**Anatomy**

It is divided into: 1) Nasopharynx 2) Oropharynx 3) Laryngo (hypo pharynx)

**Nasopharynx:**
Ant.: choana
Post: first cervical vertebra
Above: sphenoid and skull base.
Inf.: oropharynx, starting from soft palate
Lat. wall: shows orifice of the ET, behind which lies fossa of Rosenmuller
Posterosuperior wall: shows aggregation of lymphoid tissue called nasopharyngeal tonsils (adenoids)

**Oropharynx:**
Ant.: anterior pillars.
Post: 2 and 3 cervical vertebrae.
Sup.: nasopharynx.
Inf.: hypopharynx, starting from tip of epiglottis
Lat. wall: shows the palatine tonsils

**Hypopharynx:**
Ant.: larynx
Post.: 4,5,6 cervical vertebrae.
Sup.: oropharynx.
Inf.: esophagus

**Pharyngeal wall consists of 4 layers**
1- Mucous membrane: stratified squam. epithelium except roof & lat wall of NPX (respiratory epithelium)
2- Subepithelial C.T (pharyngeal aponeurosis).
3- Muscular layer 3 constrictor (Sup. mid. & inferior).
4- Buccopharyngeal fascia: separates muscles from prevertebral fascia to which connected by median raphe.
**Blood Supply**

a- Arterial

b- Venous: pharyngeal & pterygoid plexus ........ common facial ......IJV

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**Nerve supply**

a- Motor: Cranial accessory (11), via vagus (10).

b- Sensory glosso pharyngeal n. (9).

**Lymphatic drainage:** retropharyngeal & lateral pharyngeal then UDCLN

**Waldayer’s ring :**

- **Def :** ring of subepithelial lymphoid tissue that surrounds the pharynx

- **Consists of :**
  - Nasopharyngeal tonsil.
  - Tubal tonsils around orifice of E.T.
  - Palatine tonsils (the largest).
  - Lingual tonsils.
  - Discrete lymphoid nodules on lateral & posterior pharyngeal walls

- **Characterized by :**
  - Lymphoid tissue lie in direct contact e mucosa
  - No afferent
  - Drain to retropharyngeal & UDCLN

**Anatomy of the palatine tonsils**

- Two ovoid masses of lymphoid tissue lying in tonsillar fossa on each side of oropharynx

- Tonsillar fossa lies between ant. pillar, post. pillar & postero lat. third of the tongue

- Tonsil has two surfaces:
  - Lat. surface covered by tonsillar capsule, which separates it from sup. constrictor muscle (bed)
  - Med. Surface is free & covered by st. sq. epithelium that invaginates to form 12-15 crypts, largest is called crypta magna which is present near upper pole
Blood supply: as pharynx (mainly tonsillar artery)
Venous drainage: para tonsillar veins ........ pharyngeal plexus
Functions: Play a role in humoral & cell mediated immunity till age of 4-5 years

Functions of the pharynx
1- Respiratory channel 2-Voice resonance & speech articulation 3-Deglutition

Nasopharynx

Adenoids

Def: Hypertrophy of naso pharyngeal tonsils sufficient to produce symptoms.
Aet: Repeated URT infection.
Incid: Childhood (2-12 y), atrophy occurs at puberty.

It is the commonest naso pharyngeal swelling

Clinical picture:

I. Effects of hypertrophy
A-Nasal
1- Bil nasal obstruction 2- Snoring, difficult suckling & may be O.S.A
3- Bil mucoid nasal discharge 4- Nasal tone of voice
5- Post nasal drip & foetor oris
B- E.T obstruction
1- Middle ear effusion ( S.O.M )...... deafness
2- Recurrent acute otitis media...... pain & fever
C- Adenoid facies
- Narrow pinched ant. nares - Mucoid secretions over upper lip
- Open dry mouth - Prominent incisors
- High arched palate - Idiot look
II. Recurrent infections:

III. General manifestations:
- Chronic hypoxia, sleep apnea, night mares & nocturnal enuresis
- Child is shy & friendless
- Mental dullness & apathy

Examination
A. Adenoid facies
B. Ant. Rhinoscopy: (see before)
C. Oral cavity:
   - Dry distorted decayed teeth
   - Egg white post nasal discharge
   - Gums are inflamed
   - In marked adenoid hypertrophy its lower edge may be seen
D. Ear:
   - Retracted T.M
   - A.S.O.M
   - S.O.M
   - C.D by tuning fork
E. Post. rhinoscopy dark pinkish swelling
F. Digital palpation felt as punch of worms
G. Endoscopy

Investigations: Plain x ray nasopharynx lat. view: soft tissue shadow

Treatment: Adenoidectomy

- Indications: symptomatic adenoid ……see before
- Preoperative preparation & anesthesia: as tonsillectomy
- Position: patient on his back with head slightly flexed
- Technique:

- Post operative care: (as tonsillectomy)
• **Complications:**

I. **Anesthetic complications**

II. **Bleeding**

   a) Primary: blood diseases, incomplete removal, and injury to muscles.

   ttt: - Complete removal    - Suture injured muscles
   - Supply deficient factors    - Blood transfusion if needed
   - Posterior nasal pack for 48 h.

   b) Reactionary (within 24 h): usually due to coagulation defect.

   ttt: Reanesthesia and as 1 y

   c) Secondary: after 5-7 days due to infection

      ttt: antibiotics, blood transfusion, post nasal pack

III. **Incomplete removal** due to

   Blunt curette, superficial anesthesia—muscular contraction—wringling of NPX

   This leads to: - post adenoidectomy bleeding    - hypertrophy of residual tissue

IV. **Injury to surrounding structures**

V. **Infection may cause**

   Bleeding, local sepsis,
   Post nasal discharge & descending infection

VI. **Inhalation & aspiration**

   Leads to lung collapse or abscess.

• **Contra indications:** as tonsillectomy + cleft palate & submucosal cleft to avoid velopharyngeal incompetence & rhinolalia aperta

**Tumors of the naso pharynx**

I. **Benign Angiofibroma**

   **Def:** benign naso pharyngeal tumor

   **Aet.:** a. true fibroma    b. Hamartoma

   c. chemodectoma related to maxillary A.    d. Endocrinal imbalance

   **Incid:** Most common benign tumor, only young males, peak 13-16 y

   **Path:** Site of origin is superior margin of sphenopalatine foramen.
M/P sinusoidal spaces devoid of muscular coat, bundles of collagen

Blood supply: maxillary A

Behavior: - Tumor extend due to pressure necrosis
- Spontaneous regression may occur at age of sexual maturity

Clinical picture

A) General: anemia: easy fatigue, pallor

B) Nasal manifestation

Symptoms: - Intermittent, spontaneous, severe bleeding
- Gradual progressive nasal obstruction
- Purulent or bloody discharge
- Nasal tone of voice - Hyposmia

Signs: Ant. Rhinoscopy: MP discharge, D.S to opposite site.

Unilateral nasal mass, bleeds on touch

Post. rhinoscopy: pink, lobulated mass covered by intact mucosa with vessels on its surface, avoid digital palpation

C) Aural manifestations

Symptoms: deafness  Signs: secretory otitis media

D) oro pharyngeal manifestation: sagging of soft palate

E) External examination

- proptosis  - unilateral cheek swelling  - frog face deformity

Investigations:

1- CT with contrast  2-MRI
3-Carotid angiography (tumor blush)  4-Biopsy usually not needed

D.D: Huge adenoid: no bleeding, not in the nose

Antro choanal polyp: no bleeding, C.T

Malignant tumors: old age, cranial n. palsies, C.T

Treatment:

A) surgical (mainly)

1- Trans palatal.  2-Lateral rhinotomy.

3-Trans nasal, trans antral via Weber-Furgusson or midfacial degloving.
4-Craniotomy if intra cranial extension
5-Endoscopic nasal approach became widely accepted now in most cases.
- To decrease bleeding: preoperative embolization is done 2-3 days before surgery, rapid technique, wide approach, hypotensive anesthesia, vessel ligation, remove all remnants & post operative pack
- In extensive cases elective tracheostomy

B) Hormonal!!
C) Radio therapy: induce fibrosis but carcinogenic so used only in inoperable: intracranial extension or recurrence

II- Malignant: carcinoma

Def: Malignant tumor of the NPX.
Aet: a) Environmental agents: Epstien barr virus, hydrocarbons, formaldehyde, cigarette, smoke, fumes & Chinese herbal diet
    b) Genetic predisposition.
Incid: - Most common malignant tumor (80%), highest among Chinese & Orientals
    - Peak (35-60) - Male: female 3/1
path: site: commonest site is fossa of Rosenmuller
M/P: commonest is squamous cell carcinoma then anaplastic carcinoma (lymphoepithelioma: carcinoma with lymphocytic infiltration)
Spread: - Direct Ant, post, sup, inf. & lat.
    - lymphatic: very early & common may be bilateral
    - Blood: rare & late.

