ABSTRACT

PURPOSE: 3D anatomy of the cochlea with direct volume rendering as virtual surgery to cochlear implant.

OBJECTIVE: This study was to create a three-dimensional anatomy of the round window to hook region to identify the optimal site for cochleostomy in cochlear implantation and other endocochlear surgical procedures.

SUBJECTS and METHODS: 10 normal ears were studied. To develop 3D reconstructed inner ear image based on high-resolution temporal bone images obtained by a spiral CT. The axial data was applied to create 3D images on the CT work station for post processing with the use of current workstation software (GE Advantage Navigation).

RESULTS: The anatomy of the round window to hook region is complex, and spatial relationships can be difficult to evaluate using two-dimensional CT images. Three-dimensional models of the round window membrane, cochlear duct, scala vestibule, scala tympani, ductus reuniens and surrounding structures were generated. The relationship between these structures and the round window membrane and adjacent otic capsule was easily identified.

CONCLUSION: This three-dimensional model has implications for surgical procedures to the inner ear that aim to minimize insertional trauma and operation time. We can know the anatomical information before cochlear implant.

INTRODUCTION

METHODS and SUBJECTS

RESULTS

CONCLUSIONS

REFERENCES


4. European Guidelines on Quality for computed Tomography. EUR16262
