

## Abstract

This study demonstrates that the use of the MED-EL ANTS test electrode allows reliable and artefact-free monitoring throughout the surgical procedure. A patient was selected in whom it was not expected that the procedure would affect the functionality of the auditory nerve. After completing the trial without complications, the next step would be to standardize this type of monitoring and use it for future resections of vestibular schwannoma. We show that a direct CI insertion after VS removal is possible, instead of the usual CI insertion after 6 months at the earliest. By doing so, the duration of deafness is significantly reduced, and additional subjective testing to check the functionality of the auditory nerve is no longer required. A disadvantage of simultaneous treatment is the shadowing caused by the implant's magnet during monitoring of the vestibular schwannoma.

## Objectives

To report on the possibility of cochlear nerve monitoring with the ANTS electrode during trans-labyrinthine VS resection with simultaneous cochlear implantation.

## Methods

Facial nerve monitoring and recording electrodes for E-BERA (Fig.2) were positioned prior to surgery. Standard CI insertion was performed. The ANTS test electrode (MED-EL) was used as a temporary electrode for measuring the E-BERA. It consists of 3 electrodes that are stimulated individually. Initial measurements were successfully taken prior to the planned resection of the vestibular schwannoma. During removal of VS, the auditory nerve was monitored via the test electrode by repeated measurements. After the resection was completed, the test electrode was replaced with a Synchrony2 Flex 28 electrode, and another E-BERA was performed.

