Chronic suppurative otitis media

Definition: CSOM is a persistent disease, insidious in onset, often capable of causing severe destruction & irreversible sequalae & clinically manifests with deafness and discharge.

Aetiology:

1. Environmental: overcrowding, malnutrition, poor sanitation & unhygienic habits.
2. Genetic.
3. Previous otitis media (secretary or suppurative).
4. Chronic chest infections especially bronchiactasis.
5. URTI (adenoids &/or tonsils, chronic maxillary sinusitis)
6. Autoimmunity.
7. Allergic rhinitis.
8. Eustachian tube dysfunction.

Classification:

CSOM is usually classified into 2 main groups:

1. Tubotympanic disease (safe) is characterized by a perforation of the pars tensa. Patients with this disease are generally not considered to be at risk of developing complications such as intracranial sepsis.
2. Atticoantral disease (unsafe) most commonly involves the pars flaccida & is characterized by the formation of a retraction pocket in which keratin accumulates to produce cholesteatoma.

Pathology:

1. Specific: a) Cholesteatoma.
   b) Granulation tissue.
2. Nonspecific
   - Tympanosclerosis: is an abnormal condition of the middle ear, characterized by calcareous deposits in the tympanic cavity & occasionally in the mastoid.
   - Fibrous sclerosis.
   - Mastoid sclerosis.
   - Cholesterol granuloma.
   - Ossicular erosion.
   - Labyrinthitis (serous or purulent).
   - SNHL.

Bacteriology:

A wide range of organisms, both aerobic and anaerobic may be isolated from cases of CSOM (this is because the aerobic organisms create an environment in which the anaerobes can grow in mixed infections by lowering the local oxygen concentration).

Proteus species and pseudomonas aeroginosa most frequently predominate. Staph aureus and E.coli are also predominated.

Clinical assessment:

History:

The principle symptoms of CSOM are hearing loss and aural discharge. In tubotympanic disease the discharge tends to be profuse and is frequently mucoid rather than frankly purulent. It is seldom malodorous and frequently intermittent. It may be precipitated by the passage of water through a perforation.

In atticoantral disease the discharge is generally scanty, foul smelling and tends to be more chronic. Occasionally there is no H/O discharge and the diagnosis may only be made when the ear is explored because of conductive hearing loss. Alternatively there may be hardly any hearing loss because the cholesteatoma is itself transmitting sound. When there is formation of granulation tissue or an aural polyp, blood stained discharge may occur. Otalgia is uncommon, but may occasionally occur in cholesteatoma cases. The development of headache, vertigo or facial palsy is evidence of complications.

Examination:

The pinna should be inspected and it is important to look at both sides to exclude the presence of a scar from previous surgery. Otoscopic examination will reveal the presence and position of any perforations and retraction pockets. In the presence of a perforation, the condition of the middle ear mucosa can be assessed. A polyp may be observed though if this is large it may completely obstruct the ear canal precluding adequate assessment of the disease. Similarly wax crusts may obscure the opening of an attic retraction pocket.

Most cases allows discharge and attic crusts to be removed. In some cases a second examination after a course of medical treatment will help to clarify the details of the pathology. In others, especially in children, it is necessary to examine the ear under GA with the aid of a microscope in order to make a proper assessment. A labeled diagram of the findings can be very helpful. Rinne and Weber tests should be performed to establish the nature of the hearing loss.

Valuable information may also be obtained from examination of the nose & throat. Preoperative assessment of Eustachian tube function is unhelpful.

Causes of hearing loss in CSOM:

1. Perforations of TM reduce the efficiency of the drum component.
2. Destruction of the ossicular chain.
3. Presence of active mucosal disease.
4. Reduction of ossicular chain mobility by fibrosis or tympanosclerosis.
5. Presence of cholesteatoma.
6. Diffusion of the toxic products of inflammation through the scala tympani via the round window membrane.

Audiological assessment:

1. PTA including air and bone conduction with full masking is essential to evaluate the type and the degree of hearing loss.
2. Speech audiogram is valuable to check that the speech reception threshold is in the line with the mean hearing loss as assessed by PTA.

Radiological assessment:

1. Conventional radiology are of value in demonstrating pathology or to identify variations in temporal bone anatomy.
2. CT scanning: the anatomy of the temporal bone can be more effectively demonstrated by CT scanning and cholesteatoma can be demonstrated. It may be of some value in children, medically unfit patients and those with only one hearing ear. CT scanning is of vital; importance in the detection of intracranial complications.