Clinical picture:
A) Aural manifestation 1-Unilateral secretory otitis media 2- Referred otalgia
B) Nodal manifestation: Enlarged UDCLN may be the presentation (occult primary, silent area)
C) **Nasal manifestation:**

1. Nasal obstruction: usually unilateral.
   - 2-MP discharge.
   - 3-Mild epistaxis.
   - 4-Nasal tone of voice.

On exam. Ant. rhinoscopy: may reveal a nasal mass

Post rhinoscopy or endoscopy: fungating mass, ulcerative lesion, or submucosal swelling

D) **Neurological manifestation:**

1. Vidian nerve affection.
2. Cranial nerves: any can be affected.
4. Increased ICT.

**NB** the Diagnostic Trotters triad:

- Unilateral conductive deafness
- Unilateral facial pain
- Immobile soft palate

**Investigations:**

1. CT
2. Biopsy: endoscopic or direct if repeatedly negative: blind curettage
3. Tympanometry
4. Metastatic work up

**Treatment:**

- Radio therapy is treatment of choice (recently chemoradiotherapy).
- Role of surgery: Biopsy.
  - RND, if persistent after 1ry control.
  - Salvage surgery of recurrent or residual disease is of limited role due to complex anatomy.

**NB:** Other malignant tumors of NPX: Lymphoma, chordoma, & craniopharyngioma

**Congenital anomalies of the pharynx:** Cleft palate

**Def:** Failure of fusion of 2 halves forming the palate

**Types:** Depends upon: depth & length

1. Overt cleft: Bifid uvula, cleft soft palate, complete cleft (soft & hard), bipartite cleft (complete + unilateral gum cleft), tripartite cleft (complete + bilateral gum cleft).
2. Submucous cleft: deficient palatal muscles with intact mucosa.

**Clinical picture:** Nasal regurge, rhinolalia aperta
**Ttt**: at age of 1-2 year: surgery and speech therapy

**Traumatic conditions of the pharynx**

**FB**: As esophagus

**Lacerations**: Suture if needed + antibiotics

**Penetrating wounds**: Stab wounds or high velocity missiles, may be fatal due to damage to vital structures

**Caustics**: as esophagus.

**Inflammation of the pharynx**

**I. Acute**

A) non specific
B) **specific**: 1- Diphtheria 2-Vincent’s angina 3- Moniliasis
C) **Blood Diseases**: 1- Acute leakaemia 2- Agranulocytosis
D) **Systemic diseases**: 1- IMN 2-Exanthemata 3-Aphthous ulceration

**II. Chronic**

A) non specific
B) **Specific**: 1- Scleroma 2-$ 3$-T.B

**III. Inflammation of lymphoid tissue**: Adenoiditis and tonsillitis

**Acute tonsillitis**

**Def**: Acute non specific inflammation of palatine tonsils.

**Aet**: Predisposing factors: Recurrent URT infection
Bad hygiene
Low resistance

**Organism**: group A beta haemolytic streptococci.
**incid:** More in children

**Path:** 1- Acute catarrhal tonsillitis 2-Acute follicular 3-Acute parenchymatous

**Symptoms:**
*General:* high fever 39-40 , headache, malaise, anorexia & myalgia
*Local:* - Sore throat & odynophagia
- Referred otalgia
- Fétor oris
- Hot potato voice if huge tonsils

**Signs:**
*General:* Fever & proportionate tachycardia, patient looks ill.
*Local:* 1- Swollen congested tonsils, oropharynx is red & edematous.
2- Yellow white spots may be seen, yellow white membrane on the surface.
3- Edema of soft palate & fétor oris.
4- Enlarged tender UDCLN (jugulo digastric).

**Investigations:** - Swab for C&S - leucocytosis in CBC -High ESR

**D.D:** other causes of membrane over tonsil……

Scarlet fever: erythematous rash, hypertrophy of posterior pharyngeal wall

**Treatment:**
1- Rest, light diet, adequate fluids.
2- Antibiotics: - Penicillin, you may start by I. M & continue on oral e.g - Amoxycillin – Amoxycillin clavulinate- Cephalosporins & macrolids
3- Analgesics, antipyretics, anti septic mouth wash

**Complications:**
A) *local:* 1- Quinsy, para & retropharyngeal abscess ,Ludwig's angina,
2- Otitis media, laryngitis, bronchitis
3- chronic tonsillitis
B) *General:* Rheumatic fever Acute glomerulonephritis
**Chronic Tonsillitis**

_**Aet:**_ repeated acute tonsillitis

_**Symptoms:**_
1- Recurrent attacks of acute tonsillitis
2- Recurrent sore throat  
3- Referred pain to the ear
4- Recurrent enlarged cervical L.N  
5- Fetor oris
6- Snoring, sleep apnea, hot potato voice if huge tonsils
7- Septic focus: low grade fever, fatigue, anorexia, headache, arthralgia.

_**Signs:**_

_**Investigations:**_
1- High ESR
2- High ASOT. +ve CRP

_**Treatment:**_ Tonsillectomy

**Acute pharyngitis**

**A) Non specific :**
- Usually viral with common cold & exanthemata
- Fever, headache, malaise
- Generalized congestion of the pharynx
- Sore throat & dysphagia
- Treated like tonsillitis

**B) Specific :**

1) **Diphtheria**

_**Def:**_ Acute specific infection of the pharynx.

_**Aet:**_ Gram positive bacillus (corynebacterium diphtheriae) transmitted by droplets.

_**Incid:**_ Usually young 2-6 y (bellow 12 ), incubation period 2-6 days.

_**Path:**_ Site pharynx, larynx & nose (secondary), conjunctiva (rare)

- It is a pseudo membranous type of inflammation

_**Symptoms:**_ insidious onset

- _General:_ low grade fever, headache, malaise, anorexia & may be vomiting.
- _Local:_ severe sore throat & dysphasia.

_**Signs:**_

- _General:_ low grade fever, severe toxemia, tachycardia disproportionate to fever.
Local: - False membrane over the tonsil which is:
   - Unilateral - Yellow white or dirty gray.
   - Thick & firm, adherent & leaves a bleeding surface on removal & reforms rapidly
   - Often exceeds limits of the tonsils

Enlarged tender cervical LN: Bull’s neck

+ Clinical picture of laryngeal & nasal diphtheria

**Investigations:** Throat swab: a: Direct smear  b: Culture on loeffler’s serum

**Complications:** due to effect of toxins

A) Cardio vascular:
1- Toxic myo carditis  2-vagal neuritis  3-acute heart failure

B) Neurological (paralysis)
   1- Soft palate: earliest & most common.
   2- Occular paralysis: intrinsic more than extrinsic muscles.
   3- Laryngeal & pharyngeal muscles  4- Diaphragm & inter costal muscles
   5- Peripheral neuritis.

C) Respiratory:
   1- Laryngeal obstruction, lung collapse.  2-Peumonia, lung abscess
   2- Respiratory muscle paralysis & respiratory failure

D) Renal: Toxic nephritis

**D.D** membrane over tonsils

1- Acute follicular tonsillitis
   - Onset Acute
   - Fever high (39-40)
   - Toxemia mild
   - Face flushed
   - Pulse full, rapid, proportionate
   - Vomiting uncommon
   - Exudation yellow spots confined to tonsils, easily removed No bleeding
   - Side bilateral
   - Swab - ve for diphtheria

2- Diphtheria
   - Gradual
   - Low (38)
   - Severe
   - Pale
   - Weak rapid
   - Disproportionate
   - More common
   - Dirty gray membrane exceeds the tonsils adherent
   - Leaves bleeding surface

unilateral 
+ ve
3- Vincent’s angina

4- I.M.N

5- Acute leukaemia & agranulocytosis

**Treatment:**

1. Hospitalization, isolation, complete bed rest
2. Diphtheria antitoxic serum  
   To: neutralize circulating toxins  
   Dose: 40000-100000 I.U I.M or I.V repeated after 24-48 h.  
   When: diphtheria is suspected, within 48 h.  
   Precautions: do skin sensitivity before, if positive start desensitization or shift to another serum, be ready with antihistaminics, and steroids
3. Antibiotics: penicillin ½ million day IV/IM for 10 days
4. Glucose 25%, vitamins & antipyretics
5. Observe airway if stridor.............tracheostomy
6. Treatment of complications.

