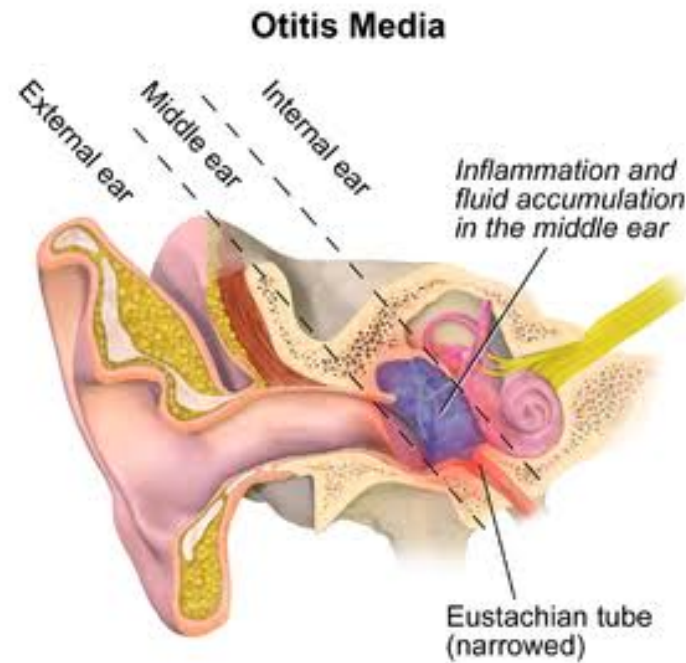


Otitis Media

Acute Otitis Media / Acute suppurative Otitis media

- An infection of the air filled space between the ear drum (Middle-ear)
- Inflammation of middle ear
- The ear infection usually caused by bacteria Or virus
- Most common Causative organism
 - Streptococcus pneumonia
 - Moraxella catarrhalis
 - H.Influenza
 - Streptococcus pyogenes

- These bacteria comes from nose and pharynx through the eustachian tube.
- The other path through which infection reaches the middle ear is traumatic perforation in the tympanic membrane



Involvements of Eustachian tube:

- Main functions of eustachian tubes are
 - To maintain the middle ear pressure equals to the outside atmosphere
 - It drains the secretions of middle ear

- It is most commonly seen in childrens

- **Pathology and Clinical presentation**

- **Stages :**
 - Various stages which occurs during this disease process are the following
 - Stage 1 Stages of tubal occlusion
 - Stage 2 Stages of pre Suppuration
 - Stage 3 Stage of Suppuration
 - Stage 4 Stage of resolution

❖ Stage 1 - Stage of tubal occlusion

- Infection in nose and pharynx
- Eustachian tube is blocked in the nasopharyngeal end or cartilaginous end
- Middle ear air pressure decreases
- Tympanic membrane is retracted (cone of light is distorted or absent)
- On the examination
 - Dull and lusterless, shiny
 - Cone of light absent or distorted
 - Pain hearing loss (conductive)

❖ Stage 2 - Stage of Pre suppuration

- Serous, mucous secretions accumulate in middle ear and also bacteria is present
- Tympanic buldges out
- Blood vesseles become prominent
- Which shows the cart wheel appearance

❖ Stage 3 - Stage of Suppuration

- This stage leads to pus formation which tends to increase in pressure followed by severe pain
- The fluids which failed to drain are converted into pus
- Hearing decreases
- O/E red congested bulging tympanic membrane is observed and which is about to burst
- Tragal sign is negative at this stage

❖ Stage 4 - Stage of resolution

- The tympanic membrane burst and the pus were drained and pain were decreased
- Perforation in the tympanic membrane
- The most common site of tympanic membrane perforation is “Anterio-inferior” Quadrant of tymapanic membrane
- It is the most the dependant quadrant because of gravity
- After few weeks,perforation heals and hearing becomes normal
- A healed tympanic membrane is dimeric (no fibrous layer)
- **Signs:**
 - Light house sign
 - Reservoir Sign