Medical management:

1. Aural toilet: this can be achieved by dry mopping the ear or by suction or sometime by gentle syringing with sterile saline. Removal of small polyps can often be achieved at the same time & granulation tissue can be cauterized with silver nitrate applied with care.
2. Topical antimicrobial therapy: it is generally considered that antibiotic or antibiotic/steroid ear drops or powder are effective in reducing aural discharge in CSOM.
3. Systemic antibiotics: for mixed infections like ciprofloxacin indicated in active disease or in cases of complications of CSOM.

Surgical management:

1. Tympanic membrane perforations treated by myringoplasty. The decision whether to operate or not based on the potential benefits to the patients in terms of:
    a) Prevention of recurrent discharge.
    b) Hearing improvement.
    c) The ability to swim without the fear of aural discharge.
2. Cholesteatoma: surgery (mastoidectomy) is the treatment of choice for the majority of cases. There is, however, a small group of elderly and medically unfit patients who are best managed by regular suction clearance of keratin in outpatient department.
3. Ossicular chain pathology:
    a) Ossicuolplasty.
    b) Hearing aid.
4. Retraction pockets:
    a) Shallow, self-cleansing retraction pockets are common incidental findings & require no treatment.
    b) Deep pocket: the pocket can be everted & the drum reinforced with a soft tissue grafts, such as temporalis fascia (myringoplasty).

Complications of Suppurative Otitis Media

Complications of CSOM are associated with a high morbidity & may be life threatening. Cholesteatoma, atticoantral mucosal disease & ASOM cause complications by spread of infection:

1. Directly via the oval window to reach the labyrinth, through osteomyelitic bone to reach the dura & lateral sinus or to affect a congenitally dehiscent facial nerve.
2. By retrograde propagation of small foci of thrombophlebitis which may extend through the temporal bone & dura to the major venous sinuses to cause a lateral sinus thrombosis & by further extension a cerebellar or temporal lobe abscess.
3. Along the periarteriolar spaces to cause a temporal or cerebellar abscess. Browning in a retrospective study has calculated that the risk of a patient with CSOM developing an intracerebral abscess is 1 in 3500.

Classification:

- **Extracranial**
    1. **Chronic otitis externa & meatal stenosis.**
    2. **ossicular discontinuity from ossicular erosion.**
    3. **middle ear adhesions.**
    4. **Tympanosclerosis which may spread from the tympanic membrane over the ossicular chain fixation.**
    5. **Squamous cell carcinoma of the middle ear.**
    6. **Lower motor neuron facial nerve palsy.**
    7. **Serous or purulent Labyrinthitis.**
    8. **Petrositis & Gradingo's syndrome(signs of ASOM, an ipsilateral abducent nerve palsy & pain in the distribution of the ipsilateral trigeminal nerve).**
    9. **Labyrinthine fistula.**
- **Intracranial**
    1. **Lateral (transverse & sigmoid) sinus thrombosis. This may extend to involve the superior & inferior petrosal sinus, the cavernous sinus, the sinus confluence, the superior sagittal sinus & the internal jugular vein. There is often a concomitant or subdural abscess which may have precipitated the formation of the thrombus.**
    2. **Meningitis.**
    3. **Extradural, subdural, intracerebral(cerebellar & temporal lobe) abscess.**
    4. **Otitic hydrocephalus.**

Clinical Features:

Patients with acute intracranial complications usually present to the neurosurgeons & are most likely to be seen by an ENT surgeon after recovery from the acute episode. Patients with CSOM who present with unilateral or occipital headaches, visual disturbance, vomiting, clumsiness, forgetfulness or drowsiness should have a full neurological examination looking in particular for signs of raised intracranial pressure, meningitis & localizing cerebellar & temporo-parietal lobe signs. A deep throbbing otalgia & serosanguinous discharge may herald malignant change.

Investigations:

A high definition CTscan of the petrous temporal bone will show the extent of mastoid disease although it may not distinguish cholesteatoma from mucosal disease. A gadolinium enhanced magnetic resonance scan is now the investigation of choice for the diagnosis of an intracranial venous thrombosis (simple thrombus shows an intermediate signal, vascularized thrombus, granulation tissue & slow flowing blood a high signal, & fast flowing blood no signal) & intracranial abscess (shows a center of low attenuation with an outer rim of high signal).

Treatment:

- High dose intravenous antibiotics to commence after taking a culture- swab of the aural discharge.
- Neurosurgeons to manage intracerebral abscess.
- Treatment of initiating otological disorder.