

# Endomeatal approach in cochlear implant surgery in a patient with small mastoid cavity and procident lateral sinus

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## DESCRIPTION

Endomeatal approach (EMA) in cochlear implant (CI) surgery avoid mastoidectomy and posterior tympanotomy (PT) by using the external auditory canal (EAC) and the round window (RW) as a natural access pathway for CI positioning.<sup>1</sup> We present a modified technique for EMA applied in a 78-year-old patient with profound hearing loss and a history of diabetes and hypothyroidism.<sup>2,3</sup> For several years, the patient has reported poor improvements through the use of an auricular prosthetic device. Our multidisciplinary team decided to undertake the procedure and perform a CI surgery in the ear with a worse auditory performance. The patient underwent vaccination for *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Neisseria meningitidis*, and CT of the brain and MRI have been performed. The instrumental diagnosis displayed the presence of a small mastoid cavity and a bilateral procident lateral sinus.<sup>4</sup>

Given the radiological objective, it was decided to perform CI surgery with an EMA, whose surgical steps are detailed on video (Video 1).

A month after the surgery, CI was correctly activated, with no signs of postsurgical complications being displayed. The patient showed an excellent capacity for social interaction and a great fitting of the implant.

The incidence of facial nerve lesions following PT—which are mainly caused by direct injury or heat produced by drilling—has been reported to be 1%.<sup>5</sup> The visualisation of the facial channel over the platina of the stape provided a safely controlled technique to ensure a healthy formation of the groove and avoid the occurrence of alterations to

the facial nerve—located in the posterior EAC wall. Thanks to mobilisation of the incus, we are sure to maintain the facial nerve intact.

The main advantages of this technique compared with the traditional mastoidectomy and PT are recognised as follows:

A faster better access to the scala tympani.

A wider electrode insertion angle.

A decreased risk for the groove formation to damage the facial nerve, as it is placed in the posterior EAC wall, which is distant to the nerve.

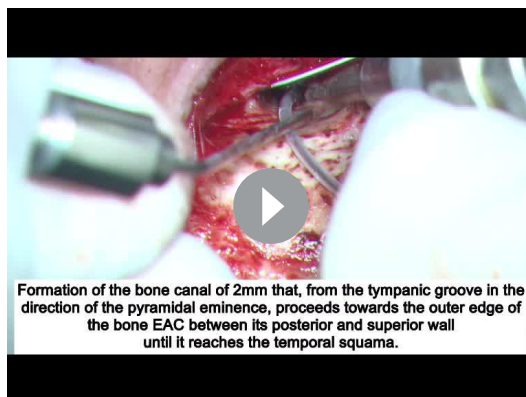
Avoidance of cholesteatoma and middle ear infections since only a small segment of the electrode array resides in the middle ear space, and no mastoid cavity is present.

A drastic reduction in the risk for the electrode to get in contact with the skin and the extrusion, as the bone paté is enough to support the electrode inside the groove.

EMA discourages false pathways and increases stimulation of the neuronal population by placing the basal electrodes at the onset of the scala tympani.

EMA is a soft surgery technique that facilitates CI collocation in alterations of classical anatomy, such as anteriorly located facial nerve, procident lateral sinus, narrow facial recess and small mastoid cavity.

Given the excellent result of our case and the possibility for this technique to be used on craniofacial malformations, we deem EMA to be an effective, safe and minimally invasive technique even in anatomically varying cases affecting the ear.



**Video 1** Surgery steps in endomeatal approach in cochlear implant collocation

## Learning points

- ▶ Endomeatal approach (EMA) in cochlear implant surgery should be the gold standard in anatomically varying cases, such as procident lateral sinus and small mastoid cavity.
- ▶ The changes made to the traditional EMA allow a better preservation of the facial nerve and a lower occurrence of dislocation of the array.

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