Pharyngitis 2001

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Pharyngitis

• Definition – inflammation of the mucous membranes and submucosal structures of the pharynx
Pharyngitis

- 40 million visits by adults to medical facilities per year
- More prescription written for pharyngitis than any other respiratory infection
Pharyngitis

- Sore throat – the most common chief complaint encountered by an otolaryngologist
- Most have viral infection and are self-treated
Pharyngitis

• Diagnosis is most commonly achieved by history and physical
• Majority of patients respond to oral antibiotics or symptomatic medication and symptoms resolve with time
Pharyngitis

• Pharyngeal mucosa exhibits an inflammatory response to many other agents
  – Opportunistic bacteria
  – Fungi
  – Environmental pollutants
  – Neoplasm
  – Granulomatous disease
  – Chemical and physical irritants
Pharyngitis

• Sore throat of greater than 2 weeks duration, raises the possibility of more sinister diagnoses
Anatomy
Pharyngeal Anatomy

- Continuation of the digestive tract from the oral cavity
- Funnel-shaped fibromuscular tube
- Approximately 15 cm long
- Common route for air and food
Pharyngeal Anatomy

- Subdivided into three regions:
  - Nasopharynx
  - Oropharynx
  - Laryngopharynx or hypopharynx
Pharyngeal Anatomy

• Pharyngeal wall is composed of five layers
  – 1) Mucous membrane covered with pseudostratified ciliated epithelium superiorly and stratified squamous epithelium inferiorly
  – 2) submucosa
  – 3) fibrous layer forming pharyngobasilar fascia
  – 4) muscular layer (inner longitudinal and outer circular)
  – 5) loose connective tissue – buccopharyngeal fascia
Pharyngeal Anatomy

• Muscles of the pharynx
  – Three overlapping constrictors (superior, middle and inferior constrictors)
  – Stylopharyngeus
  – Salpingopharyngeus
  – Palatopharyngeus
Pharyngeal Anatomy

• Innervation
  – Pharyngeal plexus of nerves
  – Run along the later aspect of the pharynx in the buccopharyngeal fascia
  – Formed by CN X and IX and sympathetic fibers from the stellate ganglion
  – Motor fibers from cranial root of CN XI – fibers carried by CN X
  – Exception - stylopharyngeus
Pharyngeal Anatomy

• Blood supply
  – Branches of the external carotid artery
    • Ascending pharyngeal
    • Dorsal branches from the lingual artery
    • Tonsillar branches of the facial artery
    • Palatine branches from the maxillary artery
Lymphatics

Nasopharynx
  retropharyngeal nodes
  lateral pharyngeal
  deep jugular chain

Oropharynx
  retropharyngeal nodes
  superior deep cervical and jugular nodes

Hypopharynx
  retropharyngeal nodes
  lateral, deep and jugular nodes
Lymphatic drainage of pharynx: posterior view
Evaluation

- **History**
  - Chief complaint – sore throat
  - Local symptoms
    - Throat scratchiness, coryza, cough, irritation
    - PMHX – HIV/AIDS, other immunodeficiencies, history of XRT
  - PSHX – head and neck
  - Sexual HX
  - Social HX – tobacco, etoh, IVDU, home environment
  - FHX – concurrent symptoms in other family members and community
Physical Examination

• Full head and neck exam
  – General – respiratory distress, toxic
  – Face – mouth breathing
  – Nose – rhinorrhea
  – Neck – lymph nodes, thyroid,
  – Oc/op - mucosal edema, tonsillar swelling, exudates, discrete lesions, deviation of the uvula or tonsillar pillars, bulges in the posterior pharyngeal wall
  – IDL/flex laryngoscopy
  – Nasal endoscopy - sinusitis
Infectious causes of pharyngitis
Viruses

• Major cause of acute respiratory disease
  • Influenza virus
  • Parainfluenza viruses
  • Rhinovirus
  • Adenoviruses
  • Respiratory syncicial virus
  • Coronaviruses
Viruses

• Most common agents in pharyngitis are the rhinovirus and coronavirus

• Both single stranded, +sense RNA picornaviruses

• Grow best at 33 degrees Celsius
  – Approximates the temperature of the nasopharynx
• Disease is self-limited
• Clinical signs and symptoms may be identical to bacterial pharyngitis
• Evaluation for Group A streptococcus is advisable
Epstein-Barr Virus (EBV)

