Infections of the Upper Airway

Tracheitis
Retropharyngeal abscess
Pharyngitis
Peritonsillar abscess

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Thursday, October 9, 2014
Background

• pediatric & young adult population

• These diseases can be similar in presentation to benign illnesses.

• Recognize the dopplegangers
Doppleganger
Tracheitis

- Laryngo-tracheobronchitis,
- bacterial membranous croup
Anatomy of the Trachea

- Larynx
- Tracheal cartilages
- Location of carina (internal ridge)
- Root of the right lung
- Root of the left lung
- Primary bronchi
- Secondary bronchi
- Lung tissue
Tracheitis

- 0.4/1,000
- Age 3-8 years 5:1
- Winter
- Mortality 40% early 20th century
Tracheitis

• URI suddenly worsening for 12 hrs
  – Insp/exp stridor
    • Turbulent airflow through nose → trachea
  – Barking cough
  – Resp distress
  – Fever, toxic
Tracheitis

• Most common pathogens: *Staph*, *GAS*, *Hflu*, *M. Catarrhalis*

• A disease of children. Only case reports
Diagnosis

• X-ray
  – “steeple sign”

• Bronchoscopy
  – Subglottic narrowing, erythema, exudate
Treatment

- Bronchoscopy is diagnostic and therapeutic
- OR intubation & pulmonary toilet
- Ceftriaxone, Clinda, Vanc (10-14 days)

- Complications
  - Pneumonia, ARDS, shock,
  - Most make a full recovery
Doppleganger
Croup

- 2-year olds in the fall and winter
- Inspiratory stridor and barky cough
- Edema and inflammation of subglottic space
- X-ray shows steeple sign
- Dexamethasone, racemic epinephrine
Epiglottitis

- 5-7 year olds
- Drooling, stridor, toxic
- Inflammation of epiglottis & surrounding tissue
- *Hflu, Staph, Strep*
- X-ray shows thumbprint sign
- OR intubation, ABX
Key Differences

- Croup: Responds to steroids, epi
- Epiglottitis: drooling
Retropharyngeal Abscess
Clinical Course

- 3m-4year
- Insidious
- fever, odynophagia, drooling, hyperextension, torticollis, neck stiffness, stridor, muffled voice “cri du canard,” pleuritic pain
- Occurs after URI/trauma, seeding from distant infection
- *Strep, MRSA*
Retropharyngeal Abscess
Diagnosis

- Manage the airway
- Bulging of posterior pharyngeal wall
- Lateral soft tissue film of neck
C2 space = 2x vertebral body (or no larger than 7mm at C2/14 at C6)

Note the widening of the prevertebral soft tissue spaces at the level of the upper cervical vertebrae.
Retropharyngeal Abscess
Management

• IV Antibiotics
  – Clindamycin
  – 37% success rate (Schunk)

• OR surgical drainage
In the adult

- Following trauma
  - Fish/chicken bone ingestion
Doppelgangers

[Image: Cartoon character with arms crossed next to a photograph of Richard Nowak, M.D.]
Ludwig’s angina

- Inflammatory process of the sublingual, submandibular, submaxillary spaces
- Pain with elevation of tongue, trismus, odynophagia, drooling

- AIRWAY EMERGENCY
Pharyngitis
Pharyngitis

- Viral 40-80% (EBV, Mono, adeno, HIV)
- Bacterial 5-15% **GABHS**
  - Adults = GC, mycoplasma. chlamydia
- Odynophagia, fever, tonsillar exudate, enlargement
  - Clinical differentiation is virtually impossible
- Centor Criteria
- Rapid Strep test
Strep Pharyngitis
Rash

- Scarlatiniform
- Blistering hands
Empirical Validation of Guidelines for the Management of Pharyngitis in Children and Adults

Warren J. McIsaac, MD, MSc
James D. Kellner, MD, MSc
Peggy Aufricht, MD
Anita Vanjaka, MSc
Donald E. Low, MD
- >3 treat without testing.
- 2-3 test (RST 95% sensitivity)
Pharyngitis

- **Treatment**
  - PCN, ampicillin

- **But why do we treat?**
  - DOES NOT shorten disease course

- **Prevent post strep sequelae:**
  - Rheumatic fever
  - NOT PSGN, OM, PTA
PREVENTION OF RHEUMATIC FEVER
Treatment of the Preceding Streptococcal Infection
CAPT. FLOYD W. DENNY
CAPT. LEWIS W. WANNAMAKER
CAPT. WILLIAM R. RAMMERSACK, Jr., M.B.
Medical Corps, Army of the United States
Cleveland
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The prevention of acute rheumatic fever by the prompt treatment of streptococcal infections with penicillin has been attempted in this study. The results obtained show that this attempt was successful, and, because of their importance, these results are presented here in a preliminary report.

The significance of an adequate means of prevention may be realized when it is considered that rheumatic fever develops in an estimated 200,000 to 250,000 persons in the general population of the United States yearly.1 Figures for the Armed Services similarly show a high incidence, with an average of 7,300 cases annually for the seven year period from 1942 through 1948.2 The gravity of the disease itself is emphasized by the estimate of Paul that at least 460,000 persons in the country today have rheumatic heart disease.3 Not only is rheumatic fever a menace to health, but it is also a serious economic problem. A conservative estimate of the cost of each case that occurs in the Armed Services is $16,000.4

DESCRIPTION OF THE STUDY
The study was conducted at Fort Francis E. Warren, in southeastern Wyoming. The Fort is an air force technical training base where approximately 80 percent of the men are trainees who report after twelve weeks of basic training at a southwestern base. The study began Jan. 24, 1949 and ran continuously until July 1, 1949, except for a ten day period in April. Although the average strength of the base during the study was 8,000 men, the actual number exposed to infection was much greater because the men remained in school only eight to thirty-two weeks.

