

Long-Term Effect Of Cochlear Implantation On Vestibular Function And Residual Hearing

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Objective: The insertion of electrodes into the scala tympani carries the risk of impairing the vestibular apparatus. This study evaluated the long-term effects of CI on vestibular function and residual hearing.

Methods: A total of 143 patients with CI were divided into three groups: Group I(n=65) with normal preoperative caloric function, Group II(n=37) with preoperative normal waveform in cervical-vestibular evoked myogenic potential testing(c-VEMP), and Group III(n=48) with pre- and postoperative pure-tone averages were available. Bithermal caloric tests, c-VEMP tests, and pure-tone audiometry were performed preoperatively and again at 3 months (3m), and 6 months(6m) postoperatively.

Results: In Group I, prevalence of unilateral weakness on the implanted side was 7.7% and 12.3% at 3m and 6m post-CI. While the total slow-phase velocity (SPV total; warm and cold stimulations) was significantly different at 3m post-CI ($P=0.011$). Subjective dizziness was associated with cochleostomy and steroid administration. The shift in the SPV total was significantly correlated with the thresholds of 125 Hz and 250 Hz at 3m post-CI. In Group II, the prevalence of an abnormal waveform on the implanted side was 16.2% and 20% at both 3m and 6m post-CI. In Group III, the SPV total on the implanted side was significantly greater among the patients, with a threshold shift <20 dB HL than those with a threshold shift >20 dB HL, at 3m post-CI ($P=0.026$).

Conclusion: CI is a relevant risk factor for damage to vestibular function. Vestibular function should be also afforded equal and simultaneous consideration in terms of preservation.