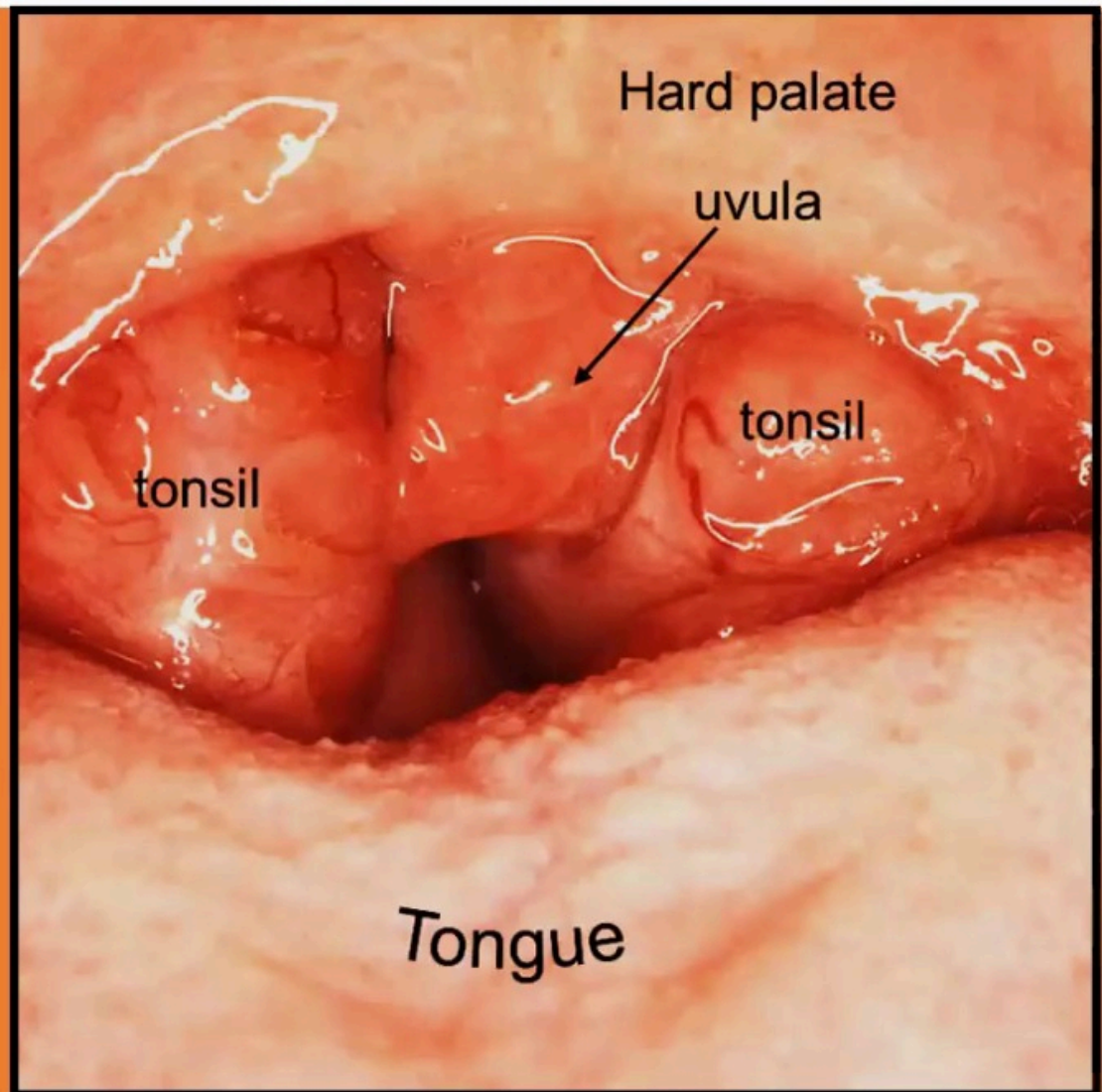


Tonsils & Adenoids

Dr. Catherine Irungu

MBCHB, MMED (UoN), FELL. (MY)