- There is collection of fluid in the middle ear even after removing fluid from the External Auditory Canal (EAC) and Middle ear, The condition is known as Mastoiditis
- the recurrent occurrence of fluid is from Mastoid
- The sign is known as Reservoir sign

• Treatment of Acute otitis Media

➤ Stage 1 & stage 2:

- Antibiotics (Amoxicycline/Ampicilin)
- Analgesics (Nsaids)
- Nasal decongestants (xylometazolene/oxymetazoline)

➤ Stage 3

- Patient will have severe pain and pus formation
- Therefore incision and drainage of fluid in tympanic membrane
- Myringotomy is performed in “Posterior inferior quadrant” of tympanic membrane
- The reason for posterior inferior quadrant is because of the rate of growth i.e., $P_s > P_i > A_i > A_s$
 - Postero superior
 - Postero inferior
 - Antero inferior
 - Antero superior

➤ Stage 4

- Because of the perforation in tympanic membrane pus drained there is reduced pain
- Wait and watch for the perforation to heal on its own
- On 90% cases perforations heals on its own
- If active infection present it should be treated with antibiotics
- Most importantly prevent the water entry into the ear

Complications of Acute Otitis media

- Most commonly perforation
- 90% heal on its own
- 10% → permanent perforation → Recurrent infection → hearing loss → CHRONIC OTITIS MEDIA
- If there is no perforation then conclusion of acute mastoiditis

Acute mastoiditis

- In 6 to 7% cases seen (Infection Travels from middle ear to mastoid)
- Seen in child with fever
- Sign → more pain & tenderness on cymba concha
- Cymba concha is the anatomical landmark for the mastoid antrum
- Mastoid seen with red, hot, smooth and ironed out mastoid
- Battle sign → Hematoma over mastoid due to fracture of middle cranial fossa
- Griesinger sign → pitting edema over mastoid due to the sigmoid sinus thrombosis (thrombosis of emissary vein)

Treatment of Acute mastoiditis

Masked mastoiditis

- Some cases of acute mastoiditis do not present with typical symptoms and signs are grouped under the term masked or latent mastoiditis
- This usually result of inadequate treatment with antibiotics
- There is a dull aching pain with some amount of hearing loss and low grade fever
- O/E the tympanic membrane shows an inflammatory thickening and congestion of tympanic mucosa
- Radiological examination reveals coalescent process of the mastoid
- The treatment is cortical mastoidectomy

Coalescent Mastoiditis

- It is a chronic complication of acute otitis media
- Middle ear inflammation resolved
- Long term / persistent pain over mastoid even after resolution of middle ear infection
- Confirm diagnosis → ct scan
- But mastoid remains inflamed, there is clouding of mastoid air cells (filled with fluid)
- **Treatment :**
 - 3 weeks of IV antibiotics (TOC)
 - If not resolved by antibiotics then mastoidectomy (simple/cortical/schwarts)

