THE PHARYNX

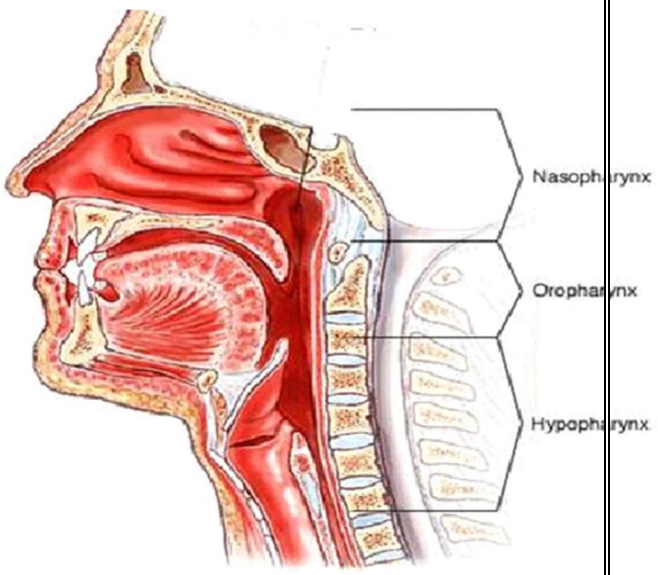
THE PHARYNX

- **Skull base:**

  -Cricoid cartilage anteriorly

  -Inferior border of C6 posteriorly

•Widest portion at hyoid (5 cm)
Narrowest portion at caudal end (1.5 cm)



- **Divided into 3 parts**:

•Nasopharunx

•Oropharynx → you can see it directly

•hypopharynx

- **Nasopharynx :**
  - *•Respiratory function*
  - *•Anterior : choana (posterior nasal aperture)*
  - *•Posterior : superior constrictor muscle*
  - *• Superior : basilar portion of occipital bone*
  - *•Inferior : soft palate*

- **Oropharynx :**
  - *•Respiratoy and digestive function*
  - *•Anterior : anterior tonsillar pillar*
  - *•Posterior : superior and middle constrictor*
  - *•Superior : soft palate*
  - *•Inferior : base of tongue , superior epiglpottis*
  - *•Laterally:*
  - *-palatoglossal*
  - *- palatopharyngeal arches*
  - - parapharyngeal space

- **Hypopharynx :**
  - *•Digestive function (narrowest area of digestive canal ,This sphincter is called the cricopharyngeus muscle)*
  - *•Lies posterior to the larynx*
  - *•Superior :superior border of epiglottis and pharyngoepiglottic folds*
  - *•Inferior : inferior border of the cricoid*
  - *•Posterior/ lateral : middle and inferior constrictors , bodies of C4-C6*
  - *•Anterior : laryngeal inlet*

