

ENT Lectures

Introduction to Otolaryngology

- **Pre-slides**
 - Everything in *Lecture Notes: ENT* is required in the exam + a book called *Key Topics: Foreign Bodies* chapter.
- ENT is an acronym for Ear, Nose, and Throat. This is the layman's term. The medical term is otorhinolaryngology.
 - Oto: ears
 - Rhino: nose
 - Laryngo: larynx
 - HNS: Head and neck surgery, maxillofacial, plastic surgery is an overlap area.
 - Base of skull surgery - Roof of the nose is the base of the anterior cranial fossa, etc.
- A patient comes through to our clinic with epistaxis (bleeding from the nose); physical examination will start before history passively. History is not always necessarily preceding the physical examination.
- History
 - Ear symptoms: Hearing Loss
 - hearing loss, ak.a. hearing impairment or deafness. When we say a person is deaf this doesn't mean that he doesn't hear me, this can be partial or complete deafness. other symptoms are ear pain (otalgia), discharge from the ear (otorrhea), tinnitus (hearing abnormal noise), vertigo (dizziness), ear itching, aural fullness (heaviness in the ear).
 - We have to ask the patient if its sudden or gradual, partial or complete, stable or progressive, constant or episodic, and unilateral or bilateral. We also have to tailor our treatment based on what the patient wants, what sort of occupation they have, etc. The most important is bilateralism of the symptoms
 - Ear symptoms: Ootalgia
 - We have to ask the normal SOCRATES associated with pain. Primary otalgia is a pathology in the ear, secondary is pathology outside of the ear (referred otalgia). Referred pain - two organs with same innervation getting the same symptoms. This means that we have referred otalgia.
 - REFERRED OTALGIA IS MORE COMMON THAN PRIMARY OTALGIA.
 - THE MOST COMMON CAUSE OF OTALGIA IS REFERRED OTALGIA.
 - Thus we have to know the sensory supply for the ear and the organs that they supply to allow us to know where to look for secondary pathologies. We will be able to do that in the physical examination. Upon finding an abnormal ear, this

is primary otalgia. If the ear is normal in examination, this means that there is secondary otalgia.

- **Sensory innervation of the ear:**
 - **Vagus nerve (X) gives a branch to the external ear → Arnold's branch of the vagus nerve for pain sensation.**
 - **Trigeminal (V)**
 - **V1 Ophthalmic**
 - **V2 Maxillary**
 - **V3 Mandibular: this is the one that supplies the ear.**
 - **Glossopharyngeal (IX) gives the pharynx and might be a cause of referred pain in the ear.**
 - **C2-C3 in the cervical plexus giving us two branches, greater auricular nerve and lesser occipital nerve supplying the external ear.**
 - **Facial nerve (VII) is mainly a motor nerve (2/3 of the fibers); the rest are sensory. They give special taste sensation through the chorda tympani nerve.**
 - **V3: Trigeminal for sensation, pain, touch and temperature.**
 - **Posterior one third is glossopharyngeal (IX) for taste, pain touch and temperature**
 - **Which structures might have pathologies and may result in referred otalgia?**
 - **Oral cavity through trigeminal**
 - **Pharynx through glossopharyngeal**
 - **Nasal cavity through trigeminal**
 - **Dental through mandibular branch of the trigeminal**
 - **DENTAL IS THE MOST COMMON SITE OF ORIGIN OF REFERRED OTALGIA**
 - **TMJ through trigeminal**
 - **Larynx through vagus nerve (2 branches - recurrent laryngeal and superior laryngeal nerve)**
 - **Cervical disc prolapse/occipital skin lesion through C2-C3**
- **Ear Symptoms: Otorrhea**
 - **Colour - blood-stained or not. If it's yellowish, bacterial infection. Greenish → pseudomonas aeruginosa (gram-negative bacilli) is one of the worst bacteria to have an infection from because it's multi-drug resistant.**
 - **History of trauma: clear, serous fluid due to CSF leak or otorrhea.**
 - **Character - serous fluid from CSF, purulent → bacterial infection, mucoid → tympanic membrane perforation or rupture.**
 - **Tympanic membrane layers: Middle fibrous layer, outer layer is stratified squamous, inner layer → anything but stratified squamous. ADD THE LAYERS OF THE EAR AND THEIR COVERING**
- **Ear Symptoms: Tinnitus**

- Objective and subjective tinnitus
 - Objective: examiner may even hear the tinnitus “ TMJ problems “
 - 99.9% of the tinnitus is subjective; only the patient hears the tinnitus.
- Very common symptoms, 10% of the general population have tinnitus. Presbycusis (presby - age related changes in hearing) due to nerves resulting in hearing loss. A lot of the older population like to stick the radio to their ears. This is so they can overcome or ignore the abnormal tinnital noise with a different kind of noise of their choice. Some of the 10% have tinnitus so severe that it is affecting their everyday function and environment. It will usually affect the patient more in night because it is a quiet environment.
- Pulsatile/nonpulsatile: one of the best descriptions of tinnitus. The patient might hear their heartbeat, which is pulsatile tinnitus. Anything can cause either. With pulsatile tinnitus, we have to think of a few things to rule out. Anything with hearing rule may cause tinnitus.
 - Causes of pulsatile tinnitus:
 - Carotid atherosclerosis
 - In the middle ear, we have the carotid artery running from below, curving anterior and inferior to the middle ear, going inside and then curving again and then anastomoses with the circle of willis. This kink at the very beginning with atherosclerosis at that area will cause the change of blood flow from normal to turbulent flow. This change will be right beside the ear.
 - AVM, carotid aneurysm
 - Glomus Jugulare Tumour
 - The venous drainage from the brain is the superior and inferior sagittal sinus, to transverse, lateral, sigmoid sinus. At the sigmoid sinus, we have the jugular bulb, which is right below the middle ear. Some cells in the jugular bulb form a tumour resulting in venous hum and pulsatile tinnitus.
 - Hypertension
 - Uncontrolled HTN patients will have bilateral tinnitus because the blood tension will increase on the blood vessels.
 - Hyperdynamic circulations
 - the blood will keep being turbulent → anemia polycythemia vera, thyrotoxicosis, pregnancy, exercise, fever, thiamine deficiency, Paget’s disease of the bone (if it hits the temporal bone → new vascularization → turbulent blood flow)

- Ear symptoms: Dizziness/Vertigo
 - What is the difference between dizziness and vertigo?
 - Vertigo is a true rotatory movement of the patient, the things around him, or anything. Dizziness is a general term than encompasses vertigo as well. Anything may cause dizziness and/or vertigo. the inner ear comprises only 20% of cases of dizziness; ear is not the only cause behind dizziness. Hyper/hypotensive/glycemia, electrolyte imbalance are major causes of dizziness. tumour, MI, CVA, hemorrhage, cervical disc prolapse are other minor causes of dizziness. Hypo/hyperthyroidism, vitamin D deficiency are other causes of dizziness. NOT EVERY DIZZINESS → EAR CAUSE
 - Syncope, light-headedness, vertigo are kinds of dizziness.
 - A patient with dizziness or vertigo, we suspect the problem is in the ear. We ask the patient about the duration (excluding non-otological causes) and they respond with
 - Seconds and minutes especially related with changes of position → Benign Paroxysmal Positional Vertigo BPPV
 - Hours - 2 days → Meniere's disease
 - Days - weeks → Labyrinthitis or vestibular neuritis
 - we have to ask about the impact on daily life → is it getting better or worse? This will determine how aggressive we are in the management or treatment of the patient.
- Ear symptoms: Ear itching
 - Any inflammatory process in the external ear may cause itching.
- Ear symptoms: Aural fullness
 - heaviness in the ear
 - eustachian tube: connects the nasopharynx and the middle ear
 - Functions (3)
 - Ventilation of the middle ear
 - Equalization of the pressure around the tympanic membrane
 - drainage of the middle ear secretions
 - The middle ear is lined by mucosa. This mucosa goes through the eustachian tube down to the nasopharynx.
 - Prevents reflux of nasopharyngeal contents
 - By closing. The levator vili pallatini and tensor vili pallatini muscles will constrict. Salpingo
 - Tensor villi is supplied by the mandibular nerve from the trigiminal but levator villi and sulpingopharengous are supplied by the pharyngeal plexus mainly from the pharyngeal branch of the vagus

- With eustachian tube dysfunction, the ventilation in the middle ear will decrease, the pressure will thereby decrease as well through the resorption of air. Thus, it will have a relative negative pressure resulting a retracted tympanic membrane. the patient who gets that will feel aural fullness. When we go down in the plane, this will reverse and the ear will 'pop'.
- Nasal symptoms: General
 - We have to stress asking about the unilateral/bilateral causes. Bilateral → function problems such as inflammation. Unilateral might be mass (polyp), fracture, foreign body.
 - We have to ask the patient if it's continuous or intermittent. If continuous, this might mean it's an anatomical problem.
- Nasal symptoms: Sleep apnea, snoring, mouth breathing, etc.
 - sleep apnea - cessation of breathing for at least 10 seconds
 - We can divide it according to
 - Obstructive
 - At the nasal cavity, nasopharynx, oral cavity, oropharynx
 - Central
 - Respiratory center in the brainstem, especially in prolonged congested patients
 - Mixed
 - Snoring - Stertor is snoring when awake
 - Partial obstruction. The level of obstruction will be supralaryngeal. if it was complete obstruction, we would get apnea and no air would come out.
 - A partial obstruction at larynx or trachea, the patient will get stridor
- Rhinorrhea - Nasal discharge
 - Colour, uni/bilateral, unilateral serous (CSF rhinorrhea and leak), character (serous → viral rhinosinusitis or allergy), purulent (bacterial), mucoid (allergy)
 - Sneezing probably due to any inflammatory condition
 - Lining epithelium for the mucosa → ciliated pseudostratified columnar epithelium. This mucous through ciliary movement is pushed into the oropharynx. The amount of mucous production daily is 500 - 1500 ml.
 - Sometimes the nerve endings in the pharynx (GERD reflux) will cause increased sensitivity to the nerve endings that the patient will get annoyed with even the normal production of mucous.
- Headache
 - The patient will feel pain right where the sinuses are affected. sphenoid → parietal or occipital pain. facial → facial headache. second premolar

and first two molars' roots go into the floor of the maxillary sinus →
with a dental pathology, this will cause sinusitis.

- Epistaxis - bleeding from the nose
 - Unilateral vs. bilateral
 - have to ask about the symptoms of anemia
 - bleeding from other orifices
 - drugs: anticoagulant, antiplatelets.
 - history of trauma
- Nasal deformity
 - Too big or small nose
- Change in smell sensation
 - Temporal lobe of the brain is responsible for smell sensation. The pathology might thus be central, like temporal lobe seizures, CVA, tumours, hemorrhages all in the area of the temporal lobe.
 - Olfactory nerve (I) might have a pathology.
 - hyposmia is the reduction in the ability to smell in the patient.
 - anosmia - total loss of smell sensation in the patient.
 - dysosmia - abnormal smell sensation
 - 1) parosmia: smell an orange like a banana. Smell something like another
 - 2) cacosmia: Smell something that is bad when there's a normal smell. "caca"smia (I died a little inside putting this in the notes). Chronic rhinosinusitis might result in cacosmia.

§ Lectures

§ Physical Examination

§ Ear examination

○ Review anatomy

§ External auditory canal is around 1 inch. The outer one third is cartilaginous. The inner two thirds are bone. The outer one third has hair follicles; inner two thirds with no hair. The outer one third has seromucous (check) glands (ear wax) and the inner two thirds with no glands.

§ The middle ear cavity has three ossicles: malleus, incus and stapes. A part of the malleus is stuck to the tympanic membrane and it is called the handle of the malleus. The smallest bone in the body is the stapes. The stapes is also the most complete ring. The largest and most lateral is the malleus. The stapes is stuck to the middle ear, called Foot plate of the stapes. This plate articulates with the oval window.

