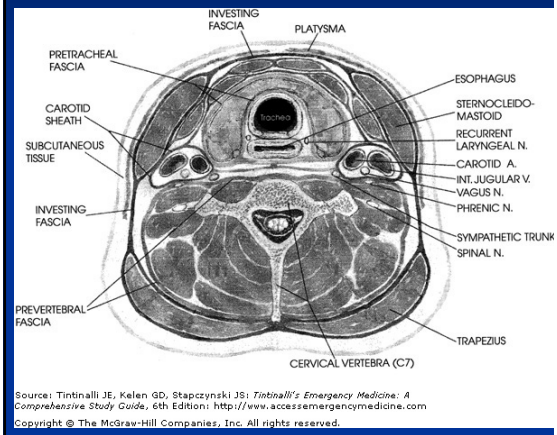
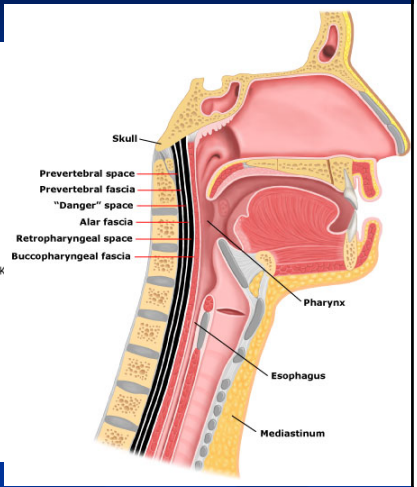
Case conference

2010.05.11

R1徐英洲/VS蕭蔚全

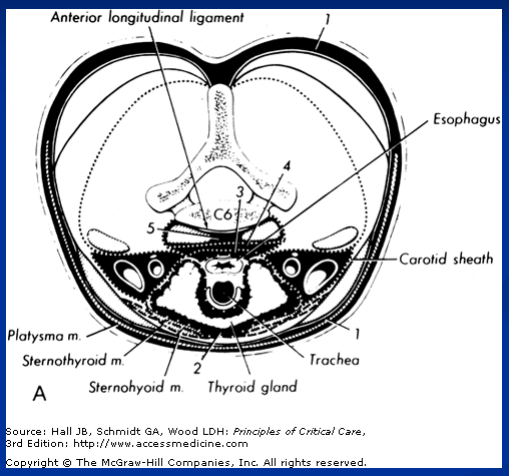
Deep neck space infections ：Anatomy

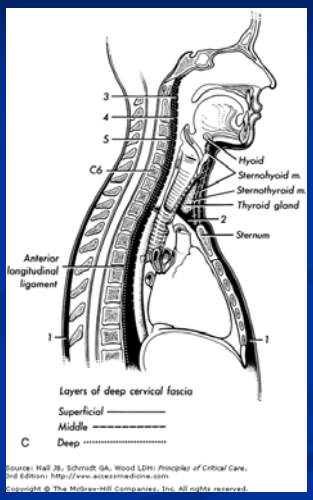




~Tintinalli's Emergency medicine 6th ed.

Deep neck space infections ：Anatomy





~Principles of Critical Care, 3rd ed.

Deep neck space infections ：Microbiology

- Anaerobes generally outnumber aerobes at all sites by a factor of 10:1
  - Dental origin：Fusobacterium nucleatum, pigmented Prevotella species, Peptostreptococcus species and Actinomyces
  - pharynx origin：facultative streptococci, particularly Streptococcus pyogenes.
  - immunocompromised ：Staphylococcus aureus and facultative gram-negative rods, including Pseudomonas aeruginosa.

Deep neck space infections ：Microbiology

- **Klebsiella pneumoniae fascial space infections of the head and neck in Taiwan: emphasis on diabetic patients and repetitive infections.**

  ~Chang CM et al. J Infect. 2005 Jan;50(1):34-40.

Methods. We reviewed records of four common aerobic pathogens isolated by the microbiological laboratory of a teaching hospital in Taiwan from July 1995 to December 1999. Patients aged 14 or older with community-acquired fascial space infections of head and neck were identified by review of medical records and included in the study.

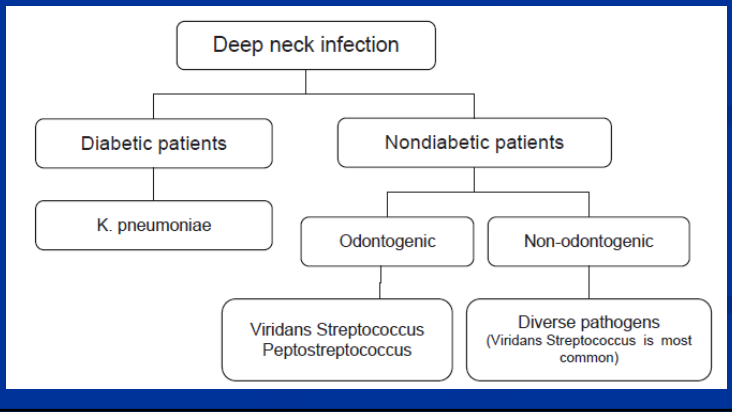
Results. A total of 100 cases were identified, and *K. pneumoniae* was the most common pathogen of monomicrobial infections (48%), followed by viridans streptococci (15%). Polymicrobial infections were noted in 35 cases. In comparison with patients with infections not caused by *K. pneumoniae*, those with monomicrobial *K. pneumoniae* infections were older ($P = 0.04$) and had a higher prevalence of diabetes mellitus ($P < 0.001$), a longer duration of antimicrobial therapy ($P = 0.007$), a longer hospital stay ($P = 0.001$), and more repetitive infections ($P = 0.001$). All but one of *K. pneumoniae* isolates were susceptible to first generation cephalosporins and aminoglycosides.