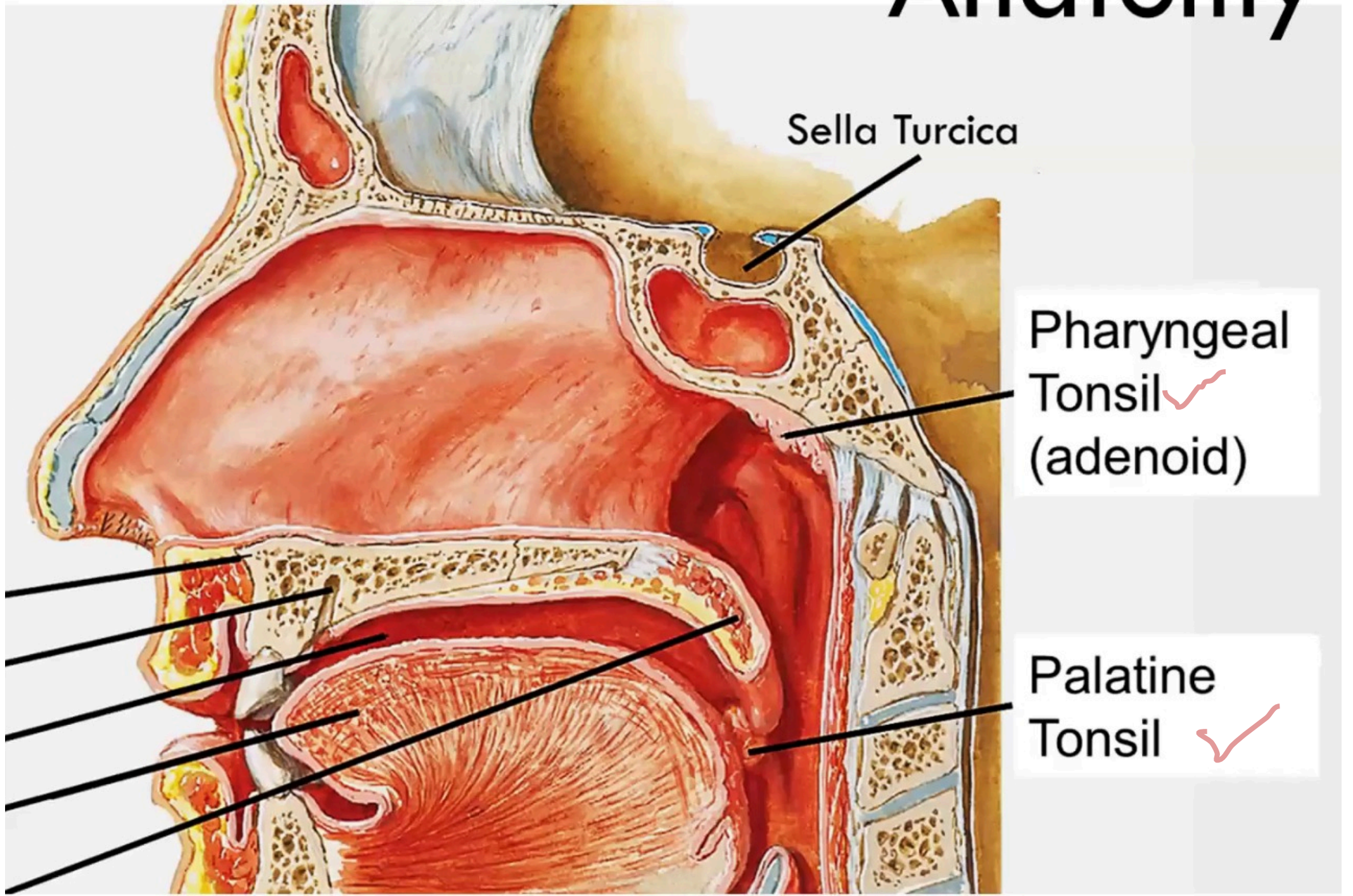
LECTURER, DEPARTMENT OF SURGERY



Introduction

- First line of immune defence- adaptive immunity
- Waldeyer's ring – MALT ✓
- Serious complications of untreated disease
- Airway obstruction 2^o to ATH -OSA ?
- Evolving surgical techniques

Anatomy



Adenoids

Arise from ~~endoderm~~
in post nasal space

Tonsils

Arise from second
pharyngeal pouch ✓

Grow from 0-5yrs ✓

Atrophy at 8-10 yrs

Peak size in puberty

No afferent lymphatics ✓

Efferents - retropharyngeal & jugulodigastric
nodes ✓

Physiology

- Adenoids and tonsils are favorably located
 - Exposed to airborne antigens – secretory IgA
 - Mediate immunologic protection of upper aerodigestive tract ✓
- Most immunologically active between 4-10 years.
- Involution of the tonsils begins after puberty
- Studies show no major immunologic deficiencies result from adenotonsillar surgery

Blood supply

Adenoid

- Ascending palatine branch of facial a.
- Ascending pharyngeal a.
- Pharyngeal branch of maxillary a.
- Ascending cervical branch of thyrocervical trunk.
- Artery of the pterygoid canal (from internal or external carotid artery)

Tonsil

- Inferior pole (primary supply)- Tonsillar branch of
 - Facial a. (Main)
 - Dorsal lingual a.
 - Ascending palatine a. (Facial a.)
- Superior pole- Tonsillar branches of
 - Ascending pharyngeal a.
 - Lesser palatine a.

Venous drainage

Adenoid

- ✓ • Pharyngeal plexus
- ✓ • Communicates with the pterygoid plexus
- ✓ • To IJV and facial veins

Tonsil

- Capsular peritonsillar ~~plexus~~
- To lingual and pharyngeal plexus then IVJ

Viruses

✓ Adenovirus

✓ Epstein barr virus

✓ Influenza A and B

Herpes simplex

Respiratory syncytial virus

Parainfluenza

Epstein-Barr virus

Rhinovirus ✓

Coronavirus

Human immunodeficiency virus (HIV)

Coxsackievirus

Cytomegalovirus

Fungus

Candida spp ✓

Bacteria

Group A β -haemolytic streptococci (5-36%)

Group B, C, G streptococcus

Haemophilus influenza (type B and non typeable)

Streptococcus pneumoniae

Moraxella cattarrhalis

Staphylococcus aureus

Haemophilus parainfluenza

Neisseria spp

Mycobacteria spp

Chlamydia pneumoniae

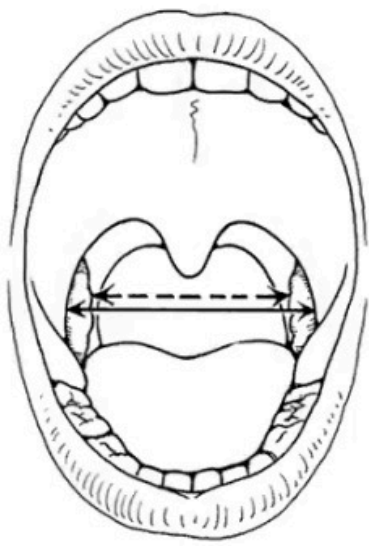
Mycoplasma pneumoniae

Corynebacterium diphtheria,
Arcanobacterium haemolyticum

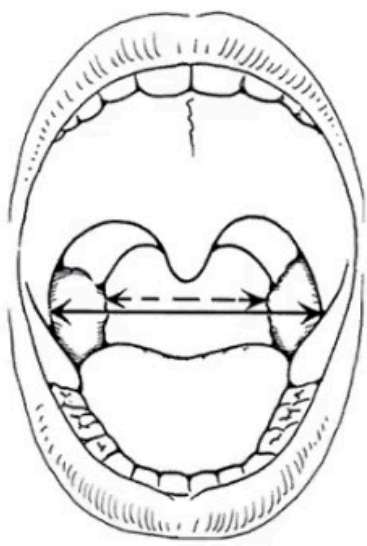
Bacteroides, Peptococcus, Peptostreptococcus,
Actinomyces, Fusobacterium necrophorum

