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Cochlear Implantation in Otosclerotic Deafness

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Abstract

The otosclerotic process commonly involves the otic capsule and may cause quite widespread demineralisation which leads to a progressive and often profound bilateral sensorineural hearing loss. In this situation cochlear implantation may be the only effective treatment. This chapter considers the pathology of this hearing loss, the effects of cochlear obliteration on implantation, and the effects of demineralisation of the otic capsule on placement of the electrode and nonauditory stimulation. A study is reported from 4 cochlear implant centres in the UK and the Netherlands of 53 patients with cochlear otosclerosis who received cochlear implantation. The CT features of their petrous bones are presented and a classification of the radiological features suggested. 38% of patients experienced facial nerve stimulation presumably due to spread of current through an otic capsule with lower than usual electrical impedance. The most common rogue electrodes were in the proximity of the geniculate ganglion. These could usually be successfully programmed out of the MAP.

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Otosclerosis is associated with a progressive usually bilateral hearing loss which may have both conductive and sensorineural components. Fixation of the stapes in the oval window causes a conductive loss, which may reach about 60 dB, but is amenable to correction either with a hearing aid or by means of stapes surgery. Demineralization of the otic capsule may involve the inner ear and cause a sensorineural hearing loss that may be severe. This process is referred to as cochlear otosclerosis. Cochlear otosclerosis and stapedia fixation can of course coexist in the same ear. Cochlear implantation offers a means of rehabilitation for many of those individuals with a severe to profound hearing