Cysts of the jaws

Bálint Vecsei dr.

RADIOLOGICAL DIFFERENTIAL DIAGNOSIS - DESCRIBING A LESION

- Despite the many different conditions that can affect the jaws, they present radiographically only as areas of relative radiolucency or radiopacity compared to the surrounding bone.
- Even this division based on radiodensity is not clear-cut - some lesions fall into both categories, but at different stages in their development.

DETAILED DESCRIPTION OF A LESION

- A systematic description of a lesion should include comments on its:
  - Site
  - Size
  - Shape
  - Outline or edge
  - Relative radiodensity
  - Effect on adjacent structures
  - Time present, if known

SITE

- The recognition of the patterns provides the key to interpretation and the formation of a radiological differential diagnosis.
- A detailed description helps identify these patterns and determine the lesion’s basic characteristics.
- For example, it can show whether the lesion is a cyst or a tumour, whether it is composed of hard or soft tissue and whether, in the case of a tumour, it is benign or malignant. This in turn often determines the mode of treatment. The final definitive diagnosis is almost always based on histological examination.

This should be stated precisely, for example the lesion(s) could be in:
- The mandible
  - Anterior region
  - Body, above or below the inferior dental canal, or related to the teeth
  - Angle
  - Ramus
  - Condylar process
  - Coronoid process
  - Bilateral
  - Several sites
- The maxilla
  - Anterior region
  - Posterior region
  - Bilateral
  - Several sites
- Both jaws
- Other bones
  - Multiple lesions may also affect the Cranial vault, long bones or cervical Spine.

SIZE

- Conventionally, the lesion is sized in one of two ways:
  - Measuring the dimensions in centimetres
  - Describing the boundaries, i.e. the lesion extends from... to... in one dimension and from... to... in the other dimension
- A few conditions have little or no growth potential and are therefore almost always small (2-3 cm), such as Stafne’s idiopathic bone cavity. Tumours, such as ameloblastoma can grow, if untreated, to an enormous size (10 cm or more). The size of a lesion, while not being specific, may give some idea of the type of underlying condition.
SHAPE

- Conventionally, the shape of the lesion is described using one or more of the following terms:
  - Monolocular
  - Multilocular
  - Pseudoloculated
  - Round
  - Oval
  - Irregular

The shape of a lesion is one of the more useful and specific characteristics contributing to radiological diagnosis.

OUTLINE OR EDGE

- Definition of the outline
  - Well defined
  - Moderately well defined
  - Poorly defined.
- Cortication of the outline
  The lesion may or may not be surrounded by a radiopaque (white) cortical margin of dense bone.
  The margin could be:
    - Well corticated, with a thick or thin cortex
    - Moderately well corticated
    - Poorly corticated
    - Not corticated.

RELATIVE RADIODENSITY

- The radiodensity of the lesion should be assessed relative to the surrounding bone, it could be:
  - Uniformly radiolucent
  - Variable radiolucency
  - Radiolucent with patchy opacities within
  - Radiopaque

EFFECTS ON ADJACENT STRUCTURES

- The following structures need to be checked:
  - The teeth
    - Resorption
    - Displacement
    - Delayed eruption
    - Disrupted development
    - Hypercementosis
  - Surrounding bone
  - Surrounding soft tissues

Surrounding bone

- Expansion:
  - Buccal
  - Lingual
  - In other directions
- Displacement or involvement of surrounding structures, including the:
  - Inferior dental canal
  - Mental foramen
  - Antra
  - Lower border of the mandible
  - Nasal cavity
  - Orbits
  - Ragged destruction
  - Alteration in the trabecular pattern or density
  - Subperiosteal new bone formation.
DIFFERENTIAL DIAGNOSIS OF RADIOLUCENT LESIONS OF THE JAWS

CYSTS OF THE JAWS

Definition: A cyst is an epithelial lined, pathological cavity having fluid, semi-fluid or gaseous contents, and surrounded by connective tissue.

ETIOLOGY:
- Developmental
- Inflammatory
- Traumatic
- Neoplastic

CYSTS - RADIOGRAPHICALLY

- Typically appear with a well-delineated border – (is lacking when inflammation is present)
- At the apex of non-vital tooth
- 1.5-3 cm diameter
- Their growth is slow
- Displaces the surrounding anatomic structures – depending upon their resistance

I. ODONTOGENIC CYSTS
(with epithelial lining)

1. Radicular cyst
   - apical cyst
   - lateral cyst
2. Periapical cyst
3. Follicular cyst
   a. before formation of hard tooth substance
      - primordial cyst
      - keratinized
   b. after formation of hard tooth substance
      - exostosis cyst
      - unerupted cyst
      - odontogenic keratocyst
   c. cyst with rudimentary tooth
4. Residual cyst of all types
II. NONODONTOGIC CYSTS
(with epithelial lining)

1. Nasopalatine cysts
2. Median (fissural) cysts
   - median dacrocele cyst
   - median palatal cyst
3. Lateral (fissural) cysts
   - unilocular cyst
   - globulomaxillary cyst
4. Median maxillary cysts
5. Residual cysts of all types

