

EAR, NOSE AND THROAT

(4) Ear III

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Doctor's note **Team's note** Not important **Important** **431 teamwork**

(431 teamwork do not highlight it in yellow, but put it in a yellow “box”)

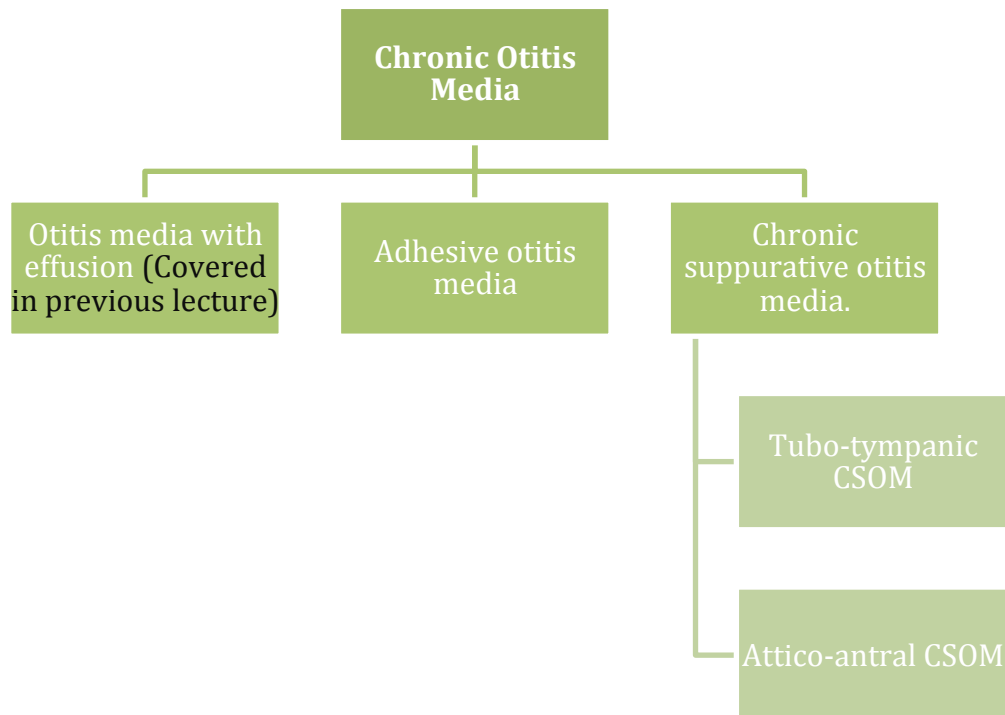
Objectives:

Chronic otitis media:

1. Otitis media effusion **Covered in Ear II Lecture.**
2. Adhesive otitis media
3. Chronic suppurative otitis media – types and management

Ear operations in brief:

1. Myringotomy
2. Tympanoplasty
3. Mastoidectomy



Chronic otitis media:

- **Definition:**

Chronic Otitis Media is an infection involving a part of the middle ear cleft or all its components that is persistent for more than 3 months.

The tympanic membrane is intact (not perforated) in Chronic non-suppurative otitis media, while in chronic suppurative otitis media it is not intact (perforated).

- To have a discharge coming through the external canal the membrane has to be perforated.

Classifications of Chronic Otitis Media

1. Chronic Non suppurative otitis media

- Otitis media with effusion (OME). **If not treated properly or not cured by itself it could lead to adhesion in the tympanic membrane in middle ear (adhesive otitis media).**
- Adhesive otitis media

2. Chronic suppurative otitis media (CSOM)

- TuboTympanic, which is also known as the **Safe** type, has no risks of serious complications. **the perforation is toward the Eustachian tube or in the middle of tympanic membrane.**
- AtticoAntral, which is also known as the **Unsafe** type, has a high risk of developing complications.

Adhesive Otitis Media

Definition:

Formation of adhesion in the middle ear after reactivation and subsequent healing of either CSOM or OME

Formation of adhesions in the middle ear (between the medial wall of the middle ear and tympanic membrane): 1. After reactivation and subsequent healing of either CSOM or OME. 2. Due to severe negative pressure due to OME or CSOM with a perforated drum which is healed by a thin membrane, and eustachian dysfunction that will cause severe retraction of the membrane.