**prophylaxis:**

1- Active DPT vaccine
2- Passive 5000-10000 IV antitoxic serum I.M for contacts

2) Vincent’s angina

**Def:** Acute specific inflammation of pharynx

**Aet:** Symbiosis between a spirochaete: borrelia vincent & fusiform bacillus

**Symptoms:** like diphtheria

**Signs:** gingivitis & pharyngeal ulceration, deep punched out edges ulceration, covered by a dirty grayish membrane, extends beyond tonsils  
- enlarged tender submandibular L.N

**Investigations**  
swab

**Treatment:**

1- Antibiotics e.g penicillin or erythrocin + metronidazole
2- H₂O₂ mouth wash
3- Oral hygiene, adequate nutrition
3) **Moniliasis (oral thruth)**

Def: Acute specific inflammation of pharynx & oral cavity

Aet: Organism: candida albicans  
Predisposing factors .....  

Symtoms: Sore throat & dysphagia, no fever

Signs: Milky white raised patches

Treatment:  
- Stop antibiotics, adequate nutrition  
- Topical antifungal: mycostation, daktarin gel  
- Systemic antifungal in severe cases e.g ketoconazole.

C) **Blood diseases**

1) **Acute leukaemia**  
neoplastic proliferation of the precursors of WBCS leading to  
- Anemia: fatigue pallor.  
- Thrombocytopenia: purpura, epistaxis, and bleeding tendency  
- Intercurrent infection: fever & sore throat, ulcers & membrane over the tonsils, swollen purpulish gingiva & easy bleeding  
- Lymphadenopathy, splenomgaly  
- Sternal tenderness

Investigations:  
1- CBC  
2- B.M aspiration

Treatment: Cytotoxic drugs.

2) **Agrunulocytosis**

Def: marked reduction in formation of PNLs

Aet: B.M depression, 1ry or 2ry to drugs (antibiotics: chloramphenicol, antimetabolites: methotrexate) or radiation.

Clinical picture  
- Fever, malaise, rapid deterioration of general condition  
- Extensive ulceration with no or little surrounding inflammatory reaction

Investigations:  
1- CBC  
2- MB aspiration

Treatment:  
1- Stop offending drug  
2- Isolation  
3- Antibiotics & blood transfusion  
4- B.M transplant
D) **Systemic Diseases**

1) **Infectious mononucleosis**

*Def:* Acute infective pharyngitis.  
*Aet:* Epstein barr virus (EBV).

*Incid:* young adults.

*Symptoms* general: fever, headache, malaise (*febrile type*)

*Local:* severe sore throat & dysphagia (*angionous type*)

*Signs:* - Congestion & edema of the pharynx
- Shallow ulcers or grayish white membrane
- Palatal petechiae in 30%
- Tender enlarged cervical L.N (*glandular type*)
- Lymphadenopathy & splenomegaly

*Investigations:* lymphocytosis & monocytosis

Serological test: Paul-Bunnel & monospot tests

*Treatment:* Supportive, avoid penicillin as it forms rash + steroids in severe cases

**Chronic pharyngitis**

A) **Non specific**

*Aet:* 1- Repeated acute tonsillitis  
2- Tobacco, alcohol, spices
3- Dusty atmosphere, mouth breathing  
4- Reflux oesophagitis
5- Septic teeth, chronic tonsillitis, sinusitis

*Symptoms:* - Persistent sore throat
- A desire to clear the throat (hawking)

*Signs:* Simple catarrhal pharyngitis
- Hypertrophic (granular) pharyngitis
- Atrophic pharyngitis

*Treatment:* - Avoid predisposing factors
- Local Treatment (gargles, cautery … etc
- Antibiotics & H, antagonists
**B) chronic specific pharyngitis**

1) **Syphilis**

Primary: chancer, Rare but may affect tonsil
   
   Hard reddish painless nodule + cervical L.N

Secondary mucous patches

Bluish Grey, slightly raised --- coalesce & ulcerate to form snail track ulcer

Tertiary Gumma Hard purple swelling ---- ulcerate

   Ulcers have deep punched out edge, indurated margins & necrotic floor

2) **T.B**

Minute Grey tubercles that soon ulcerate: superficial, undermined edges, bluish margins & yellow caseous floor, severe odynophagia

3) **Scleroma**: Usually 2ry to rhinoscleroma

   - Granulation & crustation in the pharynx
   - Painless induration without ulceration
   - Atrophic mucosa, lost uvula (Badrawy sign)
   - Fibrosis, leading to pharyngeal stenosis

**Suppurations related to the pharynx**

I. **Peritonsillar abscess (Quinsy)**

**Def**: Collection of pus between fibrous capsule of the tonsil, usually at its upper pole, & the superior constrictor muscle.

**Aet**: Usually as a complication of acute tonsillitis

   - Organisms: usually mixed aerobic & anaerobic infection

**incid**: Usually young adult

**Path**: Starts by infection in the depth of one of the crypts (usually crypta magna)

**Symptoms**: (as tonsillitis but severe)

   - **General**: Fever, headache, malaise (if pus---hectic fever)
   - **Local**: Sore throat, severe & unilateral ---Severe dysphagia & odynophagia
     - Unilateral neck pain & referred otalgia ---Foetor oris

**Signs**:

   - **General**: Fever, tachycardia, toxic facies
Local:  - Trismus, tonticollis
- Asymmetrical edema and congestion of soft palate
- Swelling above & lateral to tonsil
- Tonsil is displaced downwards & medially
- Uvula is edematous & pushed to other side
- Large, firm, tender jugulodigastris LN

Treatment:

A) during stage of peritonsillar cellulitis
   1- Parenteral antibiotics
   2- Antipyretics, analgesics, bed rest, adequate fluids, & mouth wash

B) During stage of peritonsillar abscess
   Indicated by: Hectic fever Throbbing pain
   Pitting edema on probing Aspiration brings pus
   Treated by: Incision & drainage Parenteral antibiotics
   Site of incision: 1- Most bulging point
   2- Mid point of a line from base of uvula to last upper molar tooth
   3- 1/2 cm lat. To point of crossing of a vertical line along anterior
   pillar with a horizontal line along base of uvula

   Technique: use a guarded knife, Hilton method to open loculation usually under G.A

C) Tonsillectomy should be done 4-6 weeks later.

   NB when to do quinsy tonsillectomy!!

D.D:
   Anaplastic carcinoma
   Acute leukaemia
   Abscess related to upper molar tooth
   Para pharyngeal swelling

Complications:
   Laryngeal edema & stridor. - Pyaemia & septicaemia - Para pharyngeal abscess

II. Para pharyngeal abscess:

Def.: Collection of pus in para pharyngeal space

Aet.:  - Peritonsillar abscess - tonsillitis - petrositis & mastoiditis
**Symptoms**: like quinsy + unilateral neck swelling

**Signs**: Fever, tachycardia, torticollis

Becks triad: Swelling in lat. Pharyngeal wall pushing a normal tonsil medially

Tender firm external swelling on lat. side of the neck

Trismus

**Investigations**: C T of pharynx & neck

**Treatment**: As quinsy + incision & drainage by external incision along anterior border of sternomastoid

**D.D**: All para pharyngeal swellings (salivary gland tumors neurogenic tumors, carotid aneurysm)

**Complications**:  
- Laryngeal oedema & stridor  
- Mediastinitis  
- Thrombosis of I.J.V  
- Erosion of carotid artery

**III. Retropharyngeal abscess**:  
Between buccopharyngeal fascia of the post. pharyngeal wall & the prevertebral fascia

**A) Acute R.P.A**:  
**Aet**: Suppuration of retroph. L.N (gland of Henle) following URT infection  

**Incid**: Usually child, as gland atrophies later

**Path**: Abscess occurs to one side of midline

**Symptoms**:  
- Fever, headache, malaise  
- Severe dysphagia  
- Nasal obstruction if spreads up  
- Stridor due to laryngeal oedema
**Signs:**
- Fever, tachycardia, torticollis with flexed neck
- Swelling in the post-pharyngeal wall to one side of midline with hyperaemia & congestion
- Large tender cervical L.N.

