Department Of Oral Medicine & Radiology

CYSTS OF HEAD AND NECK
Introduction:

• Cysts – common cause of chronic swellings of the jaws.

• Defined as a pathologic epithelium-lined cavity usually containing fluid or semisolid material

  (Killey and Kay – 1966).
• A pathologic cavity having fluid, semisolid or gaseous content and it is frequently, but not always lined by epithelium'.

(Kramer in 1974)
True Cyst
Lined by epithelium

Pseudocyst
Not lined by epithelium
PARTS OF A CYST

• Cystic Lumen - Central cavity - Fluid, Semifluid, Gas, Empty

• Cystic Epithelial lining – Thin, Strat. Sq. type

• Cystic Wall or Capsule – Fibrous Conn. Tissue
Cyst formation takes place in two phases:

1. Cyst initiation:
   - Stimulus for initiation is not known - developmental cysts whereas the inflammatory odontogenic cyst arise as a result of infection which acts as chronic irritating factor.
In case of develop. cysts - arise from developing odontogenic epithelium

- Dental lamina or its remnants
- Enamel organ
- Extensions of basal cells from the overlying oral epithelium
- Reduced enamel epithelium
- Cell rests of Malassez etc.
• The increase in volume of contents of cyst may be due to:
  - increase in mucous secretion in core of mucus secreting cyst
  - increase in transudation and exudation in case of inflammatory cyst.

• bone resorption - release of bone resorbing factors from capsule such as PGE2 and PGI2 and certain leucotrienes.
• **proliferation of epi** - forms a circumferential mass of cells which has a centrifugal blood supply from surrounding tissues.

• central cells got deprived of adequate oxygen, nutrients and waste removal and undergo ischemic necrosis.

• increase the osmolarity and withdraw tissue fluid resulting in increase in the size of cyst.
WHO classification:
(Kramer, Pindborg, Shear 1992)

I. Cysts Of The Jaws:

II. Cysts associated with the maxillary antrum:

III. Cysts of the soft tissues of the mouth, face, neck:

IV. Cysts of the salivary glands:
I. CYSTS OF THE JAWS

Epithelial
  (True)
  Odontogenic

Non-Epithelial
  (Pseudo)
  Non-Odontogenic

  Developmental
  Inflammatory
1. Odontogenic Developmental Epithelial (True) Cyst

i. Odontogenic Keratocyst (Primordial Cyst)
ii. Dentigerous Cyst (Follicular Cyst)
iii. Eruption Cyst
iv. Lateral Periodontal Cyst
v. Gingival Cysts of Infants
vi. Gingival Cysts of Adults
vii. Calcifying odontogenic cyst
viii. Botryoid odontogenic cyst
ix. Glandular odontogenic cyst

GOD LEG BCG
2. Odontogenic Inflammatory Epithelial (True) Cyst

i. Radicular Cyst
ii. Residual Cyst
iii. Inflammatory Collateral Cyst
iv. Paradental Cyst
Non-Odontogenic Epithelial (Fissural) Cyst

i. Nasopalatine duct (incisive canal) cyst
ii. Median palatine cyst
iii. Median alveolar cyst
iv. Median mandibular cyst
v. Globulomaxillary cyst
vi. Nasolabial (Nasoalveolar) cyst
Non-epithelial Non-Odontogenic Cyst

i. Simple bone Cyst (Traumatic, Solitary haemorrhagic bone cyst)

ii. Aneurysmal bone cyst
II. CYST ASSOCIATED WITH THE MAXILLARY ANTRUM

i. Benign Mucosal cyst of maxillary antrum

ii. Surgical ciliated cyst of maxilla
III. CYST OF THE SOFT TISSUES OF THE MOUTH, FACE AND NECK

i. Dermoid and Epidermoid Cysts
ii. Branchial Cleft (Lympho-epithelial) Cyst
iii. Thyroglossal duct Cyst
iv. Anterior Median Lingual Cyst
v. Oral Cysts with gastric or intestinal epithelium
vi. Cystic Hygroma
vii. Nasopharyngeal Cysts
viii. Thymic Cysts
ix. Cysts of the Salivary Gland – Mucocele, Ranula
x. Parasitic Cysts
IV. Cysts of the salivary glands:

1. Mucous Extravasation Cyst
2. Mucous Retention Cyst
3. Ranula
4. Polycystic (Degenerative) Disease Of Parotid
6) WHO modified classification:

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Signs of jaw cysts.

