LUCENT LESIONS OF THE MANDIBLE

A PICTORIAL REVIEW

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LEARNING OBJECTIVES

1. Develop a systematic approach in the assessment of lucent lesions in the mandible.

2. Identify common mandibular lucent lesions based on their relation to teeth and imaging findings.

3. Review diagnostic pearls and pitfalls in mandibular lucencies for the general radiologist.
FDG PET CT plays a limited role in the characterisation of lucent lesions in the mandible, typically reserved for the work up of suspected malignancy.
LUCENT LESIONS OF MANDIBLE

- Odontogenic
  - Periapical cyst
  - Dentigerous cyst
  - Odontogenic keratocyst
  - Residual cyst
  - Ameloblastoma
  - Fibrous dysplasia
  - Infection and osteonecrosis (radiation, bisphosphonate)
  - Stafne cyst (pseudolesion)

- Non-odontogenic
  - Simple bone cyst, aneurysmal bone cyst
  - Giant cell tumour
  - Eosinophilic granuloma
  - Malignancy, metastasis, myeloma
ODONTOGENIC
**TOP 3 ODONTOGENIC LUCENCIES**

**PERIAPICAL CYST**
- = radicular cyst
- Most common odontogenic cyst
- Associated with root of non-vital tooth
- Unilocular
- Typically small (<1cm), non-expansile

**DENTIGEROUS CYST**
- = follicular cyst = pericoronal cyst
- Second most common odontogenic cyst
- Associated with crown of unerupted tooth
- Unilocular
- Can be large, expansile
- May cause root erosion/resorption in adjacent teeth

**ODONTOGENIC KERATOCYST**
- Arise from dental lamina
- Variable association with teeth
  - periapical, pericoronal, lateral root or unrelated to tooth
- Favours posterior body and ramus of mandible
- Unilocular or pseudo-multilocular
- Locally aggressive, with risk of recurrence after surgery
Well-defined lucency associated with roots of teeth in two patients.
Acute infection of periapical tissues can result in an odontogenic abscess. Patients may present with pain, swelling, purulent discharge and fever. Complications include deep neck space collections, osteomyelitis and Ludwig angina.
DENTIGEROUS CYST

A well-defined thin-walled expansile cyst in the right mandible is associated with the **crown of an unerupted molar tooth**. The CT demonstrates lateral displacement of the **inferior alveolar canal**.

**Case: Craig Hacking** rID: **37830**

**REVIEW AREA**

Inferior alveolar canal displacement or dehiscence.
ODONTOGENIC KERATOCYST

Unilocular, well-defined mildly expansile cystic lesion in the right mandible. In contrast to a dentigerous cyst, no clear association with root or crown of tooth. No unerupted tooth. No root erosions.

PEARL: If multiple odontogenic keratocysts, consider syndromic associations such as basal cell naevus, Marfan or Noonan syndromes.
AMELOBLASTOMA

Well-defined, scalloped lucency in the mandible crosses the midline. There is root resorption at multiple teeth. No "soap bubble" loculation, which is a typical description of ameloblastoma on OPG.

The expansile lucency with mandibular cortex thinning is better appreciated on CT. No extraosseous soft tissue component.
Non-odontogenic benign features:

- Narrow zone of transition on OPG
- Well-defined with scalloping/thinning of mandibular cortex
- No periosteal reaction
- No soft tissue component
ANEURYSMAL BONE CYST

CT reveals a well-defined, expansile multilocular lucent lesion in the right mandible. The mandibular cortex is thinned but not dehiscent. MRI demonstrates characteristic fluid-fluid levels.
Fibrous dysplasia may appear **cystic**, **sclerotic** or mixed. When involving the craniofacial bones, fibrous dysplasia is often polyostotic.

**PEARL:** Look out for the ground glass matrix within the sclerosis of fibrous dysplasia.
A Stafne cyst reflects a cortical defect near the angle of the mandible formed by remodelling of the bone by adjacent salivary tissue. It is not a true cyst as it does not contain fluid, hence "Stafne bone cavity".
Non-odontogenic aggressive features:

- Irregular, poorly-defined or permeative destruction of cortical bone
- Aggressive periosteal reaction
- Soft tissue component
- Inferior alveolar canal involvement or perineural spread
Irregular lucency in the right mandible with surrounding sclerosis and central sequestrum. The laminated periosteal reaction is subtle on OPG, better appreciated on CT. These imaging findings are consistent with a Brodie's abscess (subacute to chronic pyogenic osteomyelitis). Note the inferior alveolar canal is intact.
OSTEORADIO-NECROSIS

Case: Oliver Hennessy rID: 33517

Case: Paul Simkin rID: 32954

OPG demonstrates irregular mixed lucent/sclerotic mandibular destruction. Prior history of radiotherapy favours radiation necrosis, in this case complicated by a fracture of the mandible. The CT below demonstrates another case of osteoradionecrosis.

The differentials for irregular cortical destruction include medication-related osteonecrosis of the jaw, osteomyelitis and recurrent tumour.
SQUAMOUS CELL CARCINOMA

67 male with painful enlarging left cheek lump:
OPG and CT demonstrate irregular lucency in left mandible, dehiscent cortex and involvement of inferior alveolar canal. CT and MRI (T1C+FS) confirm destructive soft tissue mass, with adjacent soft tissue and marrow oedema.

REVIEW AREA
Inferior alveolar canal for dehiscence CT and perineural spread of tumour on MRI.
Another case of squamous cell carcinoma of the oral cavity resulting in extensive bony destruction of the mandible.

"Floating tooth" appearance arises from alveolar bone destruction around roots of the teeth.
Aggressive lytic destruction of the mandible in this patient with metastatic prostate cancer (confirmed on biopsy).

Metastases to the mandible are rare, most commonly from breast cancer.

Top differentials for aggressive destruction of the mandible: primary head and neck malignancy, infection, myeloma and metastases.
Evaluation of lucent lesions of the mandible begins with assessment of the lesion's relation to the teeth: odontogenic vs. non-odontogenic.

Top differentials for odontogenic cysts of the mandible include periapical, dentigerous and odontogenic keratocysts.

Commonly encountered aggressive lesions of the mandible include ameloblastoma, primary malignancy, metastasis, myeloma and infection.
REFERENCES