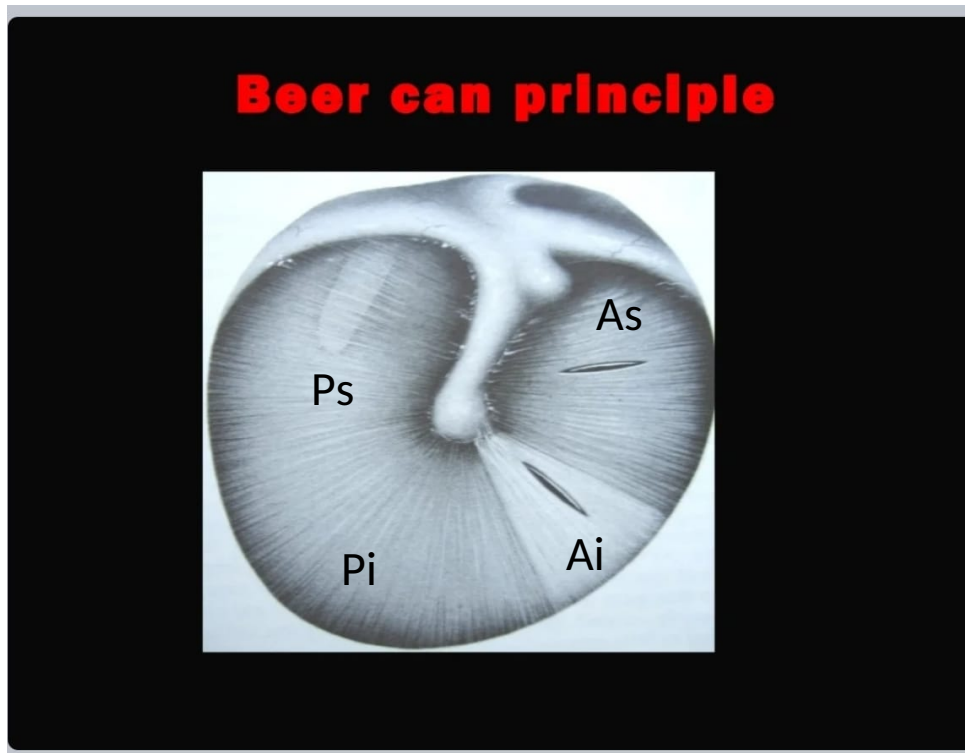
Serous otitis Media (SOM)

- Also known as mucoid OM/secretory OM
- Non suppurative Otitis media/ glue ear
- Long standing collection of serous or mucous fluid collection in middle ear
- It is a disease of Eustachian tube dysfunction
- **Reasons:**
 - Tumor in nose/nasopharynx
 - Npc → nasopharyngeal Carcinoma
 - Polyp / adenoid (seen in 5 to 7 yrs children)
 - Chronic infection

- **Complaints:** patient have hearing loss (conductive)
- No pain due to chronic long standing disease
- Blue tympanic membrane sometimes due to venous stasis
- **To confirm diagnosis :**
 - Pure tone audiometry: Ab CHL 25-30db
 - Impedance audiometry → B type curve (flat curve → fluid)
- **Treatment :**
 - Treat the cause
 - Remove the fluid from ME by myringotomy in AI quadrant
 - Grommet insertion Done

Beer can principle

- 2 incisions, 1 on Antero superior quadrant for air entry and other incision in Antero inferior quadrant for pus drainage



Otitic Barotraumas

- Eustachian tube dysfunction
- Travel in airplane → airpressure ↓↓ ,the Eustachian tube balances it
- But when there is a rapid descent from height the eustachian tube unable to maintain the pressure in the middle ear, causing injury
- If the pressure difference is $>90\text{mmhg}$ due to rapid descent, all the soft tissues around the eustachian tube are sutured in leading to locking of eustachian tube. The fluid gets accumulated in Middle Ear buldging the Tympanic membrane.

- **Treatment :**
 - Nasal decongestion
 - Steam inhalation
 - Chewing / swallowing exercise
 - Myringotomy

- Rapid Ascent – More serious
 - >90mmHg
 - Positive pressure in Middle ear
 - My burst tympanic membrane, Round window
 - If the round window is burst, it will leak causes leakage of perilymph resulting in Vertigo

Chronic suppurative otitis media CSOM / COM

- They can be divided into 2 types
 - Tubo tympanic disease (TTD)/Safe CSOM
 - Attico-antral disease(AAD)/Unsafe CSOM
- Tubo Tympanic Disease
 - Central perforation not involving fibrous annulus
 - CHL AB Gap 10-40 dB (depends on the site and size of perforation)
 - If perforations and ossicular chain erosion both occur AB gap will be 45 dB
 - Ear discharge
 - Longstanding history
 - Mucopurulent
 - Non foul smelling
 - Copious in quantity

- It is also called as mucosal disease
 - Active discharge
 - Inactive discharge
- Central perforation is also present
 - It has circular and kidney shaped
 - Well healed margins
- Traumatic perforation
 - Irregular, rough/ragged margins
 - Blood clots around perforation
 - M/c slap injury