§ The Eustachian tube connects the middle ear to the nasopharynx.

§ Temporal, zygomatic, buccal, marginal mandibular, cervical are the branches of the trigeminal nerve.

§ Chorda tympani, a branch from the facial nerve, innervates the taste in the anterior two-thirds of the tongue.

§ Tensor tympani muscle and stapedius muscle with innervation from trigeminal nerve.

§ Tegmen tympani splits the roof of the middle ear.

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§Cochlea and vestibular apparatus for hearing and balance respectively. The cochlea is two and a half turns. The cochlear or auditory nerve comes out of the cochlea. The vestibular apparatus is divided into vestibule and semicircular canals. The vestibular has utricle and saccule. Out of these canals, we get the vestibular nerve which joins the cochlear. The vestibulocochlear nerve passes the CP angle and goes to the pons.

§The inner ear has two types of fluid: perilymph, which is high in sodium low in potassium like ECF. The endolymph is like ICF, which is high in potassium low in sodium.

○We have to clean our hands and wear the headlight with every single examination, especially for the OSCE. We have to ask the patient about which ear the patient has pathology. This will allow us to know the normal background anatomy of the patient. This will also allow me to start with the ear that has no pain and establish rapport with the patient.

○*Inspection:* We look for ear deformities. The helix, anti-helix, tragus, anti-tragus, lobule and cocha.

§We have protruding or bat ears, which is a cosmetic deformity. We can correct that through otoplasty.

§Microtia: small ear. Anotia: the pinna would not be present.

§Aural atresia: the external auditory meatus would be closed off.

§Sinus/pit: preauricular or postauricular sinus or pit. The difference between sinus and fistula – abnormal communication between two epithelial surfaces. The sinus – communication between an epithelial surface and a blind cavity.

§Accessory auricles(?) – any skin tag or cartilage that is “extra”.

§Cauliflower ear (also called Wrestler’s Ear) – occurs after trauma followed by auricular hematoma.

·Cartilage is an avascular structure. It gets its perfusion from perichondrium. With trauma, there will be spacing between them, ischemia, and necrosis. Thus we have to do incision and evacuation of the hematoma.

·The patient will come with a swelling and we will feel it tense. We will enter with a needle aspiration, if blood, it’s positive. To prevent recollection, we have to cover with a gauze and compress with a bandage to prevent further damage.

·The hematoma might become an abscess as well and create further problems.

§We look for signs of inflammation, such as redness, swelling, or discharge, ulceration, hypo or hyperpigmentation.

§Scars: post-auricular scar from surgery. End-aural scar will be present obliquely in the preauricular surface. With tympanic membrane perforation, we have to repair that through tympanoplasty or myringoplasty (myringo = tympanic membrane). We use fascia, periosteum, veins, etc. But we mostly use fascia and/or cartilage (most popular two types of treatment).

·Tragal scar – evidence of using the tragus for previous repair.

○Palpation:

§We move the pinna and see if we have auricular tenderness, press on the tragus and see if we have tragal tenderness. This might be a sign of otitis externa.

§We also palpate the mastoid bone. If tenderness, sign of mastoiditis.

§Fistula Test (perilympathic fistula): we press on the tragus, close the canal for 10 seconds, then sudden release. Positive test is if the patient had nystagmus, or the patient told you they felt dizzy afterwards.

·Nystagmus: rapid, oscillatory, involuntary movement of the eye

○Percussion:

§Percuss the mastoid for mastoid tenderness.

○Otoscope:

§We always have to choose the right ear piece for the right patient. It isn't universal for everyone. We use the biggest but most appropriate ear piece for each patient. An adult = big, pediatric = small. Adult with otitis media = small.

§Pneumatic otoscope: checks the mobility of the tympanic membrane as well as doing the otoscopy. When we press, the tympanic membrane should go medially.

§We always have to examine the patient with the right ear pathology with our right hand.

§We have to grab the otoscope like a pen.

§We should pull the pinna upwards, backward, outwards, to straighten the canal. This is for adults.

§Pediatrics -> just backwards.

§Neonates -> backwards and inwards.

§Is the external auditory canal adequately patent or is it narrow? We have mention any signs of inflammation, discharge (with its own classifications as well), skin lesions, masses, foreign bodies, tumours, neoplasms.

§We look at the tympanic membrane, comment on its normal or abnormal structure.

·Normal: semi-transparent, grey-pearly colour, intact, normal position (not retracted nor bulging), presence of cone of light, presence of handle of malleus, mobile tympanic membrane through Valsalva maneuver

○Cone of light: anteroinferior quadrant.

○Handle of malleus: backwards and downwards

○Valsalva: have the patient close their nose and mouth and try to "breathe"

○Tympanic membrane is made up of pars flaccida, e.g. attic (upper small part with two layers, missing the fibrous layer), and pars tensa (lower larger part). With Eustachian tube dysfunction, pars attica moves easier. When it retracts, it's called retraction pocket. Cholesteatoma occurs with the keratinization of pars attica when it gets retracted; presence of squamous epithelia in the middle ear (Google this and add to notes).

§Impacted wax – wax closes off the view of the meatus completely.

§Tympanic membrane perforation

·Site, size (if less than ¼ of tympanic is small sized, if ¼ - ½ medium, more than ½ large), wet/dry (depending on presence of secretions), marginal or central

§Myringotomy - hole in the tympanic membrane, we put a device called ventilation tool for ear effusions.

○Tuning fork tests: At least 256 forks, even better is the 512

§Rinne Test: We grab the tuning fork with the stem. We hit the olecranon process or patella. We go in lateral to the ear by one inch, at the mastoid process. Air conduction louder -> positive (? Check). We have to do it at three positions behind the ear, at the pinna, then at the tragus.

§Weber Test: Any midline ear prominence then we ask which side is louder. Again, with the stem to the bone. If both are heard equally, centralized. If one side is more, then it is lateralized to [that side]. If the patient can't hear any side, it's called indifferent.

§These examinations are not called normal or abnormal, they're called positive or negative and centralized/lateralized. Don't use any other terminology.

○Free field hearing test: talk to the patient and see what the intensity of their hearing is.

○Facial nerve: Ask the patient to elevate their eyebrows, and have them look at the examiner's finger from up to down. Then close your eyes tightly and don't let me open them. Show me your teeth (look at angles of the mouth for drooping), whistle, and blow out your cheeks. Ask the patient to grimace for symmetry, then ask the patient for taste.

○Nasopharynx examination: (check)

§Hearing loss:

○Conductive hearing loss: pathology in the external/middle ear.

○Sensory hearing loss: pathology inner ear, nerve, brainstem.

§Nose Examination:

○Anatomy

§Nasolacrimal duct connects the inferior meatus to nasolacrimal sac. It is the only structure that connects to the inferior meatus.

§Maxillary sinus, frontal sinus and anterior ethmoidal air cells connect to the middle meatus.

§Superior meatus – posterior ethmoids

§Sphenoethmoidal recess – sphenoid sinus

§Osteomeatal complex (OMC) is the part of the middle meatus that connects the sinuses. This is important.

§Ciliated pseudostratified columnar is the lining epithelium.

§Base of the tongue is the posterior 1/3 of the tongue. Floor of the mouth is inferior to the tongue.

§The distance is 7-8 cm between the anterior aspect of the nose to the posterior.

○Inspection:

§Front, lateral, and behind the patient for any nasal deformities. Comment if the patient is a mouth-breather. Comment if the patient has epiphora (hyperlacrimation). Comment if the patient has allergic salute (transverse skin crease superior to the nose holes). Comment if the patient has allergic shiners (black spots around the eye). Comment on scars (lateral rhinotomy scars for example). Lift the tip of the nose and look at the transverse columellar scar and anterior dislocation of the nasal septum.

○Palpation:

§palpate the nose and look for localized tenderness or crepitus, emphysema, any fracture lines, etc.

§palpate the sinuses

○Percussion: tenderness on the sinuses.

○Anterior rhinoscopy:

§Look at the nose from anteriorly using a nasal speculum. Here, we use the Thudichum's speculum. We examine both sites using our left hand. We go in the nose closed, we go out of the nose open.

§Five things:

·Nasal septum: is it straight or deviated? If deviated, to which side? Which is wider cavity as well? Intact or perforated?

·Turbinates: mesotrophic (normal size), hypertrophic or atrophic?

·Mucosa: Normally pink in colour. Pale mucosa -> allergic rhinosinusitis. Red -> erythematous inflammatory mucosa.

·Masses: Polyps, neoplasm, foreign body, clot, rhinolith. We do suction to differentiate the polyp from mucous. The polyp has yellow-greyish colour. The polyp is shiny, the turbinate isn't. The polyp is soft to the touch, turbinate is hard. The polyp has no nerve endings -> insensate. The polyp doesn't bleed, turbinate doesn't. The polyp most commonly isn't bloody, if so, we have to detect neoplasm.

·Discharge: Colour, where? Character, amount, etc.

○Nasal patency test:

§Metallic testing with vapourization upon breathing. If on the right side there's more condensation, this means the right is more open.

§We can also bring little cotton pieces that move upon exhaling out.

○Posterior rhinoscopy:

§Looking at the nasopharynx through a mirror. We put a long mirror through the oral cavity. We have to do warming of the mirror and depress the tongue.

○Nasal endoscopy: There's rigid and flexible nasoscopy.

·Lamina papyracea divides the ethmoid and the orbit. It's oblique to the orbit.

§Throat Exam:

○Lips

§Cleft lip, ulcers, masses, lesions

○Teeth

§Cavitations, dental carries, teeth cap, filling, braces, dentures for upper and lower teeth

○Gingiva

§Masses, ulcers, lesions

○Buccal mucosa

§Parotid duct (Stinson) opposite to the upper second molar tooth.

○Tongue

§Macroglossia, fasciculations, motility of the tongue, geographic, glossitis

○Floor of mouth

§Submandibular ducts (Warthon's duct – lateral to the lingual frenulum), frenulum

○Palate

§Cleft palate, ulcers, masses, lesions

○Uvula

§Bifid or not. 30% of bifid uvula have submucous cleft palate -> Eustachian tube dysfunction.

○Tonsils

§Anterior pillar and posterior (palatopharyngeal and palatoglossal pillars). Ulcers, masses, lesions. The tonsil if they are large or small. Presence of crypts and they are preserved -> no tonsillitis. Pus, follicles, lesions.

○Posterior pharyngeal wall

§Ulcers, masses, lesions, postnasal drip or discharge.

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turbinate

more condensation, this

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er teeth

○Larynx

§Indirect laryngoscopy

·Warm the mirror and go through the oral cavity. Pull the tongue forward and point the mirror down.

Ask the patient to make a sound to see the vibration of the vocal cords. Vocal cords with phonation go through adduction. At inspiration, they go through abduction. With adduction, there is turbulent air flow. Articulation of speech is through the tongue, buccal, mouth, lips, etc.

·Hyponasal speech: when a person has a flu or sneezing. This is because the nose or the sinuses is less than usual, if more than usual -> hypernasal speech. This is similar in the cleft palate patients.

·False vocal cords are at a higher level than true vocal cords.

§Neck exam

○Scars, masses, striae, lesions, hyperpigmentation

○Palpation

§Mass, I have to test it. I also have to test thyroid and lymph node groups.

○Percussion

§Mass

○Auscultation

§Mass or goiter

○Consistency, tenderness, fixed or mobile, attached to underlying structures, pulsations, transilluminations, fluctuance.

