

ENT SAQ

By: 430 ENT

Ear lectures+ Deafness +Audiology

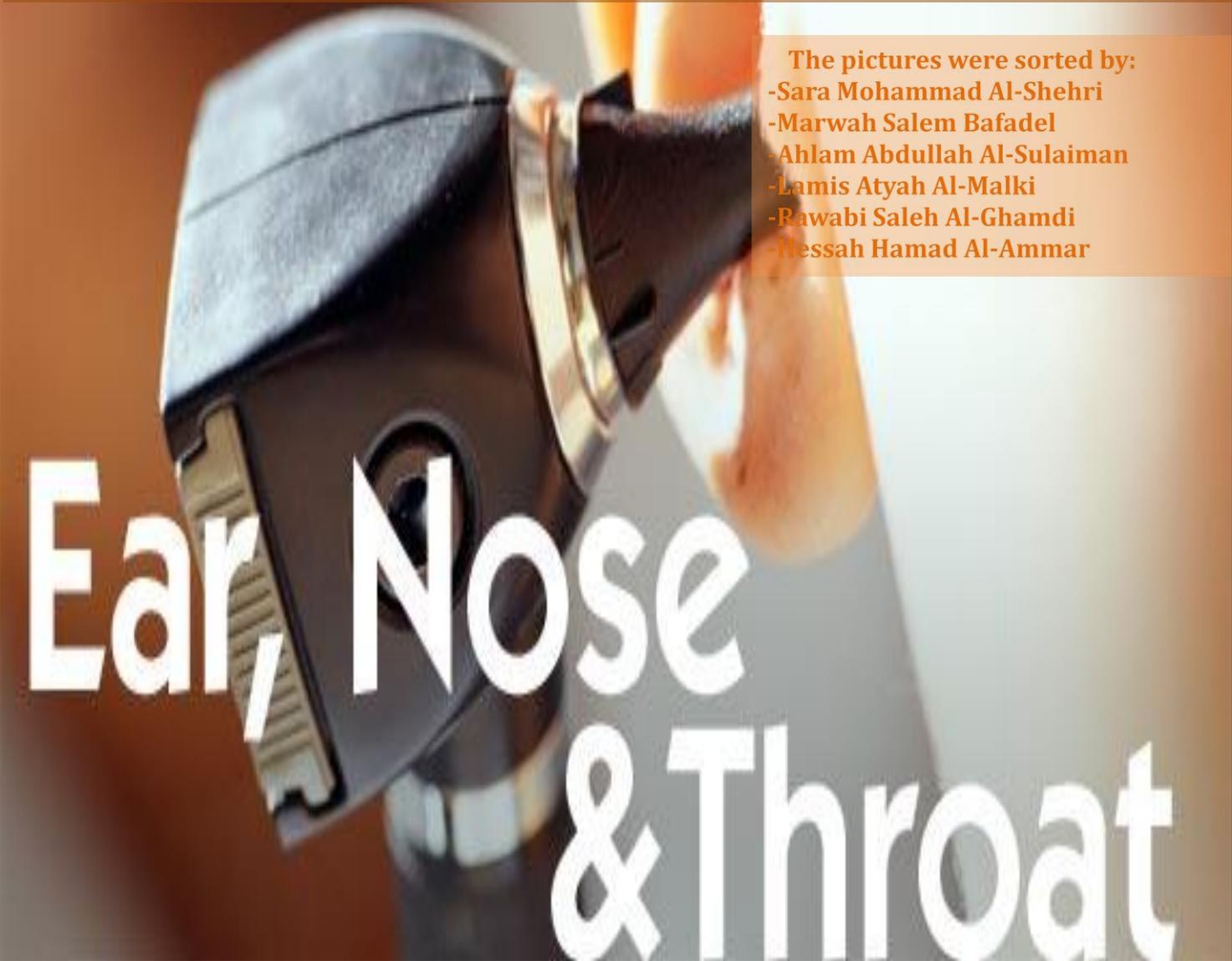
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Note: please refer to the original lecture given by the doctor

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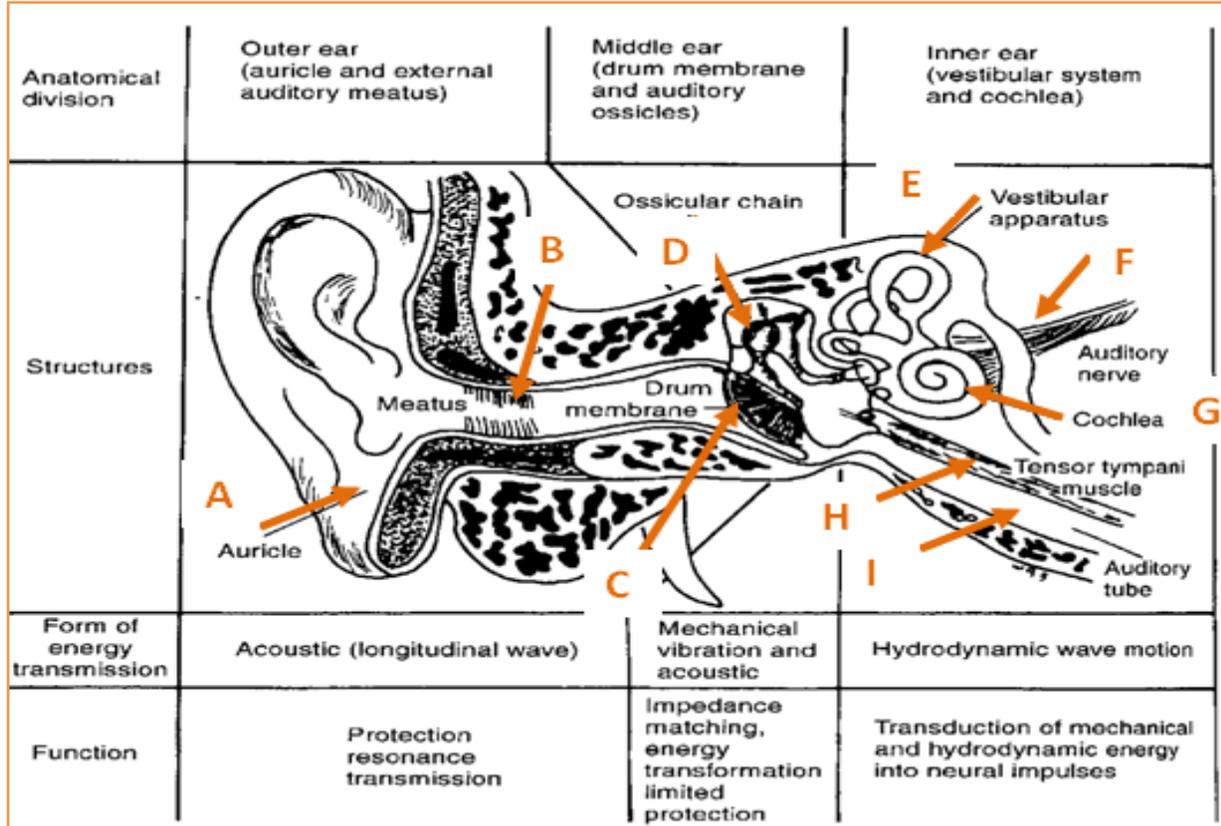


Ear, Nose
& Throat

Anatomy & physiology of the Ear:

➤ Ear is anatomically divided into :

- ✓ External Ear (Auricle or Pinna , External Acoustic Canal and Tympanic Membrane)
- ✓ Middle Ear (Bony Ossicles & it's filled with Air)
- ✓ Inner Ear (Semicircular canals & cochlea)

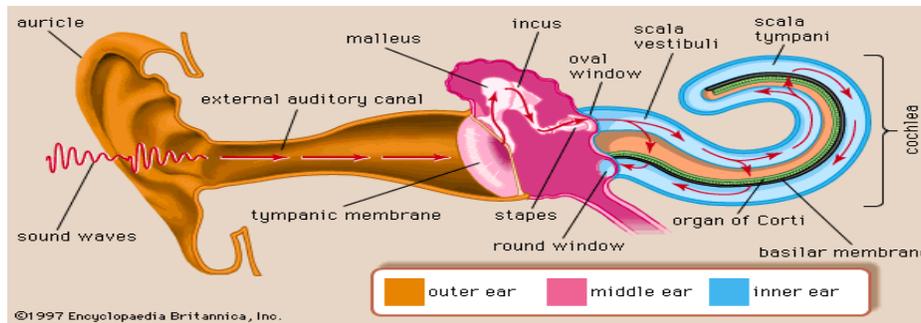


➤ Identify the pointed structures?

