Deep Neck Space Infections in the Pediatric Patient

Andrew R. Simonsen, D.O., FAAP
Pediatric Otolaryngology
Jacksonville, Florida
Etiology

- **Tonsillitis (most common, children)**
- **Lymphadenitis**
- **Congenital cysts**
- **Trauma**
- **Salivary gland**
- **Mastoiditis**
- **Odontogenic**
Most common locations in children

- Peritonsillar (42%)
  - 80% adolescents
- Parapharyngeal (34%)
  - 100% children (<6 yrs)
  - Two fold increase, 2000-2009
- Retropharyngeal (18%)

Objectives

- Diagnostic considerations
- Pediatric airway management
- Microbiology
- Peritonsillar space abscesses
- Retropharyngeal space abscesses
- Parapharyngeal space abscesses
Diagnostic considerations
Diagnostic considerations

• H&P
  • Fever, sore throat, lymphadenopathy
  • Trismus, decreased neck range of motion, torticollis, neck mass
  • Stridor, respiratory distress? – airway management
  • PTA on exam? - treat

• Labs
  • CBC
  • PPD/Quantiferon
  • EBV titers
  • Bartonella titers
Diagnostic considerations

• Imaging
  • Plain X-ray
  • Ultrasound
  • CT
Radiation exposure in children

- CT is 100-500 x the effective radiation dose of an X-ray
- Solid cancer – 1.1-2.4/10,000 head CTs
- Leukemia – 0.5-1.9/10,000 head CTs
- Consider ultrasound or no imaging
- Discuss with radiology: reduce effective radiation dose

Diagnostic considerations

• Imaging
  • PTA on H&P – no imaging
  • Neck mass – ultrasound
  • S&S of abscess, no PTA, no neck mass – CT
Pediatric airway management
Airway management

• Safe to transfer to OR?
• ET intubation
• Direct laryngoscopy
  • Parsons laryngoscope
    • 9cm (<12-18mo)
    • 11cm (>12-18mo)
  • Laryngotracheal anesthesia
    • 2 – 4% topical lidocaine
Airway management
Airway management
Airway management

- Rigid bronchoscopy
  - 3.5
- Tracheotomy
  - Pediatric
- 18g angiocatheter

<table>
<thead>
<tr>
<th>Age</th>
<th>Size</th>
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<tbody>
<tr>
<td>Premature</td>
<td>2.5</td>
</tr>
<tr>
<td>Term Newborn</td>
<td>3</td>
</tr>
<tr>
<td>6 months</td>
<td>3.5</td>
</tr>
<tr>
<td>18 months</td>
<td>3.5 or 4.0</td>
</tr>
<tr>
<td>3 years</td>
<td>4.0</td>
</tr>
<tr>
<td>5 years</td>
<td>5.0</td>
</tr>
<tr>
<td>10 years</td>
<td>6.0</td>
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</table>
Antibiotic coverage

• Polymicrobial
• Anaerobic bacteria
  • 99.9%
• Aerobic bacteria
  • Strep pyogenes (~30-50%)
  • Staph aureus
  • Haemophilus influenza
  • Beta-lactamase + (60-70%)

• Amoxicillin/clavulanate acid
  • 80-90 mg/kg/day PO
• Ampicillin/sulbactam
• Clindamycin
Peritonsillar space abscess
Peritonsillar abscess

• Anatomy
• Etiology
  • Suppurative tonsillitis
  • Weber glands
• Diagnosis
  • History and physical
    • Trismus, dysphagia
    • Sore throat, fever
  • CT often unnecessary
Peritonsillar abscess

• Treatment
  • Antibiotics
  • Steroids +/-
  • Needle aspiration
  • I&D – Chiari 1889
  • Tonsillectomy – Bateman 1954
Peritonsillar abscess

  - Steroids +/-
  - Needle vs. I&D
    - ~10% recurrence
  - Quinsy tonsillectomy may be considered

  - 83 children
  - 50% to operating room
  - 31% quinsy tonsillectomy
  - 19% required interval tonsillectomy
Peritonsillar abscess

