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AUDITORY IMPLANTS

Evolution of speech perception in patients with ossified cochlea and short array cochlear implant

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Abstract

Short array cochlear implant is indicated as rehabilitation in patients with severe to profound deafness, especially when there is cochlear ossification. In these cases, with reduced intracochlear patency, total insertion becomes more difficult, requiring the use of this type of electrode (15 mm). Few studies have been published to evaluate auditory performance, presenting controversial audiological results.

A retrospective analysis of medical records of patients who underwent surgery for cochlear implantation with a short array, between 2009 and 2020, at the Hospital for Rehabilitation of Craniofacial Anomalies, University of São Paulo (HRAC-USP), Brazil, was carried out. There was performance evolution in the speech perception tests in the data analysis. Meningitis and congenital hearing loss were the main indications for CI in the sample. In conclusion, CI with a short array is an alternative in the management of patients with a history of cochlear ossification and severe or profound sensorineural hearing loss.

Objectifs

To report the speech perception of users of cochlear implants (CI) with short array.

Méthodes et Matériels

This is a retrospective and descriptive study, with a two-year longitudinal follow-up, of data from the medical records of all patients who underwent surgery for CI with a Compressed electrode from the company Med-El® (Innsbruck, Austria). The data collected and analyzed by the study were: age, presence of associated syndrome, clinical indication, complete or partial insertion of electrodes, presence of cochlear ossification and pre-surgical speech perception tests and 3, 6, 12, and 24 months after implantation.

The tests collected and described are: IT-MAIS (Infant Toddler – Meaningful Auditory Integration Scale), MUSS (Meaningful Use of Speech Scale), hearing category, language category, word recognition and sentences recorded in silence and in noise, according to what was done in each analyzed patient. Friedman Test was used to assess the effect of the five periods (pre-implantation, 3 months, 6 months, 12 months and 24 months) on the score of each test performed on the individual.

Résultats

In a total of 1713 patients undergoing implantation, 70 were users of the MED-EL Cochlear Implant, Sonata Ti 100 internal device. Among the 45 patients eligible for the study, 53 ears implanted unilaterally or bilaterally were analyzed.

Patients with ossification, regardless of the etiology of hearing loss (*n* = 25 ears), were evaluated in 5 periods with eight tests performed at each time. In Language Category, stability of scores was observed in the first 12 months of follow-up and an improvement after 24 months of CI use (p = .001). Word and Sentence Recognition in Silence and Noise also tended to increase scores at 24 months, but without statistical significance (p = .09, p = .09 and p = .24, respectively). IT-MAIS showed worsening scores over time, but also without statistical significance (p = .64) (Table 2). Patients without ossification were also evaluated in the same period (Figure 1).

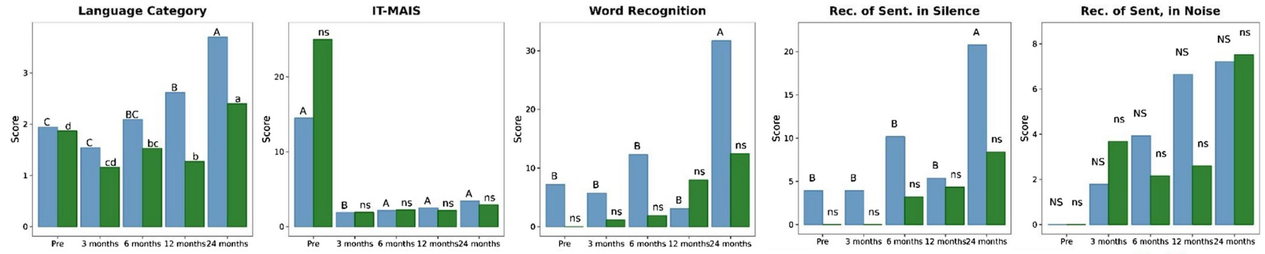

Figure 1. Evolution of tests in patients with and without cochlear ossification (uppercase letters: group without ossification, with "A" being the best score found and "C" being the worst; lowercase letters: with ossification, with "a" being the best score and "d" the worst; NS/ns: not significant at a significance level of 5%; different letters in the same group represent statistically significant difference).

Conclusion

A short-array cochlear implant is an alternative in the management of patients with a history of cochlear ossification and severe or profound sensorineural hearing loss. The benefits for these patients are more clearly seen in subjective measures, showing evolution in auditory performance, especially with long-term effects.

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