- A. Auricle or Pinna
- B. External Acoustic Canal
- C. Tympanic Membrane
- D. Bony Ossicles (MIS "Malleus , Incus & Stapes")
- E. Semicircular canals
- F. Auditory Nerve
- G. Cochlea
- H. Tensor Tympani Muscle
- I. Auditory Tube "Eustachian Tube"

➤ **Mechanism of hearing in brief :**

Air-conducted sound waves which are directed towards the ear canal by the Pinna. The External Acoustic Canal serves to channel the sound waves into the tympanic membrane and then the middle ear which is composed of three bones. These three bones mechanically transmit these waves to the oval window, which is part of the inner ear. The oval window vibrates inwardly, creating pressure waves in an incompressible fluid which fills the inner ear (Endolymph). This fluid pressure excites the membranes in the cochlea, a section of the inner ear shaped like a snail shell which contains the basilar membrane. The basilar membrane has tiny hair cells of (Organ of Corti) which transform the mechanical motion of the pressure waves into nerve impulses. These impulses are then transmitted to the brain where they are decoded and interpreted as sound. The impulses are then transmitted as nerve impulses to the auditory cortex of the brain through the auditory nerve.

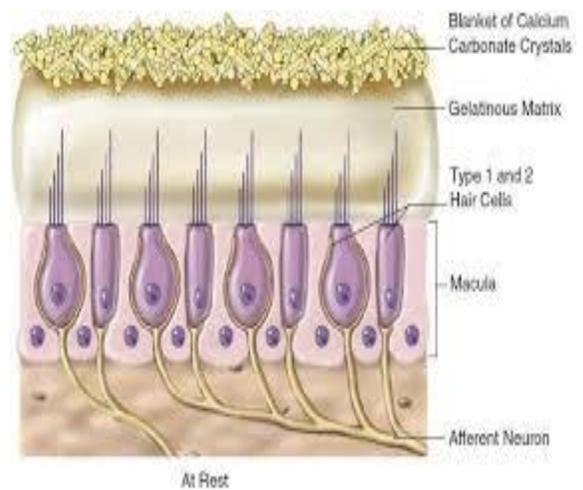
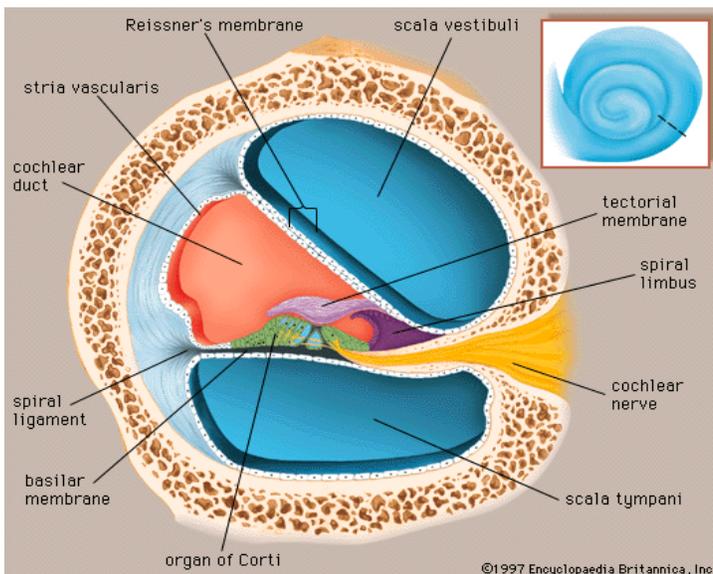


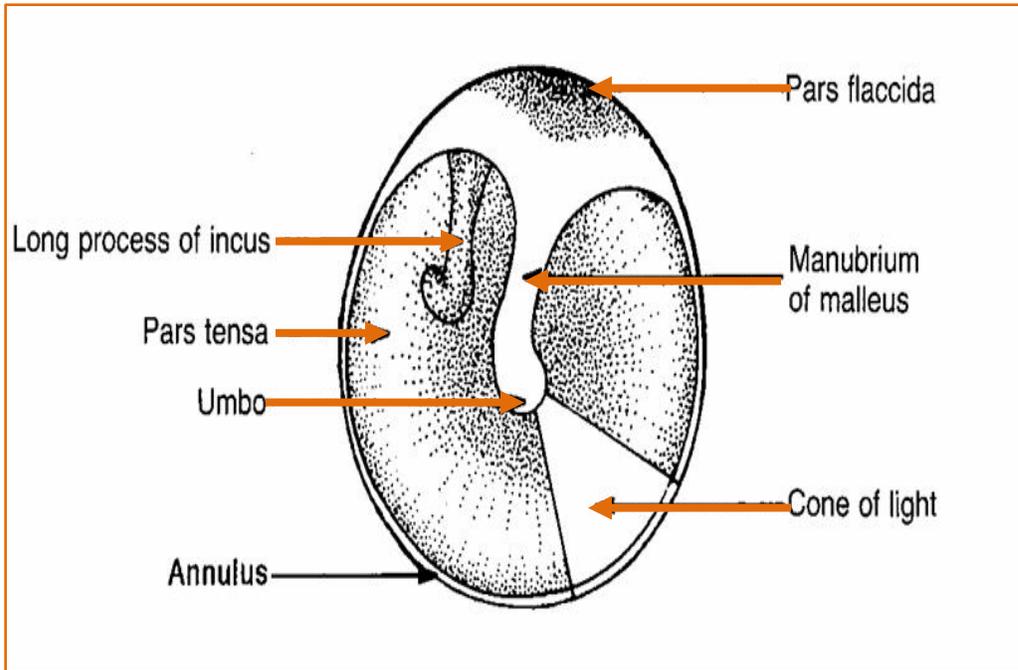
➤ **What is the organ of hearing?**

✓ Organ Of Corti.

➤ **End organ in Utricle:**

✓ Macula.





➤ **Tympanic Membrane (Layers):**

- ✓ Outer, Epithelial Layer "Continuation of the skin lining the meatus".
- ✓ Middle, Fibrous Layer "encloses the handle of malleus and has three types of fibers Radial, Circular and Parabolic".
- ✓ Inner, Mucosal "Continuation of the mucosa of the middle ear".

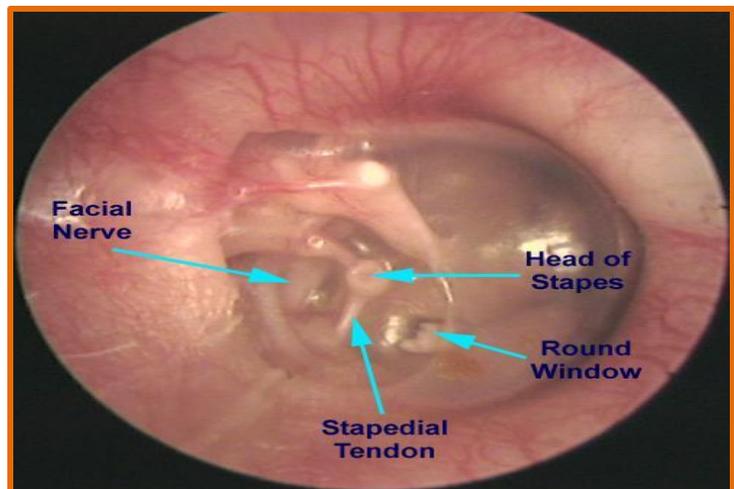
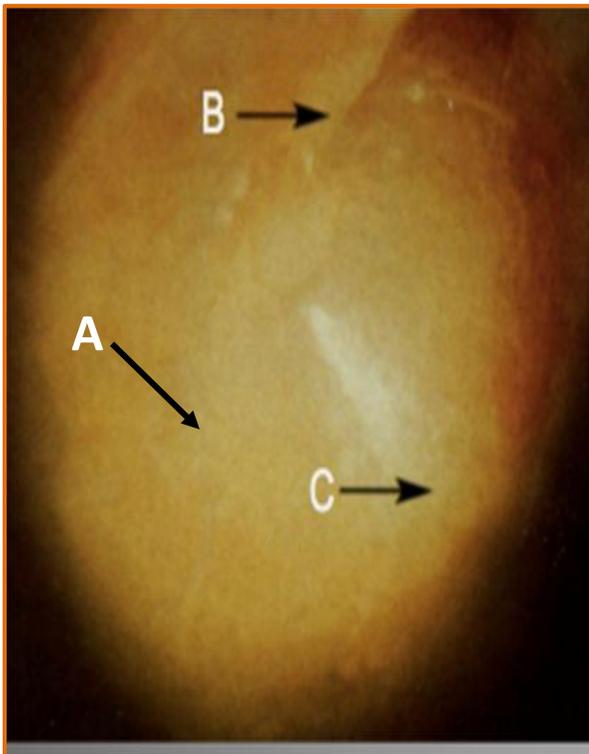
➤ **Identify the pointed structures?**