III. PSEUDOCYSTS
(without epithelial lining)

1. Solitary bone cyst
2. Aneurysmatic bone cyst
3. Latent bone cavity (Stafne)

DISTRIBUTION OF 3498 JAW CYSTS ACCORDING TO DIAGNOSIS

<table>
<thead>
<tr>
<th>Cysts</th>
<th>Number</th>
<th>%</th>
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<tbody>
<tr>
<td>Apical alveolar cyst</td>
<td>1742</td>
<td>50.0</td>
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<tr>
<td>Odontogenic keratocyst</td>
<td>592</td>
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<tr>
<td>Odontogenic keratocyst (including orthokeratinised)</td>
<td>355</td>
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<tr>
<td>Nasopalatine duct cyst</td>
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<td>11.6</td>
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<tr>
<td>Neonatal cyst (excluding juvenile type)</td>
<td>24</td>
<td>0.7</td>
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<tr>
<td>Solitary bone cyst</td>
<td>35</td>
<td>1.0</td>
</tr>
<tr>
<td>Calcifying cystic odontogenic tumour</td>
<td>28</td>
<td>0.8</td>
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<tr>
<td>Eruption cyst</td>
<td>27</td>
<td>0.8</td>
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<tr>
<td>Developmental lateral periodontal cyst</td>
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<td>0.7</td>
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<tr>
<td>Nasal/lateral cyst</td>
<td>23</td>
<td>0.6</td>
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<tr>
<td>Gingival cyst of adults</td>
<td>21</td>
<td>0.6</td>
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<tr>
<td>Softened (globulomaxillary) cysts</td>
<td>18</td>
<td>0.5</td>
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<td>Inflammatory epithelial cyst</td>
<td>15</td>
<td>0.4</td>
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<tr>
<td>Acneal cyst</td>
<td>15</td>
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</tr>
<tr>
<td>Glanulard odontogenic cyst (since 1952)</td>
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<tr>
<td>Postoperative maxillary cyst</td>
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<td>Total</td>
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DISTRIBUTION OF 7121 ODONTOGIC CYSTS ACCORDING TO DIAGNOSIS. FROM JONES ET AL. (2006), SHEFFIELD.

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<td>(including orthokeratinised)</td>
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<td>Residual cyst</td>
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<tr>
<td>Paradental cyst</td>
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<td>Unclassified odontogenic cysts</td>
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<tr>
<td>Lateral periodontal cyst</td>
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<tr>
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<tr>
<td>Gingival cyst</td>
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<td>Eruption cyst</td>
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<tr>
<td>Glanulard odontogenic cyst</td>
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<td>Epstein pearl</td>
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<tr>
<td>Total</td>
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</table>

RADICULAR CYST

- Arise from epithelial remnants
- The rests of Malassez – the Hertwig epithelial sheat
- These cells proliferate as a result of inflammation
- Always derives from nonvital teeth
AGE DISTRIBUTION OF 343 PATIENTS WITH DENTIGEROUS CYSTS

SITE DISTRIBUTION OF RADICULAR CYST

TYPICAL RADICULAR CYSTS

INFECTED RADICULAR CYST

RADIOGRAPHIC SIGNS OF RADICULAR CYSTS

- Round radiolucency with an opaque border
- Apex of the tooth is within the radiolucency
- Adjacent teeth and structures are displaced

Infected cyst:
- Cystic cavity exhibits poorly demarcated borders
- Background structures become invisible and the defect appears as tunneling.
- Periodontal ligament space around the involved tooth becomes widened.
INFECTED RADICULAR CYST

ATYPICAL MANIFESTATION OF MULTILUCULAR RADICULAR CYST

Differential diagnosis: ameloblastoma, giant cell granuloma, keratocyst

RESIDUAL RADICULAR CYST

SHOULD BE SUBJECT TO HISTOLOGIC EXAMINATION

Residual cyst  Ossifying fibroma
FOLLICULAR CYST – CYSTA ERUPTIONIS

CYSTA PARADENTALIS

INFLAMMATION-INDUCED CYSTS

1. Apical radicular cyst
2. Lateral radicular cyst
3. Residual radicular cyst
4. Paradental (Craig) cyst

DEVELOPMENTALLY INDUCED ODONTOGENIC CYSTS

1. Primordial cyst
2. Keratocyst
3. Follicular cyst
4. Eruption cyst
5. Lateral periodontal cyst

DEVELOPMENTALLY INDUCED NONODONTOGENIC CYSTS

1. Nasopalatine cyst
2. Nasolabial (globulomaxillary) cyst

CYSTA FOLLICULARIS (DENTIGEROUS)

centralis lateralis

Develops from the remnants of the enamel epithelium, after the tooth has formed
CYSTA FOLLICULARIS

Develops from the epithelium of the dental lamina
Instead of the normal tooth, which is typically missing from the series
Pseudolocular or multilocular

THE MOST IMPORTANT SITES OF KERATOCYSTS

KERATOCYSTA ODONTOGENES - PRIMORDIAL

- Develops from the epithelium of the dental lamina
- Instead of the normal tooth, which is typically missing from the series
- Pseudolocular or multilocular

KERATOCYST
INCISIVE CANAL CYST – NASOPALATINE DUCT CYST

B: fissura mediana cysta
Figure 9-13.
Sublingual salivary gland depression: typical location without a sclerotic margin.

Figure 10-18.
Median mandibular cyst. Occlusal view. Case was a residual cyst.