Diagnosis

- Comprehensive history ✓
- Clinical examination
 - General examination findings ✓
 - ENT examination findings ✓
 - Rigid rhinoscopy and Flexible fiberoptic nasopharyngoscopy ✓
- Laboratory test ✓
- Radiology
 - Diagnostic ✓
 - Evaluation of complications ✓

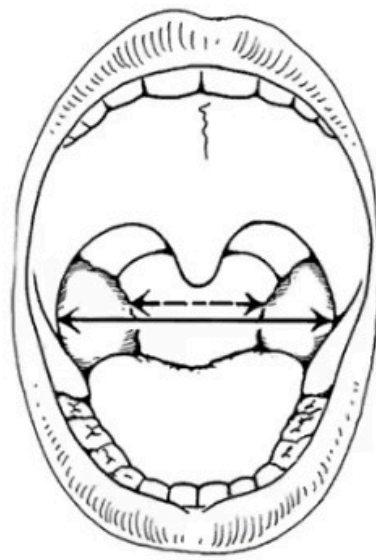


Grade 0



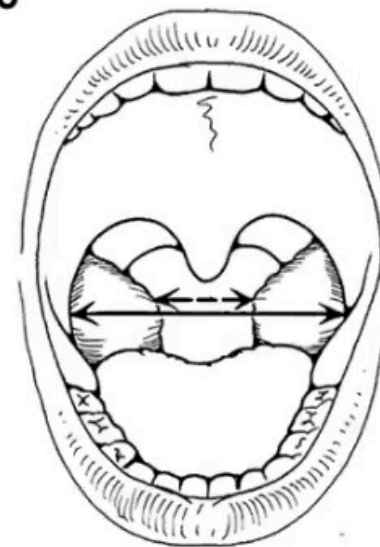
Grade 1

<25%



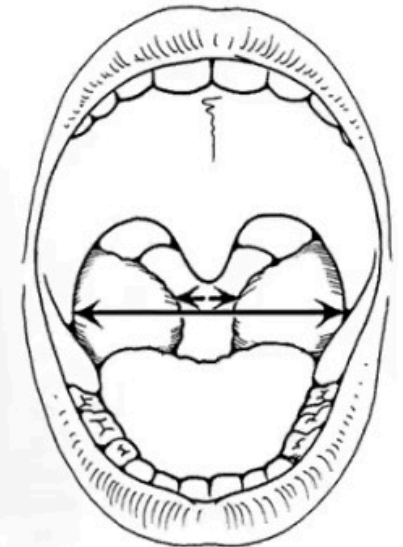
Grade 2

<26%-50%



Grade 3

<51%-75%



Grade 4

>75%

Brodsky Grading Criteria

Parikh adenoid grading system

Grade 1

Adenoid tissue not in contact with structures

Grade 2

Adenoid tissue in contact with torus tubarius

Grade 3

Adenoid tissue in contact with vomer

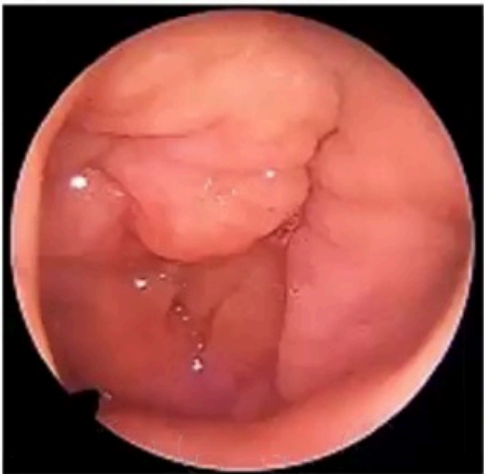
Grade 4

Adenoid tissue in contact with soft palate (at rest)



