P128

AUDITORY IMPLANTS

Cochlear implant electrode displacement: a case serries

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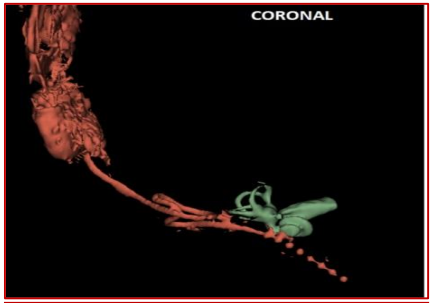
Objectifs

Reviewing cases of extracochlear electrode array placement in children with cochlear implantation (CI)

Méthodes et Matériels

In the case of the 3-year-old child who underwent cochlear implantation in the right ear using a SYNCHRONY STANDARD electrode array from MED-EL, several key points stand out: surgical procedure: the cochlear implantation surgery was performed in a standard manner without any intraoperative peculiarities. This suggests that the surgical technique itself was likely appropriate and adhered to standard protocols. Electrode Characteristics: The electrode array used had a length of 31.5 mm, which is within the typical range for pediatric cochlear implantation. This indicates that the chosen electrode was suitable for the child's anatomy and age. Intraoperative Telemetry: The intraoperative telemetry reading of 0.42 Ohm indicates that the electrode was appropriately inserted and had good contact with the cochlear structures. A low impedance reading is typically indicative of good electrode placement. Autoart Registration: The positive autoart registration on all channels further confirms the adequacy of electrode placement and suggests that the electrode was functioning correctly and stimulating the auditory nerve effectively. Postoperative Imaging: The X-ray performed on the second day after surgery revealed that the electrode array was located in the projection of the mastoid cavity, indicating extracochlear placement. This represents a deviation from the intended intracochlear positioning within the cochlea.

In the second case: A 4-year-old child underwent cochlear implantation in the right ear using a SYNCHRONY STANDARD electrode array from MED-EL, with a length of 31.5 mm. The surgery proceeded without any intraoperative features or complications. Intraoperative telemetry measured a reading of 1.02 Ohm. Autoart registration was recorded on channels 10-11-12. Postoperative radiography of the temporal bones revealed that the electrode array was located in the projection of the auditory tube, with its end positioned at the level of the nasopharynx. This description provides a clear overview of the second case, highlighting the relevant surgical details and postoperative imaging findings.



In the third case: A 4-year-old child with IP-I (presumably indicating inner ear anomalies) underwent cochlear implantation in the right ear using a Sonata COMPRESSED electrode array from MED-EL, with a length of 15.0 mm. Intraoperative features included cochleostomy (surgical opening into the cochlea) and a gusher (leakage of cerebrospinal fluid from the cochlea). Intraoperative telemetry measured a reading of 0.46 Ohm, indicating appropriate electrode placement and contact. Autoart registration was recorded only on channel 8. Postoperative CT imaging of the temporal bones revealed that the proximal end of the electrode array of the implant was located in the projection of the right internal auditory canal.

Conclusion

The presented clinical examples underscore the importance of postoperative radiological evaluation in confirming the accurate placement of cochlear implant electrode arrays.

Despite positive intraoperative audiological indicators such as telemetry readings and autoart registration, extracochlear migration of the electrode arrays was observed in all cases. This highlights a critical limitation: relying solely on intraoperative auditory assessments may not reliably ensure intracochlear placement. Incorporating intraoperative radiological control, such as X-rays or CT scans, can provide real-time visualization of electrode placement relative to cochlear structures. This additional imaging modality would offer more precise guidance during surgery, enabling surgeons to verify the intracochlear position and avoid inadvertent extracochlear migration.

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