Sequel of secretory otitis media if not treated.

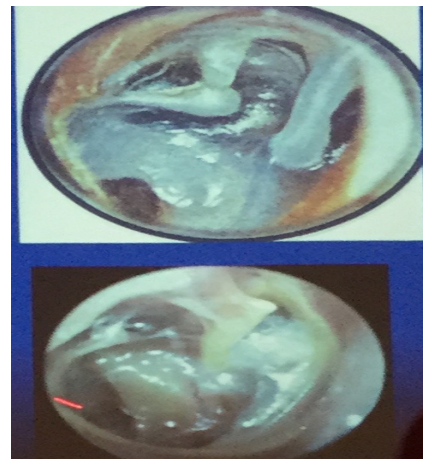
If the tympanic membrane still can move despite the adhesions we call it retraction, but if the tympanic membrane adheres to the middle ear mucosa we call it adhesive otitis media. => Any fluid enters the ear can get stagnated and causes infection & Conductive hearing loss because there's no more space in the middle ear to allow the movement of air.

Clinical features:

1. History of CSOM or OME
2. **Deafness** is usually the only symptom
3. TM shows various structural changes.

You don't see the typical TM, instead you see prominent ossicles.

It's either retraction (Can be treated in early stage) or adhesive (Adhesive is hard to treat). Surgical treatment of adhesive could lead to cholesteatoma.



Treatment:

- ✓ Observation, every 6 months if there were any complications.
- ✓ Surgical treatment: Ventilation tube insertion.
- ✓ Hearing aid will help a lot

Chronic Suppurative Otitis Media

Definition:

Chronic suppurative otitis media is a long standing infection of a part or whole of the middle ear cleft characterized by ear discharge (Otorrhea) and permanent perforation of tympanic membrane.

Etiology:

- Environmental
- Genetic
- Previous OM * Specially children.
- Upper respiratory tract infections. They can get it from one URTI, if severe the pus can accumulate in the TM and perforate it. It becomes chronic if recurrent infection and the pus didn't relieve.
- Eustachian tube dysfunction. Any patients with nasal polyps, adenoid or anything pressing the Eustachian tube, affect the healing of the acute otitis media and accumulate the pus leading to CSOM.

Pathology:

Signs of suppurative infection

- Discharge & perforation
- Chronic inflammatory reaction in the mucosa and the bone (osteitis)

Signs of healing attempts:

- Granulation tissue & polyps (Is severe CSOM untreated he can present with oral polyp)
- Fibrosis & tympanosclerosis (Calcium deposition as a result of TM healing)

Cholesteatoma (specially if it's attic-antral type).

Cholesteatoma = Skin in the wrong place. The superficial layer of TM is squamous epithelium – usually there's shedding of the lining epithelium and it gets out with discharges and the sebum if the TM intact (Normal), but if the TM is perforated it won't. So it goes into the bone. Especially if the perforation is marginal.

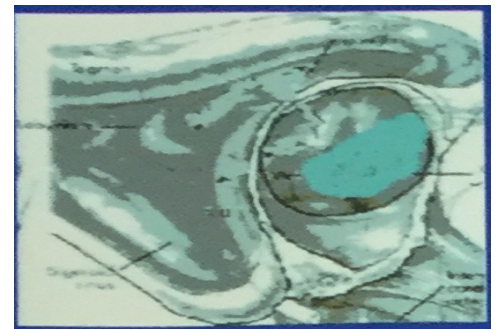
Clinical features of CSOM:

Clinico-pathological types:

Chronic suppurative otitis media is divided clinically into two types:

1- TuboTympanic (TT):

- Also known as the Safe type.
- It involves the anterior inferior part of middle ear cleft.
- Perforation is central.
- It has no risks of serious complications.