- Etiologic agent of infectious mononucleosis (IM)
- Herpes virus 4
- Double stranded DNA virus
- Selectively infects B-lymphocytes
EBV

• Early infections in life are mostly asymptomatic
• Clinical disease is seen in those with delayed exposure (young adults)
• Defined by clinical triad
  • Fever, lymphadenopathy, and pharyngitis combined with +heterophil antibodies and atypical lymphocytes
Ebstein-Barr Virus (EBV)

• Other clinical findings
  – Splenomegaly – 50%
  – Hepatomegaly – 10%
  – Rash – 5%
• Pharyngitis
  – White membrane covering one or both tonsils
  – Petechial rash involving oral and palatal mucosa
EBV petechiae
EBV
EBV

- **Diagnosis**
  - By Clinical presentation
  - CBC with differential (atypical lymphocytes – T lymphocytes)
  - Detection of heterophil antibodies (Monospot test)
  - IgM titers
Treatment

- Supportive management
- Rest
- Avoidance of contact sports (\(\rightarrow\) splenic rupture?)
- Glucocorticoids (severe cases)
EBV

- Complications
  - Autoimmune hemolytic anemia
  - Cranial nerve palsy
  - Encephalitis
  - Hepatitis
  - Pericarditis
  - Airway obstruction
Cytomegalovirus (CMV)

- Herpes virus 5
- Ubiquitous
- 50% of adults seropositive
- 10-15% of children seropositive by age 5 years
- Etiology of 2/3 of heterophil-negative mononucleosis
CMV

• Clinical manifestation
  • Fever and malaise
  • Pharyngitis and lymphadenopathy less common
  • Esophagitis in HIV infected patients
CMV

• Diagnosis
  • 4-fold rise in antibody titers to CMV
Herpes Simplex Virus (HSV)

- Herpes (Greek word herpein, “to creep”)
- Two antigenic types (HSV-1, HSV-2)
- Both infect the upper aerodigestive tract
- Transmission is by direct contact with mucous or saliva
HSV

• Clinical manifestations
  – Depends on
    – Anatomic site
    – Age
    – Immune status of the host
  – First episode (primary infection)
    • More systemic signs and symptoms
    • Both mucosal and extramucosal sites involved
    • Longer duration of symptoms
HSV

• Clinical manifestations:
  – Gingivostomatitis and pharyngitis – most common in first episode
  – Usually in children and young adults
  – Fever, malaise, myalgias, anorexia, irritability
HSV

- **Physical exam**
  - Cervical lymphadenopathy
  - Pharynx – exudative ulcerative lesions
  - Grouped or single vesicles on an erythematous base
    - Buccal mucosa
    - Hard and soft palate
Herpes Simplex Virus-1
HSV

- Clinical manifestations
  - Acute illness evolves over 7-10 days
  - Rapid regression of symptoms
  - Resolution of lesions
HSV

• Immunocompromised patient
  • Persistent ulcerative lesions are common in patients with AIDS
  • Lesions more friable and painful
  • Aggressive treatment with IV acyclovir
HSV

• Diagnosis
  – Usually clinical
  – Isolation of HSV
    • Culture from scrapings of lesions
      – Results in 48 hours
HSV

• Treatment
  – Acyclovir, 400 mg PO 5X/day X 10days
  – Valacyclovir, 1000 mg PO BID X 10 days
  – Recurrent disease
  • Acyclovir 400 mg PO 5X/day for 5 days
    – Duration reduced from 12.5 to 8.1 days
  • Acyclovir 400 mg po bid every day
    – Recurrence reduced 36% to 19%
Measles

- Paramyxovirus
- Linear, negative-sense, single stranded RNA virus
- Highest incidence in children sparing those under 6 months
- Decline in recent decade from immunization programs
Measles

• Cases today mostly due to one-dose vaccine failures or in groups who do no accept immunization
Measles

- Clinical manifestations
  - Symptoms 9-11 days after exposure
  - Cough, coryza, conjunctivitis, fever
  - Koplik's spots (3 days after onset)
    - Pinpoint gray-white spots surrounded by erythema
    - Appear on mucous membranes
    - Common on buccal mucosa
Measles – Kopliks spots
Measles

– Rash appear one day later
  • Starts on head then to torso and extremities
  • Persists for 3-5 days then fades

– Adenitis uncommon
Measles

• Diagnosis is clinical
• Further work-up for immunocompromized with more severe manifestations
  – Isolation from oropharynx, urine
  – Grown in cell culture
Measles - Complications

