Tympanosclerosis Presenting as Intratympanic Focal Mass in a 14-Year-Old Girl

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Keywords
tympanosclerosis, myringosclerosis, tympanic membrane, intratympanic membrane cholesteatoma

Received January 11, 2022; accepted January 21, 2022.

Tympanosclerosis is characterized by progressive deposition of hyaline material around the tympanic membrane and hypertrophic submucosa in the middle ear cavity due to inflammation.1,2 Myringosclerosis, one type of tympanosclerosis, is characterized by calcification and hyalinization of the connective tissue layer of the tympanic membrane.2 Calcification around the tympanic membrane and ossicles restricts their mobilization, causing conductive or mixed hearing loss.1 Tympanosclerosis or myringosclerosis usually appears as a white, plaque-like lesion in the tympanic membrane.2-4 However, when the presentation of tympanosclerosis is atypical, clinical diagnosis can be difficult. This case report describes tympanosclerosis presenting as an intratympanic white focal mass similar to intratympanic membrane cholesteatoma in a 14-year-old girl. The Institutional Review Board of the National Health Insurance Service Ilsan Hospital exempted the review of this study (NHIMC 2021-08-009).

Case Report

A 14-year-old girl visited the otorhinolaryngologic department for a mass in the right tympanic membrane that had been discovered incidentally several days prior. She had no symptoms, such as hearing loss or otorrhea. She had a history of acute otitis media in the right ear with otalgia several months prior. In otoscopic examination, a white, hard, oval focal mass (0.1 x 0.2 cm) was observed on the right tympanic membrane (Figure 1). Temporal bone computed tomography revealed a small, hyperdense focal mass in the right tympanic membrane without involvement of the middle ear (Figure 2). Pure tone audiometry revealed mild conductive hearing loss of 36 dB in the right ear. The diagnoses under consideration were tympanosclerosis and intratympanic membrane cholesteatoma.

Although the patient reported no symptoms, surgical removal was planned because, if the lesion was a cholesteatoma, it could...
expand into the middle ear. Conversely, tympanosclerosis could cause conductive hearing loss, which might be improved with removal of the lesion.

In surgery with a microscope under local anesthesia, the intratympanic focal mass was removed from the tympanic membrane. Histopathologic examination revealed calcification, hyalinization, fibrosis, and mineralized lamellar bone, and there was no evidence of cholesteatoma. Thus, tympanosclerosis was diagnosed.

After 9 months, the right tympanic membrane healed well without perforation. The patient had no symptoms, such as otorrhea or hearing loss. Postoperative pure tone audiometry revealed mild conductive hearing loss of 35 dB in the right ear, showing no improvement of the preoperative conductive hearing loss.

Discussion

Tympanosclerosis is thought to be caused by nonspecific and irreversible results of chronic inflammation in the middle ear.1 Tympanosclerosis occurs not only in patients with chronic otitis media but also in those with acute otitis media or otitis media with effusion, especially in patients who have undergone myringotomy and ventilation tube insertion.1,2 Tympanosclerosis around the ossicles could limit their mobility, resulting in hearing loss.1 Although the treatment of choice is surgery for restoration of hearing, the benefits of surgery for tympanosclerosis could be limited in several cases.1 The controversy is whether or not removal of sclerotic plaques would improve hearing.2

Intratympanic focal tympanosclerosis should be differentiated from intratympanic membrane cholesteatoma. While calcified plaques in the lamina propria present as thin plates, cholesteatoma shows a spherical shape.3 Like this case, however, tympanosclerosis can appear as a focal spherical or oval mass, which makes it difficult to discriminate from cholesteatoma. Intratympanic membrane cholesteatoma can occur through metaplasia within the tympanic membrane caused by local inflammation.5 Tympanosclerosis can induce symptoms such as conductive hearing loss, whereas intratympanic membrane cholesteatoma usually is asymptomatic.

These 2 diseases must be differentiated because their treatments differ. Surgical removal is recommended for cholesteatoma because it could progress and involve the middle ear.5 In contrast, for tympanosclerosis, surgical treatment is not necessary if the lesion is limited within the tympanic membrane and the patient has no conductive hearing loss.

This case is significant because it demonstrates that tympanosclerosis can appear as a focal mass mimicking an intratympanic membrane cholesteatoma in a young patient. In patients with a white focal mass on the tympanic membrane and a history of recurrent or chronic inflammation in the middle ear, tympanosclerosis and intratympanic membrane cholesteatoma should be considered for diagnosis. However, if the patient has conductive hearing loss, it is more likely to be tympanosclerosis. The exact diagnosis can be established by pathologic confirmation.

Author Contributions

Junhui Jeong, conceptualization, data curation, funding acquisition, investigation, resources, validation, visualization, writing—original draft, writing—review and editing.

Disclosures

Competing interests: None.
Sponsorships: None.
Funding source: This work was supported by a National Research Foundation of Korea grant funded by the Korean government (Ministry of Science and ICT; 2019R1F1A1062649).

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