Grade 0

Grade 1



Grade 2



Grade 3



Grade 4



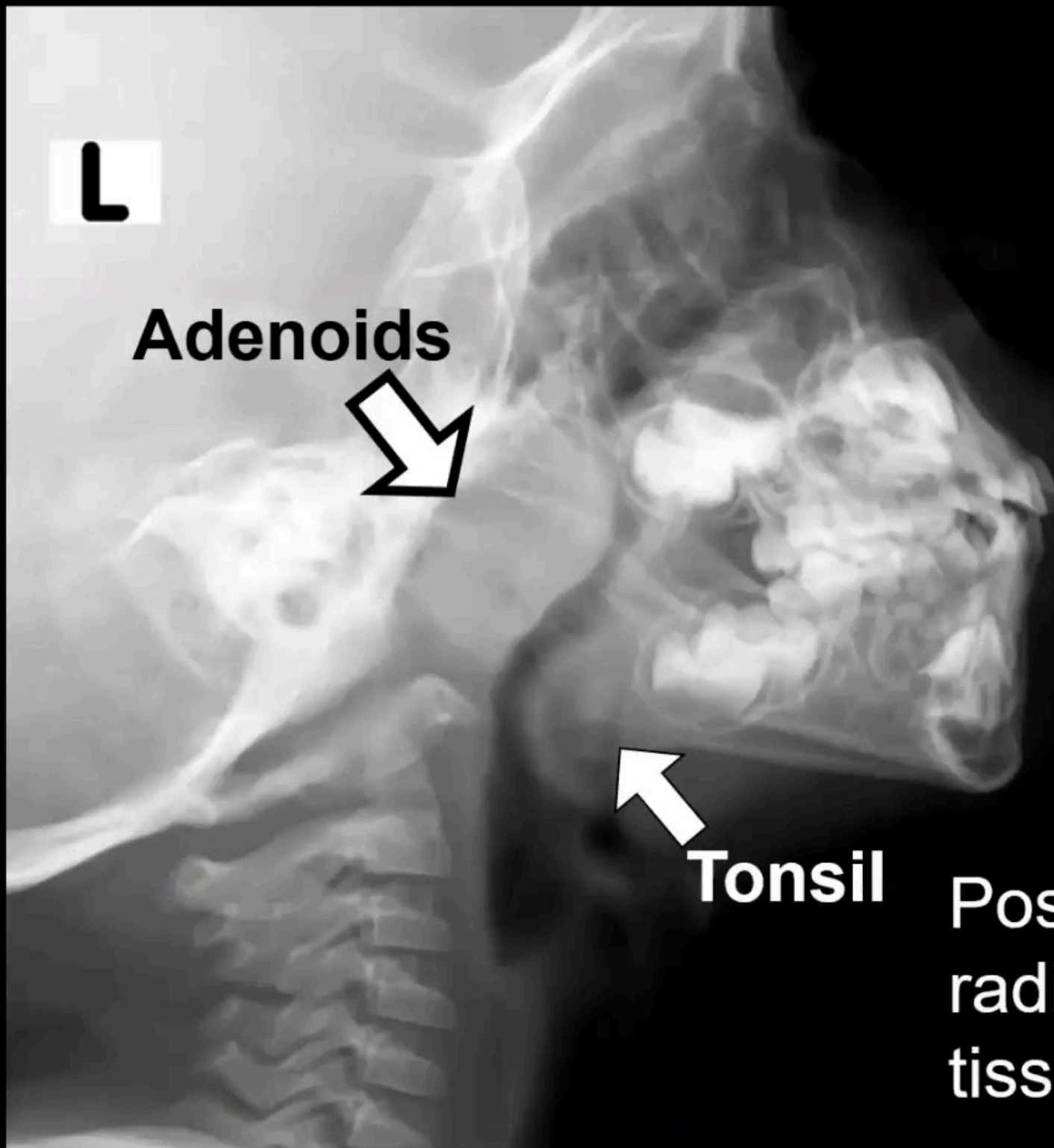
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Adenoids