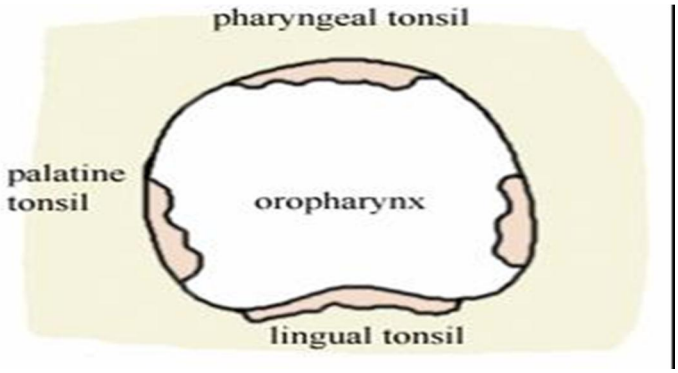
- **Pharyngeal Wall:**

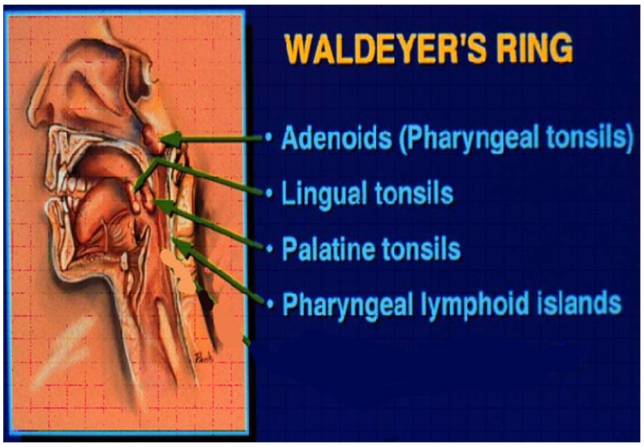
1-Mucous membrane

- *•Nasopharynx*
  - *Ciliated columnar epithelium*
- *•Oro and hypopharynx*
  - *Stratified squamous epithelium*

2-Submucosa

- *•Nerves, blood vessels, and lymphatics*
- *•Mucous and salivary glands*
- *•Subepithelial lymphoid tissue→*





Characteristics of Waldeyer's Ring:

- *•No afferents*
- *•Efferent to deep cervical nodes*
- *•No capsule except the palatine tonsils*

3-Muscular layer

External circular and internal longitudinal (opposite in reminder of GI tract)

*•**External** : 3 constrictors, constrict the wall of the pharynx during swallowing*

*•**Internal**:*

- Elevate pharynx and larynx during speech /swallow

1.Palatopharyngeus

2. Salpingopharyngeus

3. Stylopharngeus

4. Levator yell palatine

***There is a weak area in the wall of the pharynx covered by mucosa only called Killian's triangle. It is the area for Zenker's diverticulum*

-Tenses soft palate and opens Eustachian tube during yawn/swallow Tensor veli palatini (V3)

-Approximates tongue and soft palate Palatoglossus (CN XI via X(

4-Fibrous layer (Buccopharyngeal fascia) → pharyngeal plexus of nerves and veins.

- **Nerve Supply:**

• Motor Muscles of Pharynx & palate : Acessory nerve (cranial) via Vagus nerve

Except:

-tensor palatini muscle by mandibular division of trigeminal nerve (CN V)

-Stylopharyngeusmuscle by glossopharyngeal nerve (CN IX)

•Secretomotor, Sensory & Taste sensation through Vagus & Glossopharyngeal nerves

- **Blood Supply Of Pharynx :**

•*Arterial : All from External Carotid Art*

-Ascending Pharyngeal artery (Ext Carotid)

-Tonsilar Artery (Facial Art) imp!.

-Descending Palatine artery (Maxillary Art)

- Ascending Palatine artery (Facial Art)

-Branch of Lingual Artery

•**Venous** : *Pharyngeal & Pterygoid plexus Common Facial Internal Jugular Vein*

- **Pharyngeal Lymphatic Drainage :-**

•*Nasopharynx : retropharyngeal space*

• *Oropharynx : parapharyngeal space*

• *Hypopharynx : neck*

• *Deep cervical (jugular) nodes*

-Side Notes : when a patient comes with Unilatera cervical lymphadenopathy with sudden conductive hearing loss and middle ear effusion.. Think of Nasopharyngeal carcinoma unless proven otherwise.
-How to confirm ? CT, FNA
-First presentation of nasopharvngeal carcinoma is streaks of blood in oropharynx

- **Physiology of the Pharynx**-:

-Breathing (inspiration and expiration)

-Speech (expiration)

--Deglutition

Swallowing (expration) 2000/day

-Ventilation (ME)

-immunity→ Production of immunoglobulins, plasma cells and lymphocytes

- ***DISEASES OF THE PHARYNX***

1-DISEASES OF THE NASOPHARYNX:

ACUTE INFECTION OF NASOPHARYNX

•Pathologically: is a part of acute rhinitis (common cold)

•Clinically: has no specific clinical features

ADENOIDS

•Lymphoid tissue in nasopharynx

•Enlarged during childhood

•Just lateral and posterior to Torus tubarius is a common area for nasopharyngeal carcinoma.