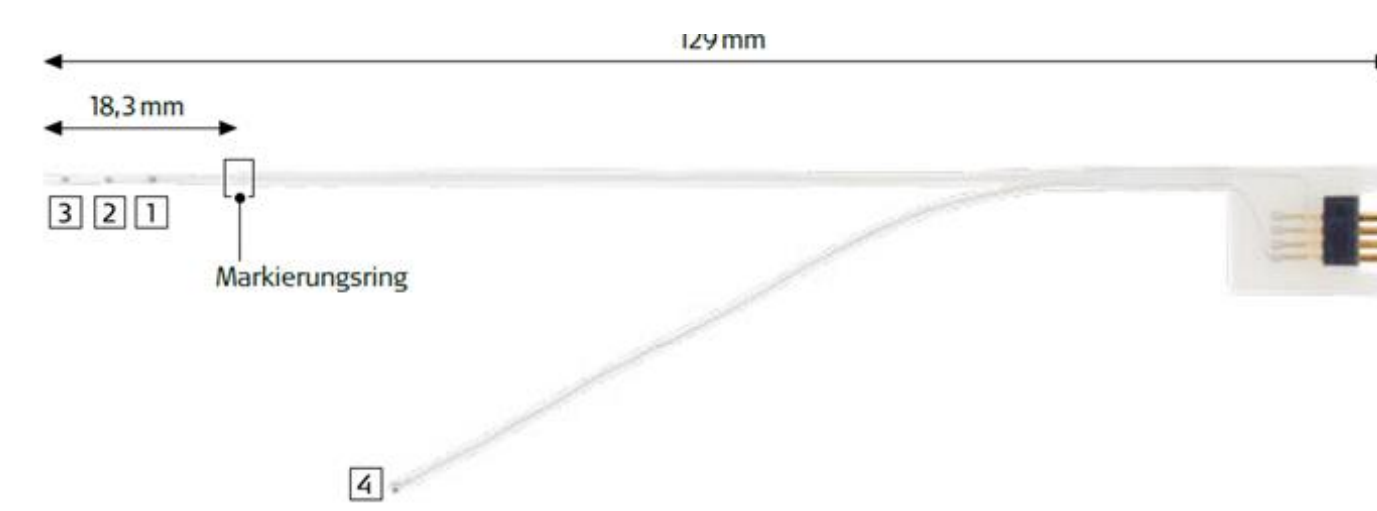


Fig 2: Test electrode ANTS from Medel

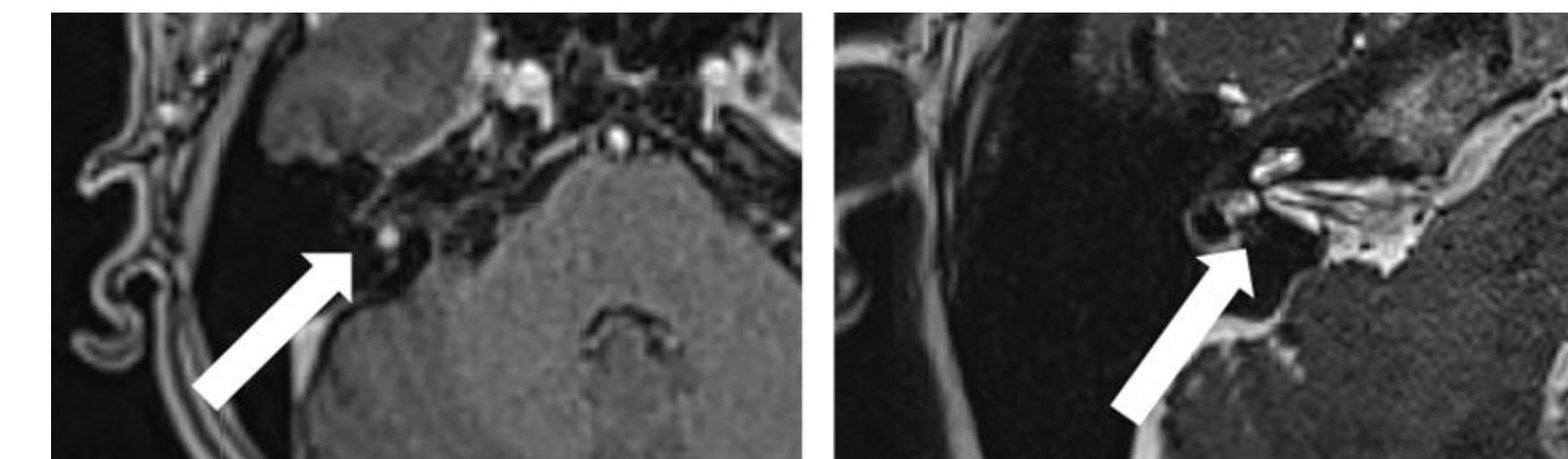


Fig 1: Localization of the tumor, intralabyrinthine VS, left image T1 with contrast medium, right image T2 CISS 3D

## Results

Potentials were successfully recorded with the test electrode prior to the planned resection of the vestibular schwannoma (Fig. 3) and at all times during the surgical procedure (Fig.4). The final E-BERA measurements using the inserted Synchrony2 Flex 28 electrode were also successful (Fig. 5). During monitoring, the stimulation energy had to be slightly increased to obtain clear potentials (Fig. 4). There were no other complications throughout the procedure. The first fitting of the speech processor took place 4 weeks after the operation. The patient achieved open speech reception within a very short period of time.

