Published in final edited form as:

Otol Neurotol. 2011 December ; 32(9): e38. doi:10.1097/MAO.0b013e318218cfeb.

NEW BONE FORMATION IN PATIENTS WITH COCHLEAR IMPLANTS AND OTOSCLEROSIS

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The presence of bone within the cochlea can present technical problems to the implant surgeon unless it is anticipated. The two most common causes of intracochlear neo-ossification are meningitis and advance otosclerosis.¹ Herein we are reporting on a case of total hearing loss, due to otosclerosis, that underwent a successful cochlear implant in spite of new bone formation in the scala tympani.

The patient was first examined at age 51 because of a progressive hearing loss that began at age 26. His audiometric tests indicated a mixed hearing loss of 63 dB in the right ear and 60 dB in the left ear. A wire loop-gelfoam stapedectomy on the left ear enabled him to hear with a hearing aid. However the sensorineural component of the hearing loss progressed to a where he could hear nothing above 500 cps. His right ear was implanted when he was 82 and served him well until his death at age 92. Because of bone in the round window and scala tympani, it was necessary to use the drill to allow electrode insertion.

Histopathological examination revealed that both cochleae were surrounded by otospongiosis and otosclerosis that also involved the walls of the internal auditory canals. There was some loss of hair cells but not enough to account for the severe hearing loss. There was however a significant loss of the stria vascularis and spiral ganglion cells, either one of which could account for the elevated thresholds. In the right ear, the electrode can be seen entering the scala tympani through the round window and extending into neoosteogenesis, which fills the scala tympani for a distance of 7 mm. The otospongiotic phase of the lesion is invading the new bone at the level of the round window. Figs. 1&2

References

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Fig. 1. Electrode entering scala tympani of basal segment of cochlea. Electrode Path (EP), Otosclerosis (Osc), Otospongiosis (Osp), Middle ear (ME), Scala vestibuli (Sv), Round window niche (RWN), Neo-ossification (Neo), Normal bone (NB). Hematoxylin and Eosin (H&E) $\times 40$

Fig. 2. Higher power of otospongiosis (Osp) invading new bone (Neo) in scala tympani. Spiral vein of inferior cochlea (SV). Normal bone of cochlear capsule (NB). (H&E $\times 100$)