• Early lesion - slow growing - pain less convex contour –soft consistency - ‘tennis ball’ feeling.

• Further - thinning of cortical plates - on pressure produce sound or feeling of ‘egg-shell crackling.’

• Cyst appears - Smooth, shining, bluish with soft fluctuant consistency.
Symptoms of jaw cysts:

- Most – asymptomatic- painless Lump formation.
- Cause- displacement of adjacent teeth- convergence of crowns.
• Egg shell cracking is used to describe the fragile outer shell of bone that has thinned out due to the expansion and the thinning of cortical plates which produces sound like egg shell crackling

• Fluctuation is elicited when the cystic lining lies immediately beneath the mucosa.
Radiographic features of jaw cysts:

- Defined round / oval radiolucency, circumscribed by a sharp radiopaque margin.
- Resorption and expansions of cortical plates.
- Displacement of adjacent teeth.
- Perforation of cortical plates occurs - appears as a window, or a radiolucency inside a radiolucency.
Unilocular / Multilocular with Scl. border
1. Odontogenic cysts:

- arising from odontogenic tissues.
1. Gingival cysts of infants

- Odontogenic origin.

- Two specific varieties:
  - ‘Epstein’s pearls’ - occur along midpalatine raphae.
  - ‘Bohn’s nodules’ - seen around dental ridges.
Clinical features

- Frequently - new-born infants.
- Rarely seen - after 3 months of age.
- Nodules - 2-3 mm in diameter.
- White or cream-coloured appearance.
- Most of them undergo - involution & disappear, or rupture
Treatment:

• No need of treatment.
• Rupture / undergo involution-disappear.
2. Gingival cysts of adults:

- Rare condition.
- Accounts -0.5% (all cysts of the jaws).
- Occur 5th and 6th decades.
- No significant gender predilection.
- Mandible > maxilla.
Clinical features:

- Cysts are well-circumscribed swellings.
- Slowly enlarging, Painless swelling.
- Usually less than 1 cm in diameter.
- Occur -attached gingiva or interdental papilla,
- Always present on-facial aspect.
Radiographic features.

- No radiographic change.
- Only a faint round shadow indicating superficial bone erosion.
Treatment:

- Removed by local excision.
3. Keratinizing Odontogenic Cyst:

- Keratocyst is described as a cholesteatoma (Hauer-1926; Kostecka-1929).
- Term odontogenic Keratocyst introduced by Philipsen (1956).

- 2 types: 1. para keratinising odontogenic keratocyst.
  2. Orthokeratinising odontogenic keratocyst.
a. Para keratinizing odontogenic keratocyst:

- Peak incidence - 2nd and 3rd decades.
- Account: 5-11% - (all cysts of the jaws).
- Occurs: whites > blacks.
- Males > females.
- Mandible > maxilla (about 75%).
- Pain, swelling or discharge.
- Paresthesia of lower lip and teeth.
- Pathologic fractures.
B. Orthokeratinized odontogenic keratocyst:

- 2nd type – keratinizing jaw cyst.
- Orthokeratinised – variant of OKC.
- Frequency of occurrence - 12%.
- Male > female
- Occurs at age – 40 yrs.
- Associated with impacted tooth.
- Radiographically: monolocular.
- may exhibit aggressive clinical behavior
- significant recurrent rate

Fig. 1A – Large OKC involving an impacted third molar tooth, unilocular with scalloped borders, representing the typical radiographic appearance of OKC.
- found anywhere in jaws
- can radiographically mimic other types of cysts
➢ Etiology