- **CLINICAL FEATURES**
  - *•Nasal obstruction*
    - *-Mouth breathing*
    - *-Snoring, sleep disturbance, apnea etc*
  - *•Ear symptoms due to Eustachian tube obstruction*
  - *•Nasal tone (because of hyopnasality)*
  - *•Bilateral OME (because Hperatrophy of adenoid + the tubal lymph nod)*
  - *•Adenoid face*
    - *-Mickey Mouse*
    - *-Overbite*
    - *-Long face*
    - *-Crowded incisors*
- **PreOp Evaluation of adenoid disease**:
  - *• Triad of:*
    - *-Hyponasality*
    - *-Snoring*
    - *-Mouth breathing*
    - *-Rhinorrhea*
    - *-Nocturnal cough*
    - *- Post nasal drip*
- **Treatment :** *Adenoidectomy*
  - *•Local Contraindication of Adenoidectomy→*

-Palatopharyngeal incompetence

•*Another Contraindication of Adenoidectomy→*

-Bleeding

-Recant infection

- **Adenoidectomy**
  - ✓ **Absolute Indications**

    -Adenoid hyperplasia resulting in sleep disturbances or sleep apnea
    associated with cor pulmonale
    -Nasal obstruction associated with orofacial abnormalities
    - Failure to thrive (not attributable to other causes)
  - ✓ **Relative Indications**

    -Chronic adenoiditis with persistent sore throat, halitosis, or cervical adenitis

    -Swallowing difficulties (not attributable to other causes) recurrent or chronic otitis media or sinusitis

  - ✓ **Contraindications**

    -Palatal clefting

    -Velopharyngeal insufficiency (hypernasal speech, nasal regurgitation)

  - ✓ **Complications**

    -Immediate and Delayed Hemorrhage
    - Postoperative Airway Compromise
    - Dehydration typically secondary to pain
    -Atlantoaxial (C1-C2) Subluxation
    -Velopharyngeal insufficiency
    -Nasopharyngeal Stenosis
    -Eustachian Tube Dysffunction

2-DISEASES OF THE OROPHARYNX:

1. *Acute tonsillitis*
2. *Acute non-specific pharyngitis*
3. *Acute diphtheria*
4. *Infectious mononeuclosis*
5. *Vincent's angina*
6. *Scarlet fever*
7. *Moniliasis*

1-ACUTE TONSILLITIS:

- *Tonsils size : (occupation of oropharynx)*

Grading system:

A. **0 tonsils in fossa**
B. **+1 tonsils less than 25%**
C. **+2 tonsils less than 50%**
D. **+3 tonsils less than 75%**
E. **+4 tonsils greater than 75%**

N.B. Tonsils size is not an indication for surgery unless it is symptomatic

.

- **ETIOLOGY**

  •A disease of childhood, with a peak incidence at about 5 to 6 years of age.

  - %70viruses →Influenza, Rhinovirus, Adenoviruses, Coronaviruses
  - %20bacteria →: GABHS,Strept pneumonia, H. infleunzae, Staph. aurius
  - %40are beta-lactamse producing bacteria

  • GABHS : Group A Beta Hemolytic Streptococcus. The most common bacteria causing tonsillitis → Very sensitive to penicillin