Fig. 3: E-BERA via ANTS electrode before tumour removal

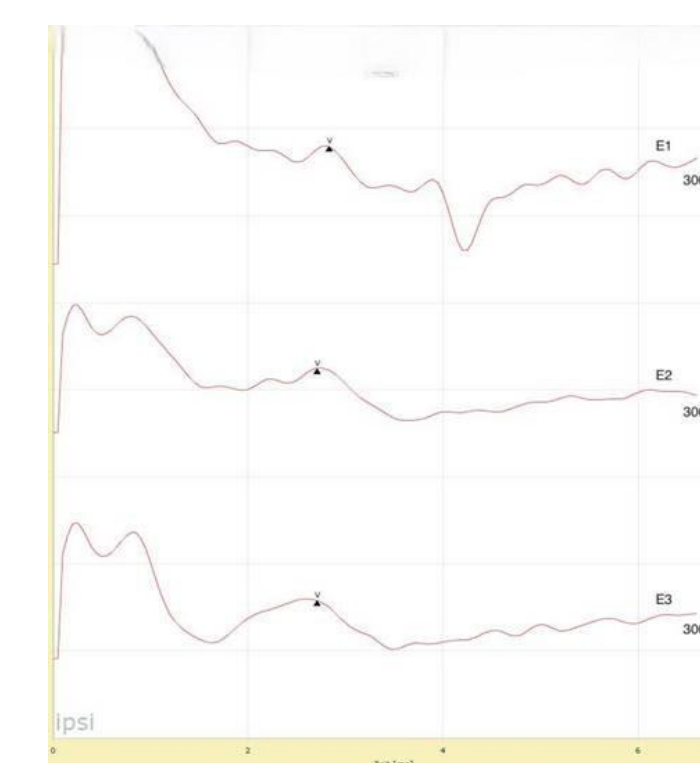


Fig. 4: E-BERA via ANTS electrode during tumour removal at different time points

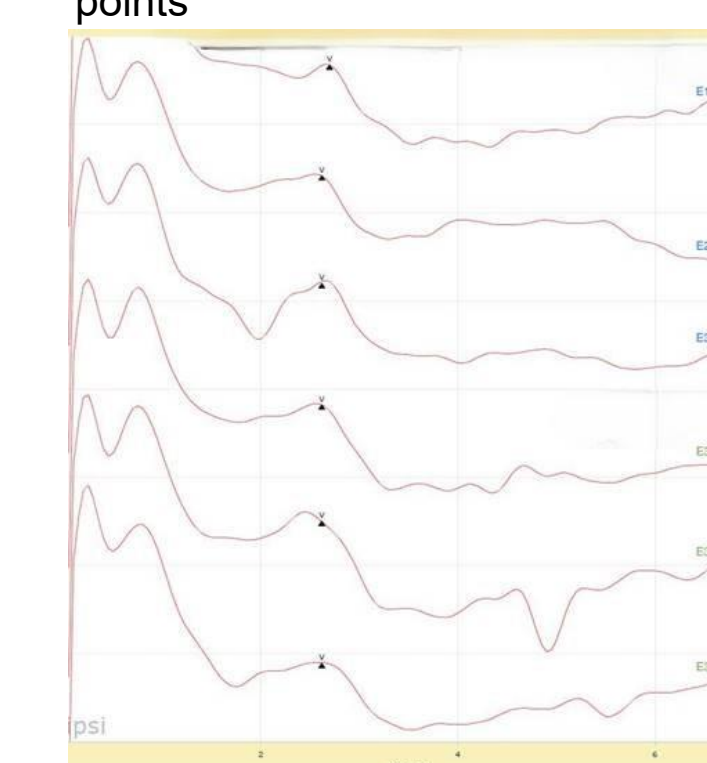
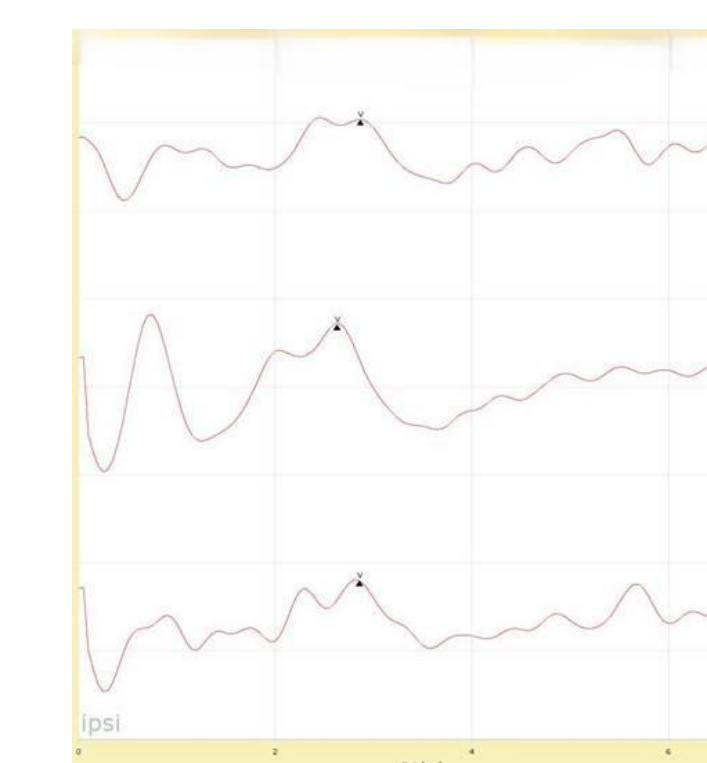


Fig. 5: E-BERA via CI electrode Synchrony Flex 28



## Conclusion

Our results suggest that this method holds promise for standardization in future vestibular schwannoma resections. Further research and standardization efforts are required to validate and optimize this approach for broader clinical application.