

Ludwig's angina & other deep tissue infections of the neck  
[created by Paul Young 02/10/07]

aetiology

- tonsillar & pharyngeal infections
  - dental infections or abscesses
  - oral surgical procedures
  - salivary gland infection or obstruction
  - trauma to the oral cavity & pharynx
  - foreign body aspiration
  - cervical lymphadenitis
  - brachial cleft abnormalities
  - thyroglossal duct cysts
  - thyroiditis
  - IV drug use
  - mastoiditis & Bezold abscess
- common organisms are:
- S. pyogenes
  - S. viridans
  - S. pneumoniae
  - S. aureus
  - Fusobacterium nucleatum
  - Bacteroides oralis
  - Spirochaeta
  - Peptostreptococcus
  - Neisseria spp
  - Pseudomonas, E.coli & H. influenzae

defn

- Ludwig's angina describes inflammation of the submandibular space which usually begins in the submaxillary space & spreads to the sublingual space via the fascial planes not the lymphatics
- other deep neck infections include those of the:
  1. pharyngeal space
  2. retropharyngeal space
  3. prevertebral space
  4. danger space
  5. masticator space
  6. carotid space
  7. pretracheal space
  8. peritonsillar space
  9. parotid space
  10. temporal space

symptoms

- symptoms related to deep space neck infection are:
1. pain
  2. respiratory difficulties
  3. dysphagia

investigation

1. Bloods:
  - Blood chemistries
  - FBC
  - clotting profile
2. microbiology
  - blood cultures in septic patients
  - abscess cultures with gram stain
3. imaging:
  - lateral soft tissue X-rays of the neck
  - mandible series (with particular attention to the 2nd and 3rd mandibular molars because the apices of these teeth extend below the mylohyoid giving them access to the submandibular space)
  - CXR: to evaluate mediastinum, check for subcut air or pneumomediastinum or concurrent pneumonia suggesting aspiration or Lemieres syndrome
  - CT scanning

signs

- physical examination should focus on determining the location of the infection, the deep spaces involved and any potential functional compromise or complications
- most consistent signs of a deep neck space infection are:
  1. fever
  2. elevated WCC
  3. tenderness
- other signs depend on location and include:
  1. asymmetry of neck & associated neck masses or lymphadenopathy
  2. medial displacement of lateral pharyngeal wall & tonsil caused by parapharyngeal space involvement
  3. trismus caused by inflammation of the pterygoid muscles
  4. torticollis and decreased range of motion of the neck caused by inflammation of paraspinal muscles
  5. fluctuance (may not be palpable because of deep neck location & extensive overlying soft tissues)
  6. possible neural deficits (particularly of cranial nerves) - eg hoarseness from vocal cord paralysis with carotid sheath & vagal involvement & Horner's syndrome from involvement of the cervical sympathetic chain
  7. regular spiking fevers (may suggest internal jugular vein thrombophlebitis & septic embolisation - Lemieres syndrome)
  8. tachypnoea & shortness of breath (may suggest pulmonary complications & warn impending airway obstruction)

treatment

1. airway is first priority
2. obtain cultures wherever possible
3. volume resuscitation
4. choose parenteral antibiotics most likely to cover causative organisms (depending on local sensitivities)
5. incision & drainage if indicated