**Investigations:**
- Xray: widening of prevertebral space - CT

**Treatment:**
1. Incision & drainage: trans oral route.
2. Tracheostomy if stridor.
3. Parenteral antibiotics.

**B) Chronic R.P.A (cold abscess, Pott’s disease)**

**Aet:** T.B of cervical spine

**Incid:** In adult, uncommon

**Path:** Cold abscess

**Symptoms:**
- **General:** TB toxaemia, night fever, night sweat, loss of wt, loss of appetite
- **Local:** Sore throat & odynophagia

**Signs:**
- **General:** Neurological signs
  
  Associated pulmonary T.B
  
  **Local:** Bulge of post. Pharyngeal wall
  
  Tenderness over cervical spine

**Investigation:**
1. X-ray: destroyed vertebral bodies, chest x ray.
2. Sputum analysis, tuberculin test, needle biopsy.

**Treatment:**
1. Anti tuberculous ttt.
2. Incision & drainage along post. border of sternomastoid.
3. Orthopaedic ttt.
**IV. Ludwig’s angina**

**Def:** Suppuration in submandibular space.

**Aet:** Dental causes in 90%, infection of lower tooth.
- extraction of septic tooth.

**Incid:** More in diabetics.

**Symptoms:**
- **General:** Fever, headache, malaise
- **Local:** Severe pain with dysphagia, muffled voice, difficult respiration

**Signs:**
- **General:** Fever, tachycardia
- **Local:**
  - Massive indurated tender neck swelling
  - Swollen floor of mouth with the tongue pushed upwards

**Treatment:**
1. Parenteral antibiotics, antipyretics, analgesics
2. Secure airway: tracheostomy
3. Drainage: a free incision for decompression

**Stomatitis & Oropharyngeal Ulceration**

**I Traumatic**

A) **Mechanical:** Stiff bristles of tooth brush, fish bones, cheek biting, ill fitting denture, all have serrated edge with soft base

B) **Chemical:** Corrosives.

C) **Physical:** Thermal due to hot foods, radio therapy (xero stomia)

  - Topical antibiotic with cortisone (oro base)

**II. Infective:**

A) **Bacterial:**
- **Acute:** pharyngitis, tonsillitis, diphtheria, vincent’s
- **Chronic:** T.B.

B) **Viral**

1. **Exanthemata:** e.g. measles, Kopliks spots in the cheek opposite the molar teeth in the febrile stage, before rash appear.

2. **Herpes simplex : type I** Prodroma of fever, headache, malaise followed by severe vesicular & ulcerative stomatitis, vesicles rupture to form multiple shallow ulcers
3- **Herpes zoster**
- caused by varicella zoster
- vesicular eruption occurs along 5,9,10 cranial nerves
- strictly unilateral with severe dysphagia, vesicles & ulcers
- usually accompanied by H.Z.oticus **ttt:** analgesics & acyclovir

3- **AIDS**
caused by HIV

NB: E.N.T. manifestations of AIDS:

- Sever intercurrent infections (especially mucormycosis)
- Oropharyngeal ulceration **Moniliasis**
- Hairy leukoplakia **cervical LN**
- Kaposi sarcoma

4- **Herpangina** (foot & mouth disease) caused by coxsakie virus, occurs in epidemics especially in children with vesicles & ulcers on the feet, hands, & oral cavity

5- **Infectious mononucleosis**

C) **Fungal ( moniliasis )**

**III. Neoplastic**
malignant ulcer: raised everted edge, necrotic floor & indurated base

**IV. Miscellaneous**

**Allergic stomatitis**
- Chemical or contact allergy e.g lip stick, tooth paste
- Vesicles rupture …… ulcers

**Aphthous stomatitis**
- Aetiology is unknown may be abnormal immune reaction to oral bacteria viral infection, autoimmune, endocrinal disturbance.
- Multiple superficial recurrent ulcers
- **ttt** mouth wash, tetracycline, topical steroids, levamezole

**Blood diseases**
- leukaemia
- agranulocytosis

**Behcet syndrome** oral ulceration, genital ulceration, irido cyclitis

**ttt:** steroids

**Cancrum oris**
Rapidly spreading ulceration up to gangrene usually in children with low resistance
**Dyspeptic ulcers:**
- Related to constipation, diarrhea, hyperacidity
- Small, painful, superficial

**Drugs & metals:** Epanutine, lead … gingival hypertrophy & ulcerations

**Metabolic: D.M:** xerostomia, red painful tongue **uraemia:** brown coated tongue

**Vitamin deficiency**
+ B: glossitis & angular stomatitis
+ C: scurvy: swollen gums that bleeds easily

**Pre cancerous lesion** leukoplakia raised white patches.

**Skin diseases**
- pemphigus! autoimmune
  - Bullae ……rupture…….painful ulcers on the palate, buccal mucosa & tongue.
  - Rubbing of oral mucosa……bulla formation (diagnostic)
  - Ocular & neurological manifestations
  - Biopsy: acantholysis ttt by steroids.
- **Bullous pemphigoid** less severe
  - Oral lesions similar to pemphigus with no other lesions
  - No acantholysis on biopsy- chronic course

-Lichen planus: reticular: raised interlacing whitish lesion
  - Erosive: painful erythematous ulcer (premalignant)
  - Biopsy is diagnostic, ttt by steroids

-Lupus erythematosis

-Erythema multiformis
  - Delayed hypersensitivity …… bullae……..ulcers ttt by steroids

**Oropharyngeal tumors**

**Benign:** papilloma: in tonsil or soft palate Mixed salivary tumors

**Malignant:**

Squamous cell carcinoma: old males with risk factors, malignant ulcer
  Ttt: surgery &/or radiotherapy

Sarcoma: mostly non Hodgkin lymphoma, Ttt: chemoradiotherapy
**Tonsillectomy**

**Indications**

1. Repeated attacks of acute tonsillitis
2. Rheumatic fever, RHD, glomerulonephritis due to B haemolytic streptococci
3. Septic focus with:
   - Recurrent sore throat
   - Recurrent URT infection
   - Recurrent otitis media, pharyngitis, bronchitis
   - Foetor oris
   - Other manifestation of septic focus
4. Tonsillar hypertrophy with
   - Obstructive sleep apnea
   - Difficult swallow
   - Recurrent cough
5. Trauma to the tonsils
6. Tumors of the tonsil (unilateral tonsillectomy)
   a. Benign: papilloma, fibroma
   b. Malignant: as biopsy
   c. At end stage in occult primary
7. Tonsillolithiasis (impacted F.B)
8. Abscess: quinsy to avoid recurrence
9. Bleeding: persistent or recurrent
10. Cervical adenitis e.g T.B not resolving with medical treatment
11. Diphtheria carrier

**Contraindications:**

1. Blood diseases e.g haemophilia, purpura
2. Patient on aspirin or NSAID to avoid bleeding.
3. Uncontrolled systemic disease e.g heart failure
4. Active rheumatic fever
5. Acute infection e.g tonsillitis or URT infection
6. Exanthemata e.g measles, chicken pox
7. Epidemics of polio
8. Peritonsillar abscess

**Pre operative preparation**

A) History & exam To exclude contra indications (acute attack)
B) investigations
1- CBC including HB %, blood group, ESR
2- Coagulation profile
   - Bleeding time B.T (N: 1-4 min)
   - Clotting time C.T (N: 4-10 min)
   - Prothrombin time P.T (N: 12 sec)
   - Prothrombin concentration P.C (N: 100%)
   - Partial thromboplastin time PTT (N: 25-45 s)
C) Fasting 6h before surgery:
D) On the morning of surgery Check vital signs & tonsils

Technique
Anaesthesia usually general with cuffed tube
Position supine with neck extended
Procedure dissection method (usual one)
   - Guillotine, cryosurgery: old, rarely
   - Laser tonsillectomy: less pain & bleeding
   - Coblation and radiofrequency

Post operative care:
1- Patient is placed in tonsillectomy position
2- Observe for:
   a. Vital signs weak rapid pulse & hypotension denote bleeding
   b. Bleeding : frequent swallow, spitting of blood or vomiting of dark blood
   c. Respiration : irregular respiration or cyanosis
3- Medications:
   - Antibiotics for 10 days
   - Analgesics & antipyretics (paracetamol)
   - Vitamins
   - Decongestant nasal drops (if adenoidectomy)
4- Feeding:
   - Starts 4h. after surgery!
   - Semisolids & cold drinks in the first day
   - From 2nd to 10th day avoid hard, spicy & hot foods.
Complications of tonsillectomy:

1- Anaesthetic complications

Cardiac Arrest  Aspiration of blood or vomitus
Succinyl choline Apnea  Anaphylaxis

