www.jcimcr.org

JCIMCR OPEN ACCESS Journal of Clinical Images and Medical Case Reports

ISSN 2766-7820

Clinical Image

Open Access, Volume 5

Extra-cochlear insertion in the internal auditory canal during cochlear implantation: Is reimplantation possible?

Davide Lourenço Marques*; Sofia Chaves; João Elói-Moura; Ricardo Caiado; Sofia Paiva; António Miguéis; Jorge Miguéis

Otorhinolaryngology Department, Coimbra Hospital and University Center, Portugal.

***Corresponding Author: Davide L Marques**

Otorhinolaryngology Department, Coimbra Hospital and University Center, Portugal.

Email: davide.marques@edu.ulisboa.pt

Received: Jul 25, 2024

Accepted: Aug 12, 2024

Published: Aug 19, 2024

Archived: www.jcimcr.org

DOI: www.doi.org/10.52768/2766-7820/3212

Abstract

Cochlear Implant (CI) auditory rehabilitation is indicated for patients with severe to profound sensorineural hearing loss who do not benefit from conventional hearing aids. In the vast majority of cases, cochlear implantation is performed effectively and safely, without significant complications. However, in approximately 0.5% of patients, surgical revision is necessary to correct malpositioned electrodes [1]. Inner ear anomalies and malformations are commonly associated with electrode malpositioning during CI surgery.

Clinical case

The authors present the clinical case of a 51-year-old male patient referred to our CI Reference Center with a diagnosis of otosclerosis. He underwent bilateral stapedotomy about 20 years ago without associated complications. After 10 years, due to worsening hearing, he received bilateral hearing aids, which provided reasonable benefit until about a year ago, when he stopped noticing improvement in his right ear. Imaging studies performed before cochlear implantation surgery highlighted changes compatible with bilateral Grade III (diffuse confluent) fenestral and retrofenestral otospongiosis, noting slightly widened (patulous) Internal Auditory Canal (IAC), with suggestions of thinning or partial absence of the bony limit between the bottom of the IAC and the basal turn of the cochlea, more evident in the lower aspects. During cochlear implantation surgery on the right ear, after cochleostomy, a gusher phenomenon was observed, which was controlled with the insertion of the electrode array, proceeding without resistance, and subsequent closure of the cochleostomy with muscle and temporalis fascia. During the programming process, due to the lack of significant functional benefit with the CI, a new computed tomography scan of the ears revealed an abnormal trajectory of the array, intercepting the basal turn of the cochlea, exiting through its lower plate and proceeding into the IAC, reaching the cerebellopontine cistern (Figure 1). Consequently, the patient underwent revision surgery, which was uneventful. Intraoperative impedance telemetry and neural response telemetry were performed with favorable results, and postoperative computed tomography (Figure 2) confirmed proper positioning of the electrode array, entering through the cochlear window and traversing the basal and middle turns of the right cochlea.

Conclusion

IAC insertion is a rare complication of cochlear implantation that occurs more frequently in association with cochlear malformations [2]. In cases of IAC insertion, cochlear implantation revision can be safely performed by experienced surgeons, with the expectation of good functional performance of the CI.

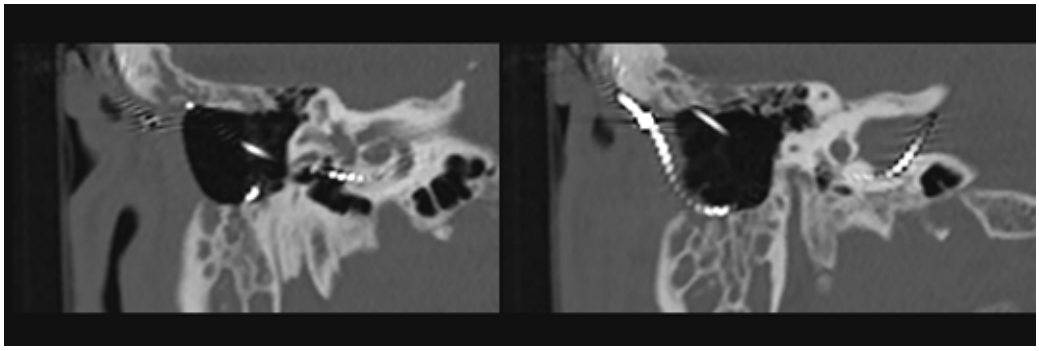

Figure 1: Computed tomography revealing signs of surgical intervention in the right ear, with the placement of a cochlear implant, showing an abnormal trajectory of the electrode that intercepts the basal turn of the cochlea, exiting through its lower plate, proceeding into the internal auditory canal, and reaching the ponto-cerebellar cistern. Additionally, on the right side, inflammatory filling of the mastoid apex and some cells of its horizontal squama is observed. The already known extensive foci of fenestral and retrofenestral otospongiosis bilaterally are present.

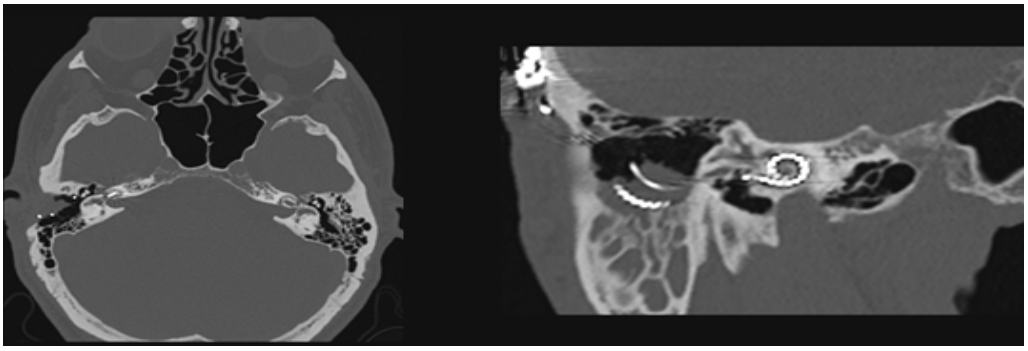

Figure 2: Computed tomography after revision surgery shows repositioning of the material, with the electrode currently appearing to be well positioned, entering through the round window and traversing the basal and middle turns of the right cochlea. At the level of the mastoid, the surgical material forms a 'loop'.

References

1. Heman-Ackah SE, Friedmann DR, Cosetti MK, Waltzman SB, Roland JT Jr. Revision cochlear implantation following internal auditory canal insertion. Laryngoscope. 2013; 123(12): 3141-7. doi: 10.1002/lary.23340.

2. Gözen ED, Tevetoğlu F, Yener HM, Kara E, Ataş A, Şirolu S, Kızılkılıç O, Cansız H, Karaman E. Extra-cochlear insertion in cochlear implantation: A potentially disastrous condition. J Int Adv Otol. 2019; 15(3): 358-363. doi: 10.5152/iao.2019.6492.