Treatment of Tubotympanic disease

- Antibiotics for active discharge
- Tympanoplasty for inactive discharge
[myringoplasty+repair of ossicles]
- Rx OC for TTD - Tympanoplasty

Tuberculosis of middle ear

- It is not an uncommon disease, particularly in india
- Occurs almost always secondary to pulmonary tuberculosis
- Chronic,painless,foul smelling, otorrhea
- Multiple perforation (sieve like tympanic membrane)
- Pale granulation in the middle ear
- ConductiveHearing Loss (out of proportion to the signs and symptoms)
- Sensory neural hearing loss (Invovment of labyrinth)
- Also conditions of facial nerve Palsy

Route of infection

- Tubercular bacilli usually reaches the middle ear through the eustachian tube
- The coughed out sputum from from the infected lung reaches the tube and bacilli travel to the middle ear
- Drinking the unpasteurized milk of infected cow can cause the infection
- Tubercular otitis media may also be blood borne

Clinical features

- **The diagnosis is made by following characteristics:**
 1. Slow onset of disease
 2. Painless condition
 3. The discharge is thin, scanty and odorless
 4. The tympanic membrane is pale yellow to rose-pink in color
 5. The posterior part of membrane is bulging and anterior part shows dilated blood vessels
 6. Perforation in the membrane are usually multiple and may be associated with pale granulations
 7. Hearing loss is disproportionate to other symptoms.
confirmation is done by stained smear, culture of discharge or by biopsy of the granulations
 8. Tx is Usually Anti-tubercular therapy

Attico Antral Disease

- **Cholesteatoma (keratoma)**
 - Normal keratinized Stratified Squamous epithelium (ectoderm)
 - In a wrong place
- **Types**
 - Congenital
 - Acquired
 - Primary Acquired
 - Secondary Acquired
- **Congenital Cholesteatoma**

Epithelium is trapped inside,during or before the formation of Middle ear

 - white pearly mass behind Tympanic membrane
 - No history of tympanic membrane perforation

- **Acquired Cholesteatoma**

- Epithelium Goes into the Middle ear cleft after the birth

- **Secondary Acquired Cholesteatoma**

- Secondary to perforation

- Migration of squamous epithelium

- Squamous epithelium from the EAC migrates / Invades into the middle ear
Along the Marginal perforation

- **Squamous Metaplasia**

- due to chronic infection/Inflammation, Mucous epithelium in middle ear transforms into squamous epithelium

Investigations of Attico antral Disease

- Hearing assesment: this usually reveals the conductive deafness unless the inner ear has also been involved
- Bacteriology: the culture usually reveals a mixed group of organisms like proeus spp, pseudomonas Aeruginosa, pseudomonas pyocyanaeous, E.coli and anaerobic bacteria. These are the only secondary invaders in the disease
- Radiology: x-ray of mastoids, usually towne's , schuler's and laws lateral views and CT scan of temporal bone are taken into the study the extension of the disease.
- The mastoids are usually sclerotic, hypocellular or Acellular

Treatment of atticotympanic disease

- The aim of treatment in cholesteatoma is to make the ear safe by eradicating the disease and to prevent its recurrence
- Also important is the reconstructive surgery of the damaged ossicles and the membrane (tympanoplasty)
- Depending upon the extent and location of the disease and degree of deafness various surgical procedures are undertaken like
 - Atticotomy
 - Modified radical mastoidectomy
 - Radical Mastoidectomy
 - Mastoidectomy with tympanoplasty
 - Combined Approach tympanoplasty

Complications of Chronic suppurative otitis media

1. Intracranial complications

- Extradural/epidural abscess
- Brain Abscess
- Lateral sinus / Sigmoid sinus thrombosis

2. Extracranial complications

Extra cranial complications are of 2 types

Intratemporal extracranial Complication

- Labyrinthitis - Serous and suppurative
- Labyrinthine Fistula
- petrositis

Extratemporal Extracranial complications

- post aural / sub periosteal abscess
- Bezolds abscess
- Luc's abscess
- Zygomatic abscess
- Citelli's abscess

Thank-You