

## **Variability of an ideal insertion vector for cochlear implantation.**

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### **HYPOTHESIS:**

Based on a three-dimensional analysis, the orientation of the basal turn of the cochlea, the disposition of the basilar membrane, and the characteristics of the hook region--all of which determine the ideal electrode insertion vector during cochlear implantation--might vary among individuals to a greater degree than previously considered. The aim of this study is to assess the variability of an ideal insertion vector among a sample of surgical candidates from a purely anatomical perspective as well as from a more intraoperative-surgical perspective.

### **BACKGROUND:**

During cochlear implantation through a cochleostomy or round window approach, the angle or vector of insertion after the first entry point seems to be related to intracochlear damage, which might correlate with anatomical and functional features.

### **METHODS:**

Three-dimensional reconstructions of the temporal bones of 50 cochlear implant candidates (a total of 100 ears) were assessed. The spatial orientation of an ideal insertion vector for a cochleostomy and a round window approach were estimated.

### **RESULTS:**

A difference as great as 60 degrees was observed for an ideal insertion vector among the subjects. From an intraoperative perspective, this variability involves pushing the electrodes "as near to the buttress" or "as near to the emergence of the corda tympani" as possible, depending on the case.

### **CONCLUSION:**

The orientation of the basal turn and the corresponding ideal electrode insertion vector vary widely among subjects. A proper preoperative estimation on a case-to-case scenario for this feature might lead to technique adaptation during insertion, possibly contributing to minimizing electrode insertion trauma and thus optimizing the anatomical and functional results.