



External auditory canal atresia – Our methods to speed up procedure with maximal safety and efficacy

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Introduction

External auditory canal atresia is a rare unilateral or bilateral congenital disorder. With a conductive hearing loss of 60 dB, even the unilateral atresia affects hearing related social skills. Reconstruction surgery is difficult and hazardous and functional results may be insufficient, which makes bone-conduction hearing aids the first-line therapy nowadays.

Methods

Two 6-year-old children with unilateral cartilaginous and bony external auditory canal atresia were enrolled. Investigation involved physical examination, pure-tone and speech audiometry, and high-resolution computed tomography with three dimensional reconstructions (3D Slicer). Reconstruction surgery from retroauricular approach comprised maximal enlargement of the tympanic and mastoid cavities while the facial nerve canal was preserved. The cavities were closed with an adapted conchal cartilage, the medial part of which was made thinner to serve as a tympanic membrane.

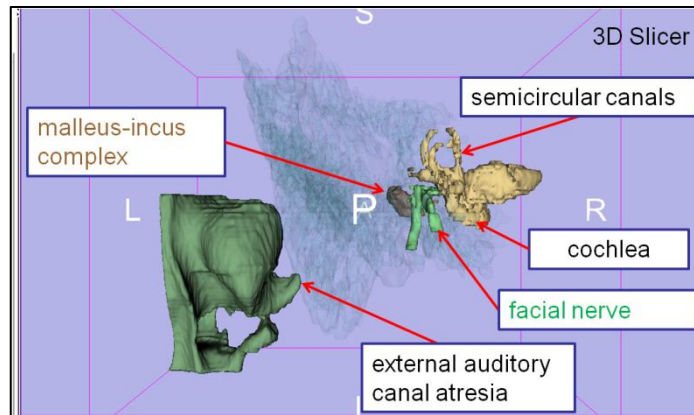


Figure 1: preoperative 3D CT reconstruction (3D Slicer)

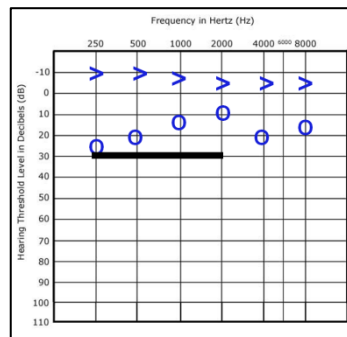


Figure 2: postoperative pure-tone audiometry



Figure 3: postoperative cosmetic result, patent external auditory canal

Results

Postoperative period and facial nerve function were normal. Hearing improvement reached the level above the social threshold, with which both subjects were absolutely satisfied. The reconstructed auditory canal remained stable and patent during the follow-up period of 1 year.

Conclusion

Surgical reconstruction of the external auditory canal is safe and effective and involves reasonably short surgical time. Stable audiological benefits improve patients' satisfaction and quality of life without the necessity of hearing aids. The procedure is essentially assisted by careful preoperative imaging techniques and intraoperative facial nerve monitoring. Further improvement in hearing levels can be reached in a second sit by thinning down and readapting the conchal cartilage to serve as a tympanic membrane.