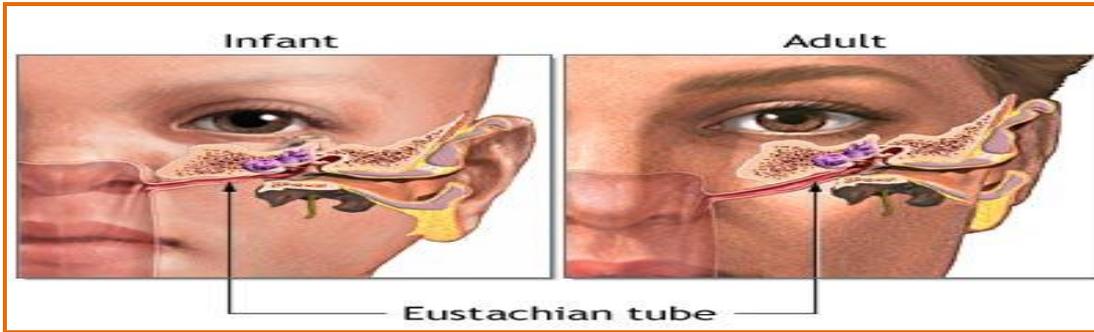
-The **Right Ear** (The Cone of light is directed to the right which means that this is the right ear).

A- Pars Tensa.

B- Handle Of Malleus.

C- Cone of light "Light Reflex".



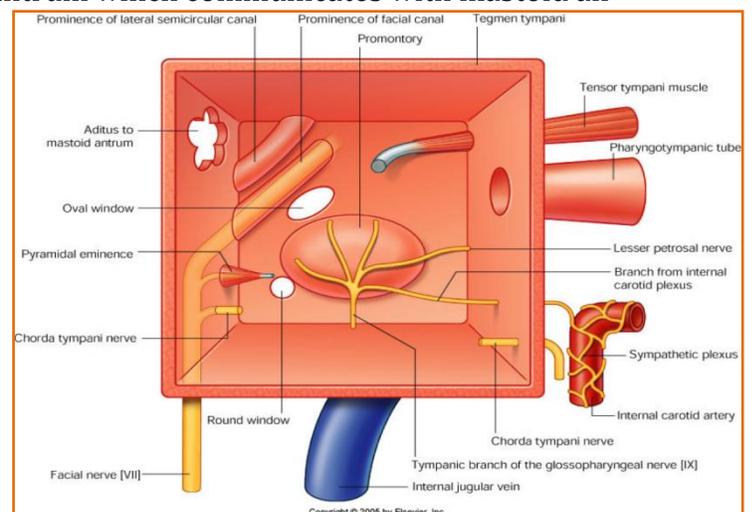


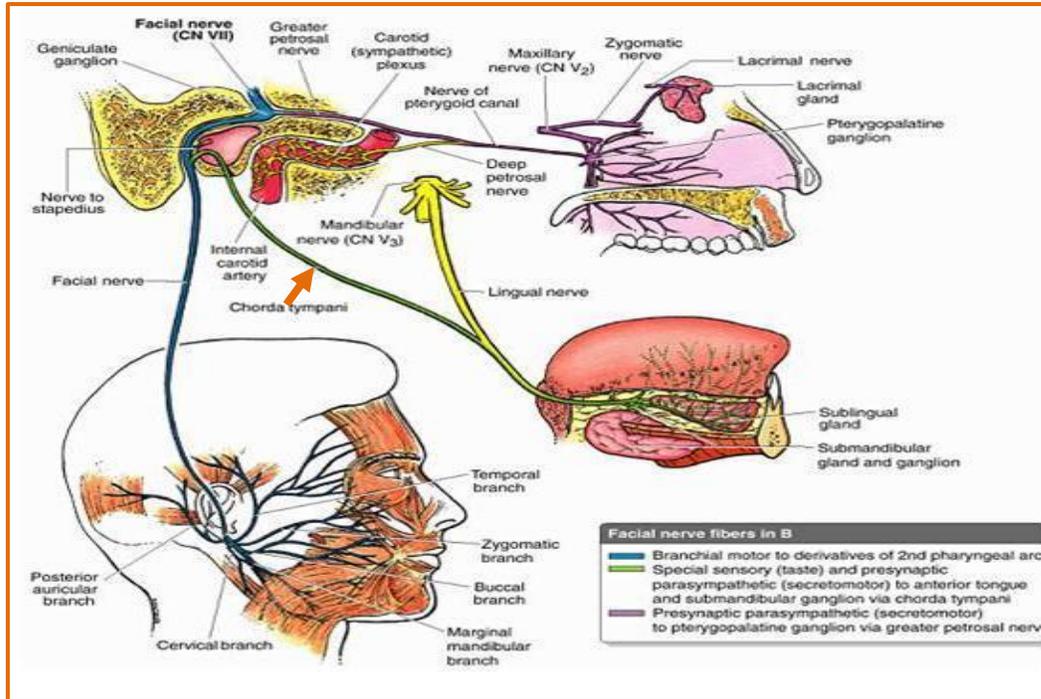
➤ **Auditory Tube "Eustachian Tube":**

- Mention 2 major differences between adults and pediatrics Eustachian Tube ?
 - In Pediatrics, It Is:
 - ✓ Shorter
 - ✓ More Horizontal
 - ✓ Wider
 - **Function :**
- Connects the middle ear to the nasopharynx.
 - It regulates the pressure within the middle ear, equalizing it with the air pressure outside the body. Most of the time the Eustachian tube is closed, but it opens during activities such as yawning, swallowing, and chewing by tensor palatine muscle action to allow air passages between the middle ear and nasopharynx.
 - It is lined by ciliated mucosa which helps in clearing the middle ear secretions.

➤ **Structures of the middle ear walls :**

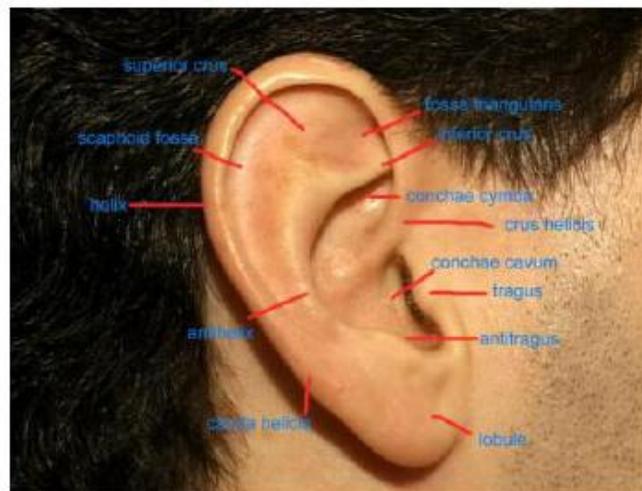
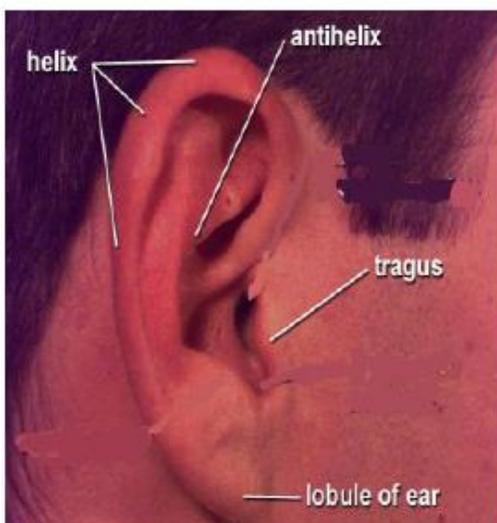
- ✓ Roof → (Formed by thin plate of temporal bone called "Tegmen Tympani" and also extends posteriorly to form the roof of "Aditus and Antrum").
- ✓ Floor → (Thin plate of bone separates the tympanic cavity from the jugular bulb "if there is a congenital deficit, it will be covered by a mucosa only as a result jugular bulb may project into the middle ear").
- ✓ Anteriorly → (Internal Carotid Artery, it has two opening: canal of tensor tympani muscle "Upper one" and the Eustachian tube "lower one").
- ✓ Posteriorly → (Aditus to the mastoid antrum which communicates with mastoid air cells, pyramidal eminence {the tendon of stapedius muscle}).
- ✓ Medially → (Oval window, Round window, Facial Nerve, Promontory).
- ✓ Laterally → (Mostly formed by the Tympanic Membrane and to a lesser extent by a bony outer attic wall called Scutum).