✓ develop from dental lamina remnants in mandible + maxilla
Clinical Features

- common jaw cysts
- occur in any age
- peak incidence within 2nd-3rd decades of life
Clinical Features

- mandible
  - posterior portion of body
  - ramus region

- maxilla
  - 3rd molar area
Radiographic Features

- well-circumscribed radiolucency
- with smooth radiopaque margins
- most lesions are unilocular

Fig. 1A – Large OKC involving an impacted third molar tooth, unilacular with scalloped borders, representing the typical radiographic appearance of OKC.
Radiographic Features

- 40% was noted to be adjacent to crown of unerupted teeth
- buccal + lingual enlargements occasionally seen
Treatment & Prognosis

- surgical excision with peripheral osseous curettage
- ostectomy
Treatment & Prognosis

- follow up examinations are important due to recurrence rate
- most recurrence become clinically evident within 5 years of treatment
Gorlin-Goltz syndrome

• First described by Binkley and Johnson – 1951
• Transmitted as an autosomal dominant trait - characterised by

• **Cutaneous anomalies:**
  – Basal cell carcinoma,
  – Benign dermal cysts and tumours,
  – Palmar pitting,
  – Palmar and plantar keratosis
  – Dermal calcinosis

• **Dental and osseous anomalies:**
  – Multiple okc,
  – Mild mandibular prognathism,
  – Rib anomalies (often bifid),
  – Vertebral anomalies,
  – Brachymetacarpalism.
Clinical features.

- Asymptomatic,
- Some time-Swelling on buccal aspect of gingiva.
- Formed- intraosseous near crest of ridge.
- Tooth – vital.
Radiographic features:

- a round or oval well-circumscribed radiolucent area, usually with a sclerotic margin.

- Cysts lie between the apex and cervical margin of the tooth.
Treatment:

• surgical enucleation,
• if possible- without removing the associated tooth.
Dentigerous cyst (follicular):

- Cyst typically encloses the crown of an unerupted tooth by expansion of its follicle and is attached to the neck of the tooth.
- Prevents eruption &
- Displace tooth - considerable distance.
- Accounts -16% (all jaw cysts).
- Seen -2nd and 3rd decades of life.
- Frequency: greater - males & whites.
- Majority - involve the mandibular 3rd molar.
Radiographic features:

unless they become infected.

- 3 radiological variants:
  - unilocular radiolucent area - crowns of unerupted
  - Crown is enveloped symmetrically.
  - Expanded follicle is seen on one side of the crown (lateral dentigerous cyst).
  - Entire tooth is involved (circumferential dentigerous cyst).
  - Resorption of roots - adjacent teeth.
Treatment:

• Small lesions - surgically removed entirely.
• Larger cysts - involve serious loss of bone
• Treated - marsupialisation.
Eruption cyst:

- A dentigerous cyst occurring in soft tissues
- Formed - when a tooth is impeded - path of eruption - soft tissues overlying the bone.
- Affects - children of different ages.
- Deciduous and permanent teeth – affected.
- Affects - frequently anterior 1st permanent molar.
Clinical features:

- A smooth swelling - over the erupting tooth
- Colour - normal gingiva or blue.
- soft and fluctuent.
- Usually painless - unless infected,
- May burst spontaneously.
Radiographic feature:

• No bone involvement,
• soft tissue shadow.

• Transillumination – help to distinguish it from an eruption hematoma.
Treatment:

• Cyst roof may be removed-
• Tooth allowed to erupt.
Calcifying odontogenic cyst (COC):

- well-recognised lesion,
- Rare (about 1% of all jaw cysts).
- Occurs- 2\textsuperscript{nd} decade.
- Equal sex distribution.
- No racial predilection.
- Maxilla = mandible.
- anterior part -more common site.
Clinical features:

- Swelling – most frequent symptom.
- Intra-osseous lesions - produce a hard bony expansion - extensive.
- Cortical plate may be perforated.
- Pain is a rare symptom.
- Many cases - asymptomatic.
Radiographic features:

• Radiolucent area with regular or poorly defined margins.
• Irregular calcified bodies - varying size & opacity - seen in the radiolucent area.
Treatment:

• surgical enucleation.

