

Abstract EFAS/DGA 2007

Influence of Iridium Coating and Application of Steroids on Electrical Stimulation with Cochlear Implants

Paasche, G., Lesinski-Schiedat, A., Stöver, T., Lenarz, T.
Medical University Hannover

Background:

The increase of impedances of cochlear implant (CI) electrodes shortly after implantation is typically explained by the formation of a fibrous tissue sheath around the electrode carrier. Earlier investigations have shown, that intra-operative and intra-cochlear application of steroids resulted in a long-term reduction of the postoperative impedances of the stimulating electrodes in the cochlea. The development of the impedances shall be correlated with the stimulation effect (daily impedance difference between unstimulated and stimulated electrodes) and the post-operative development of T- and C-Levels.

Methods:

All patients received a Contour electrode array. The following groups of patients have been investigated: a) control (N=17), b) intraoperative application of steroids (N=8), c) Iridium-coated cochlear implant (N=10), and d) Iridium-coated CI with intraoperative application of steroids (N=8). Impedances have been measured using standard fitting software and common ground mode during rehabilitation period in the morning before switch-on of the device and in the afternoon after at least 4 hours of stimulation. Impedances and T- and C-Level were evaluated during regular test sessions from first fitting to two years post implantation.

Results:

During evaluation of the stimulation effect, reductions of impedances by 0 to 5 kW or 0 to 50 % of its initial value were found. On average, the largest stimulation effect and also highest T- and C-Levels were found in the group with Iridium-coated electrodes. A correlation between initial impedances and the stimulation effect was only found in the steroid-treated group.

Conclusions:

Intra-operative application of steroids reduces the impedances on a long term but does not affect the development of the stimulation level. As the data for the stimulation effect showed some large variations between the patients, differences could not be allocated to the different treatments.