- **Identify the pointed part?** Corda Tympani.
- **What are the types of fibers carried by this part?**
 - ✓ Special sensory fibers providing taste sensation from the anterior two-thirds of the tongue.
 - ✓ Pre-synaptic parasympathetic fibers to the submandibular ganglion, providing secretomotor innervations to two salivary glands: the submandibular gland and sublingual gland and to the vessels of the tongue, which when stimulated, cause a dilation of blood vessels of the tongue.

➤ **Part of pinna (Auricle):.**

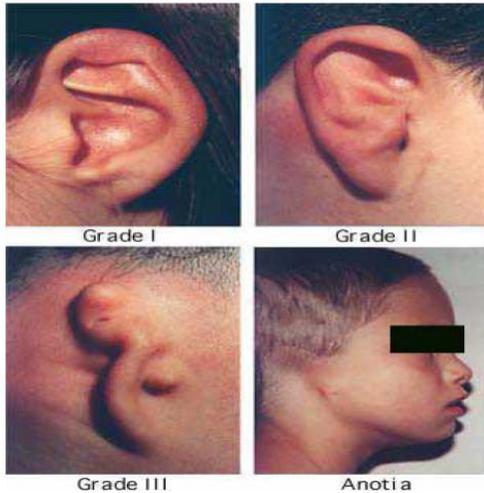


Disease of the external ear and acute otitis media



➤ **Anatomy of the external ear :**

1. Helix.
2. Antihelix.
3. Tragus.
4. Lobule.



➤ **There are four grades of microtia:**

-Grade I: A less than complete development of the external ear with identifiable structures and a small but present external ear canal

-Grade II: A partially developed ear (usually the top portion is underdeveloped) with a closed [stenotic] external ear canal producing a conductive hearing loss.

-Grade III: Absence of the external ear with a small peanut-like vestige structure and an absence of the external ear canal and ear drum. Grade III microtia is the most common form of microtia.

-Grade IV: Absence of the total ear or anotia.



A. What is your diagnosis for the giving picture?

✓ Microtia.

B. What is the surgical treatment for this patient?

✓ By Bone Anchored Hearing Aid (BAHA)

C. Which grade is this patient?

✓ Grade 3.



➤ **This is a child with prominent (bat) ears.**

A. What is the exact abnormality causing this?

✓ Absence of Antihelix.

B. What is the best age to treat?

✓ Preschool age (4-6 y).



A. Identify the pathology in both pictures?

✓ Pre-auricular sinus.

B. Mention 2 presenting symptoms?

1. Discharge
2. Swelling.
3. Skin ulceration.



C. How would you manage this patient?

-Medical: once a patient acquires infection of the sinus, he or she must receive systemic antibiotics. If an abscess is present, it must be incised and drained, and the exudates should be sent for gram staining and culturing to ensure proper antibiotic coverage.

-Surgical: excision of the sinus.



➤ A child presented to you with this picture.

A. What is your diagnosis?

✓ Accessory auricle.

B. What is the source of this condition?

✓ Small ectopic remnant of the sixth embryological hillocks

C. What is the treatment?

✓ Surgical excision for cosmetic reason



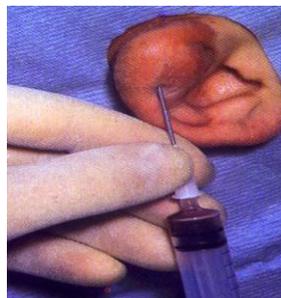
➤ This is a picture for a male who had a trauma.

A. What is your diagnosis?

✓ Hematoma auris

B. What is the probable complication?

✓ Cauliflower ear



Drainage of the hematoma



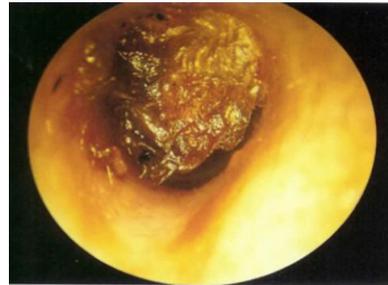
➤ This is otoscopic picture for a right ear of patient complaining from hearing impairment.

A. What is your Diagnosis?

- ✓ Impact wax in the right ear.

B. What is your treatment?

- ✓ Syringing or suction clearance.



A. What is your diagnosis?

- ✓ Perichondritis of the pinna.

B. What are the causes?

- ✓ Usually follow trauma (hematoma auris, surgical, frostbite, burn) or otitis externa.

C. What is the causative microorganism?

- ✓ Pseudomonas.

D. What is your management?

- ✓ Evacuation and drainage of pus and Antibiotics.



➤ An Otoscopic pictures of patient who is complaining of itching, pain and deafness.

A. What is your diagnosis?

- ✓ Fungal Infection of external ear (Otomycosis).

B. Give 2 organisms that may cause it?

1. Candida Albicans.
2. Aspregillus Niger.



➤ This patient present with history of bilateral deafness for one year.

A. What is your diagnosis?

- ✓ Bilateral secretory otitis media.

B. What is the surgical treatment?

- ✓ Watchful waiting ('wait and see') or myringotomy with ventilation tube if the hearing is affected.



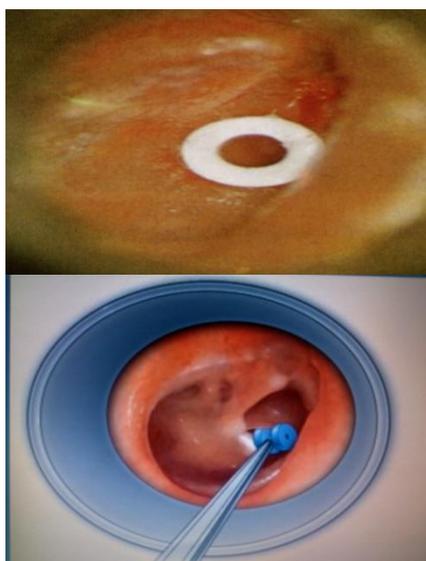
➤ Ventilation tube in child with bilateral OME.

A. What is the presenting sign?

- ✓ Deafness (Conductive hearing loss).

B. What is the function of the tube?

1. Drainage.
2. Aeration.
3. Pressure balance.



➤ Identify the Equipment in both pictures?

- ✓ Grommet's tube or ventilation tube.

➤ Give 2 Indications?

1. Otitis media with effusion (Glue ear).
2. Recurrent Acute otitis media.

➤ Give 2 complications?

1. Perforation.
2. Tympanosclerosis.
3. Infection.
4. Obstruction.



A. What is the diagnosis?

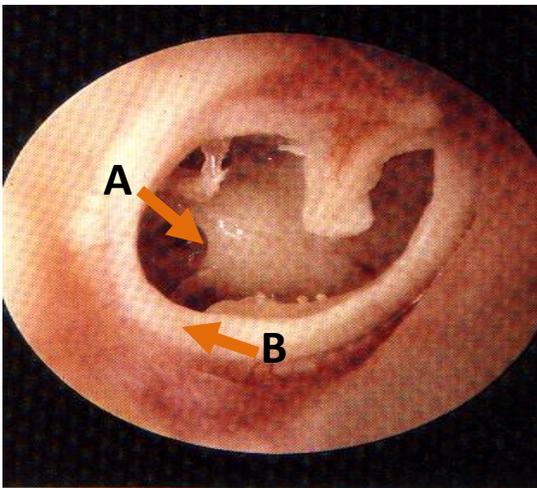
✓ Tympanosclerosis.

