Educational Objectives

- Understand basic dental terminology
- Understand the difference between and recognize the radiographic appearance of common periapical lesions
- Recognize the most common dental cysts
- Recognize the most common odontogenic tumors

Terminology

- Periapical vs periodontal
  - Periapical is at the apex of the tooth. Lesions are a result of pulp death. "Vitality" testing is important in the dental world.
  - Periodontal – related to the supporting structure of the tooth: alveolar bone, lamina dura, periodontal ligament space.
- Periodontal disease causes bone loss of the alveolar crest (near the cervical margin of the tooth) not at the apex
- Cemento-enamel junction (CEJ) important landmark

Odontogenic Cysts

- Periapical (radicular)- most common cyst
- Residual
- Lateral periodontal
- Botryoid
- Dentigerous – second most common
- Keratocystic Odontogenic Tumor (formerly odontogenic keratocyst)?
Some general observations

- Lesions above the mandibular canal are likely odontogenic.
- Lesions within the mandibular canal are either vascular or neural.
- Lesions below the mandibular canal are non-odontogenic.

Periapical Cyst

Epithelium comes from rests of Malassez—presents as well-defined periapical radiolucency which often has sclerotic or corticated border which is highly indicative of a cyst.

Periapical Radiolucentes

Epicenter of lesion is apex of tooth which will be non-vital. Differential: PA abscess, PA granuloma, PA cyst. By far the most common odontogenic pathology. Usually incidental finding on CT scans.

Amalgam, Gutta Percha in endodontically treated teeth. Periapical lesions associated with pulpal pathology are unilocular RLs and NEVER multilocular. You may not be able to see the cause of the pathology because of the streaking artifact from the metallic restorations.

How old is this patient?

These are normal in a 14 year old patient—the root has not yet finished developing. This is not normal and represents pulpal periapical disease.

Periapical Cemental Dysplasia

When it becomes more extensive it is known as florid cemento-osseous dysplasia (FCOD).

Note coiled appearance in edentulous area typical of fibro-osseous lesions. As it matures, radiopacities appear.
Do not confuse with this lesion...

Cementoblastoma – apex of root not visible

Little to no expansion unless it is associated with simple bone cysts. It does NOT have the capacity for limitless proliferation. It requires no treatment.

Florid Cemento-osseous Dysplasia
- Middle-aged AA females
- May affect all 4 quadrants
- Above the mandibular canal
- May be associated with SBCs
- Little to no expansion

Residual Cyst
- CBCT pan reformat
- Well-defined round/oval unilocular radiolucency
- Remains in jaw after affected tooth removed. In mandible will be ABOVE mandibular canal

Lateral Periodontal Cyst
- Between roots - mand premolar area
- Buccal more than lingual
- Teeth are VITAL
Multilocular lesion

Botryoid odontogenic cyst

No expansion

Same patient with second lesion – Lateral periodontal cyst

Pericoronal Lesions: Around the crown of an impacted tooth

- Lesions may be
  - completely radiolucent
  - radiolucent with radiopacities within

KCOT
Ameloblastic Fibroodontoma

Patient’s are entitled to as many diseases as he or she pleases!

KCOT

The most common PCRL is a dentigerous (follicular) cyst – second most common cyst of the jaws after periapical cyst

Differentiate follicular space from pathology

- Size > 3mm
- Shape - becomes more rounded
- Attachment at the CEJ

Normal follicular space is < 3mm
Dentigerous Cyst

> 3mm gives a high index of suspicion for pathology

Fluid accumulates between the reduced enamel epithelium and the crown of the tooth; 75% occur in mandible. Mand 3rd molars > max 3rd molars > max canines.

Histologically the lesion attaches at the CEJ (cemento-enamel junction).

Significant tooth displacement

Even in this very large example, the root apex is not involved, and the lesion attaches at or close to the CEJ.

Mandibular right second molar displaced to buccal.

Lesion associated with tooth 32 with apparent well-defined margins around the tooth crown. Ill-defined margins more mesially with destruction of buccal cortex.

