



EVALUATION OF LEADWIRE FIXATION FOR PAEDIATRIC COCHLEAR IMPLANTS

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A paediatric cochlear implant should include a leadwire system that can readily expand in the presence of tissue adhesions and can be effectively fixed at a site close to the cochlea to ensure that the electrode array is not displaced during skull growth. In this study, leadwires were implanted in six young animals for a period of five months. During explantation, the mean force \pm standard deviation required to expand individual leadwire was found to be 12.5 ± 5.0 g. In order to evaluate the efficacy of leadwire fixation techniques, four fixation procedures were initially developed in human temporal bones and subsequently used to fix leadwires implanted in the temporal bones of eight animals for a period of four months. Leadwires were fixed by platinum wires at the fossa incudis or by platinum wires with a titanium barbed nail at the mastoid. The biomechanical evaluation revealed that the forces required to displace the leadwire from fixation points were 70.6 ± 33.5 g. Significantly, the forces required to withdraw a chronically implanted electrode array from an animal cochlea were 1.5 ± 0.4 g. The present results highlight the importance of an effective leadwire fixation technique for paediatric cochlear implants, particularly in preventing the displacement of an electrode array from the cochlea during skull growth.



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Title:

Evaluation of leadwire fixation for paediatric cochlear implants [Abstract]

Date:

1994

Citation:

Xu, S. A., Shepherd, R. K., & Clark, G. M. (1994). Evaluation of leadwire fixation for paediatric cochlear implants [Abstract]. In Abstracts of the International Cochlear Implant, Speech and Hearing Symposium, Melbourne.

Persistent Link:

<http://hdl.handle.net/11343/26927>

File Description:

Evaluation of leadwire fixation for paediatric cochlear implants [Abstract]