- Usually self-limited
- Close f/u to watch for bacterial superinfection
  - AOM
  - Sinusitis
  - Pneumonia
  - Mastoiditis
  - sepsis
Measles

• Prevention
  – Vaccination - MMR (mumps, measles, rubella)
  – Live attenuated vaccine
  – Given at 13-15 months followed by boosters
Human Immunodeficiency Virus (HIV)

- Pharyngitis
  - Usually opportunistic infection
    - HSV
    - CMV
    - Candida

- Viral particles have been detected in lymphoepithelial tissues of the pharynx
Bacteria
Streptococci

- Gram-positive spherical cocci arranged in chains
- Significant portion of indigenous microflora
- Found in oral cavity and nasopharynx
- Classified based on their hemolysis
  - Alpha, beta, or nonhemolytic
**Streptococcus**

- Beta hemolytic bacteria further subdivided based on cell membrane carbohydrates (Lancefield Groups A, B, C, D, F, and G)
TABLE 16–2. USUAL HEMOLYTIC, BIOCHEMICAL, AND CULTURAL REACTIONS OF COMMON STREPTOCOCCI AND ENTEROCOCCI

<table>
<thead>
<tr>
<th></th>
<th>Susceptibility to</th>
<th>Bile Solubility</th>
<th>Bile/Esculin Reaction</th>
<th>PYR</th>
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<tr>
<td></td>
<td>Bacitracin</td>
<td>Optochin</td>
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<tr>
<td><strong>Streptococci</strong></td>
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<tr>
<td>β-Hemolytic</td>
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<tr>
<td>Lancefield group A</td>
<td>+</td>
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<tr>
<td>Lancefield groups B, C, F, G</td>
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<tr>
<td>α-Hemolytic</td>
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<tr>
<td><em>S. pneumoniae</em></td>
<td>−</td>
<td>+</td>
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<tr>
<td>Viridans group</td>
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<tr>
<td><strong>Nonhemolytic</strong></td>
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<tr>
<td><strong>Enterococci</strong></td>
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</tbody>
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*a* All are tests commonly substituted for serological identification in clinical laboratories.

*b* Tests for the ability to grow in bile and reduce esculin.

*c* PYR = pyrrolidonyl arylamidase test.
Group A Streptococcus (beta-hemolytic)
Streptococcus

• Pharyngitis
  – Group A streptococcus – most common
  – Streptococcus pneumoniae
  – Group C streptococcus
Steptococcus

• No proven benefit of treating non-group A streptococcal pharyngitis
Streptococcus

• Reasons for treating Group A streptococcus
  – 1) relief of symptoms related to infection
  – 2) prevent rheumatic fever
  – 3) prevent suppurative sequelae
  – 4) prevent further spread of group A streptococcus in the community
Streptococcus

• Clinical characteristics
  – Sore throat
  – Erythema of the involved tissues with or without purulent exudate
  – Petechiae of the soft and hard palate
Group A Streptococcus
Group A Streptococcus
Group A Streptococcus

• Diagnosis
  – All patient with suspected group A streptococcal pharyngitis should be test for the organism.
  – Methods include
    • rapid antigen detection tests (RADT) – 10min,
    • slide-culture test using a bacitracin disk - overnight
    • Blood agar culture - overnight
Group A Streptococcus

- Bacitracin-susceptible beta-hemolytic colonies suggest the presence of group A streptococcus
- Further confirmation should be made by agglutination, using antisera to group A-G to avoid false positives
Group A Streptococcus

• Treatment
  – Penicillin V for 10 days – drug of choice
  – Erythromycin – second line
  – Amoxicillin and Ampicillin – better absorption
    • No proven benefit
    • Possible rash from ampicillin Rx, if EBV is the cause
Group A Streptococcus

- Recurrent pharyngitis
  - Bacteria inhibited but not killed
  - Beta-lactamase produced by normal flora (staphylococci and anaerobes)
  - Drug tissue levels (different absorption)
  - Re-infection by family members
Group A Streptococcus

• Recurrent Pharyngitis
  – After the use of penicillin V, use erythromycin
  – Dicloxacillin – benefit in children
  – Tonsillectomy
Chronic tonsillitis
Why exclude the diagnosis of Group A streptococcal pharyngitis?