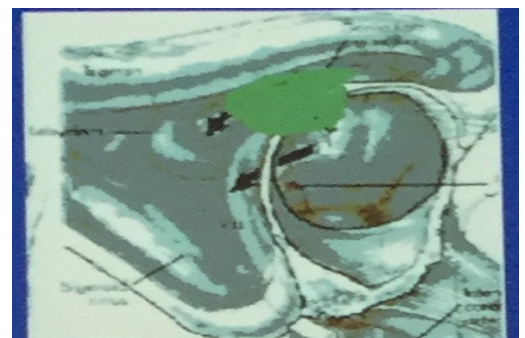


Tubo-tympanic

Safe: the squamous epithelium will find its way out

2- AtticoAntral(AA):

- Also known as the Unsafe type.
- It involves the posterosuperior part of the cleft such as the attic, antrum and mastoid.
- Perforation could be attic or marginal.
- It has a high risk of developing complications.
- It is associated with Cholesteatoma.



Attico-antral (Cholesteatoma)

The perforation is marginal, so it goes to the bone.

Symptoms of CSOM:

Common presentation of uncomplicated chronic otitis media:

- **Otorrhea**
 - Intermittent, profuse & odorless in TT type
 - Persistent, scanty & malodorous in AA type
- Deafness according to the size of TM perforation and the involvement of the bones.
- Tinnitus

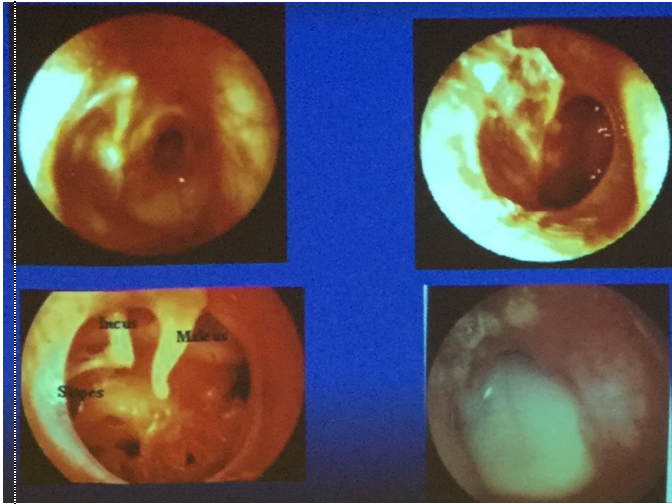
N.B Any other symptoms means complication

- E.g. Headaches (could indicate intracranial complications), Vertigo (indicates involvement of the inner ear), Facial movement abnormalities (indicates involvement of facial nerve), Vomiting and fever (indicates involvement of the balance system and increased intracranial pressure).

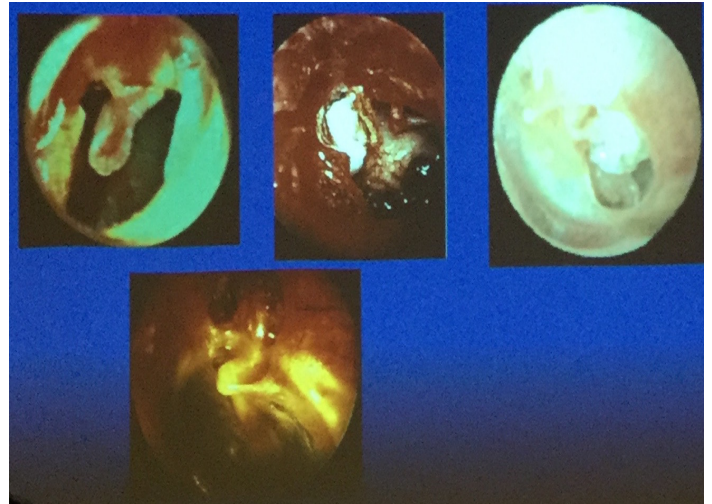
Otoscopic examination:

- Discharge
 - Present in TT type if active but may be absent
 - Usually is present in AA type
- Perforation
 - **Cantral: in TT type**
 - **Marginal or attic in AA type with cholesteatoma**

