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Comparison of intrascalar location of straight vs perimodiolar electrode array by flat-panel computerized tomography

Presenter Bio:

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Abstract:

Introduction: One of the fields of technological advancement in cochlear implants (CI) pursued by all manufacturers is the development of less traumatic electrodes that can conform to the anatomy of the cochlea, and possibly enhance the outcomes. Recently, a slim precurved perimodiolar electrode with an insertion guidance sleeve has been designed in order to facilitate the insertion and to avoid the inter-scalar dislodgement that frequently occurs at the first basal turn. Aim of this study was to evaluate the intracochlear position of different Nucleus electrode arrays in adult and pediatric CI recipients by means of flat-panel volume computerized tomography (FPCT).

Methods: Fifty-six CI recipients (37 females, 19 males), 1 to 80 years of age, operated by the same surgeon with the same technique, were included. All underwent FPCT with a C-arm angiographic system including a digital flat panel detector 30 x 40 cm, with a source-to-image-receptor distance of 120cm. The imaging assessment was performed the day after surgery in all cases. Sequential and simultaneous CI were included and a total of 68 ears have been analyzed. The primary objective was to identify the scalar location of the array (completely in scala tympani vs. partially dislodged in scala vestibuli) and the site of dislocation. Secondly, we measured the medial-lateral position within the scala, the insertion depth (mm and angles). The FPCT findings were also contrasted with the type of cochleostomy (round window (RW), extended RW, promontorial) and with the residual hearing preservation.

Results: Fifty-nine ears were implanted with a perimodiolar electrode, either Nucleus CI532 (n=45) or a CI412 / CI512 Contour Advance (n=14), while 9 received a straight one (Nucleus CI422/CI522). A RW approach was performed more frequently (41 out of 45 = 91.1 %) with CI532 than with the other arrays (10 out of 23 = 43.5%). Inferior and/or anterior cochleostomy were never performed. The CI532 showed the most consistent and reliable intrascalar position, close to the modiolus and in the scala tympani. Scala vestibuli dislodgement was observed in (14.3%) of the Contour Advance electrodes and in (6.7%) of the CI532. Pre-operative residual hearing was preserved within 10 dB HL in 62% of the cases.

Conclusion: the CI532 electrode array achieved the most consistent and reliable perimodiolar location by FPCT; in our small series it appeared to be dislodged in the scala tympani in the minority of cases.

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Author Disclosure Information:

D. Zanetti: None. **G. Conte:** None. **E. Scola:** None. **F. Di Berardino:** None. **A. Gasbarre:** None. **S. Cavicchiolo:** None. **L. Caschera:** None. **F. Triulzi:** None.

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Yes

This abstract should be entered into the Student Poster Competition.: No

Learning Objectives (Complete):**Objective 1*:**

: Describe the intracochlear position of different Nucleus electrode arrays in adult and pediatric CI recipients by means of flat-panel volume computerized tomography (FPCT).

Key Words for Objective 1*:

: flat-panel volume computerized tomography

Objective 2:

: Compare the FPCT findings with the type of cochleostomy (round window (RW), extended RW, promontorial) and with the residual hearing preservation.

Key Words for Objective 2:

: cochleostomy

Status: Complete

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