All patients admitted to the hospital for disease of the respiratory tract were seen within a few hours by one of the members of the professional staff of the laboratory. Those having exudate on the tonsils or on the pharyngeal wall were included in the study group. A total of 1,634 such patients were observed.

A total of 798 patients whose Air Force serial numbers ended in an even digit received penicillin treatment, and 804 patients whose serial numbers ended with an odd digit comprised the control group and received no specific treatment.5 Prior to March 3, 1949 the treatment consisted of 300,000 units of crystalline procaine penicillin G (suspended in peanut oil containing 2 percent aluminum monostearate) given intramuscularly as soon after admission as possible. This dose was repeated in seventy-two hours. After March 3 the following change was made in the dosage schedule: 300,000 units were administered at the time of admission and again in forty-eight hours, and 600,000 units were given ninety-six hours after the initial dose. Of the 798 patients who received penicillin, 253 were treated before March 3. Eighty-eight per cent of the treated patients received the first penicillin within sixty hours after the onset of the symptoms of the streptococcal illness.

Follow-up studies for the detection of rheumatic fever were performed between the third and fourth weeks after the initial infection, without knowledge of the serial numbers of the patients or of their previous treatment. Those patients suspected of having acute rheumatic fever were hospitalized until a satisfactory diagnosis was established.6 Rigid criteria for diagnosis were followed. A modification of the classification of Jones7 was used. This classification may be seen in the following tabulation:

<table>
<thead>
<tr>
<th>Major Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Definite cardiac enlargement</td>
</tr>
<tr>
<td>b. Appearance of a significant murmur before not present</td>
</tr>
<tr>
<td>c. Friction rub</td>
</tr>
<tr>
<td>d. Heart block or other electrocardiographic findings indicative of carditis</td>
</tr>
<tr>
<td>e. Cardiac failure</td>
</tr>
<tr>
<td>Migrating polyarthritis</td>
</tr>
<tr>
<td>History of recurrences</td>
</tr>
<tr>
<td>Chorea</td>
</tr>
</tbody>
</table>

Subcutaneous nodules

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1. Reference 1
2. Reference 2
3. Reference 3
4. Reference 4
5. Reference 5
6. Reference 6
7. Reference 7

Risk Reduction
1%
NNT = 60
No cases of RF in a study since 1961

• Incidence <1/1,000,000 (1994)
• No longer tracked by CDC

– Dwindling rheumatogenic strains
– Better nutrition, hygiene
– Disease of developing nations
Cochrane Review 2013


- Included 27 RCT 1950-2013
- 12,835 cases <1year - >50 years
- placebo vs. abx

Outcomes
- 16 hours less of symptoms
- OM NNT 200
- PTA NNT 50-225
Treatments

- Give Dexamethasone, NSAIDS
- Salt water gargles
- Lozenges, sprays
  - EMRAP, David H. Newman

- Only treat with ABX if immunocompromised, Aborigine, developing nations
Prevention of upper respiratory tract infections by gargling: a randomized trial.

- 130 participants who contracted URIs
  - 0.26 episodes/30 person-days among control subjects.
  - 0.17 episodes/30 person-days in the water gargling group,

- Prevention, symptom control

Doppleganger
Lemierre’s Syndrome

- Suppurative thrombophlebitis of IJ with *Fusobacterium Necrophorum*
- Seeding from pharyngitis
- Fever, swelling, pain with mvmt
- Unilateral neck swelling
- CT neck
- IV abx
Peritonsillar Abscess
Peritonsillar Abscess

- Adolescents, young adults
- 1/10,000
- Sequelae of pharyngitis
- Odynophagia, hot potato voice, uvular deviation to contralateral side
- Physical exam, X-ray, CT with contrast
- Drain, ABX
How to Drain PTA

- Light source
- Tongue depressor
- Needle
- Suction

Photo 1: Use a laryngoscope to provide adequate lighting and exposure of the pharynx.
Ultrasound Guided Techniques

• Intracavitary ultrasound probe
  – *Academic Emergency Medicine Journal* 2012
  – 100% diagnostic accuracy (PTA vs PTC)

• High frequency linear transducer
  submandibular space (5-case reports)
Nutshell

• Tracheitis and Retropharyngeal abscess
  – Stridor, toxic appearance, poor Epi response
  – IVabx, intubation ENT Consultation

• Pharyngitis
  – Mostly viral
  – Bacterial infections change little with ABX
  – Dexamethasone Symptomatic treatment

• Peritonsillar abscess
  – US guided drainage
Bibliography

• Spinks, A. Glasziou, P., Del Mar, C. Antibiotics for sore throat., Cochrane Review November 5, 2013.
• Costantino, T.G., Satz, W.A., Dehnkamp, W., Goett, H., Randomized trial comparient intraoral ultrasound to landmark based needle aspiration in patient with suspected peritonsillar abscess. Academic Emergency Medicine, 2012.