DEFINITION

Chronic inflammation (>6-12 wk) of the middle ear and mastoid cavity presenting with recurrent ear discharge (or otorrhea) through a tympanic membrane perforation.

INTRODUCTION

• Usually the result of an initial acute attack of otitis media.
• About 90% of the cases occur in Asia and Africa.
• 60% of patients suffer from clinically significant hearing impairment.
• Most frequent cause of moderate hearing loss in many developing countries.
• Important cause of preventable hearing loss in the developing world.
• Major cause of acquired hearing loss in children in developing countries.

TYPES OF CSOM

• Inactive CSOM
• Active Mucosal CSOM
• Active CSOM with Cholesteatoma

• Tubotympanic
  — Safe
• Atticoantral
  — Unsafe

TYPES OF CHRONIC OTITIS MEDIA
• Draw a line through the long axis of the tympanic membrane.
  
  \[\text{Illustration showing a line through the tympanic membrane.}\]

• Region below and in front of this line is involved in \textit{tubotympanic type}.

• Region above and behind this line is involved in \textit{atticoantral type}.
Central Perforation

Marginal Perforation

INACTIVE CSOM
Evidence of previous disease
- Tympanic Membrane
  - Sclerotic Plaques
  - Replacement Membrane
  - Retraction Pockets
  - Perforation
• Ossicular Chain
  • Eroded
  • Fixed

II. ACTIVE MUCOSAL CSOM

• Tympanic Memb. Defect
  • Pars tensa / Flaccida
• Inflamed Mucosa – M.E. or Mastoid
• Granulation tissue or Polyp

III. Active CSOM with Cholesteatoma

• Mucosal Disease & Acquired Cholesteatoma

ETIOLOGY : GENERAL

O Environmental:
  O Lower socioeconomic group
  O General health
  O Diet
  O Overcrowding

O Genetic:
  O Not Clear

O Previous OM:
  O Sequel of AOM / OME
ETIOLOGY : GENERAL (Contd.)

- Upper Respiratory Tract Infection
  - Rhinitis / Sinusitis
  - Tonsillitis / Adenoids

- Allergy:
  - Role not clear

- Eustachian Tube Malfunction
  - Blockage : Edema / Mass

All agents are common to external auditory canal:

- Pseudomonas aeruginosa
- Staphylococcus aureus
- E. Coli
- Proteus species
- Klebsiella pneumoniae
- Diphtheroids
- Anaerobes
  - Bacteroides
  - Pepto-streptococcus
  - Peptococcus
- Fungi
  - Aspergillus
Candida may grow concurrently

PATHOLOGY:

- Perforation
  - pars tensa
  - central
- Middle ear mucosa
  - normal
  - edema with swelling
- Polyp
- Ossicular chain
  - Intact
  - Necrosis - long process of incus
- Tympanosclerosis
- Fibrosis and adhesions

T.T: CLINICAL FEATURES

- OTORRHEA
  - Profuse
  - mucoid or mucopurulent
  - Odorless
  - constant or intermittent
  - mostly at time of UTI

- HEARING LOSS
Conductive may be mixed

- PERFORATION
  - Central

- MIDDLE EAR MUCOSA
  - Normal or red edematous and swollen
  - Polyp may be seen

**TUBOTYMpanic (cont'd)**

**CHOLESTEATOMA**

A sac lined by keratinizing stratified squamous epithelium containing keratinous debris, inflammatory cells with or without cholesterol crystals.

**Introduction**

**Histopathology:**
- Cystic content – anucleate keratin squames
- Matrix – keratinizing squamous epithelium
- Perimatrix – granulation tissue in contact with bone (produces proteolytic enzymes)

**Classification**

- Congenital
- Acquired
  - Primary acquired (retraction pocket)
  - Secondary acquired

**Pathogenesis**

- Congenital
— Arise from embryonal rests of epithelial cells
— Location (petrous pyramid, mastoid and middle ear cleft)

— Levenson criteria
  • White mass medial to normal TM
  • Normal pars flaccida and tensa
  • No history of otorrhea or perforations
  • No prior otologic procedures
  • Prior bouts of otitis media not a ground for exclusion

Pathogenesis

• Primary acquired
  — Eustachian tube dysfunction
  — Poor aeration of the epitympanic space
  — Retraction of the pars flaccida
  — Normal migratory pattern altered
  — Accumulation of keratin — enlargement of sac
‘Conveyor belt’ Theory
Skin migrates from umbo outwards across TM and out along canal

Primary Acquired Cholesteatoma
Cholesteatoma
Pathogenesis — Acquired Cholesteatoma

— Implantation — surgery, foreign body, blast injury
— Metaplasia — transformation of cuboidal epithelium to
squamous epithelium from chronic infection

— **Invasion/Migration** – medial migration along permanent perforation of TM

— **Papillary ingrowth** – intact pars flaccida, inflammation in Prussack’s space, break in the basal membrane, cords of epithelium migrate inward

**AETIOLOGY : ACQUIRED CHOLESTEATOMA (Contd)**

• **Metaplasia :**

Episodes of Inflam. – Collumnar Epi. of Mucosa – Sq. metaplasia – Cyst – Bursts through T/M Cholesteatoma