○Lymph nodes

§Submental -> submandibular -> upper anterocervical, middle anterocervical, lower anterocervical -> posterior border of cervicals -> pre-auricular -> post-auricular -> suboccipital

§Cranial nerve examination

○Add this

x Throat and neck symptoms

← History بالاسئلة
سنة موجودين

i) → Pain (in mouth, sore throat, radiated to ears) (oral cavity + pharynx + larynx)

sore throat → and discomfort in the throat

Localized → causes → inflammation

or

diffuse
(systemic)

- allergy (allergic rhinitis)
- foreign body or trauma
- GERD (laryngopharyngeal reflux)
- Smoking and Alcohol ingestion (chronic irritation)

Causes

→ Infectious mononucleosis (EBV, CMV → double stranded DNA virus)

→ Tumors (lymphoma, Multiple myeloma)

→ Antithyroid medications

→ Head and neck radiation therapies

2) **Dysphagia**

- ↳ To solids → anatomical cause
- ↳ liquids → neuro muscular cause

3) **Odynophagia**

4) **Dyspnea**

5) **Stridor**

- ↳ Snoring or stertor → supralaryngeal obstruction
- ↳ Stridor → laryngeal or tracheal obstruction

- ↳ Stridor → inspiratory
 - ↳ Expiratory
 - ↳ Biphase

6) **Cough**

7) **Aspiration**

8) **Hemoptysis**

9) **Dysphonia** → ^{عيب في الصوت} Hoarseness (abnormal voice)

علاج
أعراض
Dysphonia (Aphonia → low pitched voiced → عيب في الصوت)

10) **GERD symptoms**

11) **Neck lumps**

12) **Associated symptoms related to the underlying pathology.**

①

Adenotonsillar diseases

* The most common symptom is \Rightarrow Sore throat (any discomfort to the throat)

\rightarrow Causes of sore throat

- 1) Smoking
- 2) Alcohol
- 3) Chronic pharyngitis
- 4) Chronic tonsillitis
- 5) Chronic non-infective laryngitis
- 6) Post nasal drip from sinusitis
- 7) GERD
- 8) Head and neck surgeries (by damage to the salivary glands)
- 9) Drugs (inhalers, methimazole, mitoxantrazole, chemotherapeutic agents)
- 10) Infections (Candidiasis, Diphtheria, Infectious mononucleosis)

Diphtheria \rightarrow Gram positive bacillus

\rightarrow pseudomembrane or membrane on the tonsils and pharynx and may extend downwards and may bleed easily

\rightarrow 2 problems with Diphtheria

- ① May result in airway compromise
- ② production of cardiotoxins and neurotoxins

\rightarrow Mx \rightarrow swab for culture and sensitivity

\rightarrow we give empirically penicillins and macrolides (such as azithromycin)

\rightarrow we also should give the patient anti toxin serum to counteract the effects of toxin

Infectious Mononucleosis \rightarrow EBV (Glandular Fever) (Kissing disease)

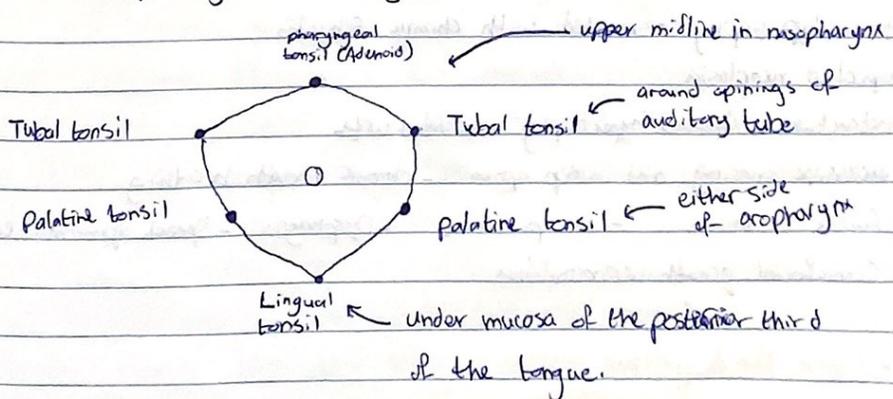
\rightarrow classic triad of ① fever ② pharyngitis ③ lymphadenopathy

\rightarrow WBC are normal to moderately elevated \rightarrow lymphocytes are increased.

\rightarrow Diagnostic test is \rightarrow Mono spot test or Paul-Bunnell test.

\rightarrow Mx \rightarrow supportive therapy, oral hydration, antipyretics, analgesics.

* Waldeyer's ring \rightarrow An interrupted circle of protective lymphoid tissue at the upper ends of the respiratory and alimentary tracts.



* The difference between Adenoids and Tonsils

Adenoids	Tonsils
→ posterolaterally in the upper midline of Nasopharynx	→ in the tonsillar fossa btw the ant. and post. pillars on either side of larynx
→ pseudostratified columnar epithelium	→ stratified squamous epithelium
→ They are a collection of one	→ They are two
→ have furrows (wrinkling on the surface) 2-4	→ have crypts (8-16)
→ unencapsulated	→ encapsulated
→ afferent and efferent lymphatics	→ only efferent lymphatics

* Adenoidal disease → is a disease of paediatrics, they grow until 6-7 years and then they get smaller until 12-15 years

- ⇒ Symptoms & ① Nasal obstruction & mouth breathing ^{they will have teeth crowding bec there is no contact btw jaws}
- ② Snoring and sleep apnea
 - ③ Recurrent infections in pharynx and chest
 - ④ Bilateral rhinorrhea
 - ⑤ Hyponasal speech
 - ⑥ Eustachian tube obstruction leading to - ① Otitis media with effusion
 - ② Acute otitis media
 - ③ Chronic suppurative otitis media

⇒ Diagnosis → Rhinoscopy
↳ lateral neck soft tissue X-ray (constricting of airway at nasopharynx level)

⇒ Indications of the Adenoidectomy

- ① Infection → Purulent Adenoiditis
 - ↳ Adenoid hypertrophy associated with:
 - Chronic otitis media with effusion or with perforation
 - chronic recurrent otitis media - otorrhea or chronic tube otorrhea
- ② Adenoid hypertrophy associated with chronic sinusitis
- ③ Suspected neoplasia
- ④ Obstruction → Adenoid hypertrophy associated with
 - excessive snoring and sleep apnea
 - chronic mouth breathing
 - Failure to thrive
 - Cor pulmonale
 - Craniofacial growth abnormalities
 - Dysphagia
 - speech abnormalities

→ pre-op evaluation

■ Adenoid Facies → long face, crowded incisors, mouth breathing, snoring, rhinorrhea, post-nasal drip.

■ evaluation of palate → cleft palate, bifid uvula, CNS or neuromuscular disease.

↳ in cleft palate patients, after getting rid of adenoids there will be a nasal regurg of fluids and food; this condition is called Rhinolalia Aparenta.

→ The surgery is called Adenoidectomy using the mouth gag and curette.

→ Complications of surgery

1) Hemorrhage (bleeding) 2) Injury to the teeth 3) Otitis media

4) Regrowth of residual adenoid tissue 5) Rhinolalia aperta

6) TMJ dislocation 7) C-spine injury while extending the neck.

↳ in Down syndrome patients we have to make sure that there is no Atlanto-axial subluxation (inj. of patients)

→ Tonsils

→ Grading (0 → in fossa) (1 tonsils less than 25%) (2 tonsils less than 50%) (3 tonsils less than 75%)
(4th tonsils greater than 75% or kissing tonsils)

→ Acute tonsillitis (Acute tonsillopharyngitis)

→ most common cause is viral infection but from the bacteria is Group A beta hemolytic streptococcus (strep pyogenes), this organism is associated with a risk of rheumatic fever and glomerulonephritis.

→ signs: 1) enlarged tonsils 2) absence of crypts 3) pus 4) Hyperemia 5) lymphadenopathy

→ Symptoms → Viral → 1) Coryza 2) Hoarseness 3) Cough 4) Conjunctivitis

→ Bacteria → 1) Fever $> 38^{\circ}\text{C}$ 2) Anterior cervical LAP 3) Pharyngeal or tonsillar exudate
4) Absence of cough

→ Mx → 1) Bed rest 2) Analgesia 3) Antipyretics 4) encourage patient to drink

→ if Bacterial infection is suspected → Abx (Amoxicillin + clavulanic acid)

→ complications → Local → AGM, peritonsillar abscess (Quinsy), Parapharyngeal abscess in adults, retropharyngeal abscess in children, pulmonary infections

→ Systemic → Rheumatic fever, glomerulonephritis, scarlet fever, febrile convulsions

• Quinsy → Abscess formation outside tonsillar capsule (peritonsillar abscess)

↳ Fever, sore throat, dysphagia, odynophagia, trismus, unilateral swelling of soft palate/pharynx with uvula deviation to the opposite side.

2

حیاتی Hearing Assessment Tests

* There are subjective tests and objective tests, we use the objective tests in some special cases → Malingering, mental retardation, unconsciousness

→ OAE (Oto Acoustic Emission) → we perform this test on newborns to test the cochlea response to certain sounds by producing sounds, if it produces sounds detectable by the computer it's positive. If it was negative we repeat the test after 2 weeks, if still negative we do the ABR test. (Auditory Brainstem Response) this test will tell us if there is hearing compromise and if yes, it's amount.

① Rinne Test → we use a 512 Hz Tuning fork, we hit it with our elbow or knee, we place it on the patient's mastoid process and when he stops hearing we put it beside the meatus if he still hears, $AC > BC$.

→ Rinne +ve → $AC > BC$ → Normal, SNHL

→ Rinne -ve → $BC > AC$ → CHL

→ False -ve → severe unilateral SNHL

② Weber Test → we use a 512 Hz Tuning fork, we hit it with our elbow or knee, we place it on the patient's forehead and we ask, in which ear the sound is heard.

→ Normally → heard equally in both ears (Centralized)

→ Lateralized to the worse ear in CHL

→ Lateralized to the better ear in SNHL

③ Tympanometry → objective test for middle ear function

1) Indirect measure for middle ear pressure 2) Test for mobility of TM and ossicles

→ useful in 1) CHL (but it doesn't differentiate btw it and SNHL)

2) Uncooperative patients 3) No need for sound proof room.

• Type A → normal • Type Ad → Ossicular discontinuity or dislocation, Hypermobile TM

• Type As → Myringosclerosis or Otosclerosis → Low volume

• Type B-Flat → 1) External ear blockage (infection, impacted wax) 2) TM perforation

3) Aural fullness 4) Middle ear effusion

• Type C-negative pressure → 1) Eustachian tube dysfunction 2) TM retraction

④ Pure Tone Audiometry → subjective test used to identify hearing threshold levels, determine the degree, type and configuration of a hearing loss.

→ differentiates btw CHL and SNHL

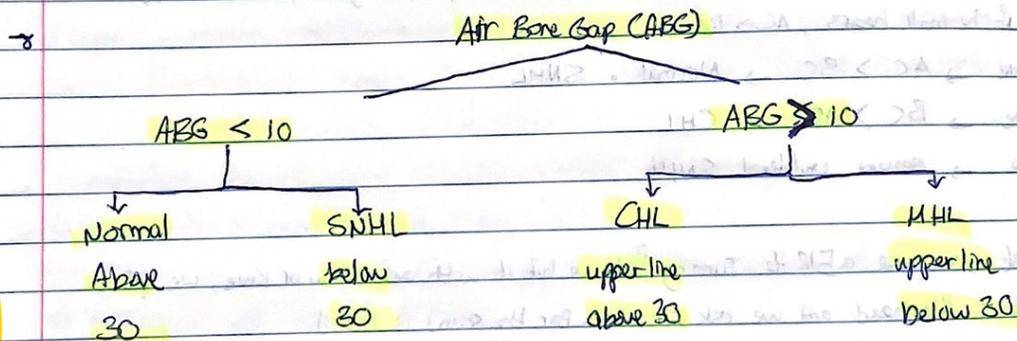
→ Needs a cooperative patient > 5 years.