- Treatment is not required for non-group A streptococcal pharyngitis
  - Unnecessary exposure to expense and hazards of treatment
  - Development of antibiotic-resistant bacteria
Neisseria gonorrhea
Neisseria gonorrhoea

- Gram-negative diplococci
- Two pathogenic types of Neisseria
- *N. gonorrhoea* causes pharyngitis with exudate
- Diagnosis requires high index of suspicion in patients with suggestive sexual history
N. gonorrhoea

• Diagnosis
  – Gram-stain from swab
    • 95% sensitive
    • 50% specific
  – Culture should always be done
    • Grows on chocolate agar with high CO2
  – Rapid nucleic acid probe tests now available
Neisseria gonorrhea
N. gonorrhea

• Treatment
  – 125 mg single IM dose of Ceftriaxone and Doxycycline, 100 mg PO Bid X 7 days
Corynebacterium diphtheriae

- Causative organism of diphtheria
- Gram-negative bacillus
- Produces exotoxin at site of infection
  - Travels to heart and nervous system
- Spread by close contact via droplets or contaminated articles
- Humans are the sole carriers of the organism
- More common in children < 10 years
- Rare occurrence today because of routine vaccination
C. diphtheria

• Clinical manifestations
  – Systemic symptoms from exotoxin
    • Fatigued
    • Lethargic
    • Tachycardic
    • toxic
C. diphtheria

- Clinical characteristics
  - Pharynx
    - grayish membrane (composed of fibrin, leukocytes, and cellular debris)
    - extends from pharynx to larynx
  - Extensive cervical lymphadenopathy (‘bull neck’)
Diphtheria
Diphtheria
Diphtheria
‘Bull-neck’
C. diphtheria

- Diagnosis
  - Isolation of the organism
    - Culture from local lesion
    - Grows on selective media containing potassium tellurite
    - Notify microbiology lab if diphtheria suspected
Diphtheria
Corynebacterium Diphtheriae
C. diphtheria

- **Treatment**
  - Started before culture confirmation
  - Airway
  - Resuscitation
  - Skin test for allergy to horse serum
  - Administer diphtheria antitoxin
  - Have epinephrine available
  - Antibiotics (erythromycin, penicillin G, rifampin, or clindamycin) used to eradicate carrier state
C. Diphtheria

• Prevention
  – Vaccine
    • Trivalent vaccine – diphtheria toxoid, tetanus toxoid and pertussis (DTP)
    • 6 weeks of age, 2 more 4-8 weeks intervals, and 4th 6-12 months later
Treponema pallidum

- Causative agent of syphilis
- First recognized in the 16th century
- First isolated by Schaudinn and Hoffman in 1905
- Member of the Spirochete family along with Borrelia, Leptospira, and Fusobacteria
- Endoflagella
Syphilis

- Transmitted by direct sexual contact with individuals with primary or secondary syphilitic lesion
- Organism multiplies locally
- Primary lesion 2-10 days after infection
  - Chancre – hard-based, non-tender ulcer
Syphilis

- Four stages
  - Primary
  - Secondary
  - Latent
  - Tertiary
Syphilis

• Primary
  – Single ulcer at the site of infection
  – Resolves in 3-8 weeks if untreated

• Secondary
  – Systemic dissemination
  – Symmetric mucocutaneous, maculopapular rash and generalized non-tender LAD
  – 1/3 develop condylomata lata
Syphilis
Syphilis
– Diagnosis

• dark field microscopy
• fluorescent antibody microscopy
• Rapid plasma reagin (RPR)
• Fluorescent treponemal antibody absorption (FTA-ABS)
• Microhemagglutinatoin assay for antibodies to *T. pallidum* (MHA-TP)
Treponema pallidum
Syphilis

• Treatment
  – Benzathine penicillin G 2.4 million units, single dose IM.
  – If penicillin allergy, tetracycline, 500mg PO Qid daily or doxycycline, 100 mg PO Bid X 14 days
Other bacteria

- Mycoplasma pneumoniae
- Chlamydia pneumoniae
- Influenza A and B
Fungal pharyngitis
Candida albicans

- An opportunistic fungus
- Normally present in the oral cavity
- Ability to adhere to mucosa is a distinguishing feature
**C. albicans**

- Causes of candidiasis (monilia)
  - Increase relative proportion
    - long term antibiotics
  - Compromise of general immune capacity of host
    - Leukopenia
    - Corticosteroid therapy
  - T lymphocyte dysfunction
    - AIDS
    - Medications – cyclosporin
    - leukemia
  - Diabetes mellitus
Candidiasis