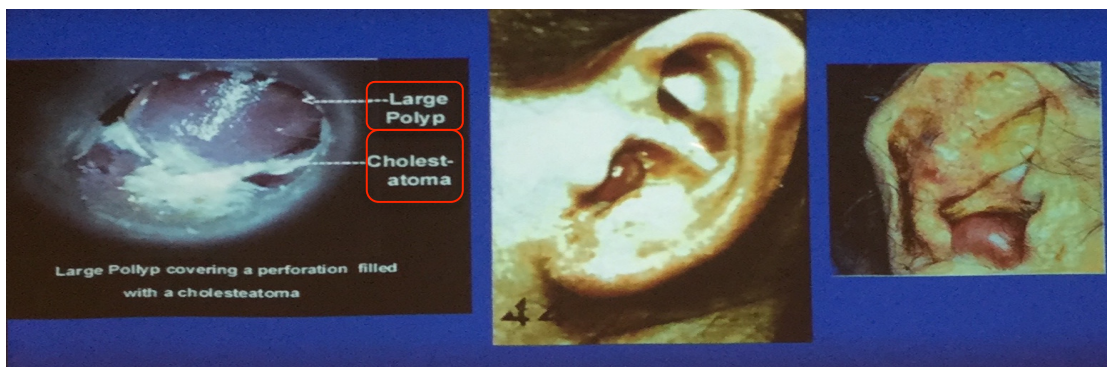
* Polyps, granulation tissue, tympanosclerosis



Perforation in TT CSOM



Perforation in AA scan



Polyps mean there's a chronic non-healing process is going on and most likely there's cholesteatoma.

Cholesteatoma

Definition

The presence of a desquamating stratified squamous epithelium in the middle ear. Normally it's in the external canal not in the middle ear.

- The associated chronic inflammatory process causes progressive destruction of surrounding bony structures



Classification of cholesteatoma

- Congenital, entrapment of the epithelium during the development of the middle ear. It has different presentation.

- Acquired (more common)

- Primary
- Secondary

- **Symptoms:**

- History of otitis media (especially if unilateral), ventilation tubes, ear surgery
- Progressive hearing loss (predominantly conductive although may get sensorineural hearing loss in late stage)
- Otalgia, aural fullness, fever

- **Signs:**

- Retraction pocket in TM, may contain keratin debris
- TM perforation
- Granulation tissue, polyp visible on otoscopy
- Malodorous, unilateral otorrhea

Effect of cholesteatoma

- Keratin encourage
- Persistence of the infection
- Matrix causes bone erosion

It could go anywhere: to the mastoid, tegmen tympani, to the brain and causes abscess there, to the semicircular canal and causes imbalance, go to the ossicles and erode them, to the facial nerve causes facial nerve paralysis.

It causes persistence infection so the patient will have persistent scanty discharge. The matrix causes bone erosion.

Table 7. Complications of Cholesteatoma

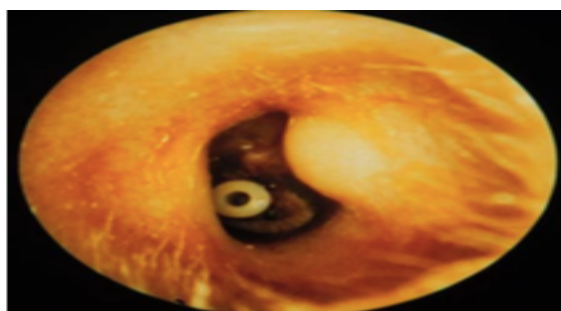
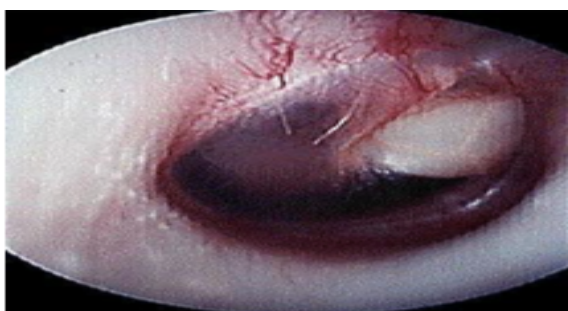
Local	Intracranial
Ossicular erosion: conductive hearing loss	Meningitis
Inner ear erosion: SNHL, dizziness, and/or labyrinthitis	Sigmoid sinus thrombosis
Temporal bone infection: mastoiditis, petrositis	Intracranial abscess (subdural, epidural, cerebellar)
Facial paralysis	

