P150

AUDITORY OBJECTIVE MEASURES
ELECTROPHYSIOLOGY & AUDITORY EVOKED POTENTIALS

# INTRAOPERATIVE ASSESSMENT OF COCHLEAR NERVE FUNCTIONALITY IN VARIOUS VESTIBULAR SCHWANNOMAS CENARIOS: LESSONS LEARNED

Luis Lassaletta, Miryam Calvino, Jose Manuel Morales-Puebla, Javier Gavilán. *Otolaryngology Department, La Paz University Hospital, Madrid, Spain*

## Background

The use of cochlear implants (CI) is on the rise for patients with vestibular schwannoma (VS). Besides cochlear implantation following tumor resection, new scenarios such as implantation in observed and/or irradiated tumors are becoming increasingly common. A significant emerging trend is the need of intraoperative evaluation of the functionality of the cochlear nerve in order to decide if a CI would be placed.

## Objectives

To explore the experience of a tertiary center with the application of the Auditory Nerve Test System (ANTS) in various scenarios regarding VS patients. The results are compared to that of the studies that have previously used the ANTS in this condition.

## Methods

Population: Patients with unilateral or bilateral VS (NF2) who were evaluated with the ANTS prior to considering CI in a tertiary center between 2021 and 2023 were analyzed.
The presence of a robust wave V was chosen to define a positive electrical auditory brainstem response (EABR). Two patients underwent promontory stimulation (PromStim) EABR previous to ANTS evaluation (Fig.1).

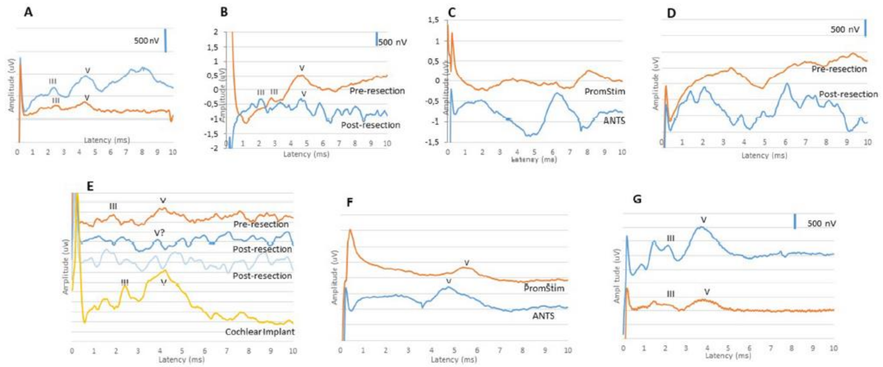


**Fig. 1**. EABR responses of the seven patients included in the study

## Results

Seven patients, 2 NF-2 and 5 with sporadic VS were included. The initial scenario was simultaneous translabyrinthine (TL) tumor resection and CI in 3 cases while a CI placement without tumor resection was planned in 4 cases. The ANTS was positive in 4 cases, negative in 2 cases, and uncertain in one case. Two patients underwent simultaneous TL and CI, 1 patient simultaneous TL and auditory brainstem implant, 3 patients posterior tympanotomy with CI, and 1 patient had no implant placement. In the 5 patients undergoing CI, sound detection was present (Table 1).
There was a good correlation between the PromStim and ANTS EABR.
The literature research yielded 35 patients with complete information about EABR response. There was one false negative and one false positive case; that is, the 28 implanted cases with a present wave V following tumor resection had some degree of auditory perception in all but one case.

| Case | Ipsilateral PTA4 (dB) PreOP | Ipsilateral PTA4 (dB) PostOP | Surgery | PTA4 aided (dB) | SDS quiet aided (%) | Time of PostOP evaluation (months) | Implant user |
|---|---|---|---|---|---|---|---|
| #1 | 82 | 112 | PT, RW approach | 49 | 42 | 26 | Yes |
| #2 | 70 | >120 | TL | 33 | 48 | 19 | Yes |
| #3 | 95 | 109 | PT, RW approach | N/A | N/A | N/A | N/A |
| #4 | 72 | >120 | TL | 35 | 0 | 7 | Yes (ABI) |
| #5 | 77 | >120 | TL | 32 | 17 | 4 | Yes |
| #6 | >120 | >120 | PT and intracochlear tumor removal | 37 | 38 | 4 | Yes |
| #7 | >120 | >120 | PT, RW approach | 42 | 64 | 6 | Yes |

**Table 1.** Audiological findings of the patients included in the study.
PTA4- Pure tone average of frequencies 500, 1000, 2000 and 4000Hz; SDS- Speech discrimination score; dB- decibel; TL- translabyrinthine approach; PT-posterior tympanotomy; NA –not applicable; ABI- auditory brainstem implant

## Conclusion

The ANTS is a useful intraoperative tool to asses CI candidacy in VS patients undergoing observation, irradiation or surgery. A positive strongly predicts at least sound detection with the CI.

## References

Luis Lassaletta, Miryam Calvino, Miguel Díaz, José Manuel Morales-Puebla, Isabel Sánchez-Cuadrado, Isabel Varela-Nieto, Javier Gavilán. Intraoperative assessment of cochlear nerve functionality in various vestibular schwannoma scenarios: Lessons learned. Hear Res 2024: 446:108997