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Value of section plane, MPR, and 3D-CTVR techniques in the fine differential diagnosis of ossicular chain in the case of conductive hearing loss with intact tympanic membrane

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ABSTRACT

AIM To assess the quality of high-resolution CT section planes (HRCT), multi-planar reformation (MPR) and 3-dimensional volume rendered computer tomography (3D-CTVR) were here used in the fine differential diagnosis of ossicular chain in the case of conductive hearing loss with intact tympanic membrane

METHODS Here, 17 cases of otosclerosis and 22 cases of ossicular chain deformity were selected. All patients had normal external ear canals, intact tympanic membranes, conductive hearing loss, type A tympanograms, and negative Gelle's tests. The respective radiological reports of the status of the ossicles via 3 protocols were compared to surgical findings. The quantitative assessments of the representation of different segments of the ossicular chain were based on a 3-point scoring system.

RESULTS MPR and CTVR imaging both showed the integrity of whole ossicular chain well. MPR and CTVR imaging were found to be superior to section planes with respect to showing the superstructure of the stapes and malformations ($P > 0.05$).

CONCLUSION CTVR and MPR imaging were found to be better able to show the whole ossicular chain in the conductive hearing loss with normal tympanic membranes. Furthermore, the use of these techniques can have profound contributive value in the differential diagnosis of otosclerosis and ossicular chain absence or malformation.

Key words:

Ossicular chain; conductive hearing loss; volume rendered computer tomography; multi-planar reformation; section plane.

INTRODUCTION

In some cases of conductive hearing loss, patients all have normal external ear canals, intact tympanic membranes, type A tympanograms, and negative Gelle's tests. This raises the question of how to assess the status of the ossicular chain, such as whether the condition is otosclerosis or whether the ossicular chain is absent or malformed.