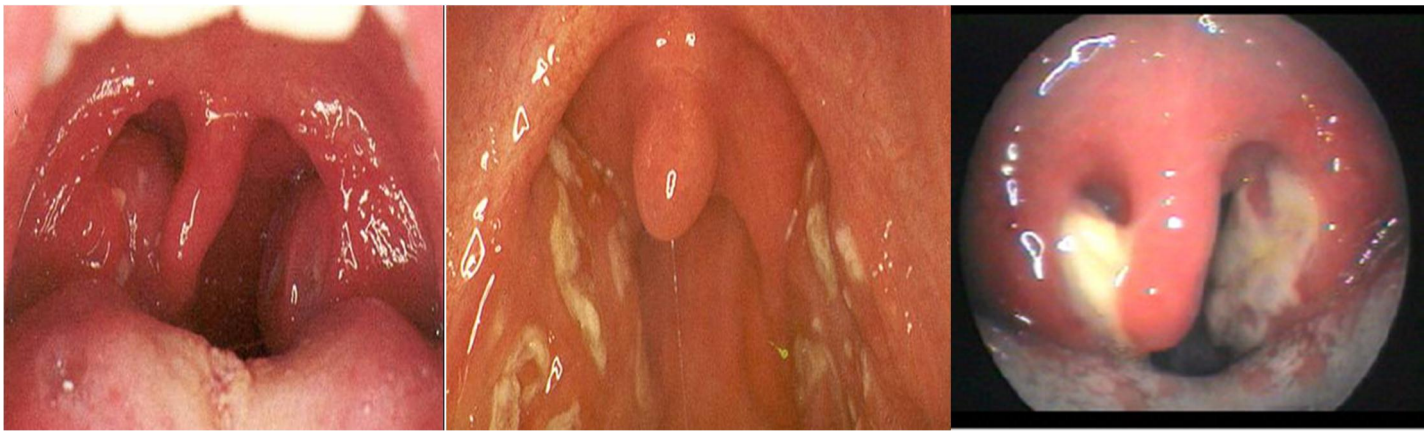
- **Clinical features**

  -Dysphagia
  - odynophagia
  - Otalgia
  -Headache
  -Painful cervical lymphadenitis

-Fever
-Exudates
-Absence of cough coryza and hoarseness
-± sever sore throat , deep cervical lymph node enlargement

- **THROAT EXAMINATION**

A. Parenchymatous tonsillitis B Follicular tonsillitis C. Membranous tonsillitis



- **NECK EXAMINATION**

•Enlargement and tenderness of the jugulo-digastric lymph nodes

- **INVESTIGATIONS**

•Throat swab
•CBC

- **TREATMENT**

•Symptomatic & supportive treatment
•Antibiotics
-Penicillin V for 5-7days→ first line
-Erythromycin – second line

•Steroids

•IV antibiotics

•Recurrent , chronic tonsillitis or obstruction → Tonsillectomy

- **COMPLICATIONS OF ACUTE TONSILLITIS**

  General→ due to toxin produce by GABHS

  - *Acute rheumatism*
  - *Acute glomerulonephritis*
  - *Septicaemia*

Local:

- *Peritonsillitis & peritnosillar abscess (Quinsy(*
- *Neck Abscess*
- *Parapharyngeal abscess*
- *Retropharyngeal abscess*

- **PERITONSILLAR ABSCESS (QUINSY)**

•An abscess between the tonsil capsule and the adjacent lateral pharyngeal wall

- **CLINICAL FEATURES**
  - *•More common in adults*
  - *•Usually unilateral*
  - *•Usually follow an attack of tonsillitis*
  - *•Sever pain > one side*
  - *•Unilateral earache and cervical lymphadenitis*
  - *•More odynophagia & drooling*
  - *•Trismus*
  - *•Thickened speech (hot potato voice)*
- **TREATMENT**
  - *•IV antibiotics*
  - *•Incision and drainage followed by elective tonsillectomy 6 -8 weeks later.*
  - *• Hot (abscess) tonsillectomy*

- **Th parapharyngeal space (PPS)**
  - *Cone shaped at the lateral wall of pharynx.*
    -Base at temporal bone
    -Apex at the hyoid bone
    •Between
    -Pharyngeal
    -Lateral and medial pterygoid muscles
    •Most frequently involved with infection .

  - ***Contents :*** *they are very important because any infection in the tonsils or pharynx can spread and cause parapharyngeal abscess so you should worry about these structures . Local spread can happen also.*

-Loose fibrofatty tissues
- Carotid artery
-Internal jagular vein
-Cranial nerves IX, X, XI , and XII - Cervical sympathetic chain
-Lymph noded
▰Nasal cavity , paranasal sinuses
■Nasopharynx and oropharynx
■Mastoid tip

- **Communication-:**
  -Submandibular
  -Retropharyngeal
  -Parotid spaces
  -Masticatior
  -peritonsilar