• Clinical manifestations
  – White, cheesy plaque
    • Loosely adherent to mucosa
    • Painless
    • Painful if removed
Candidiasis
Candidiasis
Candidiasis

• Diagnosis
  – Usually made clinically
  – Exudates or epithelial scrapings may be examined by KOH prep or G-stain
    • Demonstration of budding yeast associated with hyphae and pseudohyphae is diagnostic
Candidiasis

- Treatment
  - Oral (thrush)
    - Nystatin suspension: 10-15 cc mouth rinses 5X/day for as long as the patient is susceptible
    - More severe forms with laryngeal or esophageal involvement – fluconazole 400mg PO bid X 14 days
  - Disseminated candidiasis – Amphotericin B
Granulomatous disease of the pharynx

• Define:
  – Granuloma – aggregation of epithelioid cells, usually surrounded by a collar of lymphocytes
  – Pattern of inflammation characteristic of type IV (cell-mediated) hypersensitivity reaction called granulomatous inflammation
Granulomatous disease of the pharynx

- Large number of disease processes resulting in granuloma formation
- Those that may affect the pharynx include tuberculosis and other mycobacteria, Wegener’s granulomatosis, sarcoid, parasites, and Crohn’s disease
Wegener’s Granulomatosis (WG)

- Systemic disease
- Granulomatous vasculitis of the upper and lower respiratory tracts with glomerulonephritis
- Hallmark pathologic finding
  - Necrotizing vasculitis of small arteries and veins with granuloma formation
WG

• Clinical characteristics
  – Severe upper respiratory tract findings
    • Paranasal sinus pain and drainage
    • Purulent or bloody nasal discharge with or without mucosal ulceration
    • Nasal septal perforation
    • Saddle nose deformity
**WG**

- **Pharyngitis**
  - WG rarely directly affects the pharynx
    - Pharyngitis results from irritation for nasal drainage
  - More commonly, WG may involve the larynx
    - Subglottis is the most common single site
WG

• **Diagnosis**
  – Clinicopathologic
    • Demonstration of necrotizing granulomatous vasculitis on biopsy.
    • Pulmonary bx via thoracotomy offers the highest diagnostic yield
WG

• Treatment
  – Cyclophosphamide – single most affective agent
    • 2 mg/kg/day for one year
  – Prednisone, 1mg/kg/day for 6 months
  – 90% have significant improvement of Sxs
  – 75% have complete remission
Tuberculosis (TB)

• Mycobacterium tuberculosis – Gram-negative bacillus with staining characteristics of acid-fastness.
• Resurgence in recent years due to HIV
• Involvement in the head and neck is uncommon
TB

• Pharyngitis
  – Secondary to expectoration of infected sputum
  – Granular or ulcerated surface mucosa

• Laryngitis
  – Most common granulomatous disease of the larynx
  – Posterior third of glottis – most common site
TB

• **Diagnosis**
  – Demonstrating the tubercle bacilli in the sputum, urine, body fluids, or tissue
  – Acid fast stain allows for quick identification
  – Culture must be done to confirm the specific AFB and to determine sensitivities
TB

• Therapy
  – Isoniazid
  – Rifampin
  – Pyrazinamide
  – Ethambutol
Sarcoidosis

• Chronic, multisystem disorder
• Unknown etiology
• Characterized pathologically by noncaseating granulomas
• Woman > men
• 20-40 years
• Higher incidence in black women
Sarcoidosis

• Clinical manifestations
  – Most with pulmonary complaints (persistent cough)
  – 20% with persistent nasal congestion
  – Any structure in the mouth, pharynx and larynx may be involved
Sarcoidosis

– Pharyngitis
  • Tonsil is the most common site in pharynx
    – Unilateral erythema and hypertrophy

– Larynx
  • Most common site - epiglottis
Sarcoidosis

• Diagnosis
  – Clinicopathologic
    • 90% have abnormal CXR – bilateral hilar adenopathy
    • Biopsy required for definitive dx
      – Lung biopsy is ideal
      – Also lip, conjunctiva and skin
Sarcoidosis

• Treatment
  – Controversial
  – 50% spontaneously clear
  – Some base treatment on criteria base on gallium scan or ACE levels
  – Usual therapy is prednisone 1mg/kg for 4-6 weeks, followed by slow 2-3 month taper.