Ludwig's Angina

Background

1. Definition
   - First described by Wilhelm Fredrick von Ludwig in 1836 as characterized by
     - Inflammation of cellular tissue around the submandibular gland, neck and
       floor of mouth
     - Symmetrical hard sublingual swelling
     - Induration of the floor of the mouth
     - Extreme difficulty with deglutition, speech and respiration
   - Potentially fatal, rapidly progressing submandibular & sublingual necrotizing
     cellulitis

2. General information
   - Usually originates from 2nd and 3rd mandibular molar infection
   - Potential therapeutic emergency with risk for life threatening complication of air
     way obstruction

Pathophysiology

1. Pathology of disease
   - Originates from the oropharynx
   - Spreads by continuity rather than by hematogenous or lymphatic spread
   - Extends
     - Superiorly and posteriorly \( \rightarrow \) elevation of the floor of the mouth & tongue
     - Anteriorly \( \rightarrow \) distortion and "bull neck" appearance \( \rightarrow \) upper airway
       obstruction
   - Mixed infection of aerobic & anaerobic bacteria including predominately the oral
     flora
     - Staph spp, Strep spp and Bacteroides commonly isolated
     - Atypical organisms eg. G- rods & fungi in immunocompromised host

2. Incidence, prevalence
   - Quite rare where health access not generally a problem
   - Less common in the antibiotic era

3. Risk factors
   - Dental caries, recent dental treatment, poor dental hygiene (accounts for 75-90% of
cases)
   - Systemic diseases (Sickle cell dz, DM, SLE), alcoholism, malnutrition
   - Immunosuppression (HIV, transplant recipients, chemotherapy); IVDA
   - Trauma: mandibular fracture, facial trauma, tongue piercing, frenuloplasty
   - Submandibular sialoadenitis
   - No apparent cause (especially in peds)

4. Mortality
   - Currently around 10% ; close to 100% if untreated
In pre-antibiotic era 60%

**Diagnostics**

1. History
   - Tooth pain
   - Painful neck swelling
   - Restricted neck movement
   - Dysphagia
   - Dysphonia
   - SOB
   - Sore throat
   - Fever, malaise

2. Physical exam
   - Carious molar teeth
   - Tachypnea
   - Tachycardia
   - Fever
   - Erythema
   - Swelling
   - Drooling
   - Dyspnea
   - Cyanosis
   - Stridor
   - Tenderness to palpation of submandibular area
   - Neck rigidity
   - Trismus
   - Tongue displacement indicate imminent airway compromise

3. Diagnostic testing
   - Laboratory evaluation
     - WBC count
     - ESR
     - Possible blood culture or other tests to assess severity of illness
   - Diagnostic imaging
     - Xray neck and chest
     - Most important
     - Contrast enhanced CT of the neck
     - Dx test of choice
   - Diagnostic criteria
     - No validated criteria available in primary care

**Differential Diagnosis**

1. Peritonsillar abscess
2. Parotid space infection
3. Mumps
4. Parapharyngeal or retropharyngeal space infection
5. Paravertebral space infection
6. Suppurative jugular thrombophlebitis

**Therapeutics**

1. **Acute treatment**
   - Requires hospital admission and treatment
   - Prompt airway management if compromised
     - Fiberoptic intubation preferred
     - Direct laryngoscopy for intubation can precipitate airway collapse
     - Cricothyrotomy & tracheostomy in emergency for severe cases
   - IV antibiotics (immunocompetent patients)
     - Ampicillin/sulbactam 2 g IV q4hr
     - Penicillin G 2-4 MU IV q4-6hr plus metronidazole 500 mg IV q6hr
     - Clindamycin 600 mg IV q6hr for PCN allergy
   - IV antibiotics (immunocompromised host)
     - Cefotaxime 2 g IV q6hr
     - Ceftizoxime 3 g IV q8hr
     - Imipenem 500 mg IV q6hr
     - Piperacillin-tazobactam 3.375 g q6hr
   - Dexamethasone 10 mg IV x1, then 4 mg q6hr x48hr
   - Nebulized epinephrine 1 ml of 1:1000 diluted to 5 ml with 0.9% NS

2. **Further management**
   - I&D of abscessed carries; decompression of submandibular space
   - Removal of carious molars

**Follow-Up**

1. Potential surgical and airway emergency requiring hospital level care and aggressive antibiotic treatment

**Prognosis**

1. Guarded

**Prevention**

1. Oral hygiene

**References**


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