

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 ⁹
 - 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 ²

Pathophysiology

1. Pathology of disease
 - Originates from the oropharynx
 - Spreads by continuity rather than by hematogenous or lymphatic spread ^{1,3}
 - Extends
 - Superiorly and posteriorly → elevation of the floor of the mouth & tongue
 - Anteriorly → distortion and "bull neck" appearance → upper airway obstruction ^{2,3}
 - Mixed infection of aerobic & anaerobic bacteria including predominately the oral flora ^{3,4}
 - Staph spp, Strep spp and Bacteroides commonly isolated ^{2,5}
 - Atypical organisms eg. G- rods & fungi in immunocompromised host ^{1,2,5}
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) ^{1, 4, 5, 7}
 - Systemic diseases ^{1,4}(Sickle cell dz, DM, SLE), alcoholism, malnutrition
 - Immunosuppression (HIV, transplant recipients, chemotherapy); IVDA ^{1, 4, 6}
 - Trauma: mandibular fracture, facial trauma, tongue piercing, ^{1,2,5}frenuloplasty
 - Submandibular sialoadenitis
 - No apparent cause (especially in peds ^{4, 6})
4. Mortality
 - Currently around 10% ; close to 100% if untreated ³

- 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 2
 - Most important
 - Contrast enhanced CT 7 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 ²
 - Fiberoptic intubation preferred
 - Direct laryngoscopy for intubation can precipitate air way collapse
 - Cricothyrotomy & tracheostomy in emergency for severe cases
 - IV antibiotics (immunocompetent patients) ^{2,7}
 - 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 ^{6,8}
 - Nebulized epinephrine 1 ml of 1:1000 diluted to 5 ml with 0.9% NS ⁶
2. Further management
 - I&D of abscessed carries; decompression of submandibular space ⁸
 - 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

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