• If associated with an odontogenic tumour, a wider excision is required.
2. Non odontogenic cysts:

cysts arising from ectoderm involved in the development of the facial tissues.
1. Naso palatine duct cyst: (Incisive canal)

- Derived - embryonic epithelial residues
  - nasopataline canal
  - lines of fusion of facial processes,
- Occurs within - nasopataline canal or soft tissues of the palate.
- most common - non-odontogenic cysts.
- Occurs - 4th, 5th and 6th decades.
Clinical features:

- swelling, anterior region of the midline of the palate.
- labial aspect of alveolar ridge.
- Bulge on the floor of the nose.
- Pain and/or discharge.
- Salty taste and displacement of
Radiographic features:

- Radiolucency in the area is a cyst or a large incisive fossa.
- Shadow less than 6 mm wide.
- Present- midline of the palate, above or between the roots of the central incisor teeth.
- Round, ovoid or heart-shaped.
- Margins are well-demarcated.
Treatment:

• surgical enucleation.
2. Naso labial cyst: (Naso alveolar)

- occurs outside the bone in the nasolabial folds below the alae nasi.
- very rare lesions.
- Occurs- 40-60 years-age.
- Females>males. (75-80%).
Clinical features:

• cyst grows slowly.
• Swelling - nasolabial fold
• Pain and difficulty in nasal breathing.

Radiographic:

• localised increased radiolucency of the alveolar process.
Globulomaxillary cyst:

• As a fissural cyst found within the bone between upper lateral incisor and canine.

• It causes the roots of these teeth to diverge.

• There is now considerable opinion against the theory that it is a fissural cyst.
3. Inflammatory cysts:
1. Radicular cysts: (periapical & lateral)

- Cyst arises from the epithelial remnants in the periodontal ligament as a result of inflammation.
- Follows the death of the dental pulp.
- Cysts arising - found - apices & lateral aspect of involved teeth.
- Occur in all tooth-bearing areas,
- Commonly seen- maxillary anterior region.
Clinical features:

- Many cyst -symptomless
- Slowly enlarging swellings are often complained of.
- 1\textsuperscript{st} swelling is bony-hard -becomes bigger, sponginess & fluctuence are elicited.
- Swelling may be buccal/labial.
- Pain and infection .
- Non-vital tooth is a central finding.
Radiographic features:

- small, round radiolucency with radiopaque margin.
- Lesion is 2 mm in diameter or larger.
- Present -lateral aspects, or b/w roots.
treatment

• Enucleation with extraction or root.

• Filling - associated teeth.
2. Residual cyst.

- 10% of odontogenic cysts - residual cyst.
- Cyst are left behind – following enucleation of radicular cyst.
- Retained radicular cyst - Extraction of tooth.
- Also form – from apical granuloma after extraction.
- Seen – middle aged/elderly.
- Present on – premolar/molar areas
Clinical features:

- Detected co-incidently.
- Always asymptomatic.
- History of extraction of tooth.
- Present on edentulous ridge.
- Some time unrecognized - persists – increase in size

- Aspiration - amber colored fluid.
Radiographic feature:

- Small –large in size, round, radiolucency present on mandible premolar & molar area,
- Differentiation- white radiopaque lining
Treatment:

• Surgically removed.
• Large cyst- marsuplization.
3. Paradental cyst: (Inflammatory colateral cyst)

• Introduced by Criag - 1976
• Located in – distal aspect of partially erupted 3rd molars.
Clinical features:

- Seen- mandibular 3\textsuperscript{rd} molars.
- Associated with pericoronal inflammation.
- Partially erupted tooth – slight swelling present.
- Occasionally cyst- bilaterally.
- Lies distal – distal root
Radiographic features:

• Unilocular, well defined radiolucency – sclerotic borders.
• Mandibular canal are depressed.
• Present on distal aspects of 3rd molars.
Treatment:

• Cyst is removed along with 3\textsuperscript{rd} molars.
• Recurrence is rare.
1. Solitary bone cyst:

- very rare cyst.
- Occurs mostly - mandible , rarely - maxilla.
- Occurs in young individuals.
- Frequency – 2\(^{nd}\) decade.
- Pathogenesis : not known.