Dentigerous (follicular) cyst

- Second most common jaw cyst (after periapical cyst)
- 2nd and 3rd decades, males=females
- Well-defined with corticated border
- Loss of cortex means secondary infection or another lesion
- Displaces tooth which may end up near floor of lesion
- Multiple cysts associated with Maroteaux Lamy syndrome or maybe XCGTS instead (NBCCS)
- Lining can give rise to ameloblastoma, SCCa, mucoepidermoid carcinoma

75% occur in mandible: Mand 3rd molars > max 3rd molars > max canines.
The epithelial lining of dentigerous cysts can undergo metaplasia to:

- Ameloblastoma
- Squamous cell carcinoma
- Mucoepidermoid carcinoma

Pericoronal radiolucencies without radiopacities differential

- Dentigerous cyst
- Keratocystic odontogenic tumor
- Unicystic ameloblastoma
- Ameloblastic fibroma

This lesion is “creeping” up the ramus which is more characteristic of a KCOT.

What are these little calcifications?

The mandibular canal is located inferiorly and buccally to the impacted tooth. Note minimal expansion.

Initial Pan of 35 yo male

Multilocular
Unilocular
Pericoronal

KCDTs

In the maxilla KCDTs can cause expansion
Nevoid Basal Cell Carcinoma Syndrome (Gorlin-Goltz, Bi-fid Rib)
- AD linked to chromosome #9
- Multiple nevoid basal cell carcinomas
- Skeletal abnormalities
- Palmar or plantar pitting
- Multiple jaw cysts
- Calcification of the falx cerebri

Odontogenic Tumors
- Cementoblastoma
- Cemento-ossifying fibroma
- Keratocystic Odontogenic Tumor
- Odontoma
- Calcifying Epithelial Odontogenic Tumor (CEOT)
- Adenomatoid Odontogenic Tumor (AOT)
- Calcifying Odontogenic Cyst/Tumor
- Ameloblastic Fibro-odontoma (AFO), AF, AO
- Ameloblastoma
- Odontogenic Mxymoma
- Central odontogenic fibroma

Pericoronal Radiolucencies with Radiopacities
- Odontoma
- Calcifying epithelial odontogenic tumor (Pindborg)
- Adenomatoid odontogenic tumor
- Calcifying odontogenic cyst (Gorlin) now calcifying cystic odontogenic tumor
- Ameloblastic fibro-odontoma
- Ameloblastic odontoma

Most common PCRL with Radiopacities is an ODONTOMA
- Compound Odontoma contains tooth-like structures

Odontoma
- Thought to be a hamartoma
- Appear as radiopacity within well-defined radiolucency (Target Lesion)
- Complex: RO is non-descript mass of dental tissue. Prefers posterior cf. compound
- Compound: ROs resemble small teeth
  - in compound teeth are found
- Ave age 11–17yrs, slightly older for complex
- 50% associated with impacted teeth. Not all PC

7 yo female
- Note tooth-like structures
Complex Odontoma

Prefers the posterior jaws and has little or no resemblance to tooth morphology

Odontogenic Tumors

- Cementoblastoma
- Odontoma
- Keratocystic odontogenic tumor
- Calcifying Epithelial Odontogenic Tumor (CEOT)
- Adenomatoid Odontogenic Tumor (AOT)
- Calcifying Odontogenic Cyst/Tumor
- Ameloblastic Fibro-odontoma (AFO), AF, AO
- Ameloblastoma
- Odontogenic Myxoma
- Central odontogenic fibroma

Ameloblastoma – MOST common multilocular radiolucency

“Soap bubble” loculations. Locally aggressive; root resorption; very expansive; extreme displacement of the mand 3rd molar

Ameloblastoma

- Second most common oral tumor behind odontoma
- Mean age 35, males>females slightly
- Mandible ramus area, plexiform more common in maxilla and potentially more mutilating
- Locally aggressive
- Metastases associated with multiple recurrences
- Several histo variants: follicular, plexiform, granular cell, acanthomatous, basal cell and desmoplastic

35 yo Hispanic female
Summary
- Look for association with tooth
- Odontogenic/nonodontogenic
- What relationship does lesion have with tooth?
  - Periapical/periapical
  - Pericoronal: Radiopacities within or not?
- Are loculations present?
  - Many/Few?
  - Curved/straight septa?
  - Septa at right angles to expanded cortex?
- Is there multifocal disease?
  - FCOD
  - NBCCaS