B. Name 2 things that might cause it?

1. Ventilation tube.
2. Otitis media.

C. Treatment?

- ✓ No need for treatment, just observation.
- ✓



A. Name the pointed structures?

- A. Stapedius ms. Tendon.
- B. Round Window.

B. What is the Diagnosis?

✓ Chronic Supportive Otitis Media, Tube-tympanic (safe) type.

C. Treatment?

✓ Tympanosclloplasty (Tympanoplasty).



➤ **The patient has a history of bilateral hearing loss for 7 months.**

A. What is your diagnosis?

✓ Otitis Media Effusion (OME).

B. What is he cause?

✓ Eustachian tube dysfunction.



➤ 60 year old patient has earache & hearing loss in one ear.

A. What is the most likely diagnosis?

✓ Otitis Media Effusion Caused by Nasopharyngeal carcinoma.

B. What is The Treatment?

✓ Radiotherapy.



➤ 75 y/o diabetic male complaining from deafness, purulent discharge and temporal headache.

A. Diagnosis?

✓ Malignant necrotizing otitis externa.

B. Serious complications of this condition?

✓ Cavernous sinus thrombosis.

C. what is the common organism for such case?

✓ Pseudomonas and anaerobic organism

D. what is your management?

✓ Intense IV antibiotics and sometime associated with surgical drainage



➤ An Otoscopic pictures for patient who had head trauma.

A. Diagnosis?

✓ Hemotympanom.

B. Give example of something that might give same otoscopic picture of the second picture?

✓ Glomus Jugular Tumor.



Glomus Jugulare Tumor.
Characteristic:
hyperemia in the lower half of the drum.



➤ **Patient Complaining from earache, deafness and facial paralysis.**

A. Diagnosis?

✓ Acute Otitis Media.

B. Treatment?

✓ Myringotomy with ventilation tube.

C. Mention 2 complications?

1. Mastoiditis.
2. Labyrinthitis and labyrinth fistula.
3. Facial Nerve Paralysis.

D. Name 2 microorganisms?

✓ H. Influenza, strept. pneumoniae.



A Child with ventilation tube came after 1 month with this picture.

A. What do you see?

✓ Extraction of the tube.

B. Give 2 indications for insertion?

1. Otitis Media effusion
2. Recurrent Acute Otitis media.



➤ **75 y/o diabetic male complaining from deafness, purulent discharge and temporal headache.**

A. what is your diagnosis?

✓ Malignant necrotizing otitis externa.

B. Serious complications of this condition?

✓ Cavernous sinus thrombosis.

C. Name another complication?

✓ Facial Nerve Paralysis.



➤ Patient in these pictures has ear pain on chewing food.

A. What is your diagnosis?

- ✓ Furunculosis (Local otitis externa).

B. Name two nerves supplies the external ear?

1. Auriculotemporal nerve.
2. Greater Auricular nerve.

C. What is the commonest causative microorganism?

- ✓ Staphylococcus Aureus



➤ Patient has left lower motor neuron lesion of the facial nerve, he has earache and eruption in the external ear.

A. What is your diagnosis?

- ✓ Ramsay Hunt Syndrome.

B. What is the causative organism?

- ✓ Herpes Zoster Virus.



➤ This is the ear of 60 year old lady with uncontrolled diabetes mellitus, who presented with severe right earache and scanty discharge. On examination the external auditory canal showed granulation tissue coming from the floor. Culture swab showed *Pseudomonas aeruginosa*.

A. what is your diagnosis?

- ✓ Malignant Otitis Externa.

B. What is the treatment?

- ✓ Control her blood Glucose and antibiotics (ciprofloxacin)



➤ Otoscopic picture for a female complaining from bilateral deafness for 7 months.

A. What is your diagnosis?

- ✓ Adhesive Otitis Media.



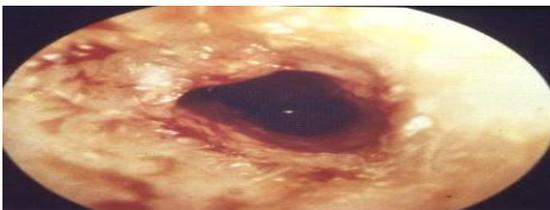
➤ Otoscopic picture of a 22 y/o female complaining from 2 years history of discharge and deafness.

A. What is your diagnosis?

- ✓ Chronic suppurative otitis media (Safe type) Tubo-Tympanic.

B. What is your treatment?

- ✓ Tympanoplasty.



A. what is your diagnosis?

- ✓ Diffuse infective O.E.



A. what is your diagnosis?

- ✓ Bullous myringitis.



A. what is your diagnosis?

- ✓ Eczematous and seborrheic O.E.



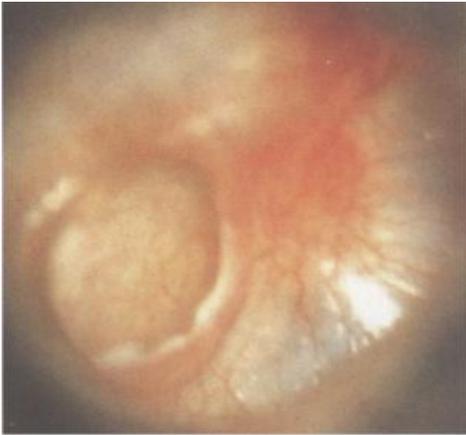
A. what is your diagnosis?

- ✓ Eczematous otitis externa.



A. what is your diagnosis?

- ✓ Herpes affects the pinna and pre-auricular region



➤ This patient present with history of profuse, intermittent and odorless discharge and deafness.

A. What is your diagnosis?

✓ Chronic Supportive Otitis Media, Tube-tympanic (safe) type.

B. What is the surgical treatment?

✓ Myringoplasty. While if you have a problem with the ossicles too, then we have to do Tympanoplasty.



➤ A 20-years old male came complaining of chronic otalgia and history of scanty, continuous and foul smelly discharge with hearing loss.

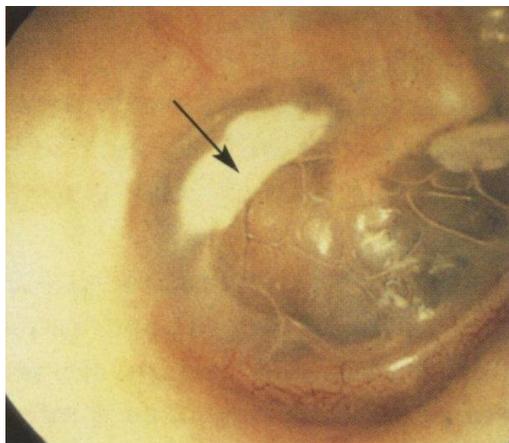
A. What is the diagnosis?

✓ Chronic Supportive Otitis Media, Atticoantral (Unsafe) type with cholesteatoma.

B. Mention 2Cranial (Intratemporal) complications?

1. Acute Mastoiditis.
2. Facial Nerve injury (facial nerve paralysis).

C. Treatment? Modified radical mastoidectomy.



A. What is the diagnosis?

✓ Otitis media with effusion (glue ear).

B. Treatment?

✓ Watchful waiting ('wait and see') or myringotomy with ventilation tube if the hearing is affected.

✓ Arrowed is "chalk" patch (tympanosclerosis).

**A. What is the diagnosis?**

✓ Total perforation in chronic suppurative otitis media.

B. Treatment?

✓ Tympanoplasty.

**A. What is the diagnosis?**

✓ Adhesive otitis media.

B. Treatment?

1. Medical
2. Surgical (Ventilation tube insertion)



➤ This is a child presented with fever & right earache.

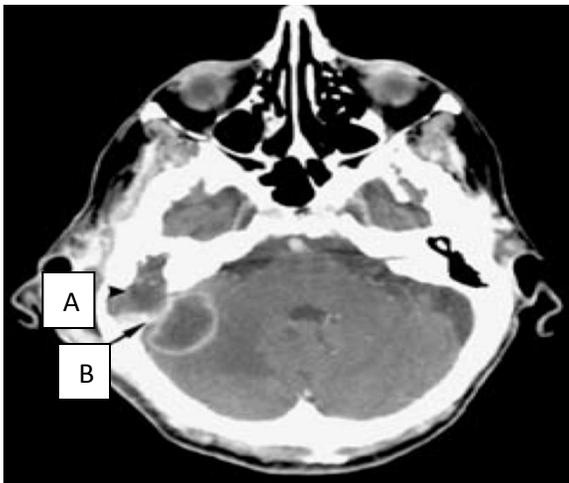
A. What is your diagnosis?

