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INVOLVEMENT OF THE INTERNAL AUDITORY CANAL IN SUBJECTS WITH COCHLEAR OTOSCLEROSIS: A PREVIOUSLY UNACKNOWLEDGED THIRD WINDOW THAT AFFECTS SURGICAL OUTCOME

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Objectives: To investigate the correlation between post-operative hearing outcomes and cavitating lesion involving the internal auditory canal (IAC) in subjects with cochlear otosclerosis.

Methods: Retrospective chart review of 134 subjects with otosclerosis from Jan' 2011 to Jun' 2017 at Seoul National University Bundang Hospital was conducted. Of 134, 16 subjects (23 ears) with temporal bone computed tomography (TBCT) confirmed cochlear otosclerosis who underwent stapedotomy were included in the current study. According to the 2012 AAO-HNS standard for reporting hearing loss, pure tone average was calculated using 0.5-, 1-, 2- and 3-kHz thresholds. Postoperative hearing outcome were compared between cochlear otosclerosis with and without an IAC involvement group (IAC group and non-IAC group, respectively).

Results: 14 of 23 ears showed involvement of the IAC. There were no statistically significant differences with regard to age, side of otosclerosis, laterality (bilateral or unilateral) and preoperative hearing thresholds between the two groups. The mean postoperative air- and bone conduction thresholds and air-bone gap of the IAC group showed significantly worse results (44.1 dB , 32.7 dB, and 11.3 dB, respectively) than those of the non-IAC group (24 dB, 19.7dB, and 4.3dB respectively). (p=<0.001, 0.005, and 0.003 respectively)

Conclusion: Cochlear otosclerosis with an IAC involvement showed significantly poorer post-operative hearing outcomes. Cavitation of the otosclerosis foci that extends to the IAC may act as a previously unacknowledged third window, resulting in a failure of air-bone gap closure.

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