Pathogenesis of cholesteatoma

- Infection and perforation like discussed above.
- Implantation (Congenital or acquired). E.g. If during a surgery the surgeon did suction to the epithelium and part of it went to the middle ear and closed the tympanic membrane.
- Iatrogenic.
- Metaplasia of the middle ear epithelium.
- Epithelial migration

Investigations:

- Audiometry. Sensory or conductive hearing loss? Usually it's Conductive hearing loss but sometimes if the infection took long time, the toxins from cholestatoma or the organism or from the medications causes sensory hearing loss.
- Bacteriology. Take a swab.
- Imaging. We do CT scan to see its extension

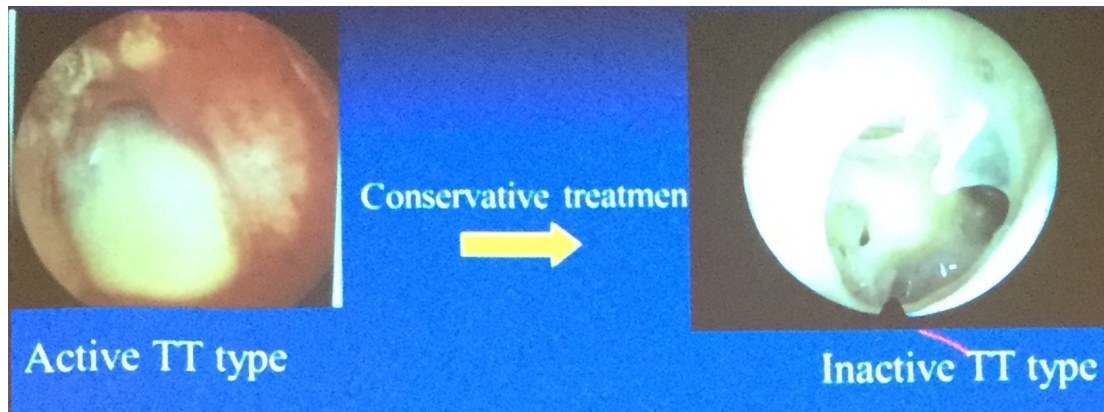


Bacteriology

- Aerobes: Pseudomonas aeruginosa (it is the most common organism causing the infection) Staphylococcus (gram positive) Proteus (gram negative) Escheria coli (gram negative) Klebsiella (gram negative)
- Anaerobes: Bacteroides fragillis Peptostreptococcus

Treatment of chronic suppurative otitis media:

Treatment of Tubo-tympanic CSOM:



✓ **Conservative treatment:** (Until we move the patient from active to non-active)

- Treatment of any predisposing factors
- Keep the ear dry
- Ear toilet
- Antibiotics
- Removal of polyps and granulations

✓ **Tympanoplasty**

An operation performed **to eradicate disease** in the middle ear cavity and **to reconstruct the hearing mechanism**. If there's **ossicles problem** we do **ossiculoplasty** (We replace the missing ossicle with prosthesis)