Traumatic aetiology.

(Olech, Sicher and Weinmann)

- Trauma to a bone- intramedullary haemorrhage, - early organisation of the haematoma in marrow spaces - subsequent liquefaction of the clot, lead to the formation of traumatic bone cyst.
Clinical features:

- Mostly –asymptomatic.
- Sometimes-Swelling,
- Pain
- Labial paresthesia,
- History of trauma to that region.
Radiographic features:

• Radiolucent area -with an irregular but definite edge, slight cortication.
• Marginal condensation & scalloping.
Treatment:

• When the cyst cavity is opened at operation, they are frequently found to be empty.
• Cyst consists of a loose vascular fibrous tissue membrane.
• Adjacent bone may show osteoclastic resorption.
2. Aneurysmal bone cyst:

- uncommon lesion
- Occurs 2\textsuperscript{nd} - 3\textsuperscript{rd} decades of life.
- Mandible > maxilla.
- Female > male.
Clinical features:

- Painful.
- produces a firm swelling .
- Lesion enlarges rapidly – thinning , perforation of overlying cortical plate
- larger lesion-displacement of teeth-malocclusion .
Radiographic features:

- Radiolucent area - produces an void of fusiform - Balloon out expansion of bone.
- Multilocular.
- Honeycomb-like appearance
Treatment:

• Surgical curettage /excision

• Non invasive method:
  • Injection of calcitonin into cyst.
  • Heal occurs – 7-9 months.
Differential diagnosis:

- Ameloblastoma.
- Giant cell tumour
- Hyperparathyroidism.
- Myxoma.
- Traumatic bone cyst
- Odontogenic kerato cyst.
3. Staffine bone cyst:

- Also known as:
- Defect of mandible
- Lingual mandibular bone cavity.
- Latent/ static bone cyst.

- 1\textsuperscript{st} recognised by –staffine.
- Congenital defect.
- Name derived from-radiographic appearance.

- Developmental inclusion – submandibular glandular tissue.
- With in / adjacent to lingual surface – body of mandible.
Radiographic features:

• Appears – Ovoid radiolucency.
• Location.: 
• Inferior canal and inferior border of mandible.
• b/w 2\textsuperscript{nd} & 3\textsuperscript{rd} molar.
Differential diagnosis:

- Traumatic bone cyst.
- Mucoepidermoid carcinoma.
Diagnosis of cyst:

1. Clinical examination:
   - Location, size, tooth vitality, sign & symptoms.
2. Radiographs:
   - Intra oral peri apical
   - Occlusal films.
   - Orthopantomogram.
4. Aspiration cytology.
6. Ultrasoundography.
7. CT
8. MRI
Significance of location or site of cyst:

- Fissural cysts - have definite location
- Dentigerous cyst - more common in mandibular third molar and maxillary canine areas
- Periodontal - cyst more in maxillary anterior region
- Odontogenic keratocyst - more in mandible
- Solitary bone cyst & aneurysmal bone cyst - occur only in mandible
- Stafne’s - only in mandible
Significance of aspiration color of cyst:

• Periodontal, Dentigerous, Fissural cysts - Light straw coloured fluid rich in cholesterol.
• Odontogenic keratocyst - Light yellow cheese like material.
• Aneurysmal bone cyst - Presence of blood under pressure.
• Solitary bone cyst - Minute amount of serous fluid indicates
Thank you