2- Post tonsillectomy bleeding

a) primary  during or immediately after
Due to: - Bad technique  - Bleeding tendency  - Bad preparation
ttt:  - ligation, suture or diathermy to bleeding point  - Suture pillars together
  - ECA ligation may be needed  - Correct shock (fluids & blood)

b) Reactionary:  During first 24 h
Due to: - Slipped ligature, open of collapsed vessels, bleeding tendency
ttt:  conservative if mild :  - Sedation, coagulants,  H₂O₂ mouth wash
  - Remove blood clots from tonsillar bed
  - Firm pressure on the bed using tonsillar clamp

Surgical: if bleeding is severe or persistent take patient back to theatre ttt as primary

c) Secondary  On 5th to 12th day due to infection
Ttt:  Conservative Like reactionary + systemic parental antibiotics for 4 days

Surgical if bleeding is severe or persistent
  a. ligature or suture : difficult due to tissue friability
  b. suture pillars together over a pack
  c. ECA ligation may be needed
d. Correct shock

3- Respiratory complications

A- Obstruction  The most serious & may be fatal
May be due to:
  - Laryngeal spasm : extubation spasm , or cord irritation by secretions or blood
  - Falling back of the tongue ( incomplete recovery )
  - Inhaled F.B or vomitus
  - laryngeal oedema from intubation

b- Infection  Pneumonia, lung abscess due to inhaled F.B
4- Injury:
- Dental from intubation or mouth gag
- Injury to uvula, soft palate, tongue
- TMJ dislocation
- Atrophy of the uvula

5- Infection: Otitis media, para pharyngeal abscess, cervical adenitis, bacteraemia

6- Incomplete removal: Remnants regrow & become infected (revision surgery).

**Hypo pharynx**

**Plummer vinson syndrome (paterson – brown kelly syndrome)**

*Def*: Chronic atrophic pharyngo oesophagitis

*Aet*: Fe deficiency  
*Incid*: more in females

*Path*: Atrophy of mucosa, submucosal fibrosis with stricture & web formation

*Clinical picture*:
1- Dysphagia: due to stricture or web
2- Glossitis, fissured angle of the mouth
3- Koilonychia: spooning of nails
4- Achlorhydria due to atrophic gastritis
5- Splenomegaly
6- Fe deficiency anemia

*Treatment*: 1- Fe supplements & proper nutrition
2- repeated dilatation
3- Regular follow up

*Complication*: Condition is precancerous……..post cricoid carcinoma

**Hypo pharyngeal carcinoma**

*Def*: Malignant tumor of the hypo pharynx

*Aet*: Predisposing factors:  
1- Tobacco smoking & alcohol consumption
2- Irradiation
3- Plummer vinson syndrome

*Incid*: Old age > 50 more, in males

Post cricoid occurs in young (20-40 y) female if on top of P.V.S

*Path*:
- **Site**: Piriform fossa 50%, post cricoid 40%, post pharyngeal wall 10%
- **G.P**: Malignant ulcer or fungating mass
- M.P Almost always squamous cell carcinoma

- Spread:
  A) Direct: high tendency to sub mucosal extension
  B) Lymphatic: common, early & may be bilateral DCLN, paratracheal & mediastinal LN
  C) Blood: late lung, liver & bones

Symptoms:

1- Gradual progressive dysphagia first to solids later to fluids in addition.
2- Pain in the throat & ipsilateral referred otalgia.
3- Hoarseness of voice due to V.F fixation, infiltration of RLN
4- Stridor: due to extension to larynx or bilateral V.F paralysis
5- Painless neck mass gradual onset, progressive course: LN or extra laryngeal spread.
6- Regurgitation, choking, cough
7- Spitting of blood, WT loss
8- Symptoms of distant spread.

Signs:

A) General: 1- Under weight, Fe deficiency anaemia
  2- Respiratory distress
  3- Signs of distant metastasis

B) Local:

1- External neck examination
   - Enlarged cervical LN (Describe)
   - Absent laryngeal click (+ ve mour’s sign)
   - Larynx is pushed forwards
   - Fixation of larynx.

2- Indirect laryngoscopy or flexible or rigid endoscope: may show:
   - Tumor itself: ulcer or fungating mass
   - Froth in piriform fossa or post cricoid
   - Invasion of the larynx

Investigations:

1- Radiology: Xray lat. View: widening of prevertebral space
   Barium swallow: filling defect
   CT of neck: shows tumor extensions

2- Endoscopy & biopsy

3- Metastatic work up
**Treatment:**

A) **Surgery:**
- The standard is total laryngo pharyngectomy with esophagectomy, recently partial resection tailored to tumor extent
- Neck dissection is mandatory
- Reconstruction of the pharynx:
  - a. Gastric pull up
  - b. Colon inter position
  - c. Myo cutaneous flaps
  - d. Free vascularised flaps

B) **Radio therapy:**
- As a palliative ttt in inoperable cases or as post operative adjuvant therapy

C) **Palliative ttt:** In inoperable or recurrent cases
- Adequate nutrition by ryle feeding or gastrostomy
- Tracheostomy if stridor
- Laser debulking
- Pain killer
- Radio & /or chems therapy

**Pharyngeal pouch (Zenker’s diverticulum)**

**Def:** herniation of the pharyngeal mucosa through a potentially weak area in the posterior pharyngeal wall (killian dehiscence)

**Aet:** Spasm, failure of relaxation, pre mature closure of crico pharyngeal sphincter

**Incid:** more in males > 40 y

**Symptoms:**
- 1-May be asymptomatic
- 2-Dysphagia
- 3-Regurgitation of undigested food
- 4-Neck swelling usually on left side
- 5-Loss of weight

**Signs:**
- 1-unilateral neck swelling, usually LT sided, cystic, compressible, empties with gurgling sensation.
- 2-I.L: may show froth in the piriform fossa.

**Investigations:**
- 1-Barium swallow: retort shaped smooth swelling
- 2-Oesophagoscopy: may show the pouch orifice
**Treatment:**
1-If asymptomatic: no ttt
2-Symptomatic cases
   a. Small: repeated dilatation
cricopharyngeal myotomy
deroscopic crush & stapling
b. Large: diverticulectomy with cricopharyngeal myotomy

**Complications:**
a. oesophageal obstruction       b. chest infection       c. malignant changes

**Septic focus**

**Def:** state of chronic bacteraemia or toxaemia

**Aet:** chronic infection in a part of the body
   Chronic tonsillitis – chronic sinusitis
   Cholycystitis – colitis
   Prostatitis – salpingitis

**Path:** Bacterial toxins produce systemic manifestation

**Clinical picture:**
1-Anemia, fatigue, anorexia       2-Headache, low grade fever
3-Heart: Rheumatic fever, infective endocarditis 4-Lung: bronchiectasis
5-Musculoskletal: myalgia, arthralgia & arthritis 6-Kidney: nephritis

**Occult primary**

**Def:** Enlarged cervical lymph node as the only presenting feature of a carcinoma
(The primary is hidden)

**Aet:** An occult primary may be one of the silent areas
   A) in the head & neck
B) Below the clavicle; Bronchogenic carcinoma, cancer breast, stomach & intestine (virchow’s gland)

**Management:**

I. History:
   1. Usually painless neck mass of insidious onset & rapid in size

II. Examination:
   1. The lump site, size, shape, surface number, consistency, mobility…
   2. Other LN
   3. Full H & N exam
   4. Abdominal exam

III. Investigations:

A) **Radiology:**
   - x ray to head & neck
   - CT from skull base to chest
   - Barium swallow, meal & enema
   - Thyroid scan

B) **Endoscopy:** under GA
   - Pan endoscopy (naso pharyngoscopy, laryngoscopy hypo pharyngoscopy, Bronchoscopy & oesophagoscopy)
   - If suspicious lesion …………… biopsy
   - If no suspicious lesion ………..blind biopsy

C) **FNAC:** (fine needle aspiration cytology) for the lump

**NB:** never to excise the neck node before exhaustive search for the primary because:
   a. Biopsy does not give clue to site of the primary: as it is usually squ. cell carcinoma
   b. Spillage of tumor cells may occur
   c. Incision may interfere later with plane of neck dissection
   d. Patient may have false sense of security

**Ttt:** If no primary was found: radical neck dissection with follow up

**Velopharyngeal incompetence**

**Def:** Failure of the soft palate to close the NPX, during speech or swallowing

**Act:**
- **congenital:** cleft palate
- **Traumatic:** perforation, radiotherapy & post operative
- **Inflammatory:** scleroma(scarring), S (perforation)
- **Neuromuscular:** palatal paralysis
- **Functional:** faulty learning
Clinical picture: rhinolalia aperta & nasal regurge