→ Needs a sound proof room.

→ The human ear can detect sounds btw 20 Hz - 20K Hz, but here we test of heard sounds btw 125 Hz - 8K Hz.

→ X → left ear O → Right ear

→ we test for both AC and BC, for BC line (the upper line) an arrow to left is for left ear and an arrow for right is for right ear.



③

Defn Hearing Loss → reduction in sound sensitivity due to an abnormality anywhere in the auditory system.

① Conductive Hearing Loss

- 1 → negative Rinne test ($BC > AC$)
- 2 → Weber test lateralized to worse (affected) ear
- 3 → Normal Absolute Bone conduction test
- 4 → Low frequencies affected more
- 5 → PTA shows ABG
- 6 → good speech discrimination
- 7 → good hearing in presence of noise

② SNHL

- positive Rinne test $AC > BC$
- Weber test lateralized to better (normal) ear.
- BC is reduced on Schwabach and ABC tests
- High frequencies affected more
- PTA with no ABG
- Poor speech discrimination
- Difficulty hearing in presence of noise.

→ Congenital causes

- 1- Congenital cholesteatoma
- 2- Ossicular discontinuity
- 3- Fixation of Head of malleus
- 4- Fixation of footplate of stapes
- 5- Neonatal Atresia

→ Congenital causes

- 1- Congenital cholesteatoma
- 2- Chromosomal syndromes
- 3- Delayed Familial progressive
- 4- Lack of development (oplasia) of cochlea
- 5- Congenital rubella syndrome, Human CMV infection

→ Acquired causes

- 1) Ear wax
- 2) Otitis externa
- 3) Foreign body
- 4) tumor
- 5) Acute otitis media with effusion
- 6) Cholesteatoma
- 7) Middle ear tumor

→ Acquired causes

- 1) Developmental and Hereditary: Alport, Usher, large vestibular aqueduct
- 2) Infections → Otitis media, viral syphilis
- 3) Pharmacological toxicity: Aminoglycosides, loop diuretics
- 4) Trauma → Head injury, noise induced
- 5) Neurologic disorders → MS
- 6) Vascular hematology disorders → Migraine, sickle cell anemia
- 7) Immune Disorders: polyarteritis nodosa, HIV
- 8) Bone disorders: Paget disease
- 9) Neoplasms: Vestibular schwannoma
- 10) Unknown etiology: presbycusis, Meniere disease.

* Usher Syndrome

- involving inner ear and retina
- No cure → Hearing Aids

* Waardenburg Syndrome

- SNHL, Hair and skin hypopigmentation, Iris pigmentary abnormality
- No cure → Hearing aids

* Pendred syndrome

- SNHL (large vestibular aqueduct and Mondini defect [absence of middle turn of cochlea and smaller cochlea]) + goiter and Hyperthyroidism.
- No Cure → Hearing aids.

* Treacher collins syndrome

- CHL (external auditory canal atresia), absence or dysplastic ossicles, or, deficient cochlea + Maxillomandibular hypoplasia + cleft palate.

* Alport syndrome → Hearing loss + glomerulonephritis.

③ Otosclerosis → Autosomal dominant, abnormal formation of bone around stapes footplate, preventing its normal movement

- leads to CHL, may rarely involve the cochlea resulting in MHL.
- Otosclerotic foci most commonly located just anterior to the oval window (Fissula arte fenestram)

⇒ signs & symptoms

- 1) slowly progressive CHL (usually bilateral) 2) Paracusis 3) Tinnitus 4) vertigo

⇒ on otoscopy, the examination might be normal (sclerotic phase),

but in some cases there will be Schwartz sign, reddish bluishness behind the TM posteriosuperiorly, loss of increased vascularity of the otosclerotic foci (active phase).

⇒ Investigations

- 1) CT-scan (double ring sign in cochlear involvement)
- 2) MRI 3) PTA 4) Rinne + Weber tests 5) Tympanometry

⇒ The surgery is called (stapedotomy or stapedectomy)

④ Presbycusis → Unexplained, slowly progressive, predominantly high frequency, symmetric hearing loss due to aging process.

→ Clinically → M > F, SNHL, Tinnitus

→ Investigations → Hx, Rinne (+), Weber lateralized to better (normal) ear, PTA

→ MRI to exclude acoustic neuroma

→ Tx → Hearing aids, Cochlear implants, Rehabilitation Lip-reading or speech reading, and avoid noise exposure.

→ on PTA → 30-50 mild, 50-70 moderate, 70-90 severe, >90 profound.

⑤ Ototoxicity → leads to High Frequency SNHL, tinnitus, vertigo

Drugs → Aminoglycosides, loop diuretics, salicylates, BBs, Cytotoxic agents, Quinine, Anticonvulsants.

⑥ Noise induced hearing loss

↳ Temporary Threshold shift → Initial noise exposure, metabolic exhaustion of hair cells

↳ Permanent Threshold shift → Increasing/repeated noise, metabolic and mechanical damage of hair cells

* Allowed exposure times → 90 dB - 8h, 95 dB - 4h, 100 dB - 2h.

Note * The most common cause of unilateral sudden SNHL is acute stroke occluding the anterior inferior cerebellar artery that feeds the internal auditory artery.

⑦ Acoustic Neuroma (Vestibular Schwannoma) → benign tumor of the superior vestibular nerve at the cerebello-pontine angle. It is usually unilateral except in NF-2, where it may be bilateral.

→ Hearing aids

① Behind ear hearing aids → behind the ear (BTE)

↳ Receiver in canal

↳ Receiver in the ear

② Hearing aids that fit in the ear → In the ear

↳ Completely in canal

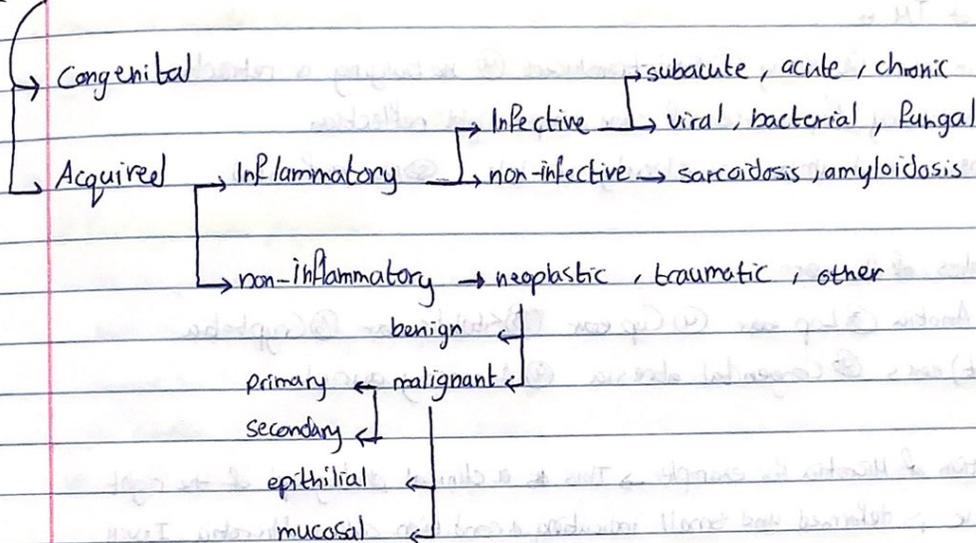
↳ Invisible in canal

③ Bone anchored hearing aid

④ Cochlear Implant

(4)

External ear diseases



⇒ Anatomy → The ear is divided into 3 main regions

- 1) The external ear → collects sound waves and channels them inward.
- 2) The Middle ear → conveys sound vibrations to the oval window
- 3) The Inner ear → houses the receptors for hearing and equilibrium.

⇒ Anatomy of the external ear &

① Auricle (pinna) ② External auditory canal ③ Tympanic membrane

↳ Auricles are bilaterally symmetric elastic cartilaginous frames, they are anchored to the cranium by skin, cartilage, auricular muscles and extrinsic ligaments, it's developed from six tubercles of the first branchial arch. Fistulae and accessory auricles result from failure of fusion of these tubercles.

⇒ The external auditory canal → length: 2.4 cm

↳ The lateral third of the ~~canal~~ canal is made of fibrocartilage and the medial two thirds of bone.

→ It is lined by stratified squamous epithelium, that has the capacity to migrate laterally allowing the canal to remain unobstructed by debris.

→ The subcutaneous layer of the fibrocartilaginous portion contains; hair follicles, sebaceous glands, ceruminous glands. while the osseous portion doesn't have subcutaneous elements.

→ related posteriorly to the mastoid process and anteriorly to the TMJ

→ Cerumen (earwax) → prevents canal maceration, has antibacterial properties, has a normally acidic pH, all of which contribute to the inhospitable env. for pathogens

→ The Tympanic membrane → composed of 3 layers: skin, fibrous tissue, mucosa

* Characteristics of TM :-

- ① pearly gray in color
- ② shiny
- ③ semi-translucent
- ④ no bulging or retraction
- ⑤ smooth in consistency
- ⑥ presence of cone shaped light reflection
- ⑦ handle of malleus and umbo are clearly visible.
- ⑧ not perforated

* Congenital anomalies of the ear

- ① Microtia
- ② Anotia
- ③ Lop ear
- ④ Cup ear
- ⑤ Stahl's ear
- ⑥ Cryptotia
- ⑦ prominent (bat) ears
- ⑧ Congenital atresia
- ⑨ Accessory auricle

→ For the description of Microtia For example → This is a clinical photograph of the right ear, the auricle is deformed and small indicating a condition called Microtia. I will examine next the other ear, the inside of both ears, and the rest of the body looking for any other syndromatic problem.

→ For the description of Auricular hematoma → this is a clinical photograph of the left ear showing a swelling and bruising of the skin, the left ear is edematous, fluctuant suggestive of auricular hematoma.

* Auricular Hematoma → ^{accumulation} collection of blood in the subperichondrial space usually secondary to blunt trauma to anterior auricle

→ Clinically → 1) An edematous, fluctuant, and ecchymotic pinna
2) loss of the normal cartilaginous landmarks.

→ Mx → evacuation

① Evacuation by aspiration

↳ Pros: easily performed, quick, less invasion, lesser chance of infection

↳ Cons: incomplete evacuation and higher chance of recurrence

② Evacuation by surgical incision, irrigation and splintage

→ complications → cartilage necrosis predisposing it to infection and further injury
↳ permanent disfigurement known as cauliflower ear.

→ Ear wax

- causes of impeded ear wax : 1) use of cotton wool buds 2) Hearing aids 3) earplugs
- symptoms of = = = : 1) Decreased hearing 2) Dizziness 3) Fullness sensation
4) Ringing in the ear 5) Ear pain 6) Itching or drainage.

→ Mx

Ⓐ Ear syringing procedure

- let the patient use sodium bicarbonate ear drops a week or two before the procedure this is a ceruminolytic agent.
- prepare the towels and use a head light
- the solution can be Sodium bicarbonate, normal saline, Tapwater and the Temp. should be btw 37°C - 38°C and the electrically driven water pump should be directed to the roof of canal.

→ complications & ① Otitis externa ② pain, local trauma ③ Cough ④ TM perforation.

- CIs & ① Frequent previous episodes of otitis externa
② A known or suspected perforation
③ Difficult ear (narrow and/or tortuous external meatus)

Ⓑ Instrumental

- Microsuction
- Waxhooks
- Endoscope
- Microscope.

→ Ear pain

- otogenic
- non-otogenic

- Otitis externa → pain is exaggerated when moving the pinna
and treated topically creams or drops, also we should avoid water contact.

