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Asymptomatic Hydrops in a Case with Otosclerosis:

Case of the Month

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Otosclerosis is a bone remodeling disorder of the human otic capsule. It can be associated with hydropic changes in the inner ear (1). In this case study, we report a case which had a postoperative prolonged vertigo after an attempt to perform a stapedectomy.

Case Report

A 79-year-old female had a history of progressive hearing loss in both ears, and died of pulmonary embolus. In addition to the ear problems she had peptic ulcer, rectal adenocarcinoma, and fronto-temporal meningioma. She started wearing hear aids at age 30. At age 62, she had a left stapedectomy under local anesthesia. During the stapedectomy, after the footplate was removed, the patient was nauseated due to labyrinthine stimulation, and the operation was discontinued. Immediately after surgery, the patient became extremely vertiginous. Although preoperative audiometry showed a mixed type hearing loss in the left ear, postoperative audiometry did not show any hearing improvement (Figures 1A, B). The patient had intensive vertigo for months after surgery. The time interval was 17 years between the stapedectomy and the temporal bone removal.

Histopathologic Findings in Temporal Bones

The external and middle ears appeared normal, other than a dehiscent facial nerve in the left ear. Otosclerosis did not involve the bony cochlea in either ear. There was a focus of otosclerosis located anterior to the oval window in both ears. In addition, otosclerotic foci were observed posterior to the oval window and lateral to the round window in the left ear. Although there were profound utricular and saccular hydrops, and these structures are communicated with each other (Figures 2, and 3A, B) no hydropic changes were observed in

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the cochlea in either ear (Figure 2). In the left ear, the operated ear, the saccular membrane was disrupted near the stapedial footplate (Figures 3A, B). A remnant of the stapedial footplate was fixed both posteriorly and anteriorly in the left ear. An otosclerotic focus was seen at the round window niche, however the round window membrane appeared normal. In the right ear, Reissner's membrane was collapsed in the basal and middle turns. There was distinctive outer hair cell loss, but the organ of Corti seemed normal and not disrupted in either ear. There was a significant loss of spiral ganglion cells in all turns in both ears.

Otosclerosis can be associated with hydropic changes in the inner ear. Evidence in the histopathologic sections reminded us of a procedure called "Cochleosacculotomy" that has been tried in order to relieve the vertigo in patients with Meniere's disease in which medical therapy has failed (2). Based on our findings, we speculate that the underlying problem for postoperative prolonged vertigo, in this case, may be secondary to the damage and fistulae in the hydropic saccular membrane during the surgical procedure. Surgeons should keep in mind the possibility of asymptomatic hydrops in a case with otosclerosis before planning a stapedial surgery.

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Figure 1.

Figure 1A. This preoperative audiogram of the patient showed a profound hearing loss in the left ear.

B. According to the postoperative audiogram, there were no changes in the patient's hearing in the left ear.

Figure 2. Histopathologic examination of the left ear showing saccular and utricular hydrops. Note that there are no hydropic changes in the cochlea and the otosclerotic focus involves the whole oval window. (ME: Middle ear; O: Otosclerosis; F: Facial nerve; S: Saccule; U: Utricle).

Figure 3.

Figure 3A. Histopathologic section showing confluence (communication between saccule and utricle). (*) shows confluence. (F: Facial nerve; O: Otosclerosis; Thin arrow: Surgery site; Thick arrow: Possible saccular membrane rupture).

B. Histopathologic section showing fibrous tissue (*) due to surgical trauma.