- **Clinical features**
  -Systemic manifestations
  -Pain, trismus, swelling

- **INVESTIGATION**
  -Laboratory and bacteriology
  -CT
  -MRI

- **PRINCIPLES OF TREATMENT**
  - *•Secure the airway*
  - *•Antimicrobial therapy*
  - *•Surgical drainage*
    - *-External cervical incision*
    - *-In order to avoid injury to the great vessels*

- **Retropharyngeal abscess**
  - ***Between***
    - *-Prevertebral fascia*
    - *-Posterior pharyngeal wall and oesophagus fascia*
  - *• From Skull base to tracheal bifurcation*
  - *•Major route → mediastinum*
  - ***•Contents :*** *Lymph node (<5 y) that receive from:*
    - *-Nose-*
    - *-Nasopharynx*
    - *-Paranasal sinuses*
    - *-oropharynx*
    - *-Middle ear*
- **ACUTE RETROPHARYNGEAL ABSCESS** → *Due to suppuration of the retropharyngeal lymph nodes present in the retrophayngeal space*

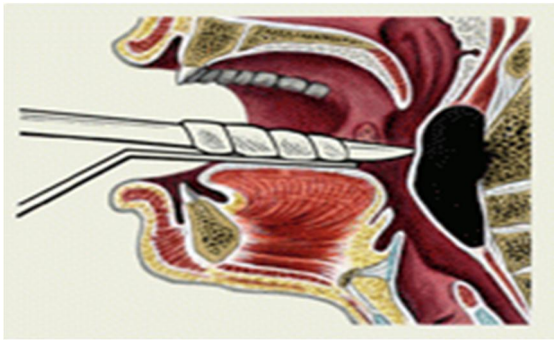
- **CLINICAL FEATURES**

  •Systemic manifestations
  •Respiratory obstruction
  •Odynophagia & Dysphagia
  •Swelling of posterior pharyngeal wall (usually unilateral)

- **INVESTIGATION**
  - *•Laboratory and bacteriology*
  - *•Plain X-rays*
  - *•CT*
  - *•MRI*

- **TREATMENT OF ACUTE RETROPHAYNGEAL ABSCESS**

  -Secure airway
  -Antimicrobial
  -Surgical drainage
  -Trans oral



- *Complications of peritonsillar , para and retropharyngeal infections*
  - *Respiratory obstruction*
  - *Spontaneous rupture (inhalation pneumonia*
  - *Extension of infection*
    - *Other spaces*
    - *Carotid & internal jugular*
    - *Mediastinitis*

- **CHRONIC RETROPHARYNGEAL ABSCESS**
  - *Tuberculous (cold abscess)*
  - *Usually due to TB spines but may be secondary to TB lymphadentis*
  - *Symptoms are insidious*
  - *Treatment is by anti tuberculous medication, repeated aspiration and external drainage*

- **Ludwig's Angina**
  - *Infection of the submandibular space (floor of mouth)*
  - *Usually secondary to dental infection or trauma*
  - **TREATMENT**
    - *Secure airway*
    - *Most cases respond to antibiotics (aggressive one)*
    - *Drainage may be needed*

2- Acute non-specific pharyngitis

•*None specific infection*

•**Causes**

-Viral (very common) , Bacteria & Fungal

-None infective : GERD, smoking ,any irritants

•**Signs and Symptoms :**

-fever

- sore throat

-Odynophagia "painful swallowing" & dysphagia.

-drilling of saliva

-Abscess in the area of the muscle cause spasm, Painful opening of the mouth

"tresmus", Lock jaw w/o pain

-snoring.

Treatment : treat the underlying cause , symptomatic, antibiotic

3-Acute diphtheria

•*Caused by Corynebacterium diphtheria*

•*Very rare nowadays because of vaccination*

- **PATHOLOGY**

•*Local grayish membrane (composed of fibrin, leukocytes, and cellular debris)*

•*Powerful Exotoxins travels to heart and nervous system*

- **CLINICAL MANIFESTATIONS**

•*Systemic symptoms due to the exotoxins*

-*Toxemia*

-*Mild fever*

-*Tachycardia*

-*Paralysis*

•*Local manifestations*

-*Sore throat*

-*Membrane*

-Marked lymphadentitis (‘bull neck’)imp…

- **TREATMENT**

•*Notification , Isolation ,Rest , Antitoxin serum as early as possible*

•*Antibiotics (erythromycin, penicillin G, rifampin, or clindamycin)*

- **COMPLICATIONS**

-*Respiratory obstruction*

-*Heart failure*

-*Muscular paralysis*

4- INFECTIOUS MONONUECLOSIS:

- *Systemic infection caused by Epstein-Barr Virus (EBV)*
- *(Epstein — Barr virus is related to nasopharyngeal carcinoma)*
- *Clinical disease is usually seen in young adults*

- **CLINICAL MANIFESTATIONS**

-*Fever*

-*Pharyngitis and/or tonsillitis*

-*fatigue*

-*cervical Lymphadenopthy "bull neck" - Ulceration*

-*Jaundice*

-Atypical lymphocytes
-if we give hem/her Ampicillin it will cause RASH
-Other clinical findings
Splenomegaly – 50%
Hepatomegaly – 10%
Rash – 5%

- **Diagnosis :** *Paul-Bunnel test & Monospot test*
- **Treatment**

- "supportive" we can give steroid for severe cases.
-Avoid ampicillin

- **COMPLICATIONS**

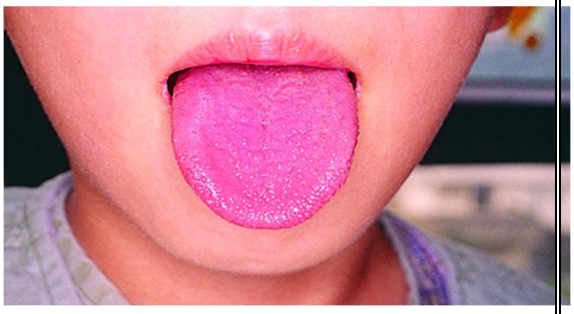
-Autoimmune hemolytic anemia
-Cranial nerve palsies
-Encephalitis
-Hepatitis
-Pericarditis
-Airway obstruction

5- VINCENT'S ANGINA

- *Subacute infection due to Spirochaeta denticolata and Vincent's fusiform bacillus.(Acute oropharyngeal ulcerative)*
- *Poor oral hygiene (fetid breath) → malnutrition→fatigue*
- *pseudomembranous ulceration*
- *cervical lymphadenopathy*
- *penicillin ,metronidazole and local oral hygiene*

6- SCARLET FEVER(الحمى القرمزية)

- *Acute specific —Strept haemolyticus*
- *Erythrotoxin cause rash*
- *Treatment: penicillin*



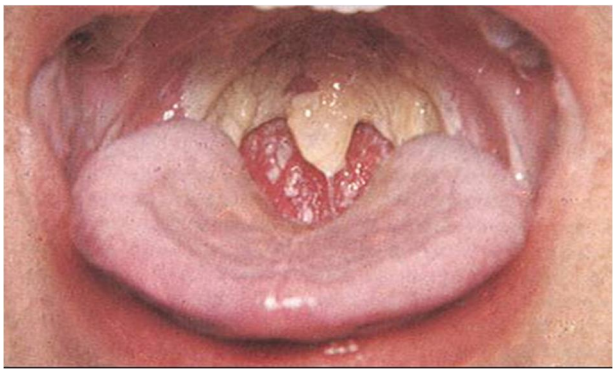
○ FUNGAL PHARYNGITIS

- **CAUSES**

-Long term antibiotics
-Immunosuppresion (Leukopenia, Corticosteroid therapy..etc)
-CANDIDIASIS (MONILIASIS, THRUSH)

- **Thrush**

•fungal infection candidiasis is the most common.
•Pseudomembranous candidiasis (Thrush)
•DM or immunodeficiency



- **Treatment**

-Nystatin

-Fluconazole

○ CHRONIC TONSILLAR HYPERTOPHY

- **CAUSES**

-Chronic or frequent acute infections
-Idiopathic (exaggerated immune response)

- **PRESENTATION**

•Upper airway obstruction

-Mouth breathing, snoring

-Disturbed sleep and apnea

•Pulmonary hypertension, cor pulmonale and heart failure.