- Malignant otitis externa → The infection goes to bone

⑤

Otitis Externa

- Infective → bacterial, viral, fungal
- non-infective → allergy, psoriasis, sarcoidosis

→ is a diffuse inflammation of the skin lining the external auditory meatus

→ Note that the EAM is usually sterile or contains *staphylococcal* ~~com~~ *albus* commensals

→ In the acute phase of otitis externa there is dilation of the dermal blood vessels with increased permeability that lead to those signs: redness, heat, edema, tenderness and loss of function

→ Predisposing factors for otitis externa

- ① narrow or tortuous ear canal
- ② underlying skin pathology: eczema, psoriasis
- ③ poking ear with objects
- ④ introducing water into the ear and swimming
- ⑤ living in hot and humid environments.

* Bacterial otitis externa causative agents.

- Diffuse type → *Pseudomonas aeruginosa*, *S. aureus*
- Frunculosis → *S. aureus*
- Malignant OE → *P. aeruginosa*
- Erysipelas → *Strept. pyogenes*

* Symptoms & ① Irritation ② Discharge ③ Pain (while moving the jaw) ④ Deafness

* Signs & ① Meatal tenderness on moving the pinna ② EAC erythema, edema, otorrhea ③ Moist debris

* Diagnosis & ① Hx ② PE ③ Microbiology (culture) ④ Radiology

* Tx → ① removal of debris from the EAC (scrupulous aural toilet)

② ^{Applying} Dressing (e.g. ear wick) soaked with the appropriate topical medication (neomycin)

③ Analgesia

④ Prevention of recurrence → Avoidance of contributing factors.

Frunculosis → infection of hair follicles in the lateral third of EAC.
by *Staph. aureus*.

- Symptoms: ① Severe pain (out of proportion), resembles that of renal colic, exaggerated by moving the pinna
- ② Discharge ③ Deafness ④ Fluctuant abscess in advanced stages
- Mx → ① Insertion of ear wicks soaked with (glycerin and ichthammol)
- ② Flucloxacillin parenterally followed by oral medication
- ③ Analgesia
- ④ Prevention of recurrence: control diabetes, control the immunologic problem

Otomycosis → the causative agent is [*Aspergillus*] than [*Candida*]

- The fungal infections are more common in immunocompromised patients: DM, steroid intake, elderly, very young.
- Symptoms → ① Itching ② Pain ③ Discharge ④ Deafness
- Signs → ① Tenderness ② Pinna erythematous with fungal debris ③ Mycelia on otoscopy.
- Mx → ① Removal of debris and debridement ② Antifungals (ketoconazole, itraconazole)

Viral otitis externa [*Herpes zoster oticus*]

- Manifests as → ① Severe otalgia ② Cutaneous vesicular eruption on pinna and EAC
- ↳ when associated with facial paralysis, it is called → **Ramsay Hunt Syndrome**
- ↳ pathophysiology → Reactivation of the virus from the ~~ear~~ geniculate ganglion.
- ↳ Associated with → vertigo, deafness, tinnitus

Malignant otitis externa (CMO: *P. aeruginosa*)

- ↳ Risk Factors: DM, immunocompromised
- ↳ Otitis externa which progresses to osteomyelitis initially of the tympanic plate which then may spread to involve the skull base and petrous part of the temporal bone.
- Symptoms → ① Constant deep otalgia ② Chronic otorrhea ③ meningitis ④ brain abscess
- ⑤ sigmoid sinus thrombosis
- Signs → ① Inflammation and granulation ② Purulent secretions ③ occluded canal
- ④ Cranial nerve involvement
- Diagnosis → ① Granulation tissue deep in the EAC
- ② Involvement of cranial nerves
- ③ ↑ ESR ④ CT
- Tx → IV Abx, analgesia, local canal debridement.

(6) Unit 5 Rhinosinusitis

* functions of the nose :- 1) Respiration 2) Olfaction 3) reception of secretions
4) Filtration, Humidification & warming of air

→ Anatomy and Histology of nose

→ Upper one third is olfactory area, lower two thirds is respiratory area

→ All the nasal cavity is lined by mucous membrane (pseudostratified ciliated columnar epi.) except for the vestibule which lined by hairy skin called vibrissae.

* Para nasal Sinuses & Frontal sinuses, Ethmoid sinuses, Sphenoid sinus, Maxillary sinuses

↳ functions :- ① Lightening the weight of facial skeleton & skull.

② Moisturizing & humidifying ambient air

③ Resonating chambers for the voice.

* Rhino Sinusitis → irritation and inflammation of the mucous membrane inside nose and paranasal sinuses.

↳ They are continuous cavities with the same mucousal lining.

→ Symptoms :- ① Nasal obs. and mouth breathing ② Rhinorrhoea ③ Sneezing ④ Nasal itching

⑤ Snoring and sleep apnoea ⑥ Olfactory problems ⑦ Headache, facial pain & dental pain

⑧ Postnasal drip ⑨ Nasal deformity ⑩ Hyponasal speech.

* nonallergic non infectious rhinitis

① Vasomotor rhinosinusitis → environmental, airborne irritants, dietary factors, - (neurogenic & hormonal)

Tx → Antihistamines (H₁ blockers) → Anticholinergics

② Rhinosinusitis medicamentosa → abuse of topical vasoconstrictive nasal sprays.

Allergic Rhinosinusitis → seasonal, perennial, or both.

Hypersensitivity reaction type I, sensitization to the antigens, release of IgE, then early phase or humoral reaction within 10-15 mins of exposure, mast cells release histamine, cytokines, leukotrienes, prostaglandins. Then eosinophils come this response is called Late phase or cellular reaction begin 4-6 h after exposure and may remain for 48h.

→ nasal turbinates are pale in colour.

→ In children → Allergic shiners (dark circles under the eyes)

↳ Nasal salute (constant rubbing of tip of nose)

⇒ Mx of allergic Rhinosinusitis

① Avoidance of and environmental controls

② pharmacotherapy → usually combination of corticosteroids & anti-histamines

③ Immunotherapy

Acute Rhinosinusitis (bacterial)

→ usually starts as a viral infection that persists > 10 days or get worse after 5-7 days, mucosal edema, mucous stasis → bacterial growth.

→ Most common causative agents are

① Strep. pneumoniae ② H. influenzae type B ③ Moraxella catarrhalis

Chronic Rhinosinusitis (bacterial) → with NP or without

Fungal Rhinosinusitis

① Invasive Fungal → complication of immunocompromised patients

→ There are fungal debris

→ Risk of thrombosis

→ MC → Aspergillus

Tx → ① Debridement ② Aggressive antifungal therapy ③ prevent recurrence

③ Fungal ball → non-invasive fungal mass, remove it

③ Allergic Fungal rhinosinusitis

⇒ Diagnosing infective Rhinosinusitis

① History & PE → anterior Rhinoscopy and flexible/rigid nasal endoscopy

② Imaging → CT vs MRI

↳ The best choice, excellent visualization of mucosal thickening, air fluid levels, bony structures

* Ddx

- 1) Viral Rhinosinusitis
- 2) TMJ pain
- 3) dental pain
- 4) headache/migraine
- 5) Sinus neoplasm.

* Medical TX

① Abx → For 10-14 days

↳ if mild disease with no recent Abx use → Amoxicillin/clavulanate

↳ if moderate = = = = = → quinolones or cephalosporins

② Nasal sprays and irrigation → Nasal steroid sprays → ↓ inflammation, ↓ size of polyps

↳ Nasal saline sprays → keep the mucosa moist and facilitate mucociliary clearance

↳ Nasal saline irrigation

③ Systemic steroids and decongestants

④ Allergy ~~tx~~

* Surgery → if disease persisted in spite of aggressive medical TX

Complications of Rhinosinusitis

① Orbital complications → Lid edema, Orbital cellulitis, Orbital Abscess

② Meningitis

③ Epidural abscess

④ Cavernous sinus thrombosis

⑤ Pott puffy tumor

* Nasal polyps

→ if in children think of cystic fibrosis

→ Nasal polyps VS turbinates

grey color

mobile

non-tender

non-vascularized

unshrinkable.

(7)

Defn: Otitis Media → Inflammation of the middle ear cleft mucosa

* Middle ear cleft includes 1) Middle ear cavity 2) Eustachian tube
3) Auditory ossicles and mastoid air cells.

* Otitis media → duration < 12 weeks → acute
→ duration > 12 weeks → chronic

* There are other classifications: recurrent otitis media, chronic suppurative OM, chronic non-suppurative OM

Otitis media

→ The most common disease of childhood, next to viral URI

→ It is an acute bacterial infection in 80% of cases (1-6)y

→ The most frequent disease treated by Abx

① Acute suppurative otitis media → Acute bacterial infection with purulent exudate in middle ear, characterized by rapid signs and symptoms.

* we should know the anatomy of the Eustachian tube bcz most of the cases of OM are due to ascending infections

→ Eustachian tube → tube connects the middle ear cavity with the nasopharynx, 3.6 cm, the part near the nasopharynx is cartilaginous (two thirds) and the distal one third is bone.

→ Functions of the FT: 1) Ventilation of the middle ear 2) Equalizing the pressure around the TM 3) Drainage of contents from the middle ear 4) preventing reflux of fluids

* Pathogenesis of AOM

A) Stage of tubal obstruction

ET obstruction → Middle ear air absorption → Engorgement of middle ear cleft mucosa

B) Pre-suppurative stage

Acute inflammation of middle ear cleft → ^(pale injected) Hyperemia of TM → serous exudation

→ Bulging of TM

C) Stage of suppuration (Middle ear contamination) [severe severe pain]

Exudation becomes purulent → Further congestion and bulging of TM →

TM may rupture → Discharge of pus

D) Stage of resolution

usually resolves with Tx and middle ear returns to normal.

* presentation of AOM

- 1) otalgia
- 2) fever
- 3) sleeplessness
- 4) Irritability
- 5) pulling of ear by the child
- 6) some degree of hearing loss
- 7) Ear discharge
- 8) Tinnitus
- 9) Ear fullness
- 10) Dizziness

* Causative agents

→ The MC is 1) Strep. pneumoniae → 2) H. influenzae B → 3) Moraxella catarrhalis

→ Tx → at least for 10 days using a broad spectrum systemic Abx.

2) Acute recurrent otitis media

→ At least 3 or more episodes of OM in 6 months or more than 4 episodes in 12 months, with complete resolution btw every attack

③ Otitis media with effusion (Glue ear) (Chronic non-suppurative OM)

- MC disease treated by pediatricians
- Myringotomy and tube insertion is the MC surgery in children
- Main presentation → decrease in hearing.
- MC cause → Adenoid and tonsillar hypertrophy
- The fluid in middle ear could be → serous, mucoid, mucopurulent
- MX → conservative MX → anti-histamines and steroid inhalants to restore function of EFT

always
treat
the underlying
cause

Note: in adults with unilateral glue ear, suspect post-nasal space malignancy

* Types of tubes used

- ① long lasting tube (T tube)
- ② short lasting tube (Grommet)

④ Chronic suppurative OM → any perforation of TM for more than 3 months

- ↳ 2 types: A) Tubo tympanic (safe) B) Attico antral (unsafe)

* Causes:

- 1) Late Tx of AOM
- 2) Inadequate or inappropriate Abx in case of AOM
- 3) upper airway sepsis
- 4) Immunosuppression
- 5) virulent infections, e.g. measles

⑤ Attico antral CSOM

* Cholesteatoma → Keratinizing squamous epithelium, small sac, ^{posterosuperior to TM} perforation erosion ^{also delay}

* Always have discharge

⑥ Tubo tympanic CSOM

- Deafness - Discharge - central perforation of TM

* Discharge can stop some times

Tx → Type A → Topical Abx (the MC causative agent is *P. aeruginosa*) for 3 weeks
~~until we get a dry middle ear, ear toilet, avoid water,~~
↳ Type B → surgery → Tympanomastoidectomy

Complications of OM

- 1) Acute mastoiditis
- 2) Meningitis
- 3) Extradural Abscess
- 4) Brain Abscess
- 5) Subdural abscess
- 6) Labyrinthitis
- 7) Lateral sinus thrombosis
- 8) Facial nerve palsy
- 9) Petrositis

(8)

Stridor

→ High pitched, wheezing sound caused by disrupted airflow.