• Quinsy tonsillectomy
  • Do they have a history of recurrent tonsillitis, OSA, or PTA?
  • Going to the OR anyway?
  • Have they been taking NSAIDs?
Peritonsillar abscess

• Complications
  • Airway
  • Spread of infection – Parapharyngeal abscess, mediastinitis
  • Lemierre Syndrome
  • Recurrence (10%)
  • Vascular injury – internal carotid
Peritonsillar abscess

- Lemierre syndrome
  - Septic thrombophlebitis of IJ
  - Schottmuller, 1918
  - Lemierre, 1936
  - *Fusobacterium necrophorum*

- High dose parenteral antibiotics
- Anticoagulation
Retropharyngeal space abscess
Retropharyngeal space

• Anatomy
  • Nodes of Rouvierre
    • 0-6 yrs of age
    • Anterior to danger space

• Etiology
  • Suppurative lymphadenitis
  • Extension from another space
Retropharyngeal abscess

• Diagnosis
  • History and physical
    • Age <5
    • Stridor/ster tor
    • Neck stiffness
  • CT

• Treatment
  • Airway
  • Parenteral antibiotics
  • Steroids
  • I&D
Retropharyngeal abscess

  - 162 patients
  - CT
    - Sensitivity 80-95%
    - Specificity 60%

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Predictors of pus by logistic regression</th>
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<tbody>
<tr>
<td>Variable</td>
<td>Odds ratio</td>
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<tr>
<td>Pharyngeal bulge</td>
<td>4.13</td>
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<tr>
<td>Trismus</td>
<td>5.96</td>
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<tr>
<td>Rash</td>
<td>0.175</td>
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<tr>
<td>Duration of symptoms 2 days</td>
<td>4.42</td>
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<tr>
<td><em>CT cross-sectional area 2 cm²</em></td>
<td>3.87</td>
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*CI indicates confidence interval.
Retropharyngeal abscess

- Complications
  - Airway
  - **Spread of infection** – mediastinitis
  - **Grisel syndrome**
  - Lemierre syndrome
  - Recurrence
  - Vascular injury – internal carotid
Retropharyngeal abscess

- Grisel syndrome
  - Subluxation of the atlanto-axial joint
  - Secondary to inflammatory ligamentous laxity
  - Torticollis
  - Neurologic deficit

- Treat infection
- Neck immobilization
Parapharyngeal abscess

- Anatomy
- Etiology
  - Suppurative tonsillitis
  - Suppurative lymphadenitis
  - Extension from another space
Parapharyngeal abscess

• Diagnosis
  • History and physical
    • Neck pain, lymphadenopathy
    • Sore throat, fever
  • CT

• Treatment
  • Parenteral antibiotics
  • CT guided needle aspiration
  • I&D
Parapharyngeal abscess

  - 12 patients
  - 7 isolated parapharyngeal abscesses
    - All treated successfully with IV abx
Parapharyngeal abscess

  • 16 patients
  • All treated with IV abx and steroids, 5-7 days
  • 5 required surgical drainage
Parapharyngeal abscess

  - 34 patients
  - 19 IV abx +/- needle aspiration
    - Length of stay 8.2 days
  - 15 IV abx + surgical drainage
    - Length of stay 11.6 days
Parapharyngeal abscess

• Complications
  • Spread of infection – retropharyngeal, carotid space, mediastinitis
  • Lemierre syndrome
  • Recurrence
  • Vascular injury
Atypical mycobacterium

• Diagnosis
  • History and physical
    • Location of lesion
    • Submandibular (50%), cervical (25%), preauricular (10%)
    • Skin changes
  • PPD + (85%), Quantiferon
  • M. avium-intracellulare, M. haemophilum (90%)
Atypical mycobacterium

• Treatment
  • Observation +/- abx
    • 6 months (71%)
    • 9 months (98%)
    • 12 months (100%)
  • Antibiotic therapy
    • 2 drug management
      • Macrolide + Rifampin or Ethambutol
  • Surgical excision or curettage

• Complications
  • Chronic draining fistula
Questions to ask

• Is the airway safe?
• Has a PPD been placed?
• Is a CT necessary?