



Intraoperative eSRTs: Feasibility of Measurement and Correlation with Post-Operative eSRTs

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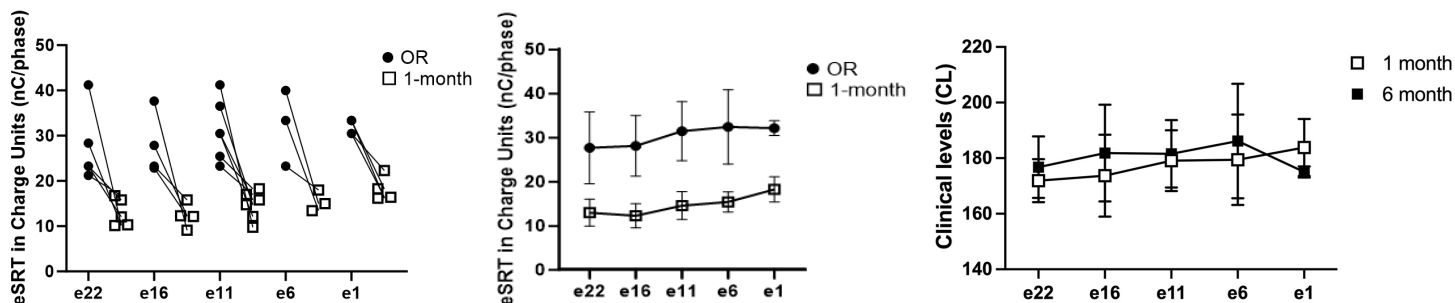
INTRODUCTION

- The electrically evoked stapedal reflex threshold (eSRT) is a useful tool for setting upper stimulation levels in cochlear implant (CI) users, as it has been shown to have good agreement with the electrical stimulation level that is comfortably loud without exceeding loudness discomfort levels. However, many CI centers do not set upper stimulation levels using the eSRT due to various factors such as time constraints and lack of access to equipment to perform eSRT measurement.
- Purpose: To assess the feasibility of intraoperative visual eSRT measurement using the Cochlear SmartNav 2 system, the correlation between intraoperative and post-operative eSRTs, and the correlation between eSRTs measured at 1- and 6-months post-activation.**

METHODS

- eSRTs were measured intraoperatively, at 1-month post-activation and at 6-months post-activation in 14 traditional adult CI recipients
 - Intraoperative: Cochlear SmartNav2 was used to elicit eSRT responses which were observed visually by the surgeon
 - Post-operative: Cochlear CustomSound Pro was used to elicit eSRT responses which were measured using TymStar Pro
 - For all three timepoints, eSRTs were measured on electrodes 1, 6, 11, 16, and 22
- Additional information collected:
 - Time to complete intraoperative eSRT measurement
 - Pulse width used to elicit eSRT
 - Type and dosage of anesthesia

RESULTS



- 11 of 14 participants had a measurable intraoperative eSRT for at least one electrode. Average time to complete intraoperative eSRTs was 3 minutes.
- To allow for comparison across timepoints and to account for differences in pulse width (PW), clinical levels (CLs) were converted to charge units (nC/phase) using the following formula provided by Cochlear: $(100^{(CL/255)} \times 17.5) \times (PW/100)$.
- The mean intraoperative eSRT was 30.74 nC/phase, and the mean one-month eSRT was 15.28 nC/phase. All intraoperative measures were significantly higher than post-operative measures as expected.
- Intraoperative eSRTs had higher variability than 1-month and 6-month eSRTs as evidenced by their respective standard deviations, 11.6 vs. 3.3 and 3.1.
- Post-operative eSRTs remained stable over time as the difference between the mean eSRT at 1 and 6 months was less than 10 CLs for all electrodes (5 for e22, 8 for e16, 3 for e11, 7 for e6, and 9 for e1).

CONCLUSIONS

- Intraoperative eSRT measurement is feasible and time efficient in adult CI patients.
- The difference between the intraoperative and 1-month eSRT is relatively consistent across the electrode array.
 - However, further investigation is needed to reduce intraoperative measurement variability and to create a usable correction factor that could be applied to intraoperative measurements for use at activation.
- The post-operative eSRT remains stable over time, which agrees with previous work (Pitt et al, 2021).