, eosinophilic in reaction, brittle in nature
• Their similarity with R.B.C’s suggest that they arise from thrombus formation

• Russel bodies, representing accumulated gammaglobulin are often found
RUSHTON BODIES
• Connective tissue consists of parallel bundles of collagen fibres that often appear compressed

• Variable number of Fibroblast & blood vessels
• Inflammatory infiltrate in the connective tissue immediately adjacent to the epithelium

• Cholesterol slits with associated multinucleated giant cells may be found in the wall of the lesion

• Lipid/ hemosiderin containing macrophages
Cholesterol clefts and hemorrhage seen in radicular cyst
Radicular cyst

- Hemosiderin pigment
- Giant cell
• Pulse or seed granulomas - occasionally found in the cyst wall, indicating apical communication with the oral cavity through the root canal and carious lesion
• Lumen contains fluid with a low concentration of protein that stains palely eosinophilic

• Occasionally lumen may contain a great deal of cholesterol, & rarely keratin may be present
• Hemorrhagic areas is a variable finding

• Histologically similar to periapical granuloma
DIFFERENTIAL DIAGNOSIS

• Periapical granuloma

• If anterior mandible - early periapical cemento-osseous dysplasia
DIFFERENTIAL DIAGNOSIS

• Posteriorly present - Traumatic bone cyst

• Occasionally odontogenic keratocyst, giant cell lesions, metastatic disease

• In all the above associated teeth are vital
TREATMENT

- RCT
- Extraction of associated non vital tooth and curetage of apical area
- RCT in association with an apicoectomy

*When necrotic tooth is extracted but the cyst lining is incompletely removed, a residual cyst may develop from months to years after initial extirpation*
References


• For any queries, mail to:
  drvandanareddy@rediffmail.com
Thank you

www.subharti.org