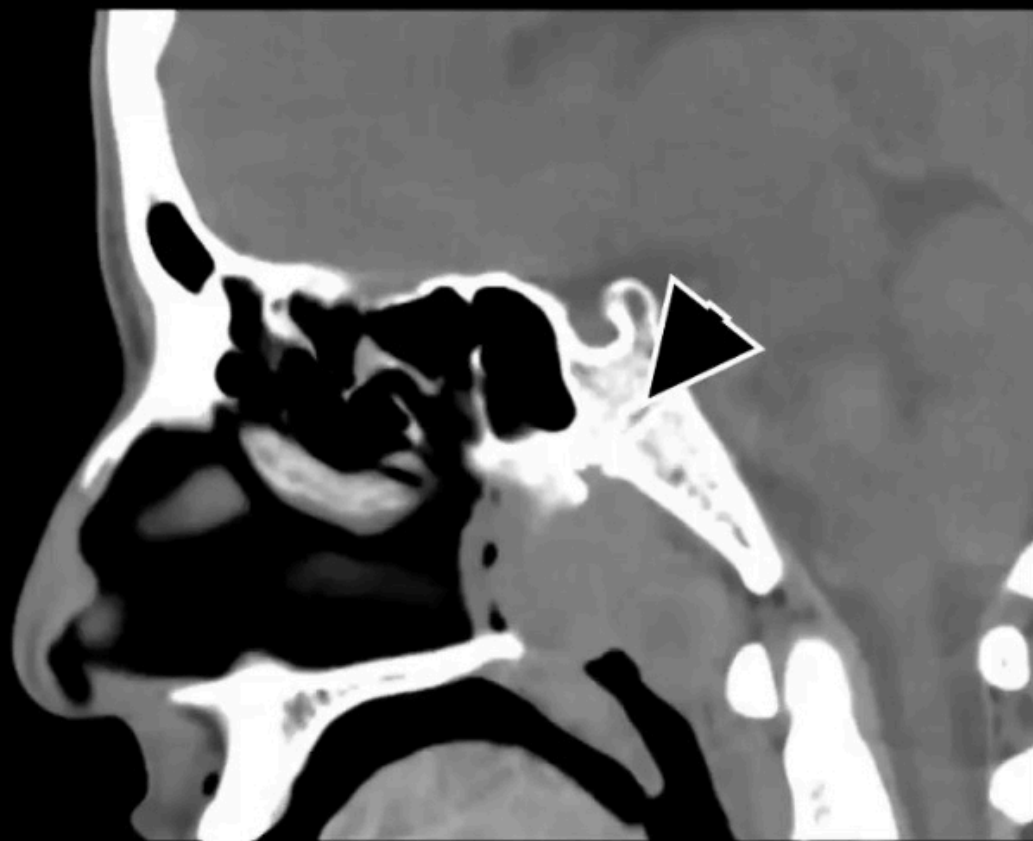
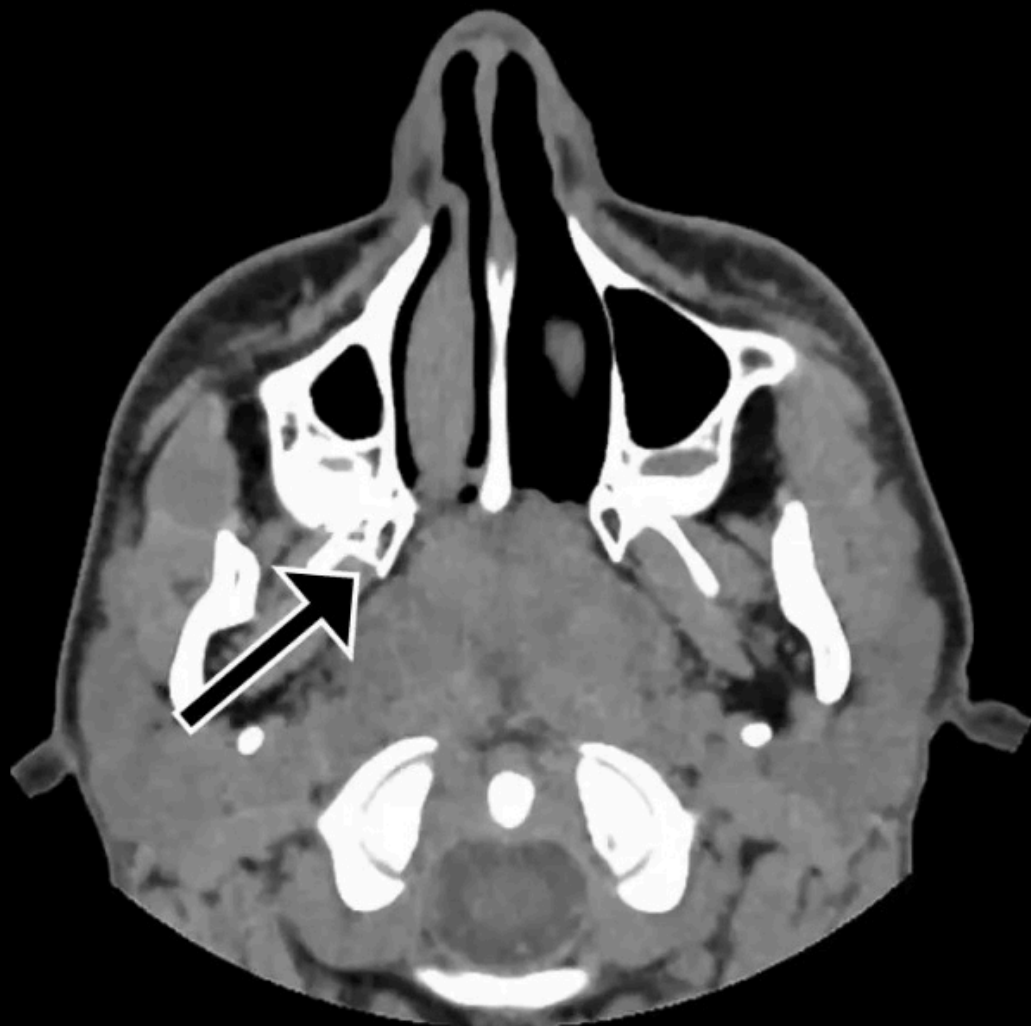


Tonsil

Post nasal space
radiograph (soft
tissue)



CT scan



CLINICAL CLASSIFICATION OF ADENOTONSILLAR DISEASE

INFECTION | INFLAMMATION

Adenoids

Acute adenoiditis

(nasopharyngitis or common cold)

Recurrent acute adenoiditis

Chronic adenoiditis

Tonsils

Acute tonsillitis

Recurrent acute tonsillitis

Chronic tonsillitis

Tonsillolithiasis

OBSTRUCTION

Nasopharyngeal

Oropharyngeal

Combined

NEOPLASIA

Benign

Lymphoproliferative disorder

Lymphoid papillary hyperplasia

Malignant

CONGENITAL

Haemangioma, teratoma,
branchial cyst

Infections & Inflammation

Acute Adenoiditis

- Snoring
- Rhinorrhea
- Nasal blockage
- Fever
- 85% viral
- 5-30% bacterial
- Most common bacteria
 - **GABHS**
 - H. influenza
 - S. aureus
 - Streptococcus pneumoniae