**PATHOLOGY**

i. Tympanosclerosis

ii. Ossicular Erosions  
  - Long process incus  
  - Stapes suprasructure

iii. Fibrous Sclerosis  (Adhesions)

iv. Mastoid Sclerosis

v. Cholesterol Granuloma

vi. Perforation  
  - Central  
  - Marginal

vii. Granulations / Polyp

viii. Cholesteatoma  
  - Fistula SCC  
  - Dehiscence Facialnerve canal

**MANAGEMENT OF CSOM**

**A. Detailed History**

— Present

— Past

— Previous surgery

**B. Clinical Examination**

— Ear
C. Investigations

- Routine
- Special

D. Treatment

- Medical
- Surgical

INVESTIGATIONS

- **Routine**
  - CBC
  - Urine Analysis
  - Sugar
  - UCE

- **Special**
  - Aural Swab for C/S.
  - Audiometry
  - X-Ray Mastoids
  - CT.Scan (in case of complication)

TREATMENT

- Medical
  - Aural toilet
  - Suction Cleaning
  - Topical Antibiotics
  - Systemic Antibiotics depending on the culture and sensitivity

AIM OF SURGERY
ERADICATION OF DISEASE

PREVENTION OF RECURRENCE

RESTORATION OF HEARING MECHANISM

TREATMENT OF COMPLICATION

TREATMENT
Surgical

A. Mastoidectomy

• Canal wall up
  (a) Cortical
  (b) Combined-approach

ii. Canal wall down
  (a) Radical
  (b) Modified Radical
  (c) Attico-antrostomy

B. Tympanoplasty

Cortical Mastoidectomy
EXPOSURE
INFILTRATION ANESTHESIA
DISSECTION
Harvesting Temporalis Fascia

Boundries of Cortical (Simple) Mastoidectomy

POST OPERATIVE CASE
MYRINGOPLASTY/TYMPANOPLASTY

It is a microsurgical technique performed to repair a perforated ear drum.

COMPLICATIONS of SURGERY

- Persistent hearing loss.
- Persistent vertigo.
- Facial paralysis.

COMPLICATIONS OF CSOM

Complications of discharging ear is defined as a spread of infection beyond the pneumatized area of the temporal bone and the associated mucosa or when the infective process spreads beyond the confines of mucosa.

Indices of Impending IC complications

- Ear Ache
- Head Ache
- Vertigo
- Nausea / vomiting
- Dizziness
- Sudden cessation of Ear Discharge
- Fits
Gait disturbance

Loss of consciousness

Routes of spread of infection:

Through Bone
- Demineralization – Acute Infection
- Resorption
  - Cholesteatoma
  - Osteitis – Chronic Infection
- Through Lateral & Superior Petrosal Sinuses
- Normal Anatomical Pathways
  - Oval & Round Windows
  - I.A.M
  - Aqueducts – Cochlear / Vestibular
  - Spread along Periarteriolar space of Virchow – Robin (brain abscess)

- Dehiscences
  - Jugular Bulb
  - Tegmen
  - Suture Lines
- Traumatic bony defects
  - Accidental—Fracture Skull base
  - Surgical
Mastoiditis
Actually occurs with most infections of the middle ear. It is not considered a complication until bone destruction occurs.

Symptoms:
• Boring pain
• Fever
• Retroauricular swelling
• Sub periosteal abscess

Signs:
• Edema of the posterior superior canal wall
• Pinna displaced inferolaterally
• Persistent pain for 2 weeks after antibiotic treatment in an ear without adequate aeration
• If there is radiographic evidence of coalescence

Mastoid Abscess
Bezold’s abscess
Labyrinthitis

• Labyrinthitis denotes inflammation of the epithelial contents of the otic capsule
• If the labyrinthitis is suppurative and due to middle ear bacterial infection, meningitis can follow and it initially affects the perilymphatic spaces

Labyrinthitis
• Symptoms
  • Severe vertigo
  • Hearing loss
  • Nausea and vomiting

• Signs
  • Nystagmus
  • Sensorineural deafness

Facial Nerve Paralysis
Petrositis

Classic triad present
Retro-orbital pain
Otorrhea
Abducens paralysis
Gradenigo Syndrome

Tympanosclerosis
Erosion of Mastoid Cortex

Meningitis

• Signs and symptoms
• Headache
• Fever
• Nuchal rigidity
• Abnormal reflexes (Kernig’s or Brudzinski’s sign).

Extra Dural and Sub Dural Abscess
Extra Dural and Sub Dural abscess

• Posterior cranial fossa
• Symptoms
  – Symptomless
  – Discovered at operation
• Deep seated pain and tenderness over the temporal bone
• Focal neurological deficits
• Seizures
• Rapid loss of consciousness

Brain abscess

The abscess usually has four stages:

10 First stage - invasive (low grade fever, malaise, and fatigue).

10 The second stage - localization phase (the abscess is clinically quiet.) This stage can last up to a couple of weeks.

10 The third stage is the enlargement stage (an actual abscess forms).
The termination, when the abscess ruptures or causes the ventricle to rupture which usually results in a fatal outcome.

**Brain Abscess**

**Signs and Symptoms:**

- Patient may lose consciousness
- Have a focal neurological deficit
- Have signs of increased intracranial pressure

**Sigmoid sinus thrombosis**

- Asymptomatic signs of toxemia / torticollis
- Septic embolization / thrombus propagates:
  - intracranial hypertension
  - otitic hydrocephalus
- **Fate of thrombus**
  - can propagate to involve the cavernous sinus

**Signs and symptoms:**

- Picket fence fever pattern
- Headache,
- Lethargy
- Papilledema
- Tenderness over mastoid
CAVERNOUS SINUS THROMBOSIS FOLLOWED BY Sigmoid sinus thrombosis
Long Term complications of csom

- Tympanic membrane perforation
- Ossicular damage
- Senorineural Hearing loss
- Speech and language delay
- Cognitive impairment

Thank you