



Pallares, N. (M.A.); Diamante, V. (Phd),  
Cansler, A. (Aud); Rossi, N. (Aud)  
Cochlear Implant Center “Prof. Diamante” Buenos Aires.  
Argentina.



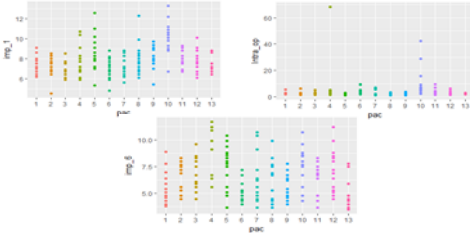
**OBJECTIVE:** The aims of this study were:

- To investigate variations in electrode Impedances (Z) over time, since intraop up to 6 months post-surgery, in 13 ears using the HiRes90K® device with HiFocus MidScala electrode. It was also studied variations in electrodes as regards position in the array.
- to investigate the Most Comfortable levels (M values) variations along time.

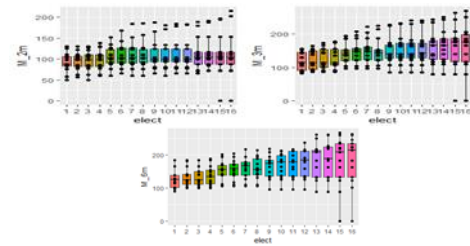
**MATERIAL AND METHOD:** Zs and the MCLs were monitored through the CI fitting software in a total of 13 ears. The Z measurements were done during surgery, during tune up (1 month post surgery), 2, 3 and 6 months after surgery.

Children average age at CI: 3.5 years (1year – 10.7 years). They had no ossification or cochlear malformations, with complete insertion of the electrode array through cochleostomy by anterior postis. No surgical complications occurred, with permanent use of the device. It was considered on electrical Z values: the topography of the electrodes, the effect of electrical stimulation, the time of use of the device.

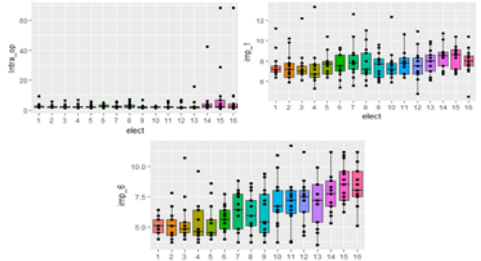
Average Global Z for each subject along time. 1 month and 6 months post surgery, the Z values are bigger in a statistically significant way in relation to intraop Wilcoxon p value  $2.2 \times 10^{-16}$



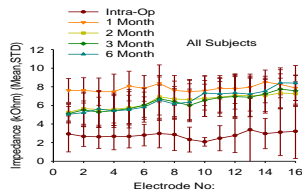
Global M values in each electrode, 2 vs 3 and 6 months post surgery Kruskal-Wallis p-value = 0.001168



During surgery and at tune up NO statistically significant difference among electrodes. At 6 months post op electrodes 14,15,16 have statistically significant differences in relation to electrodes 1,2,3,4,5,6,7,8,9. (P valor  $2.008 \times 10^{-8}$ )



Average Zs across all subjects, in each electrode, along time



**CONCLUSIONS:**

The Zs variations in current pediatric group are similar to other published studies. The future data collection involves monitoring Zs to understand reasons for changes across the electrode array.

Zs change following the implantation and through onset of electrical stimulation and later during CI usage.

Z variations could be explained by resistive characteristics of the medium surrounding the electrode (fluid and tissue) as well as the effect of electrical stimulation.

A gradual increase in MCLs was observed after the first measurement in accordance with more tolerance to electrical stimulation after tune up.

**RESULTS:**

• Z increased from intra-op to tune up, with a tendency to decrease at subsequent periods of time without reaching the intra-op measurements. There was a significant difference between intra-op and all other measurements.

Variations in electrodes as regards position in the array was observed. At 6 months post surgery electrodes 14,15,16 (basal position) have statistically significant differences in relation to electrodes 1,2,3,4,5,6,7,8,9. (apical and medial position)

- Significant increase in the MCLs values was observed along the time of the study.

*Acknowledgements: The authors would like to thank Advance Bionics group in the assistance and Lic. Claudia Buongiorno in the statistical study*