- **TREATMENT**

•Tonsillectomy & adenoidectomy

○ CHRONIC NON-SPECIFIC PHAYNGITIS

- *Primary*
- *Secondary*
  - *-Sinonasal disease*
  - *-Dental infections*
  - *-Chest infections*
  - *-Smoking*
  - *-Gastro esophageal reflux*

- **CLINICAL FEATURES**
  - *-Sore throat*
  - *-Irritation*
  - *-Cough*
  - *-O/E*
- **TREATMENT**
  - *Treatment of the cause*
  - *Humidification*

○ CHRONIC SPECIFIC PHARYNGITIS

- *Tuberculosis*
- *Syphilis*
- *Lupus vulgaris*
- *Leprosy*
- *Sarcoidosis*

○ CHRONIC TONSILLITIS

- *Persistent or recurrent sore throat*
- *Persistent cervical adenitis*
- *Halitosis*
- *Congested tonsils*

- **TREATMENT** →*Tonsillectomy*

TONSILLECTOMY

- INDICATIONS
  - ✓ *Absolute Indications*

    •- *Obstructing tonsillar enlargement→ resulting in sleep disturbances or sleep apnea associated with cor pulmonale >> IMP*

    •- *Suspected malignancy(unilateral tonsilar hypertrophy) >> IMP!*

    •- *Tonsillitis resulting in febrile convulsions (may require a Quincy tonsillectomy)*

    •- *Persistent or recurrent tonsillar hemorrhage*

    •-*Failure to thrive (not attributable to other causes)*

  - ✓ *Relative Indications*

    -Recurrent acute tonsillitis (documented 7 infections in 1 year, 5 infections in 2years)
    -Peritonsillar abscess
    -Chronic tonsillitis with persistent sore throat, halitosis or cervical adenitis
    - One attack of quinsy
    -Swallowing difficulties (not attributable to other causes)
    -Tonsillolithiasis
    -Orofacial or dental disorders (results in a narrow upper airway)
    -Recurrent or chronic otitis media
    -Individual consideration
    -PTA unresponsive to nonsurgical management

- **CONTRAINDICATIONS**

  •Bleeding tendency
  •Recent URTI
  •Leukemia hemophilias, agranulocytosis, uncontrolled systemic
  •disease - Relative Contraindicaitons: cleft palate, acute infection

- **COMPLICATIONS**

- *Hemorrhage*
  -Primary
  -Reactionary
  -Secondary
- *Respiratory obstruction*
- *Injury to near-by structures*
- *Pulmonary and distant infections*

✓ **Primary Hemorrhage**
- *Bleeding occurring during the surgery*
- *Causes*
  -Bleeding tendency
  -Acute infections
  -Aberrant vessel
  -Bad technique
- **Management**
  -General supportive measures
  -Diathermy, ligature or stitches
  -Packing

✓ **Reactionary Hemorrhage**
- *Bleeding occurring within the first 24 hours postoperative period*
- **Causes**
  -Bleeding tendency
  -Slipped ligature
- **Diagnosis**
  -Rising pulse & dropping blood pressure
  -Rattle breathing
  -Blood trickling from the mouth
  -Frequent swallowing

- **Treatment**
  -General supportive measures

-Take the patient back to OR
-Control like reactionary hemorrhage

✓ **Secondary hemorrhage**

-Occur 5-10 days posoperatively
-Due to infection
-Treated by antibiotics
-May need diathermy or packing

- **Pharyngeal (Zenker's) Pouch**
  - *A mucosal sac protruding through Killian's dehiesence*
  - *Most probably related to neuromuscular incoordination →*
    -Failure of relaxation OR
    - Early closure OR
    - Spasm of cricopharyngeus
  - ***Clinical Features***
    -Dysphagia
    -Regurgitation
    -Aspiration
  - ***Diagnosis***
    -Clinical examination
    -Barium swallow
    -Endoscopy
  - ***Treatment***
    -Excision(surgery)

Done by ENT Team 429
Mohammed Alfaif