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Otosclerosis of the Round Window

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Occlusion of the round window by otosclerosis is analyzed from the point of view of bone conduction. In this case the bone conduction audiogram shows a fall for the higher frequencies with about 6 db/octave, whereas it starts almost normally in the lower frequency range. The explanation of this behaviour is found in the acoustic leak, provided by the apertures of the cochlear aqueduct and the inferior cochlear vein in the otherwise hermetically sealed scala tympani. These acoustic pathways, being narrow, have an impedance which increases with the frequency. The mobility of the fluid columns, thus of the basilar membrane is more and more reduced the higher the frequency.

After removal of the bony obstruction in the round window niche, the bone conduction audiogram is restored to normal as is illustrated in a case report.

From this, the conclusion may be inferred: A bone conduction audiogram of the diagonal type need not always point to a perceptive loss.

Excellent speech intelligibility combined with the absence of recruitment may be taken as arguments that this bone conductive loss might be caused by a complete obstruction of the round window.

The occlusion should be acoustically rigid; as long as the round window membrane has some mobility

the phenomenon of the diagonal bone conduction audiogram will not be present.