Post Mortem Study of the Intracochlear Position of the Nucleus Standard 22 Electrode Array

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The final position of an intracochlear cochlear implant electrode array can vary depending on the pathology, the insertion technique used and the type of electrode array used. The distance of the electrodes from the target neural elements and the presence of intracochlear fibrous tissue or new bone formation are believed to affect the performance of the device. A post mortem study was conducted to assess these factors.

The present study is based on the histopathology of 14 temporal bones taken from donors who had received a Nucleus 22-channel implant. The specimens were decalcified, embedded in celloidin or Spurr’s resin, sectioned at 20 or 2 μm respectively and stained with hematoxylin and eosin. We examined the position and intracochlear pathology with the help of 3D-reconstruction and compared the findings with the corresponding T- and C-levels.

One cochlea with a preoperative history of meningitis presented with widespread destruction of the basilar membrane and new bone formation in all scalae and turns. In 10 temporal bones the electrode array was found within the scala tympani. The vicinity to the modiolus varied with insertion depth and the electrode array was frequently found to be embedded in the spiral ligament of the upper basal turn. In three cases the electrode array was actually inserted into and remained within the scala media taking the most lateral position in the cochlea. However, these cases showed only very limited signs of trauma.
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Title:
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Date:
2000

Citation:

Persistent Link:
http://hdl.handle.net/11343/27077

File Description:
Post mortem study of the intracochlear position of the nucleus standard 22 electrode array