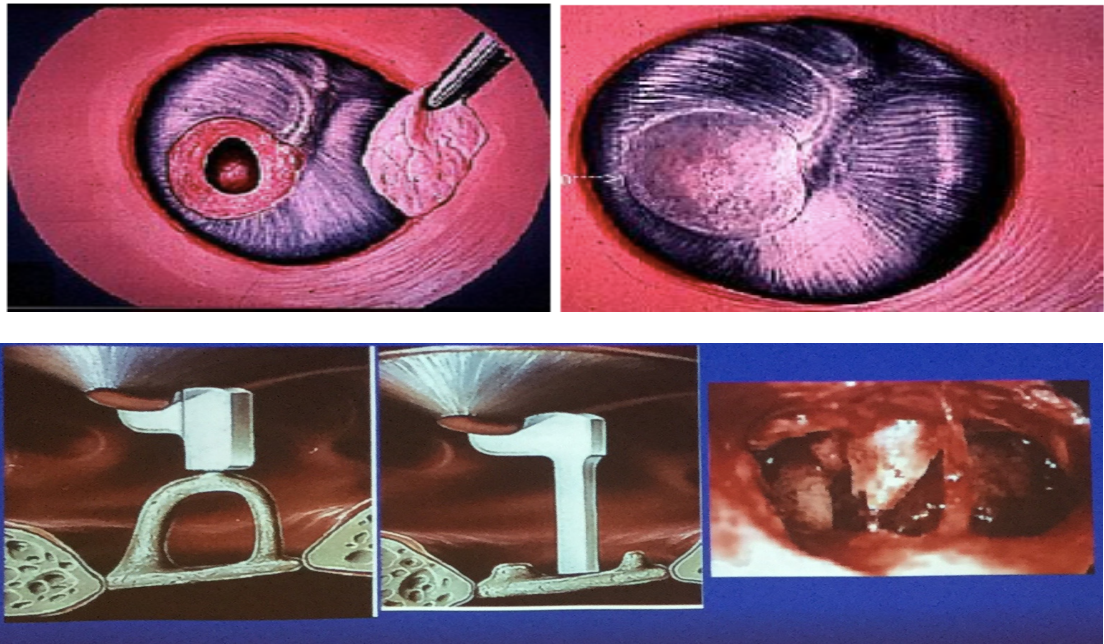
Aims of tympanoplasty:

- To close the perforation
- To prevent reinfection
- To improve hearing

✓ **Myringoplasty**

An operation performed **to repair the tympanic membrane**.

Without checking the ossicles. Done in case of small perforation.



Treatment of attico antral CSOM

There is no conservative therapy for cholesteatoma

Surgical: **mastoidectomy** ± Tympanoplasty ± ossicular reconstruction

Removal of cholesteatoma by mastoid operation. **The point to do the surgery is to REMOVE THE CHOLESTATOMA**, the hearing is of secondary importance in such a case.

✓ **Radical mastoidectomy:**

An operation in which the mastoid antrum and air cells, attic and middle ear are converted into common cavity, exteriorized to the external canal. **The tympanic membrane, malleus and incus are removed** leaving only the stapes in situ.

✓ **Modified Radical Mastoidectomy:**

An operation in which the mastoid antrum and air cells, attic and middle ear are converted into common cavity, exteriorized to the external canal. **The tympanic membrane and the ossicles remnants are retained.**

Cortical mastoidectomy is done in case of acute mastiditis, we clear the mastoid and leave the posterior mialal wall and nothing is done for the middle ear. (Only remove the cortex of mastoid bone).

Aims of radical & modified radical mastoidectomy:

- Safety (Number one)
- Dry ear
- Preserve hearing if you can

Summary

Adhesive otitis media is a consequence of secretory otitis media if not treated, and Deafness is usually the only symptom.

Chronic Suppurative otitis media

- In Tubotympanic type (safe type) the discharge is usually copious, intermittent and odorless. The perforation is central. Treatment is conservative (if there is an active infection) followed by tympanoplasty to prevent re-infection and improve hearing.
- In the AtticoAntral type (the unsafe type) the discharge is usually scanty, persistent and of bad odor. The perforation is attic or marginal with cholesteatoma. Treatment is by mastoidectomy to provide safety and dry ear.

Middle ear effusion → myringotomy and ventilation tube insertion.

Safe type CSOM → tympanoplasty

Unsafe type with cholesteatoma → mastoidectomy

MCQ's:

Q. Patient with history of chronic scanty discharge from the ear, on exam you found marginal perforation in the TM with white lesion occupying the area, what is the nature of this white lesion?

From previous MCQs

- A. Bone
- B. Cholestatoma
- C. Tumor
- D. Foreign body

For mistakes or feedback

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Answer: B