- ✓ Acute mastoiditis.

B. What is the best treatment?

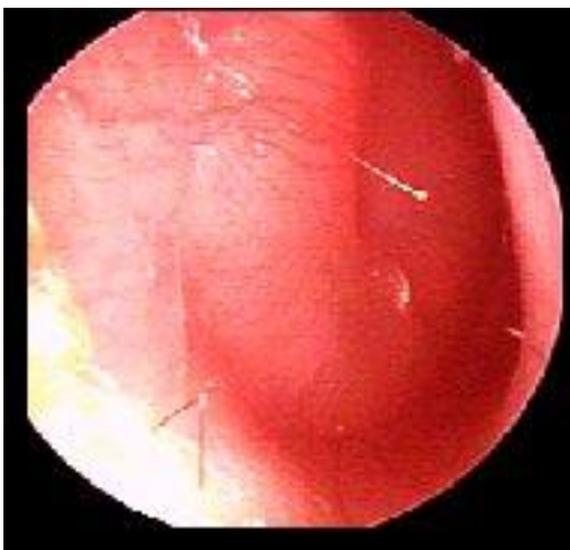
- ✓ Medical: Antibiotic therapy & hospitalize.
- ✓ Surgical: Myringotomy & cortical mastoidectomy.

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➤ Name the pointed pathologies in the picture?

- A. Right Mastoid Abscess
- B. Right Cerebellar Abscess



➤ This is the tympanic membrane of 3 years old child, who presented with earache and fever.

A. Diagnosis?

- ✓ Acute Otitis Media.

B. Treatment?

- ✓ Myringotomy with ventilation tube.

C. Mention 2 complications?

1. Mastoiditis.
2. Labyrinthitis and labyrinth fistula.
3. Facial Nerve Paralysis.

D. Name 2 Microorganisms?

- ✓ H. Influenza, strep. pneumoniae.



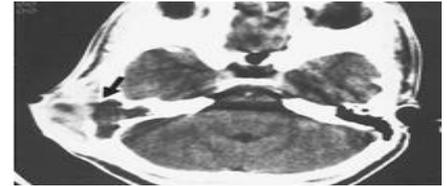
➤ This child presented with this ear finding (picture) after a history of right earache, fever. Child was stated on antibiotics for the last 5 days.

A-Give 4 possible deferential diagnosis?

✓ Acute masoiditis, otitis externa, subperiosteal abscess, subcautaneous abscess.

B. Give 2 Complications of Acute Mastoiditis?

1. Hearing Loss.
2. Brain Abscess.



➤ This MRI was taken for a 60 y/o male complaining of unilateral hearing loss.

A. What is your diagnosis?

✓ Acoustic Neuroma.

B. What is the effect in the audiogram?

✓ Unilateral Sensorineural Hearing loss.



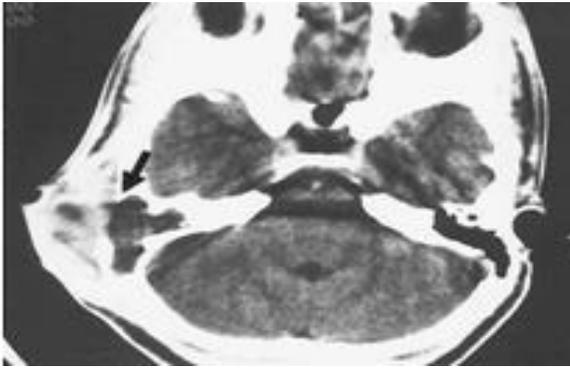
➤ This patient presented with slow growing mass for a years.

A. What is your diagnosis?

✓ Pleomorphic Adenoma.

B.Mention 2 signs of malignancy?

1. Skin Ulceration.
2. Facial Nerve Involvement.



A. What is your diagnosis?

- ✓ Mastoid Abscess.

B. What is the treatment?

- ✓ Cortical Mastoidectomy.

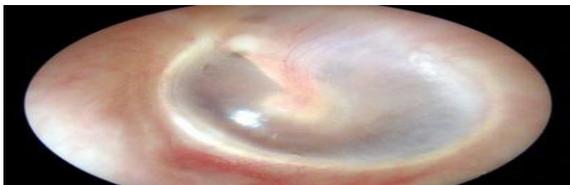


A. What is the name of this Investigation?

- ✓ Angiogram.

B. What is your diagnosis?

- ✓ Angiofibroma.



A. What is your diagnosis?

- ✓ Middle Ear Atelectasis.

B. What is the cause?

- ✓ Long standing Eustachian tube dysfunction.

C. Treatment?

- ✓ tympanostomy tubes (ventilation Tube).



➤ **A. What is your diagnosis?**

- ✓ Congenital Cholesteatoma.



A. What is your diagnosis?

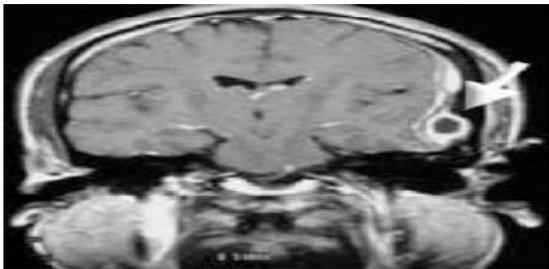
- ✓ Petrositis.

B. What is the Associated Syndrome?

- ✓ Gradenigo's syndrome (A Triad Of):
 - Otitis media (otorrhea).
 - Retro-orbital pain.
 - Squint (VI cranial nerve palsy).

C. Treatment?

- ✓ Antibiotics and myringotomy.
- ✓ Surgical drainage if medical treatment fails.



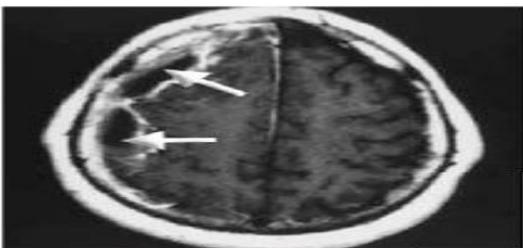
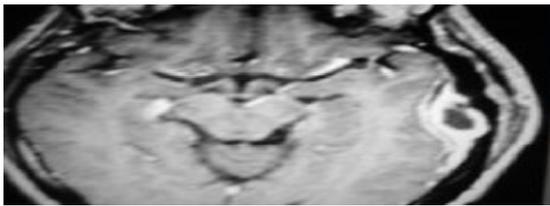
➤ Patient presented to your clinic complaining of headache, pulsating discharge and fever with this imaging.

A. What is your diagnosis?

- ✓ Extradural abscess.

B. What is your treatment?

- ✓ Mastoidectomy and drainage of the abscess.

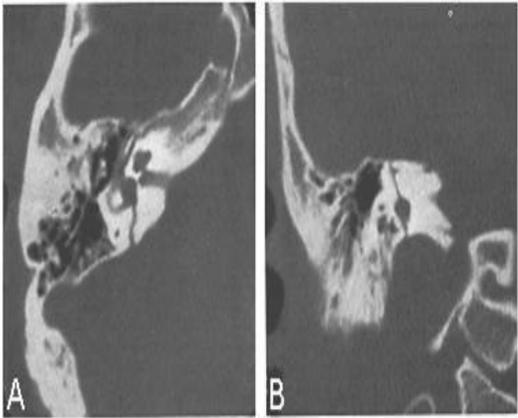


Sub-dural Abscess

A. What is your diagnosis?

- ✓ Subdural Abscess

Skull Base Fractures



A. What is your diagnosis?

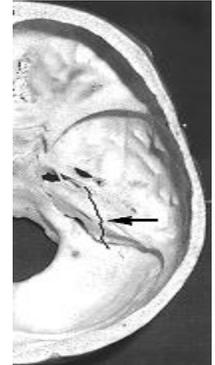
✓ Transverse Temporal Bone Fracture.