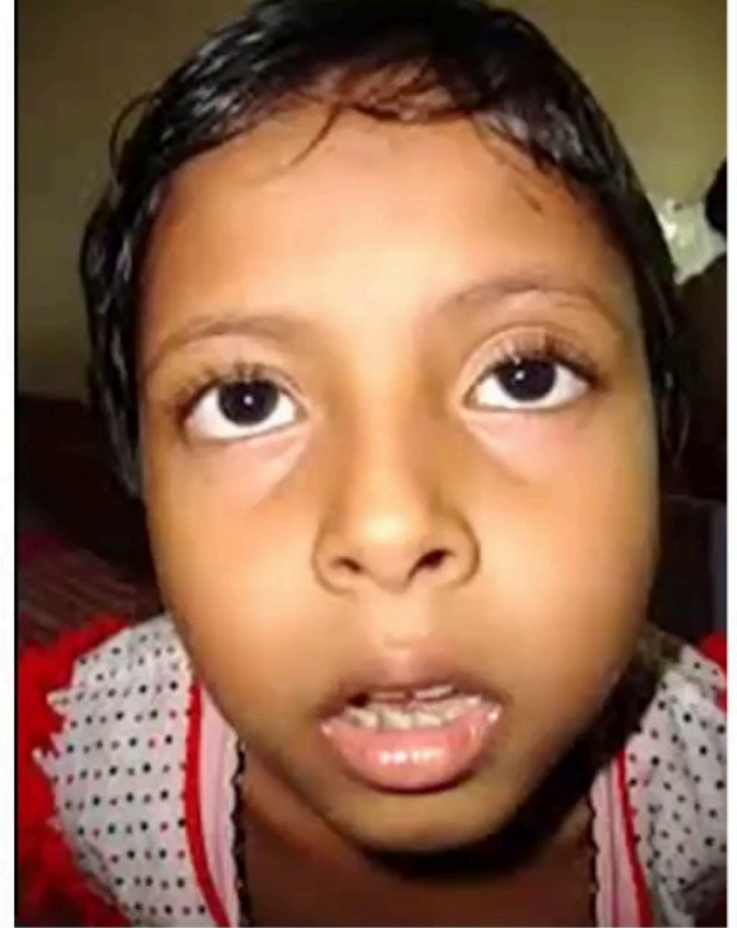


Recurrent acute adenoiditis

- ≥ 4 episodes in 6 months
- Recurrent ARS similar
- DDX - GERD induced adenoiditis in < 2 yrs

Chronic adenoiditis

- Persistent rhinorrhea, PND
- Malodorous breath
- Associated AOM >3 months
- Unremitting – ddx EER
- Association with ARS, CRS & SOM
- Craniofacial growth abnormalities



Acute tonsillitis

- Fever
- Sore throat
- Dysphagia
- Lymphadenitis
- Erythematous tonsils
- Exudates
- Malaise
- Airway obstruction



Viral Tonsillitis

- Catarrhal inflammation
- Hoarseness
- Cough
- Conjunctivitis

Bacterial Tonsillitis

- GABHS (modified Centor criteria)
 - Fever $>38^{\circ}\text{C}$
 - Anterior cervical lymphadenopathy
 - Pharyngeal or Tonsillar exudate
 - Absence of cough
 - Age
 - Age 3 to 14 years: +1 point
 - Age 15 to 45 years: 0 points
 - Age over 45 years: -1 points
 - Decision to treat

Acute tonsillitis

- **U** resolves in 3-4 days
- Viral - lower grade fever, less exudate; lower WBC (lymphocytic shift)
- Bacterial - more exudate, higher WBC (granulocytic shift)
- Throat cultures / rapid antigen test for GABHS

Paradise Criteria for recurrent tonsillitis

A. Frequency Criteria:

- Minimum number of tonsillitis episodes
 - Past 1 year: 7 episodes
 - Past 2 years: 5 episodes per year for both yrs
 - Past 3 years: 3 episodes per year for all 3 yrs

Paradise Criteria for recurrent tonsillitis

B. Episode Criteria:

- Each tonsillitis episode must include at least **ONE** of the following criteria
 - Sore throat
 - Temperature 38.3 C
 - Tender cervical adenopathy or cervical lymph nodes >2 cm in size
 - Tonsillar exudate
 - Group A β -Hemolytic streptococcus culture positive

Paradise Criteria for recurrent tonsillitis

C. Treatment Criteria:

- Each tonsillitis episode must have been treated with standard protocol

D. Documentation Criteria

- 1. Medical record documents each tonsillitis episode including above criteria or
- 2. Observation by clinician for at least 2 subsequent episodes that meet above criteria, typically over a 12 month period

Chronic tonsillitis

- Chronic sore throat
- Malodorous breath
- Presence of tonsiloliths
- Peritonsillar erythema
- Persistent tender cervical lymphadenopathy
- Lasting at least 3 months

Differential diagnosis

- Infectious mononucleosis - EBV
- Scarlet fever
- Diphtheria
- Leukaemia
- Agranulocytosis

Medical management

1. Penicillin - first line for GABHS
2. Acute UAO- NP airway, steroids, IV antibiotics, immediate tonsillectomy for poor response
3. Recurrent tonsillitis- Augmentin
4. Chronic tonsillitis or UAO- treat for 3-6 weeks, low dose treatment

Obstructive Airway Disease

Adenoid ± Tonsillar hypertrophy

- Triad of
 - Obligate mouth breathing,
 - Hyponasality,
 - Snoring /sleep disordered breathing
- Comorbidity
 - Enuresis
 - Poor school performance
 - OME
 - Neurocognitive deficits
 - Obesity

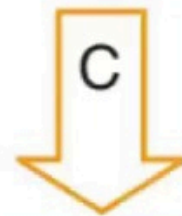
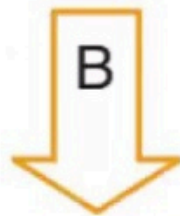
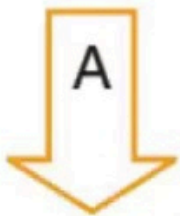
Normal UAW resistance—no snoring