* Stridor is classified into 3 types according to phases of respiration & -

- (A) Inspiratory → obstruction at the level of vocal cords or above
- (B) Expiratory → obstruction below the vocal cords (at the level of trachea)
- (C) Biphasic → glottic or supraglottic obstruction.

(1) Laryngomalacia → Congenital softening of the tissues of the larynx above the vocal cords causing it to collapse, and it is the mc congenital cause of stridor in pediatrics

→ Hx → It gets better alone
or → Supraglottic plasty

(2) Acute epiglottitis

* mc causative agent is H. influenzae type B, decreased nowadays due to vaccination

→ presentation: dyspnea, stridor, dysphagia, fever

→ Thumb sign

→ Hx → 1- Intubation 2- steroids 3- Abx

(3) Croup (Acute laryngotracheobronchitis)

* mc causative agent is parainfluenza viruses (1,2,3)

→ presentation → stridor, ^{Barking} cough, Rhinorrhoea, sore throat, hoarseness

→ steeple sign, pencil sign, wine bottle sign.

Tracheostomy → an invasive medical procedure in which we create a connection btw the trachea and skin in order to bypass an obstruction in the upper airway.

→ Indications

(1) Upper airway obstruction (tumour, infection, foreign body, vocal cord paralysis, ...)

(2) Prolonged intubation

(3) To facilitate removal of respiratory secretion

(9)

Q9) Hoarseness of voice and laryngeal tumors

Hoarseness → change in the voice quality from voice harshness to voice weakness.

* Laryngeal cartilages

↳ 3 unpaired → ① Epiglottis ② Cricoid ③ Thyroid

↳ 3 paired → ① Corniculate ② Gumiform ③ Arytenoids.

* Laryngeal muscles

⇒ Extrinsic muscles → move the larynx superiorly and inferiorly, they are composed of the suprahyoid and infrahyoid groups and the stylopharyngeus muscle.

• Suprahyoid muscles: 1) Geniohyoid 2) Mylohyoid 3) Digastric 4) Stylohyoid

• Infrahyoid muscles: 1) Thyrohyoid 2) Sternothyroid 3) Sternohyoid 4) Omohyoid

⇒ Intrinsic muscles → responsible for the vocal cords

1) Cricothyroid 2) Thyroarytenoid 3) cricoarytenoids 4) Transverse + oblique arytenoids

Notes → all the intrinsic muscles are supplied by the recurrent laryngeal nerve except for the cricothyroid which is supplied by the superior laryngeal nerve
→ Sensation above true VCs is from superior laryngeal nerve, below the true VCs is from RLN.
→ the only laryngeal abductor muscle is posterior cricoarytenoid.

① Acute laryngitis → inflammatory changes in laryngeal mucosa, for less than 2 weeks

→ Etiology → 1) Viral 2) Bacterial 3) mechanical acute voice strain 4) Hemorrhage (vocal cord edema)

→ Clinical features → 1) Hoarseness 2) Aphonia 3) URI symptoms 4) cough 5) Dyspnea 6) stridor

→ True vocal cords are erythematous/edematous with vascular injection and normal mobility.

→ predisposing factors → 1) over use of voice 2) URI 3) Smoking 4) Alcohol

→ Mx → voice rest, hydration, avoid irritants

② Chronic laryngitis → inflammatory changes in the laryngeal mucosa for more than 2 weeks.

→ Etiology → 1) Smoking 2) GERD 3) recurrent acute laryngitis 4) Chronic voice strain.

5) Chronic sinusitis with post nasal drip. 6) Chronic alcohol use

→ Features → 1) Atrophied mucosa 2) prominent anatomical structures

Leukoplakia of vocal cords → precancerous accumulation of keratin (white plaques) on the VCs.

③ Vocal cord polyps

- most common benign tumor of the vocal cords
- usually ~~unilateral~~ Unilateral
- It doesn't have a classical site
- ~~It~~ → Stop smoking or alcohol, anti-reflux medications, vocal cords rest and surgery

④ Vocal cord nodules (Singer's nodule)

- usually due to vocal abuse, subepithelial hemorrhage → fibrosis → nodule
- usually bilateral
- It does have a classical site (on the junction btw the anterior one third and the posterior two thirds of VC)
- Mx → vocal cord rest and speech therapy.

⑤ Vocal cord cyst → a sac around a fluid-filled or semi-solid center.

- ↳ 2 types → ① Mucous retention cysts ② Epidermoid (sebaceous) cysts

⑥ recurrent respiratory papillomatosis

- Development of exophytic warty lesions, primarily within the larynx
- benign → HPV (6, 11)
- Malignant → HPV (16, 18)
- either of juvenile onset or of adult onset

⑦ Vocal cord paralysis

- causes: 1) neoplastic; any tumor that could invade the vocal cords or laryngeal nerves
- 2) Traumatic mostly iatrogenic trauma
- 3) DM, rheumatoid joint arthritis.

⑧ Reinke's edema → swelling of the vocal folds due to fluid collection (edema) in superficial lamina propria of vocal folds (Reinke's space)

- symptoms → Hoarseness, dysphonia, dyspnea
- Rfs → Smoking, GERD, hypothyroidism
- Mx → eliminate the risk factor
- ↳ Surgery

① Laryngeal Carcinoma

→ Glottic > supraglottic > subglottic
↓
Hoarseness dysphagia stridor

* RIs → 1) smoking, HPV (RRP), Alcohol, GERD, Genetics, previous neck radiation.

* Histological types → 1) SCC 2) salivary gland cancers 3) Sarcomas (chondrosarcoma from cricoid cartilage)

* Mx → stages 1, 2 → radiation

stage 3 → surgery vs chemo radiation

stage 4 → surgery with possible post op radiation.

Geist

⑩ Facial & Nasal trauma

* Facial trauma (maxillofacial) trauma → any injury (blunt or penetrating) to the face, including soft tissues injuries such as burns, laceration, bruises, or fractures of the underlying skeleton, sinuses, eye socket, or teeth

→ The principle of Mx → stabilize the pts medical condition and resuscitation.

↳ by RABCs of trauma

C → stabilizing the cervical spine A → Airway mnx B → breathing C → circulation

⇒ once stable, relevant Hx may include:

- 1) Mechanism of injury
- 2) loss of consciousness
- 3) Visual disturbances
- 4) Hearing problems
- 5) Discharge from ear, nose
- 6) Numbness, tingling.

⇒ Physical examination

- 1) Face (asymmetry)
- 2) Eyes (movements, Assess pupils)
- 3) Nose
- 4) Ear (laterations, CSF leak)
- 5) tongue and mouth
- 6) mandible and TMJ.
- 7) Teeth (risk of aspirating the tooth)
- 8) Cranial nerves

⇒ soft tissue trauma

- 1- Managing blood loss
- 2- prophylactic treatment measures (ABx)
- 3- Analgesia
- 4- wound irrigation and closure

⇒ Skeletal trauma

- LeFort fracture
- Zygomatic bone (malar) fracture
- Orbital (blow-out) fracture
- Fractures of the mandible

Blowout fracture → anterior trauma to orbit can cause a fracture of the orbital floor, which result in periorbital fat sagging into the maxillary sinus

⇒ Signs and symptoms:

- 1) Diplopia
- 2) restricted eye movements
- 3) Eyelid swelling
- 4) Enophthalmos
- 5) paraesthesia
- 6) Crepitus

⇒ Mx → involve a maxillo-facial surgeon and an ophthalmologist

→ Analgesia → steroids to reduce the edema → proceed to operation

- Indications of surgery → 1) Deterioration of vision
- 2) Entrapment of eye with restricted movement
- 3) Failure of medical therapy

Nasal trauma

→ why the nose is fractures after trauma?

- 1) because of its central and prominent position in the face
- 2) lack of skeletal support
- 3) upper one third is bone and lower two thirds is cartilage.

⇒ if anterior hit (trauma) → Depressed fracture

⇒ if lateral hit (trauma) → Dislocation, displacement, avulsion.

⇒ Signs and symptoms

- Deformity
- nasal obstruction
- Epistaxis
- swelling and discoloration of skin
- Rhinorrhea
- periorbital and subconjunctival ecchymosis
- septal hematoma

⇒ Complications

- 1) Cosmetic deformity
- 2) epistaxis and CSF leaks
- 3) Septal hematoma and saddle nose deformity
- 4) Airway obstruction
- 5) Septal perforation
- 6) septal abscess
- 7) Rhinolith
- 8) cribriform plate fracture

⇒ Mx → if cut wound → (stop bleeding, clean the wound, cover it, Abx, ...)

↳ In case of fractures → no deformity, no reduction / Deformity → reduction

but if you want to reduce wait 3-7 days, until the edema resolves, but if any vital organ was compromised do it emergently.

Septal hematoma, if left untreated → fibrosis → necrosis → saddle nose deformity.

⑪ Epistaxis → nasal bleeding

→ Bleeding usually arises from the nasal septum and specifically from the Kiesselbach's plexus where the vessels supplying the nasal septum anastomose and it is located in the anterior part of the septum

* Causes

- ↳ local → ① Idiopathic (SBI) ② Traumatic ③ Inflammatory ④ neoplastic ⑤ Environmental
- ↳ systemic → ① Hemophilia ② Bleeding disorders ③ Anticoagulants ④ HTN

* Mx → stop the bleeding and treat the underlying cause

→ How to stop the bleeding?

- 1) Manual digital pressure → patient leaning forward, breathing from the mouth, pressing on lower nose
- 2) Chemical cautery → with silver nitrates
- 3) Electric cautery or diathermy
- 4) Anterior or posterior nasal packing → with ribbon gauze + Abx to prevent OM
- 5) Angiography and vessels embolization
- 6) surgical Mx

Septal perforation

* causes : 1) Trauma 2) Infection 3) Neoplasm 4) Inflammatory 5) Inhalation of irritants

→ Most perforations are asymptomatic

* Features : 1) Epistaxis 2) Nasal obstruction 3) Whistling sound on breathing
4) Dryness of nose and crusting

* Mx → treat the underlying cause

- ↳ if asymptomatic → informed reassurance
- ↳ creams
- ↳ nasal fuching
- ↳ surgery (graft or flap)

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Vertigo

↳ is a subjective sensation of movement, usually rotatory but some times linear

↳ the objective sign of vertigo is nystagmus

→ Body balance is maintained by the input to brain from the inner ear, eyes, and proprioceptive organs

→ Causes of vertigo

↳ non-otological causes e-

1) Cardiovascular (postural hypotension, arrythmia)

2) Endocrinology (hypoglycemia)

3) Central (neurological) → transient ischemic attack

4) Drugs (Alcohol, antihypertensives, ...)

5) Hyperventilation (psychological [panic attacks], ...)

6) physiological (aging [poor eyesight, impaired proprioception, ...], ...)

7) Head injury (Traumatic)

8) cervical spondylosis 9) Migrane 10) Epilepsy

↳ Ear causes e-

① Benign paroxysmal positional vertigo ② Meniere's disease ③ Labyrinthitis

→ on history e

1) Timing and duration (episodic, persistent) (secs, mins, hs)

2) Aural symptoms (deafness, tinnitus, discharge)

3) Neurological symptoms (LOC, weakness, numbness, diplopia, dysarthria).