Conclusions. K. pneumoniae is an important endemic pathogen of fascial space infections of head and neck in Taiwan, especially among diabetics. Physicians should be aware of the tendency of this organism to cause repetitive infection.

Deep neck space infections ：Microbiology

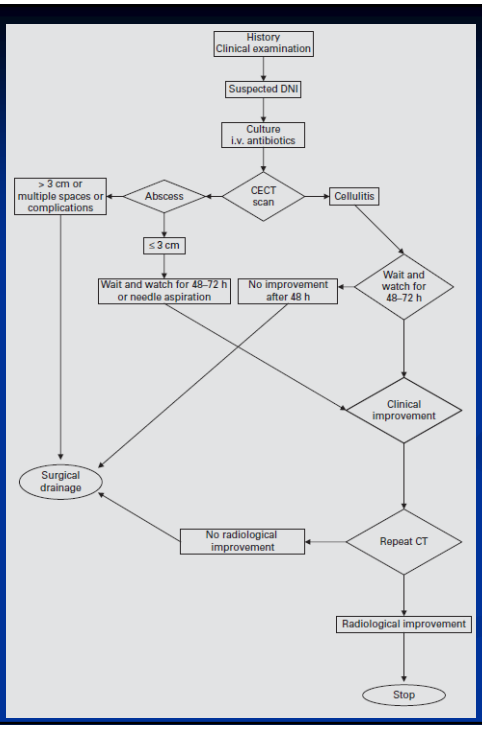
- **Factors affecting the bacteriology of deep neck infection: a retrospective study of 128 patients.**

  ~ Huang TT et al, Acta Otolaryngol. 2006 Apr;126(4):396-401.



Deep neck space infections ：Physical Findings

- Erythema, swelling of the face and neck
- purulent oral discharge.
- pooling of saliva in the mouth
- asymmetry of the oropharynx.
- Lymphadenopathy



Deep neck infections: a constant challenge.
~ Bos colo-Rizzo P et al,
ORL J Otorhinolaryngol Relat Spec. 2006;68(5):259-65. Epub 2006 May 4.

Submandibular space infections (Ludwig's angina)

- gangrenous induration of the connective tissues of the neck that cover the small muscles between the larynx and the floor of the mouth
  - The infection is always bilateral.
  - Both the submandibular and sublingual spaces are involved.
  - The infection is a rapidly spreading cellulitis without abscess formation or lymphatic involvement.

Ludwig's angina：Clinical features

- mouth pain, stiff neck, drooling, and dysphagia
- A tender, symmetric and indurated swelling, sometimes with palpable crepitus in the submandibular area.
- stridor and cyanosis
- lateral views of the neck： soft tissue swelling around the airway and possibly submandibular gas.

※The development of significant asymmetry：may be indicative of extension to the parapharyngeal space.

Ludwig's angina：Treatment

- maintenance of an adequate airway→ flexible fiberoptic scope to assess the airway and to aid in inserting an endotracheal tube.
- Antibiotics
  - Immunocompetent patients→ Ampicillin-Sulbactam
  - Immunocompromised patients→
    - Cefotaxime (2 g Q6H)
    - Imipenem (500mg Q6H)
    - Meropenem (1g Q8H)
    - Ticarcillin-Clavulanate (3.1g Q4H)
    - Piperacillin-Tazobactam (3.375g Q6H)

- **Submandibular space infection: a potentially lethal infection.**

  ~Boscolo-Rizzo P et al, *Int J Infect Dis. 2009 May;13(3):327-33. Epub 2008 Oct 25.*

Results: Multivariate analysis identified four risk factors for complications. Anterior visceral space involvement (odds ratio (OR) 54.44; 95% confidence interval (CI) 5.80–511.22) and diabetes mellitus (OR 17.46; 95% CI 2.10–145.29) were the most important predictive factors in the model. Logistic regression analysis also confirmed other comorbidities (OR 11.66; 95% CI 1.35–100.10) and bilateral submandibular swelling (OR 10.67; 95% CI 2.73–41.75) as independent predictors for life-threatening complications.
Conclusions: Airway obstruction and spread of the infection to the mediastinum are the most troublesome complications of submandibular space infections. Therefore, the maintenance of a secure airway is paramount. Patients with cellulitis and small abscesses can respond to antibiotics alone. Surgical drainage should be performed in patients with larger abscesses, Ludwig's angina, anterior visceral space involvement, and in those who do not respond to antibiotic treatment. Moreover, the clinical assessment in patients with comorbidities, especially diabetes mellitus, requires a high level of suspicion for potential life-threatening complications. Early surgical drainage should always be considered in these patients, even in seemingly less critical cases.

Thanks for your attention !