Management of Odontogenic Infections

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Stages of Infection

- I. Cellulitis
- II. Abscess
- III. Sinus Tract/Fistula
CELLULITIS

A painful swelling of the soft tissue of the mouth and face resulting from a diffuse spreading of purulent exudate along the fascial planes that separate the muscle bundles.
Abscess

- Well defined borders
- Pus accumulation in tissues
- Fluctuant to palpation
- Cellulitis – “spreading” infection
- Abscess – “localized” infection
FISTULA

A drainage pathway or abnormal communication between two epithelium-lined surfaces due to destruction of the intervening tissue.
Abscess ruptures to produce a draining sinus tract
Management of Infection

- Determine the severity of the infection
- Evaluate the host defense
- Decide on setting of care
- Treat surgically
- Support medically
- Choose and prescribe antibiotics appropriately
- Evaluate patient frequently
Severity of Infection

- Rate of progression
- Potential for airway compromise or affecting vital organs
- Anatomic location of infection
HISTORY

- Duration of infectious process.
- Sequence of events and changes in symptoms or signs.
- Antibiotics prescribed, dosages and responses.
- Review of systems with emphasis on neuro-ophthalmologic and cardiopulmonary and immune systems.
- Social history – exposure, travel, (fungal or parasitic infections), chemical dependency.
SIGNS OF SEVERITY

- Fever
- Dehydration
- Rapid progression of swelling
- Trismus
- Marked pain
- Quality and/or location of swelling
- Elevation of tongue
- Difficulty with speech and swallowing
Anatomic Location

- Graded in severity by level to which the airway and vital structures are threatened
  - Low
    - Buccal, Vestibular, Subperiosteal
  - Moderate
    - Masticator space
  - Severe
    - Lateral pharyngeal
    - Retropharyngeal
    - Danger Space
What are the primary fascial spaces?

The spaces directly adjacent to the origin of the odontogenic infections. Infections spread from the origin into these spaces, which are:

Vestibular  Submental
Canine     Sublingual
Buccal     Submandibular
Buccal

- Likely from
  - Upper Premolar
  - Upper molar
  - Lower molars
CANINE SPACE

- Superior to levator muscle attachment in canine fossa
- Can lead to:
  - orbital cellulitis
  - carverous sinus thrombosis
“A unique aspect of the veins in the head and neck is their valveless nature”

Maxillofacial Infections
Selected Readings
OMFS Vol 2 No 1
CAVERNOUS SINUS THROMBOSIS

- Cranial nerves III, IV, V, (ophthalmic), VI
- Internal carotid artery
SUBMENTAL SPACE

- Anterior mandibular teeth
- Deep to mentalis muscle
Submental Space

- Most likely caused by lower anterior teeth or mandibular symphysis fracture
SUBLINGUAL SPACE

- Presents in floor of mouth
- Superior to mylohyoid
- Drained intraorally parallel to Wharton’s duct
Submandibular Space

- Likely cause:
  - Lower molars
SUBMANDIBULAR SPACE

- Extra-oral presentation
- Deep to mylohyoid
- I & D through skin with blunt incision
LUDWIG’S ANGINA

- Bilateral sub-mandibular, sublingual, and sub-mental involvement
- Rarely fluctuant
- Often fatal
- Requires early, aggressive intervention
What are the secondary fascial spaces?

Fascial spaces that become involved following spread of infection from the primary spaces.

The secondary spaces are:

- Pterygomandibular
- Masseteric
- Superficial and deep temporal
- Infratemporal
- Lateral pharyngeal
- Retropharyngeal
- Prevertebral
The hallmark of masticator space infection is: **TRISMUS**
PHARYNGEAL SPACE INFECTIONS

- Lateral pharyngeal
- Retro-pharyngeal

(both can lead directly to mediastinum)
What factors influence the spread of odontogenic infection?

- Thickness of bone adjacent to the offending tooth
- Position of muscle attachment in relation to root tip
- Virulence of the organism
- Status of patient’s immune system
The production of “laudable pus” by:

- mucosal incision
- extraction
- endodontic access
- periodontal curetage
INCISION AND DRAINAGE

- Incise in healthy skin
- Incise in gravity-dependent, esthetic area – if possible
- Explore *entire* abscess cavity
- Non-absorbable drains
PRINCIPLES IN THE USE OF DRAINS (II)

- Drained wounds should be cleansed frequently.
- Bacteria can migrate into a wound along the drain surface.
- Latex Penrose drains are best used unmodified.
Penrose Drain
X-Ray Opaque Rubber
Single Use

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INDICATIONS FOR CULTURE

- Nonresolving infection in spite of appropriate care
- Atypical flora expected
  - = long term antibiotic treatment
  - = age extremes (<2 or >65)
  - = patients with malignancies
- Infections with systemic involvement
- Immunocompromised or myelosuppressed patients
“the most important therapeutic action in the management of orofacial infections is the drainage of pus, and antibiotics are merely an adjunct...”

Pogrel, A; OMFS Clinics of North America
Feb 1993
EMPIRIC THERAPY OF ODONTOGENIC INFECTIONS

- Penicillin
- Penicillin + metronidazole
- PCN allergy → clindamycin
MANAGEMENT OF ODONTOGENIC INFECTIONS

1. Determine severity
   Assess history of onset and progression perform physical examination of area:
   (1) Determine character and size of swelling
   (2) Establish presence of trismus

2. Evaluate host defenses
   Evaluate:
   (1) Diseases that compromise the host
   (2) Medications that may compromise the host

3. Perform surgery
   Remove the cause of infection
   Drain pus
   Relieve pressure
MANAGEMENT OF ODONTOGENIC INFECTIONS

4. Select antibiotic

Determine:

- (1) Most likely causative organisms based on history
- (2) Host defense status
- (3) Allergy history
- (4) Previous drug history

Prescribe drug property (route, dose and dosage interval, and duration)

5. Follow up

Confirm treatment response
Evaluate for side effects and secondary infections
Follow-up

- Patient should be monitored frequently
  - out-patient should return for f/u in 2-3 days
  - Patient should have decreased swelling, discharge, airway edema, malaise in 2-3 days
Follow up

- If no improvement consider:
  - Re-culture
  - Re-image
  - Repeat I and D
Questions