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Autor(en) des Beitrags:
Stark, T; Braun, K; Helbig, S; Bas, M; Boehnke, F

Titel des Beitrags:
3D Representation of the Human Cochlea with FLEXEAS Electrodes

Abstract:
The aim of this study was to create a three-dimensional data set of the cochlea with an inserted FLEXEAS electrode for later computation of the mechanical wave propagation in the cochlea. Human temporal bones (n =2) were implanted with FLEXEAS electrodes and scanned with a high-resolution p-computer-tomograph. These data were analyzed and used for 3D reconstruction. In addition all temporal bones underwent fixation methylmethacrylate embedding to allow cutting of the undecalcified bone with the electrode in situ. Histologic results were correlated to the 2D images. The 2D images showed the electrode entering the scala tympani through the round window or a cochleostomy without causing damage to the bone. 3D visualization demonstrated that insertion through a cochleostomy led to a straighter position of the electrode in the scala tympani than the insertion through the round window. Therefore we conclude that the position of the inserted electrode in the scala tympani is influenced by the surgical approach. This 3D model of the cochlea with inserted FLEXEAS electrodes will allow the study of the mechanical influence of cochlear implant electrodes on the wave propagation along the cochlear partition.

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