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SINGLE SIDED DEAFNESS & ASYMMETRIC HEARING LOSS

Multifrequency ECochG Intraoperative Monitoring during Cochlear Implantation: Surgical Considerations

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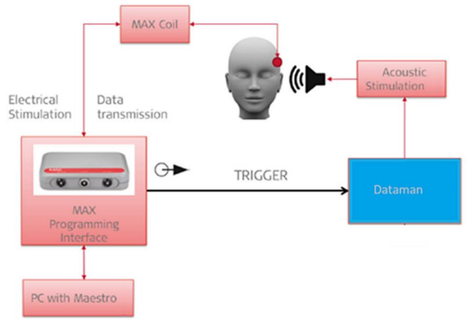
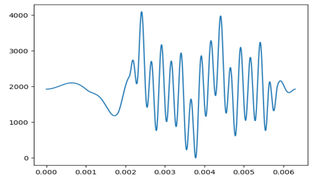
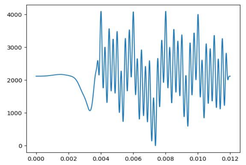
Background

Intracochlear electrocochleography (ECochG) records electrical potentials generated in the inner ear in response to acoustic stimuli. Previous studies have demonstrated that ECochG recordings are related to the remaining inner ear function after cochlear implantation.







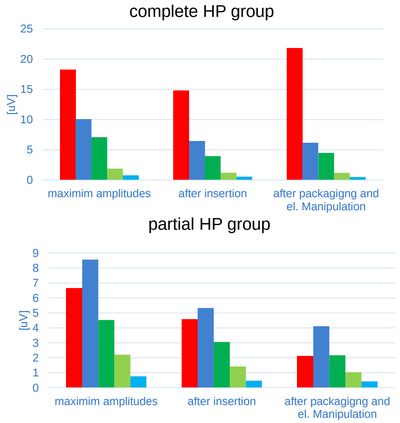
New stimuli introduced

- SPL Chirp 1

  The duration is 6ms. It consists of the following frequencies: 500, 1000, 2000 and 4000 Hz.
- SPL Chirp 2

  The duration is 12 ms. It consists of the following frequencies: 250, 500, 1000, 2000 and 4000 Hz.
- Desingned based on in vivo BM delays in human
- Calibrated in SPL/HL

Results



- All subjects had hearing preservation. Among this group 9 subject had complete hearing preservation
- Patient with compleate HP show larger EcochG responses than partial HP group
- Amplitudes at the end of the insertion may be related to HP changes and place in the cochlea.

Objectives

The aim was to use intracochlear ECochG measurement tool during CI surgery and to gain a better understanding of the impact of the surgical technique on the inner ear function.

Conclusion

Real-time intraoperative monitoring tool may allow surgeons and audiologists to assess cochlear function, irrespective of their experience with the technique. This objective intracochlear ECochG monitoring tool may be useful during the cochlear implantation surgery to get frequency specific insight on hearing preservation status of the implanted patient and to possibly minimize the hearing trauma during the surgical intervention.

Materials and Methods

Intracochlear ECochG was applied on 26 subjects with residual preoperative low-frequency hearing during the introduction of the Med-El electrode array into the cochlear and sealing of the round window after the insertion. The ECochG signal was recorded on the electrode one, and the amplitudes of each harmonics were monitored separately during the insertion of the electrode and sealing. Surgical video was used to evaluated the electrode insertion.

References

Skarżyński, P. H., Lorens, A., Walkowiak, A., Polak, M., & Skarżyński, H. (2022). Multi-frequency intraoperative monitoring of hearing preservation during cochlear implantation. Life, 12(5), 636.

19›22 September 2024

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