⇒ For example

→ episodic with aural symptoms → Meniere's disease

→ " without " → BPPV

→ constant without " → Neurological, CV, drugs, hyperventilation

→ severe acute solitary attack with aural symptoms → Labyrinthitis

⇒ Duration → secs → BPPV

↳ mins-hs → Meniere's

↳ hs-days → Labyrinthitis

→ Meniere's Disease

- Vertigo (mins to hrs), decrease hearing, tinnitus, aural fullness
- Mx → salt restriction and diuretics

→ Labyrinthitis (vestibular neuritis)

- bc2 of a viral infection
- The vertigo is usually of explosive onset, but there is neither tinnitus nor deafness
- we do MRI to rule out stroke or tumor
- steady resolution takes place over a period of 6-12 weeks, but the acute phase usually clears in 2 weeks

→ BPPV → لا كلاله في الوجود

- Cause → otoliths misdisplaced.
- Diagnosis → Dix-hallpike test (to trigger the BPPV and see the nystagmus)
- Tx → Epley manoeuvre

→ Ototoxic drugs

- Aminoglycosides (gentamycin)

→ Perilymph fistula → rupture to round window membrane or injury to foot plate of stapes

- Mx → bed rest then surgery.

(13)

Ques 13 Surgical thyroid diseases

* Thyroid exam

• Thyroid glands

- Inspection: Visible mass, redness, scar, movement with swallowing and tongue protrusion.
- palpation: Consistency, shape, surface, tenderness, thrill, movement. Feel the trachea
- Percussion: Retro sternal goiter
- Auscultation: Bruit
- Remember lymph node examination
- Pemberton's sign

• Anxiety • pulses: rate, rhythm

• Hands: Temp., sweating, palmar erythema, acropathy, tremor.

• Integumentary: dry skin, loss of eyebrow hair, pretibial myxedema

• Eyes: lid retraction, lid lag, extracocular motility, exophthalmos

• Deep tendon reflexes • proximal myopathy.

→ The most common neoplasm of Thyroid gland is → Benign follicular cell adenoma

→ The most common malignant thyroid cancer is → papillary carcinoma

* Higher malignancy risks of thyroid nodule

1) It is very firm, fixed to adjacent structures, rapidly growing, associated with enlarged LN, causes vocal cord paralysis, or signs of invasion into neck structures are present.

2) FHx of thyroid cancer

3) Patient's age and gender (young, male)

4) Hx of Head and neck radiation

5) Hx of diseases associated with thyroid carcinoma

6) suspicious findings on imaging

* Approach to thyroid nodule → measure TSH and perform ultrasound of thyroid and neck

⇒ If TSH is low (primary hyperthyroid) → perform a thyroid uptake and scan

(a) The nodule itself is hyperfunctioning (toxic adenoma) → Lobectomy

(b) All the thyroid is hyperfunctioning (even the nodule)

↳ give anti-thyroid medications

↳ on U/S → if high suspicious features → Do FNA-cytology

↳ if not

→ Follow up.

(c) The nodule itself is not functioning, but the rest of the thyroid is hyperfunctioning

↳ we treat hyperthyroidism

↳ Do FNA-cytology to the nodule.

⇒ If TSH is normal or elevated (Euo or hypo thyroid)

↳ on U/S → High suspicious features → do FNA-cytology

↳ if not → Follow up every 6 months for 3 years.

* Suspicious nodule features

1) Hypoechoic 2) Microcalcifications 3) Infiltrative margins

4) Taller than wide in transverse plane 5) Increased central hypervascularity

* suspicious LN features

1) Hypoechoic 2) Bounded 3) Absence of fatty hilum 4) Cystic or partially cystic

5) Microcalcifications

* Bethesda system for reporting thyroid cytopathology

1) Non diagnostic or unsatisfactory → estimated risk of malignancy 1-4

2) Benign (nodular goiter, colloid goiter, Hashimoto's thyroiditis) → = 2 = 2 = 2 = 0-3

3) Atypia of undetermined significance (AUS) or Follicular lesion of ~~undetermined~~ significance (FLUS) → = 5-15

4) Follicular neoplasm or suspicious for a follicular neoplasm → 15-30

5) Suspicious for malignancy → 60-75

6) Malignant → 97-99

* Mx according to Bethesda System

1) → repeat FNA after ^{6w} consider surgery

2) → Active surveillance

3) + 4) → high suspicion → Lobectomy or total thyroidectomy

→ low suspicion → Diagnostic Lobectomy

or → Molecular diagnostics

or → Active surveillance

or → repeat FNA

5) + 6) → surgery

* prognosis according to MACIS

M: Metastasis A: age C: completeness of resection I: Invasion S: size

* complications of thyroidectomy

(A) Injury to related anatomical structures

1- RLN 2- external branch of SLN 3- damage to trachea 4- pneumothorax

(B) Hormonal

1- Hypothyroidism 2- Thyroid crisis 3- Hypoparathyroidism

(C) Wound site

1- Hemorrhage 2- wound infection 3- poor scar 4- Tracheomalacia

(14)

Cervical Neck masses

* The neck is divided into an anterior triangle and a posterior triangle by the sternocleidomastoid muscle. The anterior triangle is bound by the 1) SCM, 2) Mandible, and 3) the midline. The posterior triangle is bound by the 1) SCM, 2) trapezius muscle, and 3) clavicle.

The anterior triangle is further divided by the digastric and omohyoid muscles into 2

- 1) Submental [btw the 1) Anterior belly of digastric 2) midline 3) body of hyoid bone] and it contains submental lymph nodes.
- 2) Submandibular [btw the 2 bellies of digastric] and contains 1) Submandibular glands and lymph nodes 2) Facial artery 3) Facial nerve 4) Marginal mandibular nerve
- 3) Carotid triangle [posteriorly by Anterior border of SCM, Anteroinferiorly by the superior belly of omohyoid, Anterosuperiorly by posterior belly of digastric] and contains 1) Carotid artery 2) Internal jugular vein 3) last 4 cranial nerves with the vagus being the longest root 4) lymph nodes

The posterior triangle also have subdivisions including the supraclavicular triangle which contains 1) supraclavicular lymph nodes 2) subclavian vessels

* Cervical lymph nodes 8

- ① submental ② submandibular ③ pre-auricular ④ Post-auricular ⑤ posterior occipital
- ⑥ (upper, middle, lower) anterior cervical ⑦ (upper, middle, lower) posterior cervical ⑧ supraclavicular

Note that all of them drain from neck and head, except for the supraclavicular, they drain from both below and above the neck

Note that enlarged supraclavicular LN is called Virchow's node. The presence of it which is called Troisier's sign.

* Levels of cervical lymph nodes

- I a) submental b) submandibular
- II (superior spinal accessory) (superior jugular) (Jugulo-digastric)
- III Midjugular
- IV (Inferior jugular) (Jugulo-omohyoid)
- V (Inferior spinal accessory) (Transverse cervical)
- VI (Pretracheal) (Paratracheal)
- VII (Intraclavicular) (Anterior mediastinal)

Note that you should know the drainage sites for each level since cancer goes to different levels.
e.g. tongue Ca. goes to levels 1, 2, 3 & Cancer of larynx goes to levels 2, 3, 4 and sometimes 6. Pre-auricular LNs drain the skull, ear, conjunctiva.

Note that 50% of neck masses are swollen lymph nodes. The remaining masses the most common of which is Thyroid enlargement.

Note that neck masses are either true masses or pseudo-masses.

⇒ pseudo masses → it is only an anatomical variation

examples → elongated styloid process (Eagle syndrome which can cause glossopharyngeal neuralgia),

people with tall thin necks can feel this.

↳ elongated transverse processes of axis (C2)

⇒ True masses

↳ Congenital & 1) Thyroglossal duct cyst 2) Dermoid cyst 3) Branchial cyst 4) Lymphangioma

5) Hemangioma and AV malformation

↳ Developmental: 1) laryngoceal 2) Zincker's Diverticulum

↳ Acquired & 1) Inflammatory (Infective and non-infective) 2) neoplastic

Ⓐ Congenital true neck masses

① Thyroglossal duct cyst

the thyroid gland originally arises from the foregut and descends through the thyroglossal tract until it reaches its pre-tracheal position. The tract should obliterate. Incomplete closure or failure of evolution of the tract leads to thyroglossal duct cyst.

→ mc site → infrahyoid position

→ presentation → usually in pediatric age group in the first 10 years, However 25% of cases are adults.

→ Sometimes it might be infected and painful

→ It almost always moves with swallowing and tongue protrusion, but lack of movement can't exclude it.

→ prior to surgery we must do US or CT scan of neck, why?

1) to identify the properties of the mass 2) to assert the presence of thyroid gland and tissue in its right position.

3) There is a 2% risk of malignancy in this mass, so we take a look at the surrounding LNs whether they require dissection or not.

→ The name of the operation is Sistrunk's operation, where we remove a part of the hyoid bone to decrease the recurrence to about 5% only.

② Dermoid cyst

- ↳ Epidermoid cyst → benign cyst, usually found on the skin. the cyst develops out of ectodermal tissue. Histologically it's made of a thin layer of squamous epithelium, and usually found at sites of embryonic fusion of the skin.
- ↳ True dermoid cyst → midline mass consists of skin and appendages like hair, sweat glands and sebaceous glands. usually doesn't move with swelling and tongue protrusion, and might be infected and inflamed.
- ↳ Teratoma → Derived from all three germ cell layers.

③ Branchial cyst

it's derived from the second pharyngeal pouch, it appears in teens to twenties, behind the junction of the upper one third and lower two thirds of SCM. Some times a fistula may arise from it (branchial fistula) externally at the junction or opens into the tonsillar fossa.

- wedge U/s or CT scan with contrast first then surgery.

④ Lymphangioma → benign tumor of the lymphatic vessels.

- small size → simple capillary type
- large size → cavernous type
- widely spread communicable channels → cystic hygroma

✗ Cystic hygroma → presents at birth usually at body junctions (neck and trunk, trunk and LL groin)

→ Investigations :-

1) Lymphangiogram → cystic hygroma 2) Excisional biopsy → capillary and cavernous types

→ Tx → if small and asymptomatic → leave it

→ small and symptomatic → excision

→ large → serial excisions

Note that sometimes we inject a sclerosing agent which lead to fibrosis and shrinkage of the mass

Note that we may use radiation therapy but there is risk of transformation into lymphangiosarcoma

⑤ Hemangioma and AV malformation.

↳ benign tumor of the blood vessels ↳ Abnormal communication btw the arterioles and the venous.

AV malformation

present at birth
Constant in size

- usually non-blanchable, however it can be blanchable
- Usually do not have feeder vessels

Hemangioma

present after few months of birth
Have 3 phases:

1. Growing phase (2 years)
2. Steady phase (2 years)
3. Involution phase (2 years)

usually blanchable, however it could be non-blanchable
Have feeder vessels (usually one or two)

Note that if any patient presents with hemangioma we should exclude deep hemangioma (50% of cases with cutaneous hemangioma have deep hemangioma esp. in the liver)

Mx → Hemangioma on chest with no Sx → Assurance of the pt.

→ - in the larynx → Tracheostomy until it relieves → closure

→ to decrease the period of each phase → injection of intralesional steroid.

→ we may use angiogram with embolization

→ propranolol causes shrinkage of it.

⇒ Sturge-Weber syndrome → AV malformation at site of ophthalmic division of the trigeminal nerve. There is port wine stain of the face. may be associated with AVM in the choroid → retinal hemorrhage. or AVM in the brain → ventricular H. and epilepsy.

⇒ Merril-Kasabach disease → large AVM or hemangioma lead to consumption of the blood (by breaking RBCs and platelets) → anemia and thrombocytopenia → DIC and high-output HF.