B. Is it common to have a facial nerve injury?

✓ Yes, it accounts only for 20% of temporal bone fractures but there is 50% chance for developing Facial Nerve injury.

C. What its effect in the Hearing?

✓ Sensorineural Hearing loss.



A. What is your diagnosis?

✓ Longitudinal Temporal Bone Fracture.

B. Is it common to have a facial nerve injury?

✓ No, it accounts only for 80% of temporal bone fractures but there is 10-15% chance for developing Facial Nerve injury.

C. What its effect in the Hearing?

✓ Conductive Hearing loss.



Audiometry and Tympanogram

A. Pure Tone Audiometer(PTA):

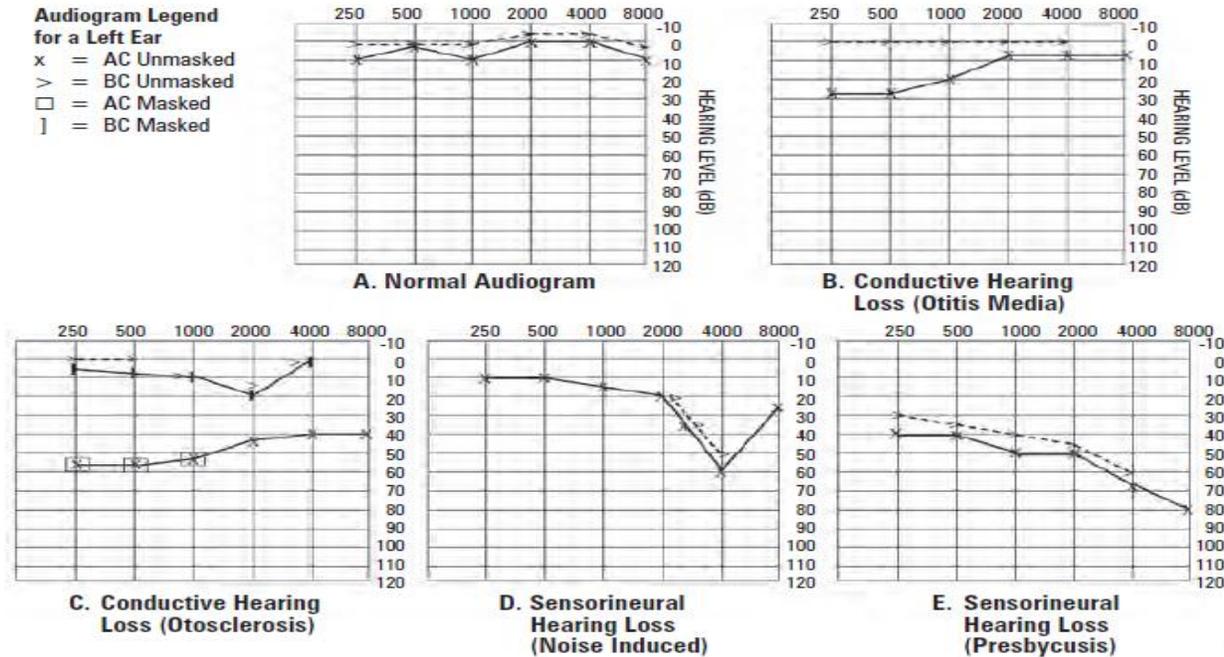


Figure 15. Types of Hearing Loss and Associated Audiograms of a Left Ear

1. Conductive Hearing Loss (CHL) (Figure 15B and 15C)

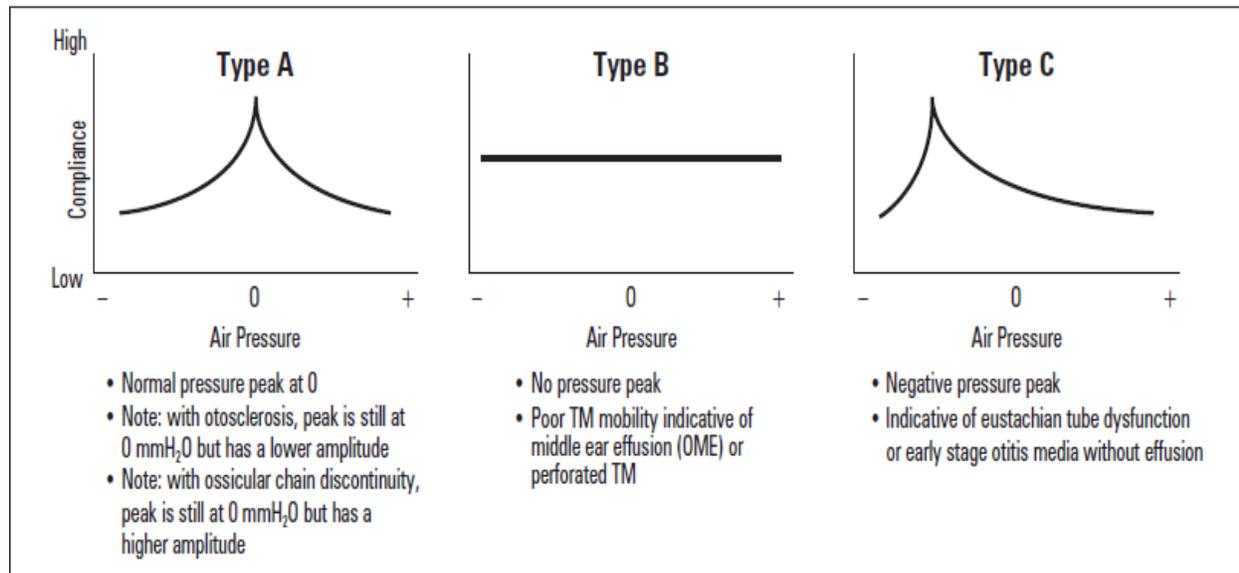
- Bone conduction (BC) in normal range
- Air conduction (AC) outside of normal range
- Gap between AC and BC thresholds >10 dB (an air-bone gap)

2. Sensorineural Hearing Loss (SNHL) (Figure 15D and 15E)

- Both air and bone conduction thresholds below normal
- Gap between AC and BC <10 dB (no air-bone gap)

3. Mixed Hearing Loss

- Both air and bone conduction thresholds below normal
- Gap between AC and BC thresholds >10 dB (an air-bone gap)

A. Tympanogram:**Figure 16. Tympanograms**

- **Static Compliance**
- ✓ Volume measurement reflecting overall stiffness of the middle ear system.
- ✓ Normal range: 0.3 to 1.6 cc.
- ✓ Negative middle ear pressure and abnormal compliance indicate middle ear pathology.
- ✓ In a type B curve, ear canal volumes of greater than 2 cc in children and 2.5 cc in adults indicate TM perforation or presence of a patent ventilation tube And less than that indicates a pathway obstruction either with wax or foreign body.

Treatment of hearing loss

A. What is the name of the Giving Test ?

Pure Tone Audiogram.

B. What is your diagnosis ?

Conductive Hearing Loss.

C. What your Manegment ?

Hearing Aids .

D. What is the Indications to use BAHA (Bone Anchored Hearing Aids)?

In conductive hearing loss that's failed to improve with the hearing Aids.

C. Give Some Causes of Conductive hearing loss ?

- ✓ Wax & foreign bodies
- ✓ Otitis externa
- ✓ Ear drum Scarring; perforation
- ✓ Otitis media (ASOM)
 - Acute suppurative
 - Otitis media with effusion (OME)
 - Chronic otitis media (CSOM)
- ✓ Otosclerosis
- ✓ Ossicular chain disruption

A.What is the Name of the Giving Test ?

Pure Tone Audiogram.