Increased UAW resistance causing only snoring

Increased UAW resistance sufficient to cause symptoms

Increased UAW resistance sufficient to elevate PaCO₂ or lower SpO₂

Intermittent complete UAW obstruction



None

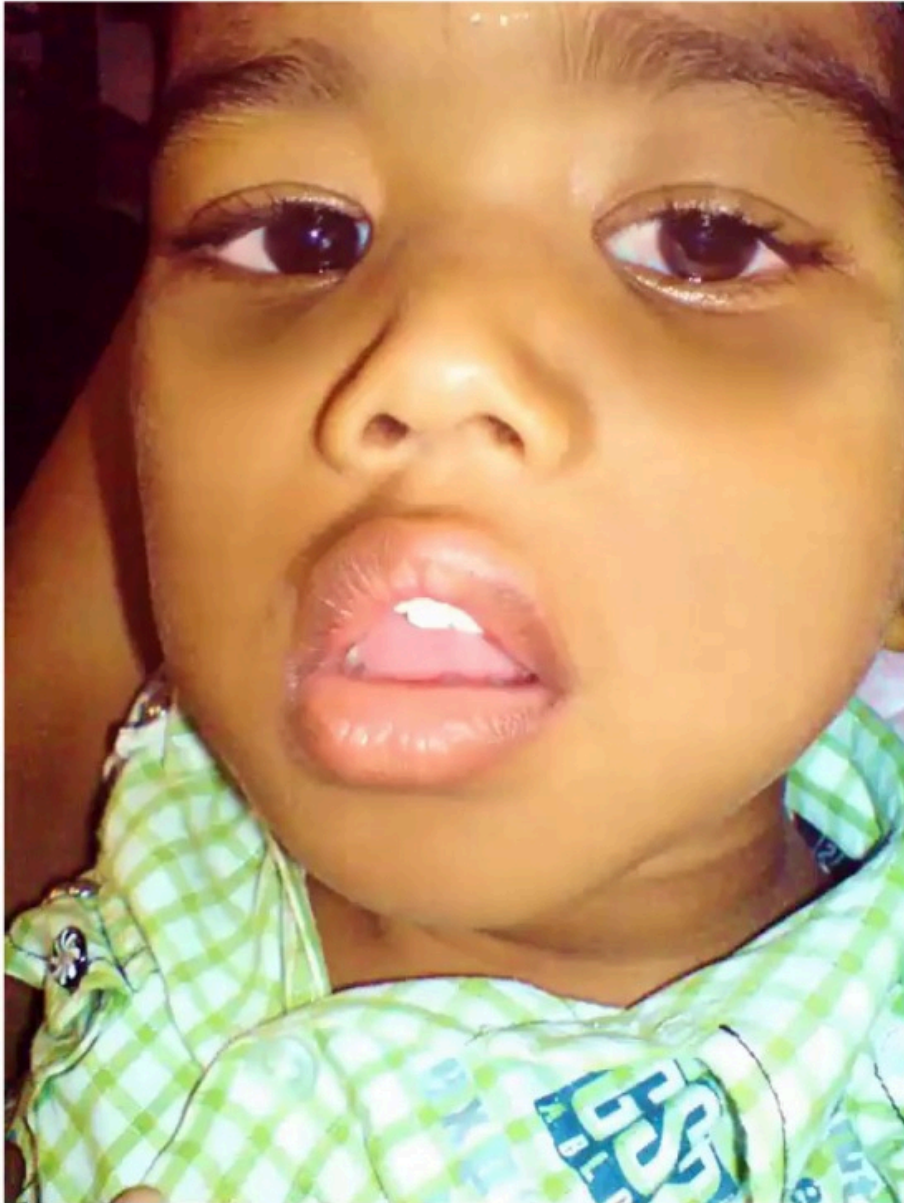
Snoring not associated with daytime symptoms

UAW resistance syndrome

Obstructive hypoventilation or obstructive hypopnea

Obstructive sleep apnea

Craniofacial growth



- Adenoid facies
 - Mouth breathing
 - Elongated face
 - Prominent incisors
 - Hypoplastic maxilla
 - Short upper lip
 - Elevated nostril
 - High arched palate
 - Rhinorrhea

Unilateral tonsillar hypertrophy

- Apparent vs true enlargement
 - Non-neoplastic: Acute vs Chronic infective – (TB, syphilis, actinomycosis)
 - Congenital: hemangioma, cystic hygroma, lymphangioma, teratoma
 - Neoplastic: papilloma, SCC, lymphoma, 2°
-