③ Developmental neck masses

① Laryngocele

- The laryngeal ventricle is btw the folds and have vocal cords
- If there is a tumor at the ventricular opening this will lead to ventricular enlargement.
- Diagnosis → CT (mass filled with air or mucus) and Direct laryngoscopy
- If large and Sx → excision

② Zenker's Diverticulum

- Lower pharyngeal constrictor muscle has two groups of fibers:
 - Oblique fiber (thyropharyngeus muscle fiber)
 - Transverse fiber (cricopharyngeus muscle fiber)
- There is a weak area btw these muscles which is called "Killian triangle" → so the bulge occur in the mucosa of this area
- Sx: dysphagia, halitosis, undigested food regurg, neck mass
- presentation usually after 50 years and more common in males
- Dx → Barium swallow
- Tx
 - ↳ if small → Diverticulotomy "trans-orally"
 - ↳ if large → Diverticulotomy by external approach.

- ✗ Sebaceous cyst → closed sebaceous gland moves with skin and treated by total excis
- It has punctum.

✗ Carotid body tumor (potato tumor) (chemodectoma)

- It's part of paragangliomas
- Arise from carotid body which has baroreceptors and chemoreceptors
- On examination → pulsatile neck mass, which moves from side to side but not upward and down
- Dx → MRI (salt and pepper appearance)
- Tx → observation, radiation, surgery (before surgery 2-2 days we perform angiogram with contrast)

Salivary glands

* Major (parotid, submandibular, and sublingual glands)

→ Parotid (the largest, its duct called Stenson's duct, opens opposite to the upper 2nd molar tooth, facial nerve divides it into superficial (90%) and deep parts and divides to its terminal branches (Temporal, zygomatic, Buccal, marginal mandibular, cervical)

→ Submandibular (divided by the mylohyoid muscle [Diaphragm of floor of mouth] into superficial and deep parts) its duct called Wharton's duct, opens just lateral to lingual frenulum.

→ Sublingual glands (drains directly through the mucosa and through Wharton's duct.

* Inflammation of the salivary glands (Sialadenitis) usually in parotid

* Stones (Sialolithiasis) usually in the submandibular, it's narrower, acute angle, thick secretions, more Ca content, washout with stimulus

→ Parotitis → caused by viruses (mumps) or bacteria in dehydrated elderly patients (Staph and anaerobes)
↳ we should encourage hydration, Abx, antipyretics, analgesics, lemon drop to stimulate secretions.

→ Sialolithiasis → 90% are radio-opaque stones

↳ Dx → sialogram = filling defect.

Tumors of the salivary glands

→ 80% in the parotid, 80% of parotid neoplasms are benign, 80% of benign parotid neoplasms are pleomorphic adenoma (2% risk of transformation to pleomorphic Ca.)

→ other benign tumor → Warthin tumor

→ Examples of malignant tumor → adenocarcinoma, SCC, mucoepidermoid, lymphoma, adenocystic Ca.

→ Parotid Ca may cause facial palsy by invasion of the facial nerve.

→ Diagnosis → FNA, technetium scan (All SG tumors are cold except Warthin and oncocytoma)

* Warthin tumor (Adenolymphoma) → tumor of elderly smoker males, recently ↑ incidence of female pts.

→ Tx → excision

→ differentiate btw submandibular gland tumor and submand. LN by bimanual palpation

"Ballotment" → if ballotable → related to gland, if not → LN.

* Ludwig angina → Abscess in the submandibular and sublingual spaces, may cause cellulitis in the FOM & present as a neck mass.

→ The edema in FOM may push the tongue upwards and backwards causing airway obs.

→ Tx → Abx covering anaerobes + surgical drainage

Foreign bodies in otolaryngology :

the most affected by foreign bodies are pediatrics at the age of 1 year; because they develop pincer grip which allows them to hold things and put them in their mouth
mentally challenged patients are also at a high risk.

* foreign bodies of the ENT are divided according to:

1-site : ear, nose, larynx, pharynx and esophagus

2-size: small, Medium, large

3-consistency: soft, hard, rubbery

4-shape: sharp, smooth surfaces

5-organic or inorganic

6-animate or in-animate

** organic foreign bodies include: anything (عضوي)

rubber, wood, paper, vegetables.

They tend to be more symptomatic and have a higher risk of complications; we need to be more aggressive in treating them than with inorganic.

Inorganic:

the most serious is batteries; because there's probability of leakage of the battery chemicals.

** animate:

alive.

Insects.

When dealing with insects we should always try to kill it before removing it using mineral oil or alcohol, in order to minimize the complications of its removal.

* after the removal of a foreign body one must reexamine to exclude complications and presence of a second foreign body.

25% of patients who have a foreign body tend to have another one.

* usually there's low threshold to use general anesthesia in pediatrics.

foreign bodies of the ear:

symptoms :

it may be asymptomatic
aural fullness
conductive hearing loss and tinnitus
otalgia
bleeding
otorrhea as a result of infection

signs:

*inspection:
visualization of the FB
signs of inflammation
auricular and tragal tenderness otitis externa
*percussion negative
*otoscopy:
wax on FB
narrowing of the canal
redness

complications:

1-otitis externa
2-tympanic membrane perforation
3-otitis media
4-bleeding and laceration of the canal

management:

the FB should be removed using forceps, ear syringe, or a hook.

The choice should be made on the nature of the FB, consistency and site.

-a soft FB is removed easier than hard ones.

-ear syringe should be avoided in:
organic FB because they possess hygroscopic features
sharp FB
batteries-leakage of chem.

Large objects lying superficial to the external ear canal **isthmus** because there is a danger of wedging them in that area.

foreign bodies of the nose:

symptoms:

- 1-nasal obstruction (sleep apnea and mouth breathing)
- 2-rhinorrhea (mucoïd-mucopurulent)
- 3-excoriated skin (unilateral)
- 4-epistaxis
- 5-csf leak
- 6-headache

Signs:

rhinorrhea, mouth breathing,
epiphora: hyperlacrimation when the FB is on the inferior turbinate
septal perforation.

Complications:

- 1-septal perforation
- 2- septal hematoma
- 3-epistaxis
- 4-laceration
- 5-aspiration.
- 6-rhinolithiasis

management:

depends also on the nature of FB, size and consistency

we can use a hook or Foley's catheter.

the FB is removed from above of the (against the floor) to achieve the least tenderness and damage.

Foreign bodies in throat (pharynx)

- One of the common foreign bodies in pharynx is Fish bone , it can stick in any pit (tonsils, base of the tongue, vallecula, pyriform sinus)
- Possible symptoms
 - o Dysphagia, odynophagia, sore throat, SOB if big foreign body, bleeding per mouth, otalgia due to referred pain from glossopharyngeal nerve.

- Depending on its site and situation we can decide if it needs local anesthesia, or GA
- One of possible complications is retropharyngeal abscess (causing sore throat, dysphagia, odynophagia, SOB, fever, neck rigidity)
 - o Management: local anesthesia and aspirate by a needle, if it was pus then it is abscess, here do an incision and drain it, or we can get a CT scan, or lateral neck soft tissue X ray where I find expanded soft tissue in front of vertebrae
 - o Give him a broad spectrum antibiotic
- Other complications include bleeding, infection.

Foreign bodies in larynx

- Symptoms
 - o Dysphonia, stridor, SOB, airway obstruction, hemoptysis, cough
- We should do direct or indirect laryngoscopy
- Stridor occurs in partial obstruction,
- if pt can't speak or take a breath and rapping his hand around his neck he may be having a complete obstruction on the larynx, first ask someone to call 911, then do Heimlich maneuver (stand behind pt, do a fist under xiphisternum, then push upward and backward to increase intra-abdominal pressure to push diaphragm upward so air is compressed to get out of lungs and push the foreign body away)
 - o if the pt has partial obstruction **DON'T DO** Heimlich maneuver, because it may turn into complete obstruction, send him to emergency room
 - o if you were alone and couldn't call 911, go to a table corner and push your xiphisternum against it
 - o if the pt was infant, put him in a prone position, and hit him on his back, then look at his mouth if you could see the foreign body take it out with your finger
 - o if an adult pt entered in a coma after an airway obstruction, you should do cricothyroidectomy (just between thyroid cartilage and cricoid cartilage in the midline) and put any tube you have (cannula, pen, straw...)
 - the layers you cut here are skin, subcutaneous tissue, cricothyroid membrane
 - in tracheostomy the layers are skin, subcutaneous tissue, platysma, strap muscles, thyroid then trachea, so trachea is always deeper than what you think

foreign bodies in esophagus

the normal narrowing sites of the esophagus:

1- upper esophageal sphincter (cricopharyngeous)

2- lower esophageal sphincter

3- at the site of crossing of the left main bronchus

4- at the crossing of the aortic arch

The narrowest of them all is: the upper esophageal sphincter

So if the foreign body was smooth and passed the upper esophageal sphincter it will go down

Sometimes the foreign body gets stuck in abnormal spaces (not the narrowing's) like if there is stricture or fibrosis or achalasia or external compression or tumor

We call the foreign body in the esophagus: foreign body ingestion or swallow

We call the foreign body in the airway: foreign body aspiration or inhalation

Possible foreign body in the esophagus:

The most common in adults is bolus of food

The most common in pediatrics is coins

Symptoms:

Dysphagia, retrosternal pain and discomfort, regurgitation, hematemesis, drooling of saliva - because he can't swallow his own saliva

how to diagnose? Esophagoscopy , diagnostic and therapeutic

but if the foreign body was a bolus of food , we encourage the patient to drink fizzy drinks like pepsi or Fanta because they stimulate peristalsis

or we can give the patient benzodiazepines like diazepam because it causes relaxation of the smooth muscles of the esophagus

however, if the foreign body was not food - a needle for example - we don't do that, we go to the esophagoscopy immediately because we don't want this to go down to the stomach unlike the bolus of food

* there is flexible and rigid esophagoscope , we use the rigid because it gives us more room for working

Possible complications of esophageal foreign bodies:

Esophageal perforation, ulceration, stricture, ...

Perforation: can cause mediastinitis , this is a very lethal and serious disease

So we don't want to come into this stage, so if a patient had esophageal perforation, we should give him prophylactic antibiotics, and put NG tube but under direct vision in order not to enter the perforation itself, to decompress the stomach , and we keep the patient NPO and on TPN and we wait for a week , if the patient developed the signs of mediastinitis like fever, leukocytosis, looking ill , shortness of breath ,....

Sometimes the perforation may heal alone , that's why we go for conservative treatment first and wait, if not , we repair it surgically

Foreign bodies in the tracheobronchial tree:

Foreign body aspiration or inhalation

It is more common to go to the right main bronchus because it is more perpendicular and shorter and wider , this is true if the aspiration or inhalation happened at upright position, i.e : the person is standing or setting , and this is true after the age of 4

If the patient was in upright position, the foreign body will go to the lower segments of the lung , but if he was in supine position, it will go the posterior segments whether upper or lower lobes

The symptoms are more severe when the foreign body is in the trachea because it causes complete obstruction, unlike the bronchi where there is another one which can compensate

Symptoms:

It may be asymptomatic

SOB, cough, choking, pneumonia, ...

If the foreign body went down to the bronchus, it may cause complete obstruction and this will lead to atelectasis , or maybe it obstruct a whole lobe and lead to collapse and shifting to the ipsilateral side

If it caused partial obstruction, it permits the air to enter and entrap it , emphysema will develop and hyperinflation, and shifting to the contralateral side

Complications: atelectasis, collapse, pneumothorax, hyperinflation, pneumonia,...

If the family of the patient were very sure that the patient aspirated a foreign bod, the diagnostic and therapeutic method is bronchoscopy

Bronchoscopy is also rigid or flexible, we use the rigid , we reach to the secondary bronchi, however, the flexible can reach the tertiary bronchi but the side working channel is small

***** NORMAL CHEST X-RAY DOES NOT RULE OUT FOREIGN BODY
ASPIRATION OR INHALATION *****

تعاهدنا على الزمن : الوفاء، الجمال، الوقفة،

تفريغ الراجون رحمة ربهم : يزن عداسي، احمد مطارنة، عبدالله بني ملحم