Ttt: Speech therapy  Obturator: limited value
Surgery: palatal repair  Palatal push pack
Pharyngeal augmentation to narrow the pharynx
Pharyngopalatoplasty by various flaps

Globus pharyngis (globus hystericus)

Sensation of lump in the throat with no organic cause, mostly on swallowing saliva, more in females, normal barium swallow & endoscopy

Ttt: Reassurance & psychotherapy

Palatal & pharyngeal paralysis

Aet: supranuclear, rare: requires bilateral cortical lesion
Nuclear (nucleus ambiguous): bulbar palsy or cranial poliomyelitis
Infranuclear: fracture base, parapharyngeal space tumor

Symptoms: unilateral: palatal: no symptoms due to compensation

Pharyngeal: patient sleeps on normal side to avoid aspiration of saliva

Bilateral: palatal: nasal regurge & rhinolalia aperta
Pharyngeal: aspiration on swallowing

Signs: palate: unilateral: uvula shift to normal side on saying AHH

Bilateral: immobile palate during phonation
Pharyngeal: loss of pharyngeal reflex on the affected side & pooling of secretion in hypopharynx

Invest: modified barium swallow (video fluoroscopy)

Ttt: of the cause

1-unilateral: usually requires no ttt

2-bilateral palatal: upper dental plate with soft palate extension

3-bilateral pharyngeal paralysis: nasogastric tube, suction, tracheostomy & gastrostomy.
Snoring & sleep apnea

Def: *snoring* sound produced during sleep due to partial airway obstruction.

*Sleep apnea*: cessation of respiration during sleep, at nostril & mouth > 10 seconds it is 3 types

- obstructive: no air flow in spite of respiratory effort (commonest)
- central: no air flow with no respiratory effort
- Mixed: start as central then trial of respiratory effort

*Sleep apnea syndrome* (OSAS): 5 episodes of apnea / night h. sleep or 30 episodes of apnea / night sleep

*Apnea index* periods of apnea / 1 h. night sleep

Aet: any condition causing narrowing of the airway

A) Nasopharyngeal
   1-Large nasopharyngeal tumor
   2-Huge adenoids
   3-Ant. & large post packs in children

B) Oro pharyngeal
   1-Marked adenotonsillar hypertrophy
   2-Large lax uvula & soft palate with excess mucosal folds
   3-Large oropharyngeal tumors

C) Hypopharyngeal:
   1-Macro glossia
   2-Micro gnathia
   3-Hypopharyngeal tumors
   4-Oedema due to radiotherapy

Exacerbating factors: 1-Nasal obstruction e.g. D.S, polypi, rhinitis or neoplasm
   2-Obesity
   3-Alcohol & sedatives

Incid: more in male, at older age

Pathogenesis:
Partial narrowing of the upper airway ..........increased – ve intrathoracic pressure ..........acceleration of air currents ..........vibrations of soft tissue ..........snoring. During sleep muscle tone decrease ..........collapse

Clinical picture: results from: oxygen desaturation & high negative intrathoracic pressure

Symptoms: Snoring: disrupted sleep: frequent movement, nocturnal choking, daytime sleep, memory loss

Obstructive episodes
Less common:
Morning headache, personality changes, nocturnal enuresis, impotence
Systemic & pulmonary hypertension, arrhythmias, right heart failure, cardiovascular mortality

Spouse (bed partner): sleep deprived, mood alteration, divorce

Examination may reveal:

a. About 70% of patients are overweight.
b. Short thick neck.
c. Systemic hypertension.
c. Oropharyngeal examination may show:
   - Low hanging redundant palate and large uvula
   - Large (kissing) tonsils.
   - Excessive pharyngeal mucosal folds.
   - Narrow oropharyngeal isthmus.
   - Large tongue.
d. Examine the larynx, nasopharynx and nose for any obstructive lesion

N.B.: Although snoring indicates some degree of obstructed breathing, and although patients who have OSA are loud snorers, yet not all people who snore have OSA

Investigations: to assess general condition, differentiates between snoring & sleep apnea, site of obstruction

1-Polysomnography, is the most sensitive and specific test in the evaluation of OSA. It measures eye movements (electro-occulography), brain activity (EEG), cardiac rhythm (ECG) pulse oximetry (to measure O2 and CO2 saturations), nasal and oral airflow, and respiratory movements (chest & abdominal movements). It allows correct diagnosis, estimation of the magnitude of the problem, and differentiates between obstructive and central sleep apnea.

2-Flexible endoscopy of the naso, and hypopharynx. (Muller’s maneuver) is performed by asking the patient to snore with the mouth closed, which may show collapse in the area.

3-Imaging: lateral cephalometry & CT.

4-Pharyngeal manometry

Treatment:
Depends on: Is it simple snoring or apnea? , patient requests, severity & complications & level of obstruction

A. Medical:
1- Weight reduction.
2- Avoid drugs that depress the CNS e.g. alcohol.
3- Progestin, which is respiratory stimulus (doubtful)
4- Theophylline; increases the hypoxic drive.
5- Protriptyline (non sedating tricyclic anti-depressant).
6- Oxygen therapy. 7- Nasopharyngeal intubation.
8- Tongue retaining devices. 9- Nasal continuous positive air pressure (CPAP).

B. **Surgical:**
Nasal surgery: for all cases for nasal obstruction
Uvulopalatopharyngoplasty (U.P.P.P.)
Laser assisted uvuloplasty (L.A.U.P.)
Palate stiffening (somoplasty)
Maxillofacial surgery: Mandibular advancement
  Hyoid advancement
  Tongue advancement
Tracheostomy: as a last resort

**Halitosis (foetor oris)**

*Def:* Bad mouth odour.

*Aet:* **dental:** bad hygiene, dental caries & pyorrhea.

*Oral:* poor hygiene, stomatitis, ulcers (vincints), chronic tonsillitis with debris in the crypts, ulcerating tumors & mouth dryness (mouth breathing, irradiation, dehydration, smoking & atropine)

*Nasal:* FB, atrophic rhinitis, sinusitis especially dental & ulcerating tumors

**Hypopharynx & esophagus:** pharyngeal pouch & gastro-esophageal reflux

**Pulmonary:** chronic bronchitis, bronchiectasis & lung abscess

**Metabolic:** diabetic ketoacidosis (acetone like)

  Renal failure (urineferous)
  Hepatic failure

**Physiological:** hunger

**Neurosis** (non existing halitosis)
**Trismus**

**Def:** Inability to open the mouth fully.

**Path:** Lesion in either muscle of mastication or TMJ

**Aet:**  **Local:**

1. Lesions causing reflex muscle spasm
   - Dental infections, stomatitis, oral ulcers, quinsy, parapharyngeal abscess, ulcerating tumors, post operative (tonsillectomy)

2. Lesion infiltrating the muscles
   - Maxillary, nasopharyngeal, infratemporal & pterygopalatine tumors

3. Fibrosis of the muscles
   - Post irradiation & prolonged interdental fixation (ttt of mandibular fracture)

4. TMJ disease
   - Arthritis, ankylosis & fracture (neck, condyle or zygomatic arch)

**General:**

1. Tetanus
2. Tetany (low Ca level)
3. Hysteria
4. Neurological: meningitis & bulbar palsy (increase muscle tone)

**Management:** of the cause
### The Oesophagus

**Anatomy:**

*It is a fibromuscular tube which extends from lower edge of hypopharynx (C6) to stomach T11*

Consists of mucosa, submucosa & muscular layer (outer longitudinal & inner circular)

Devoid of serosa except for abdominal part making healing difficult

*It consists of 3 parts:

  - Cervical – thoracic – abdominal

*It has 3 narrowings

  + At upper end (15 cm from central incisors)
  + At level of crossing of aortic arch & Lt Main bronchus (25 cm)
  + At the diaphragm (40 cm)

**Physiology**

Peristaltic movement results in food propulsion towards the stomach

The cricopharyngeus & cardia are normally closed, open on food passage, with positive pressure at rest (in the rest of esophagus: negative)

Mechanism of swallowing (3 stages):

1- Oral (voluntary): tongue pushed against palate, forcing food into pharynx, triggering reflex stages

2- Pharyngeal (involuntary): food stimulates afferent in 5 & 9, efferent travel in 5, 9, 10 & 12 to: elevate soft palate, move palatopharyngeal wall medially, close glottis, elevates the larynx, relax cricopharyngeus & close superior constrictor as bolus passes into esophagus

3- Esophageal (involuntary): solids falls by gravity, liquids pushed by peristalsis

**Clinically:**

I. History: dysphagia, pain & regurgitation.

II. Neck examination.

III. Investigations: Plain x ray, barium swallow, Oesophagoscopy.
**Congenital: esophageal atresia**

**Aet:** Incomplete canalization of wall of foregut

**Incidence:** In 85% associated with tracheo-esophageal fistula

Results from incomplete separation of trachea from esophagus

May present as esophageal atresia with proximal, distal, H shaped fistula

Leads to recurrent pneumonia

Other rare anomalies: duplicated esophagus, web, & stricture

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**F.B in the esophagus**

**Types:**
- In children: coins & buttons
- In adults: fish or meet bone.
- Old: lump of meat, dentures
- Mental & prisoners: razors, pins & needles.