B. What is your Diagnosis ?

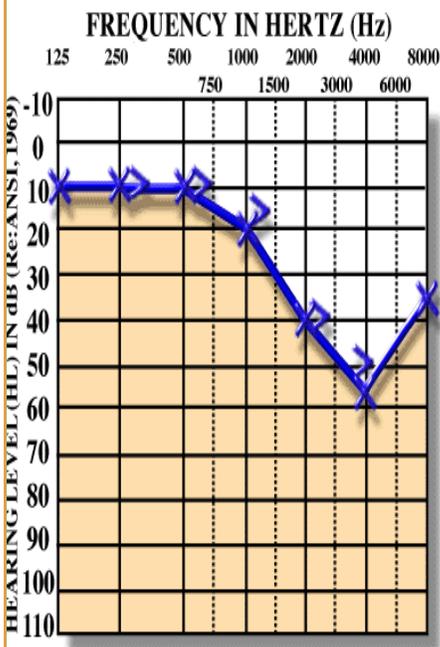
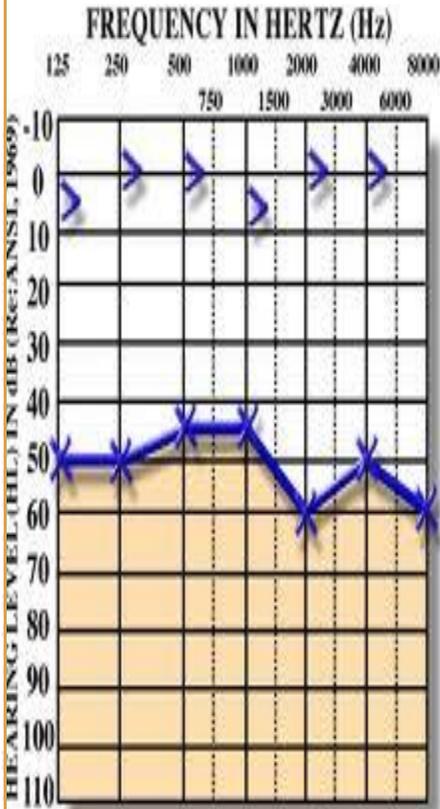
Sensorineural Hearing Loss .

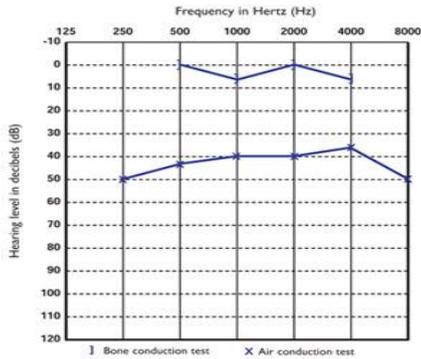
C. What your Manegment ?

Choclear Implant.

D. Give Some Causes of Conductive hearing loss ?

- ✓ Congenital
- ✓ Trauma
- ✓ Infection
- ✓ Noise
- ✓ Ototoxic
- ✓ Presbycusis And Acoustic neuroma.





➤ **Mention FOUR causes that gives the reading in the image shown:**

- ✓ Acute Otitis Media.
- ✓ Otitis Media with effusion.
- ✓ Ear wax impaction.
- ✓ Foreign body in the external canal.
- ✓ Otosclerosis .

➤ **These two tests we obtained form a patient suffering form a unilateral sensorineural hearing loss.**

A.What is the diagnosis?

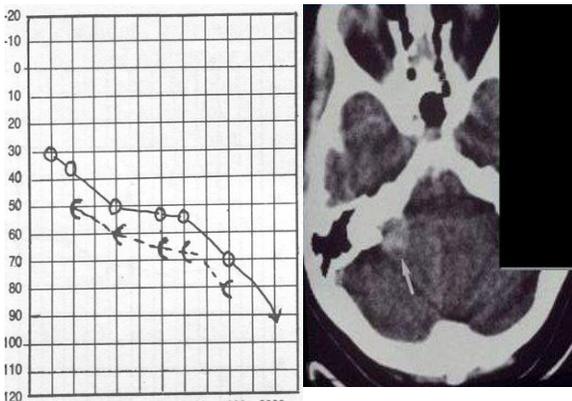
Acoustic Neruroma.

B.Give the name of a sensitive investigation to diagnose it?

CT scan.

C. Name the area.

Cerebellopontine angle or internal auditory canal.

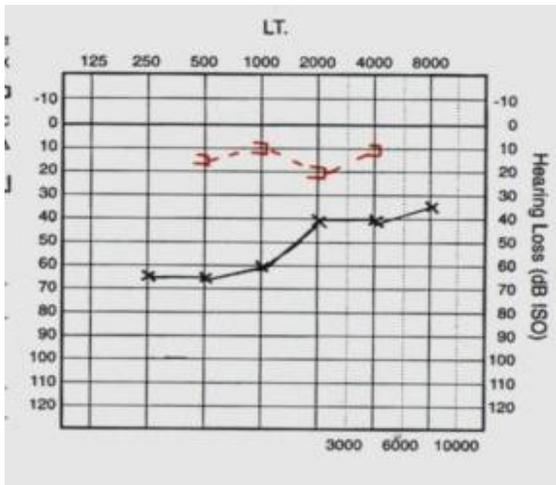


A.What is the name of this investigation?

Impedance audiometry (Tympanometry).

B.Give a cause of unilateral sensorineural hearing loss in children?

Mumps.



A. What is your diagnosis?

Conductive hearing loss.

B. Mention 2 differential diagnosis?

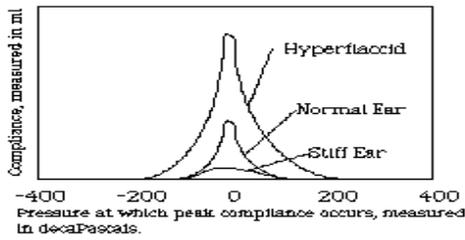
- 1- Acute Otitis Media.
- 2- Foreign body in the external canal.

C. What does decibel mean?

Intensity or loudness of sound.

D. What is this procedure?

Pure tone audiometry.



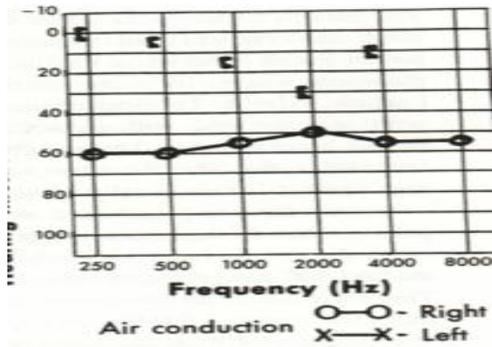
A. Identify:

Tympanogram.

B. What is the type for :

1-otitis media with effusion = type B (flat).

2-menneir disease= type A (normal).

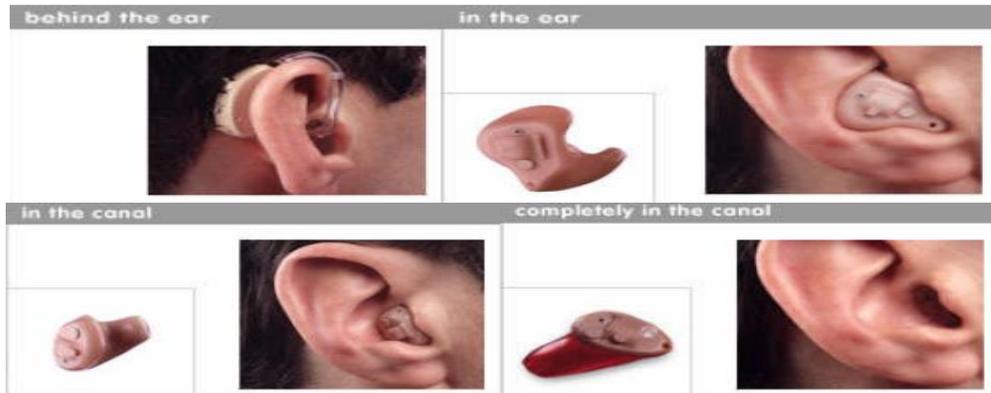


➤ This is a pure tone audiogram for a 25 year old lady who is complaining of bilateral hearing loss, tympanic membrane was found to be normal bilateral.

A. what is the most likely diagnosis? Otosclerosis.

B. what is the best surgical intervention?

Stapedectomy.



A. What is the structure in the giving images?

✓ Hearing Aids.

B. What Its Indication?

✓ Used in cases of Conductive Hearing Loss.



➤ **A. What is the structure in the giving images?**

✓ BAHA (Bone Anchored Hearing Aids)

B. What Its Indication?

✓ In conductive hearing loss that's failed to improve with the hearing Aids.

A. What is the structure in the giving image?

Cochlear Implant.

B. What its indication?

In sever bilateral Sensorineural Hearing Loss with minimal benefit from hearing aid.

A. What is the structure in the giving image?

Auditory Brain Stem Implant (ABI).

B. What its indication?

In Sensorineural hearing loss.