Complications

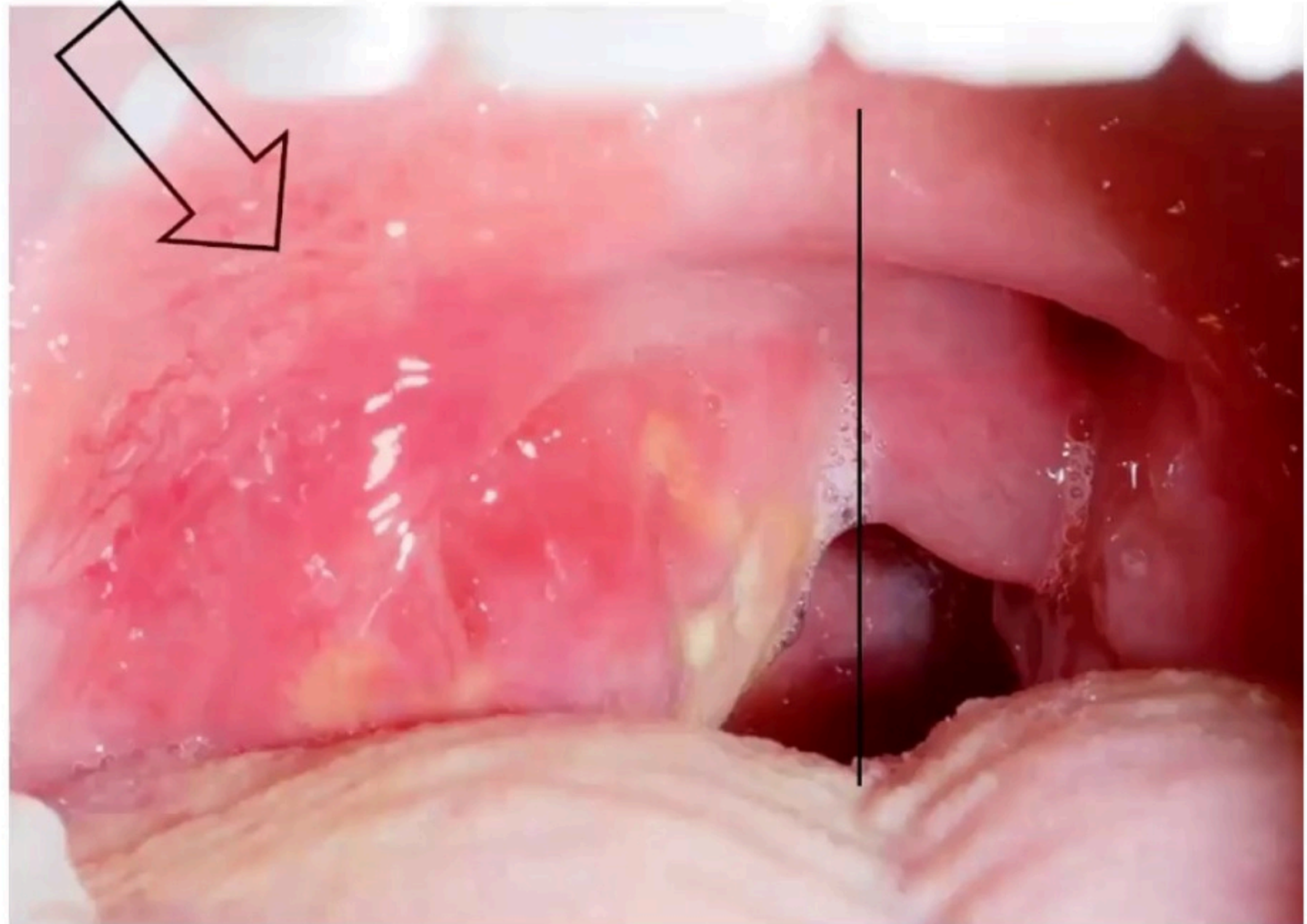
1. Suppurative adenitis
2. Acute Otitis Media
3. Peritonsillar abscess
4. Retropharyngeal abscess
5. Parapharyngeal abscess
6. Rheumatic fever
7. Acute glomerulonephritis
8. Lemierres syndrome (IJV thrombophlebitis)
9. Guttate psoriasis

Peritonsillar abscess

- Spread of infection from mucous glands of Weber or tonsil
- Unilateral soft palate swelling
- Uvula deviation
- GABHS, *S. aureus*
- Smoking

Peritonsillar abscess

- Fever
- Drooling
- Trismus
- Sore throat
- Hot potato voice
- Dysphagia



Peritonsillar abscess Rx

1. Needle Aspiration
2. Incision & drainage
3. I.V antibiotics
4. Analgesics
5. Steroids
6. Rehydration

Surgical Management Of Adenotonsillar Disease

1. Adenoidectomy
2. Tonsillectomy
3. Incision & drainage
4. Tumour resection/excision



Adenoidectomy - indications

- ≥ 4 episodes of recurrent purulent rhinorrhea in 12 months in a child < 12 .
- Persisting symptoms of adenoiditis after 2 courses of antibiotic therapy
- OSA with nasal airway obstruction > 3 months
- Hyponasal speech (rhinolalia clausa)
- OME > 3 months or second set of ventilation tubes
- Dental malocclusion or orofacial growth disturbance
- Cardiopulmonary cp^o - cor pulmonale, PAH, RVH with UAO
- Otitis media with effusion > 4 years
- Adenoid hypertrophy with Chronic sinusitis

Tonsillectomy - Indications

- ≥ 3 infections/year despite adequate medical therapy
- TH
 - dental malocclusion/ affecting orofacial growth
 - UAO,
 - severe dysphagia,
 - OSA,
 - cardiopulmonary complications
- Peritonsillar abscess unresponsive to 1^o treatment
- Halitosis due to chronic tonsillitis unresponsive to medical therapy
- CRT with streptococcal carrier state not responding to beta-lactamase resistant antibiotics
- Unilateral tonsil hypertrophy presumed neoplastic, biopsy
- Tonsillar cysts

High Risk Groups

1. < 3 Years Old
2. Severe obstructive sleep apnoea (OSA)
3. Bleeding Disorders
4. Immunosuppression
5. Infections (pneumonia, systemic)
6. Fever
7. Malnutrition
8. Cor-pulmonale

Contra-indications

- Disorders of hemostasis (absolute)
- Overt or submucous CP-bifid uvula
- Neurologic or neuromuscular abnormality with impaired palatal function
- Anemia
- VPI
- Malignant hyperthermia
- Acute infection

Preoperative

- History –bleeding disorder, co morbidities, speech
- Physical examination- cleft palate, FTT, syndromic
- Laboratory – FHG, bleeding time
- CXR, Echo

Complications

Immediate

- Hemorrhage
- Infection
- UAO - Edema, clot
- Pulmonary edema
- Dehydration, pain
- Death- anaesthetic
- Grisel's syndrome
- Trauma – lips, teeth, TMJ,
- Nerve injury – CN IX

Late

- Nasopharyngeal stenosis
- Velopharyngeal insufficiency
- Regrowth of adenoid- 20%
- Pseudoaneurysm of ICA
- Eagles syndrome
- ET injury- patulous ET, COME

Take Home Message

1. Important in adaptive immunity in early childhood
2. Untreated adenotonsillar disease – serious effects
3. Recurrent infections in <2 yrs – r/o reflux
4. Obstructive or recurrent infective episodes warrant referral
5. Distinguishing between viral and bacterial infections important
6. Surgical management safe but highly effective therapeutic option

Questions?