**Sites :**
- At the upper end (below cricopharyngeus)
- Sites of anatomical constrictions
- Sites of previous stricture

**Clinical picture:**
- Dysphagia & regurgitation of food
- Retrosternal dull pain

**Complications :**
- Perforation: mediastinitis; fever & toxaemia
- Ulceration & stenosis – TOF

**Investigation:**
- X ray neck & chest
- Oesophagoscopy

**Treatment:**
- Removal by oesophagoscope under GA
- Rarely external approach if perforation

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**Corrosive oesophagitis & post corrosive stricture**

**Aet:**
1. Caustic potash (KOH)…….liquefactive necrosis (more severe)
2. lysol, phenol, H2SO4…….coagulative necrosis

**Incid:**
- Accidental in children
- Suicidal in adult
A) **Stage of corrosive oesophagitis**

*Symptoms:*  
- Severe pain in mouth, tongue, pharynx  
- Severe dysphagia & regurgitation  
- Stridor due to laryngeal oedema  
- Shock & dehydration

*Signs:* - white sloughs, oedema - skin burns - shock

*Complications:*  
1. Shock, dehydration, electrolyte imbalance  
2. Oesophageal perforation  
3. Esophageal stricture  
4. T.O.F  
5. Stridor  
6. Chest infection

*Treatment:*  
1. Milk & egg white  
2. Management of shock & electrolyte imbalance  
3. Tracheostomy if severe obstruction  
4. Parenteral antibiotics  
5. Cortisone to decrease edema & fibrosis  
6. Rubber naso gastric tube is inserted in 1st few days to facilitate feeding & maintain the lumen  
7. Neutralization of the corrosive!!! (vingar)

B) **Stage of post corrosive stricture**

*Clinical picture:*  
1. Dysphagia reappears 2-3 weeks  
2. Dehydration & starvation  
3. Regurgitation & chest infection

*Investigations:*  
1. Plain x ray neck & chest  
2. Barium swallow: irregular narrow segment  
3. Oesophagoscopy

*Treatment:*  
A) **Permeable stricture:** Regular dilatation via rigid oesophagoscopy  
B) **Impermeable stricture (non dilatable):**  
1. Temporary gastrostomy  
2. Surgery: - Rsection of stricture & free jejunal loop reanastomosis  
   or colon bypass  
   - Oesophagogastostomy or jejunostomy - Stents

Indicated in: non dilatable stricture - complications (cachexia)
Achalasia

**Def**

marked dilatation of the lower 2/3 of the oes. due to closed cardia

**Aet**

neuromuscular incoordination of lower oes. sphincter due to degenerated auerbach’s plexus

**incid**

more in females 30-40 y

**Path**

failure of relaxation or spasm of cardia

**Clinical**

intermittent dysphagia

**Picture**

more to fluids

regurgitation

dull retrosternal pain

**Investigations:**

*Barium*

huge dilatation, fusiform with smooth lower end, absent air in stomach

*oesophagoscopy*

dilatation, stagnation

**Treatment**

re assurance, sedatives amylnitrite before meals repeated dilatation, Heller’s Cardiomyotomy cardioplasty (Vertical incision closed transversely)
esophagogastrostomy in severe cases

Cancer

malignant tumor

**Aet**

alcohol - smoking achalasia plumer - vinson

**incid**

more in males over 60

**Path**

commonest in middle 1/3 ulcer, cauliflower, schirrous, sq. cell carcinoma

**Clinical**

progressive dysphagia

**Picture**

more to solid bloody regurgitation severe pain cachexia + hoarseness of voice

**Stricture oesophagus**

I. congenital: rare

II. Traumatic: a) accidental, corrosive, F.B b) Surgical after resection

III. Inflammatory: reflux oesophagitis, peptic ulceration, TB, $

IV. malignant stricture
Perforation of the oesophagus

Aet: - During oesophagoscopy, dilatation, F.B extraction
- Malignant growth or external injury

Symptoms: - Severe retrosternal pain
- Dyspnea (pneumothorax & empyema)
- Dysphagia

Signs: Fever, toxaemia, shock
- Tenderness & swelling in the neck
- Crepitation due to surgical emphysema

tti: - Control shock
- Nothing by mouth (I.V alimentation or gastrostomy)
- Heavy antibiotics
- Intercostal tube connected to under water seal.

Oesophagoscopy

*Indications:
A) Diagnostic: examination - biopsy
B) Therapeutic: - FB extraction
- Dilatation of non-malignant stricture
- Excision of benign tumor
- Stent in oesophageal carcinoma

*Contraindications: - Acute necrotic ulceration from caustics
- Marked kyphosis
- Aortic aneurysm, vascular tumors.

*Complications: - Perforation - Hge
- Injury to teeth, tongue, pharynx

Flexible esophagoscopy: Usually performed by gastroenterologists, to assess functional phenomenon suppressed by general anesthesia, or if rigid is contraindicated
**Gastro esophageal reflux disease (G.E.R.D.)**

**Def:** Retrograde flow of gastric contents back into the esophagus

**Aet:** Normally reflux is prevented by:

- Positive pressure of the cardia.
- Contraction of the crura of the diaphragm.
- The angle between the esophagus & the stomach.

Decrease lower esophageal segment (LES) pressure is the major factor to GERD, it is affected by: smoking, alcohol, drugs, hormones, neuromuscular disease & delayed gastric emptying.

**ENT manifestations:**
- Heartburn, water brash (classic)
- Choking, hoarseness, subglottic stenosis, globus hystericus
- Asthma & chronic cough, otalgia, odynophagia

**Diagnosis:** PH manometry (Ph less than 4 more than 6% of time is diagnostic)

**Management:**

**Phase 1:** Dietary & life style modification, with anti-acids

- Encourage protein meals (increase LES pressure)
- Discourage fatty meals (decrease LES pressure)
- Avoid chocolate, carbonated beverages & caffeine
- Avoid smoking, alcohol & over eating
- Last meal 3 hours before sleep

**Phase 2:** if failed phase 1, give medication to decrease HCL production, increase LES pressure & promotes gastric emptying (H2 blockers e.g cimitidine,proton pump inhibitors e.g omeprazole)

**Phase 3:** surgery in: failed medical ttt, complications or with hiatus hernia……correct hernia with fundoplication

**Dysphagia**

**Def:** Dysphagia is defined as difficulty on swallowing , when associated with pain is called odynophagia.

**Classification of the causes**

I. **Oesophageal causes:**

   A. Causes in the lumen: Foreign body
B. causes in the wall:

1. *Congenital diseases:*
   a. congenital atresia or stenosis of the oesophagus.
   b. tracheo-oesophageal fistula (the commonest anomaly)

2. *Traumatic:*
   a. foreign body
   b. oesophagoscopy and instrumentation
   c. Chemical: ingestion of corrosives which lead to stricture formation.
   d. External injury (rare).

3. *Inflammatory:*
   a. acute ulcerations:
      - Corrosives.
      - Drugs, and specific fevers, e.g. typhoid and scarlet fever.
      - Persistent vomiting.
      - moniliasis
   b. chronic inflammatory changes in:
      - Reflux oesophagitis
      - Peptic ulceration
      - Pullmer vinson syndrome.

4. *Neoplastic:*
   a. Benign tumours (rare) : e.g. leiomyoma, fibroma.
   b. Malignant tumours : carcinoma.

