Dental Infections and their Complications

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Overview
- Dental Caries and Periapical Abscess
  - Disease patterns
  - Systemic implications
- Necrotizing Fasciitis
- Ludwig’s Angina
- Odontogenic Sinonasal inflammation and infection
- Osteomyelitis, Osteonecrosis and Osteoradionecrosis

Dental Caries Pattern
- Carious lesions typically on Occlusal or Interproximal surface
- Buccal or lingual surfaces uncommon
- Numerous buccal / lingual caries:
  - Radiation treatment
  - Immune compromise
  - Nutritional/metabolic
  - Iatrogenic

Periapical abscess: Endodontal disease

Periapical abscess: Periodontal disease
**SLS / SMS Abscess**
- Focal collection of pus within the SMS or SLS.
- Most common source: periapical abscess
- Other sources:
  - SMG duct / gland abscess
  - Penetrating trauma
  - I.V. drug use

**OC/OP Abscess: Necrotizing Fasciitis**
- Most commonly follows odontogenic infection > trauma > peritonsillar abscess.
- Anaerobes, gram (-) rods, group A β-hemolytic strep, staph.
- DDx cellulitis -> requires prompt surgical debridement
  - Tx delay > 24 hrs 70% mortality vs 36% < 24hrs.
- Significant presence of subcutaneous gas.
- Reticular cellulitis, involvement of deep fascia and SCM.
- Involvement of multiple spaces: SMS, PPS, carotid.
- Mediastinitis, arterial erosion, IJV thrombophlebitis, carotid thrombosis.

**Ludwig’s Angina**
- Rapidly spreading / fulminate cellulitis involving bilateral SLS, SMS, submental spaces.
- Sig: induration soft tissues, tongue swelling, airway compromise
- Etiology: ~ 80-85% dental infection / abscess, other oral (salivary, trauma, FB).
- Imaging:
  - Extent: true Ludwig's?
  - Degree / potential of/for airway compromise
  - Source

**Necrotizing Fasciitis**
- Rim enhancing fluid collection
- Relation to mylohyoid
- Phlegmon + cellulitis.
- Myositis, stranding
- Suppurative adenopathy
**Ludwig’s Angina**

- Inflammation of bone and bone marrow
- Etiology: dental and trauma
- Mixed microbial infection of OC source
- Pus and edema in medullary cavity & periosteum
  - obstructs blood supply
  - Ischemia
  - Necrosis

**Osteomyelitis**

- Inflammation of bone and bone marrow
- Etiology: dental and trauma
- Mixed microbial infection of OC source
- Pus and edema in medullary cavity & periosteum
  - obstructs blood supply
  - Ischemia
  - Necrosis

- Adapted from Fig. 5, Slootweg PJ, 2014

**Garrés Sclerosing Osteomyelitis**

- Proliferative nonsuppurative periostitis
- Most common in mandible in H&N
- Etiology: dental infection or hematologic

**Osteoradionecrosis**

- Slow / non-healing XRT-induced ischemic necrosis of bone
- Associated soft tissue necrosis
- Absence of local 1st tumor necrosis
- Absence of recurrence or metastasis

- Adapted from Fig. 3; Chrcanovic et al. OMFS 14: 3-16, 2010

**Bisphosphonate Osteonecrosis**

- 1st described in 2003.
- Patients receiving I.V. bisphosphonates for
  - Multiple myeloma (10-12%)
  - Metastatic prostate ca (2.9%)
  - Metastatic breast ca (2.5%)
- BRONJ w/ oral admin. rare.
- Hypothesized Mechanisms:
  - N inhibit mevalonate pathway → osteoclast inhibition
  - Anti-angiogenic action → avascular necrosis

- From Fig. 1 Ficarra & Benianti 2007
## Bisphosphonate Osteonecrosis

### FDA Approved Bisphosphonates

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<th>Generic Name</th>
<th>Brand Name</th>
<th>Formulation</th>
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### Bisphosphonate Osteonecrosis