

Tympanosclerosis (Myringosclerosis)

What is tympanosclerosis?

Tympanosclerosis is a condition in which there is calcification of tissue in the eardrum and middle ear, including the tympanic membrane. If extensive, it may affect hearing.

Tympanosclerosis may be classified as:

- *Myringosclerosis* – involving only the tympanic membrane.
- *Intratympanic tympanosclerosis* – involving other middle ear sites: the ossicular chain or, rarely, the mastoid cavity.

Tympanosclerosis causes (aetiology)

- The precise cause of tympanosclerosis is not understood. It may be an abnormal healing response.
- Tympanosclerosis commonly develops secondary to acute and chronic otitis media^[1].
- Studies have shown that there are identical risk factors for atherosclerosis and tympanosclerosis. Patients with tympanosclerosis have high levels of homocysteine, low-density lipoprotein, total cholesterol and triglyceride^[2].
- Children who have had a ventilation tube (grommet) inserted for otitis media with effusion have a higher risk of developing tympanosclerosis^[3]. This risk has been reported as 11-37%^[4].

Tympanosclerosis symptoms

- There are no symptoms associated with tympanosclerosis.

- Characteristic chalky white patches are seen on inspection of the eardrum.
- There is conductive hearing loss in some cases.

Tympanosclerosis diagnosis

- The opaque or patchy white appearance of the eardrum is fairly unique and usually easy to identify. The amount of eardrum involvement can vary considerably between cases.
- Intratympanic tympanosclerosis is more difficult to identify but may be suspected if there are typical chalky lesions on the eardrum, scarring of the eardrum, or a history of otitis media, with non-progressive conductive deafness and no family history of otosclerosis.

Differential diagnosis

- [Cholesteatoma](#) may look similar but the whiteness appears behind, rather than in/on the tympanum ^[5] .
- Other causes of conductive hearing loss – eg, [otosclerosis](#).

Investigating tympanosclerosis

- Investigations are not usually required if the lesions are typical, not extensive and there is no suspicion of hearing loss or other middle ear disease.
- Audiometry should be undertaken if hearing loss is suspected.
- Transtympanic endoscopy may be undertaken in some cases ^[6] .

Tympanosclerosis treatment and management

Treatment is only required if there is hearing loss.

- Hearing aids can be beneficial, as with any form of conductive hearing loss.

- Surgery:
 - Surgery for tympanosclerosis involves excision of the sclerotic areas and reconstruction of the ossicular chain.
 - Stapes mobilisation is usually required^[7] .
 - There are various surgical procedures and some involve two-stage surgery. Reported success rates are variable.
 - Manubrio-stapedioplasty has been shown to be an effective method for ossicular reconstruction in cases of malleus and incus fixation due to tympanosclerosis^[8] .
 - In those patients with isolated malleus fixation with tympanosclerosis, performing a canaloplasty to clean the sclerotic plaques without damaging the normal anatomy of the ossicle system using a diamond burr is a safe surgical option that provides significant recovery in hearing levels^[9] .
 - Surgery for tympanosclerosis usually results in significant improvement of hearing.
 - Damage to the inner ear is a possible and serious complication, which can cause sensorineural deafness.

Complications with tympanosclerosis

Conductive hearing loss:

- With myringosclerosis alone, hearing loss is uncommon but may occur if the plaques are large or adhere to other structures (as the drum will be less compliant).
- Conductive hearing loss can occur with intratympanic disease; the severity depends on the severity of the middle ear involvement and on how the ossicular chain is affected.

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