5. *Neurological: (Functional disordes of the swallowing mechanism)*
   a. Paralytic : paralysis of the pharyngeal and oesophageal muscles due to
   b. Incoordinated motility :
      - Pharyngeal pouch
      - Achalasia of the cardia
      - Diffuse oesophageal spasm

C. Pressure on the oesophagus from outside

1. *in the cervical region (upper 1/3)*
   a. malignant thyroid tumor     b. huge multinodular goiter
   c. enlarged cervical lymph nodes e.g. metastasis, and lymphoma
2. in the thorax (middle 1/3)
   a. Mediastinal tumours  
   b. Pericardial effusion
   c. Enlarged left atrium  
   d. Bronchogenic carcinoma
   e. Aneurysm of the aorta

3. in the abdomen (lower 1/3)
   a. Enlarged left lobe of liver  
   b. Paraesophageal hiatus hernia

II. Extraoesophageal causes:

1. Nasal: nasal obstruction in infants (e.g. adenoids), and nasopharyngeal fibroma, they cause difficulty in feeding

2. Oral:
   a. Congenital: cleft palate
   b. Traumatic: injuries, corrosives, palatal tear
   c. Inflammatory:
      - stomatitis & ulcerations of mouth, gums and tongue
      - glossitis, dental sepsis
      - sialadenitis
      - Ludwig’s angina
   d. Tumors of the oral cavity e.g. carcinoma of tongue, palate, tonsils.
   e. Miscellaneous: tongue paralysis

3. Pharyngeal:
   a. Congenital: web, stricture
   b. Traumatic: lacerations, corrosives.
   c. Inflammatory:
      - Acute and chronic pharyngitis  
      - Acute and chronic tonsillitis
      - Quinsy
      - Retropharyngeal abscess
      - Parapharyngeal abscess
      - Pulmmer vinson
   d. Tumors: Oropharyngeal and hypopharyngeal carcinoma
   e. Miscellaneous: pharyngeal pouch, globus hystericus

4. Laryngeal:
   a. Perichondritis  
   b. T.B.
   b. Any lesion involving the inlet of the larynx (epiglottis, arytenoids, aryepiglottic folds) e.g. supraglottic carcinoma, arytenoid edema
   c. Laryngopharyngeal malignancies
   d. Laryngeal incompetence: choking & cough
Laser In ENT

Def:
- Laser is the abbreviation of light Amplification by Stimulated Emission of Radiation
- The history of laser begins in 1917 with Einstein who discovered stimulated emission, in 1960, Maiman made the first laser.
- The radiant energy emitted by laser has 3 characters: monochromatic (one wave length), coherent (in one phase) & collimated (parallel)
- Laser has 3 essential elements: lasing medium (gas, liquid or solids)

  Excitation source (e.g. electrical)
  Two mirrors for optical feedback

Advantages of laser use:
- Precise dissection
- Non touch technique
- Less operative bleeding
- Less post operative pain
- Minimal post operative edema & scarring
- Possibility of local anesthesia
- Less post operative hospital stay & cost

Types of laser used in medicine: (according to lasing medium)

1- CO₂ laser
2- Argon laser
3- ND: YAG
4- KTP laser
5- Diode
6- Dye laser

Carbon dioxide laser:

Most common type, wave length 10.6 um (invisible), site indicated by helium – neon aiming beam.

Intracellular water absorbs light energy causing cell vaporization, used by hand piece, or connected to operating microscope

Uses of CO₂ laser in ENT

A) Nasal surgery

- Cong.: Choanal atresia
- Inflammatory: laser turbinectomy
- In seileroma: excision of localized mass, widening of nostril after fibrosis
- Allergy: laser polypectomy
- septum: laser septoplasty
- Neoplastic excision of benign tumors - Epistaxis photo coagulation of HHT
- external rhinologic laser surgery: excision of rhinophyma, keloids, scars.

B) Laryngeal surgery:

Cong: laryngeal web, laryngomalacia

Traumatic: subglottic stenosis

Inflammatory: V.F nodules, polyps & cyst, Reink’s oedema

Neoplastic: Benign papilloma especially in children

Malignant: curative in T1, palliative in advanced cases

Miscell: bil abductor paralysis: laser arytenoidectomy & post cordectomy

C) Oral cavity & oro pharynx

1- Tonsillectomy: dissection or cryptolysis
2- LAUP (laser assisted uvula palatoplasty) in snoring
3- Partial tongue resection in OSA
4- Lingual tonsillectomy
5- Excision of haemangioma, laukoplakia

D) Otological surgery

1- Excision of auricular lesion
2- Laser myringotomy: for ventilation
3- Laser tympanoplasty: removal of granulation tissue
4- Laser stapedotomy (precise, haemostasis, visualization & less cochlear damage)
5- Removal of cerebello pontine angle tumor

Precautions for CO₂ laser surgery

1- Protect the eye: Patient eye by moist eye bag, operating room personnel by protective glasses, a sign placed outside laser room
2- Protect adjacent tissues with wet cotton, gauze or drapes
3- Avoid flammable anesthesia
4- Use endotracheal tubes specially designed for laser
Head & neck swellings

I- Lateral swellings

1- Lymph nodes:
   a- Inflammatory:
      Acute: non specific lymphadenitis,
            specific infectious mononucleosis
      Chronic: non specific
            Specific: TB syphilis

   b- Primary malignancy (lymphomas)
   c- Blood diseases e.g. leukemia
   d- Metastatic
   e- Others: metabolic & autoimmune e.g. AIDS

2- Branchial cyst:
   From remnants of second branchial cleft
   Cystic swelling under the anterior border of upper third of sternomastoid
   Aspirated fluid contains cholesterol crystals
   Track passes via bifurcation of CCA to lateral pharyngeal wall, behind the tonsil

3- Pharyngeal pouch

4- Parotid swellings
   Present below and infront of the auricle,
   Divided by facial nerve into superficial and deep lobes
   Parotid duct (stenson): open into inner aspect of cheek opposite second upper molar tooth
   Swelling may be 1-Inflammatory (sialadenitis)
2-Neoplastic a. benign: Pleomorphic adenoma (most common)
  Warthins tumor (adenolymphoma)
  Hemangioma and lymphangioma
b. malignant: adenoid cystic carcinoma (commonest)
  mucoepidermoid
  adenocarcinoma

Malignancy suspected if: rapid growth, facial palsy, pain, hardness, fixation, and LN

5-Submandibular swellings
Present below the mandible
Divided by mylohyoid into superficial and deep lobes
The duct (Wharton) opens into the floor of the mouth
Related to lingual and hypoglossal nerves
More commonly affected by calculi (viscid secretion and drainage against gravity)
Swelling may be 1- Inflammatory (sialadenitis): swelling enlarges with meals
  2- Neoplastic (as parotid)

6-Laryngocele: external or combined type

II- Midline swellings
7-Thyroid gland related swellings:
a: Goiter: Enlarged thyroid gland, that present as a butterfly shaped swelling in the lower neck that moves up & down with deglutition
  - Simple physiological goiter
  - Simple nodular goiter: usually multinodular, may be solitary nodule.
- Colloid goiter: enlarged gland with irregular surface & soft consistency
- Toxic goiter (thyrotoxicosis)

b- Thyroid neoplasms:

Benign: follicular adenoma, presents as solitary nodule

Malignant:

Papillary carcinoma: spread to LN
Follicular carcinoma: invade the capsule & spread by blood
Anaplastic carcinoma: local, lymphatic & blood spread (lethal)
medullary carcinoma: familial, secretes calcitonin (tumor marker), lymphatic & blood spread

C- Thyroglossal cyst:

Any where along the course of thyroglossal duct, commonly beneath the hyoid, moves up with swallowing as with tongue protrusion.

e- Thyroglossal fistula:

Follows infection or inadequate removal of thyroglossal cyst.

8- Ranula: Retention cyst arise from sublingual salivary gland, contains a gelatinous material

Form a cystic swelling on one side of floor of mouth, may present in Submandibular region as well (plunging or Thomson ranula)
**Emergencies in E.N.T**

**Ear:**
**Trauma:** Auricle: cut wound, hematoma  
EAC: FB  
TM: traumatic perforation, otitic barotrauma  
Fracture skull base & CSF otorrhea

**Inflammation:** Complications of otitis media  
Vestibular neuronitis

**Miscellaneous:** Traumatic facial paralysis, accidental or post operative  
Sudden SNHL: give high dose of cortisone early

**Nose**
**Trauma:** Fracture  
FB  
Septal hematoma  
Septal abscess  
CSF rhinorrhea

**Inflammation:** Complications of sinusitis

**Epistaxis**

**Sudden blindness post FESS:** immediate orbital & optic nerve decompression, high dose of steroids

**Throat & esophagus**
**FB:** larynx, trachea, pharynx & esophagus

**Corrosive ingestion**

**Stridor**