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Perilimphatic fistula test: a video clip demonstration

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Abstract. – Perilymphatic fistula (PLF) is an abnormal condition in which a communication is present between the perilymphatic space of the inner ear and the middle ear or mastoid, secondary to a dehiscence in the otic capsule, oval or round window.

PLF may induce hearing loss, tinnitus, aural fullness, vertigo, disequilibrium, or a combination of these symptoms; the vagueness of symptoms caused by PLF and the lack of specificity of clinical signs and symptoms make the diagnosis elusive.

We report a video of a positive PLF test induced by the application of pressure on the tragus, just anterior to the left external auditory canal in a patient with cholesteatoma and PLF of lateral semicircular canal confirmed by CT scan imaging.

Key Words:
Vestibular, Fistula, Test, Nystagmus.

Introduction

Perilymphatic fistula (PLF) is an abnormal condition in which a communication is present between the perilymphatic space of the inner ear and the middle ear or mastoid, secondary to a dehiscence in the otic capsule, oval or round window[1].

This connection may result in leakage of perilymph fluid out of the inner ear or an increased middle ear pressure driving air into the inner ear with clinical consequences of both labyrinthine and cochlear dysfunction. Fistulas may be congenital or due to acquired causes, including iatrogenic leaks following stapedial surgery, chronic otitis media, barotraumas[2].

PLF may induce hearing loss, tinnitus, aural fullness, vertigo, disequilibrium, or a combination of these symptoms; the vagueness of symptoms caused by PLF and the lack of specificity of clinical signs and symptoms make the diagnosis elusive.

The anamnestic suspicion of PLF is traditionally confirmed by a positive fistula test**:** the application of both positive or negative pressure to a tympanic membrane causes vertigo and documentable nystagmus in the presence of PLF[3].

We report a video of a positive PLF test induced by the application of pressure on the tragus, just anterior to the left external auditory canal in a patient with cholesteatoma and PLF of lateral semicircular canal confirmed by CT scan imaging.

Case Report

A 77 years old male referred to our Hospital with an history of recurrent otorrhea, progressive left hearing loss and disequilibrium typically evocated by compression of the tragus. Otomicroscopic examination of the left ear revealed a dry posterior quadrants perforation of the tympanic membrane. The audiometric test showed a mixed hearing loss on the left side.

A variation of the external ear pressure pushing with a finger on the tragus evoked a vertigo and horizontal rotatory nystagmus with fast phase directed toward the left side (see the video online at http://youtu.be/x5MhSILF9O4). A temporal bone CT scan with bone window revealed a lesion with the density of soft tissue, probably a cholesteatoma, filling the middle ear and mastoid cavity and a bone erosion of the left semicircular lateral canal compatible with PLF (Figure 1).

Discussion

A simple pressure variation in the external ear pushing the tragus was enough to induce vertigo and objective nystagmus in a patient with PLF . A positive fistula test, therefore, was found to strongly indicate the presence of PLF, but it was more often negative than positive in the presence

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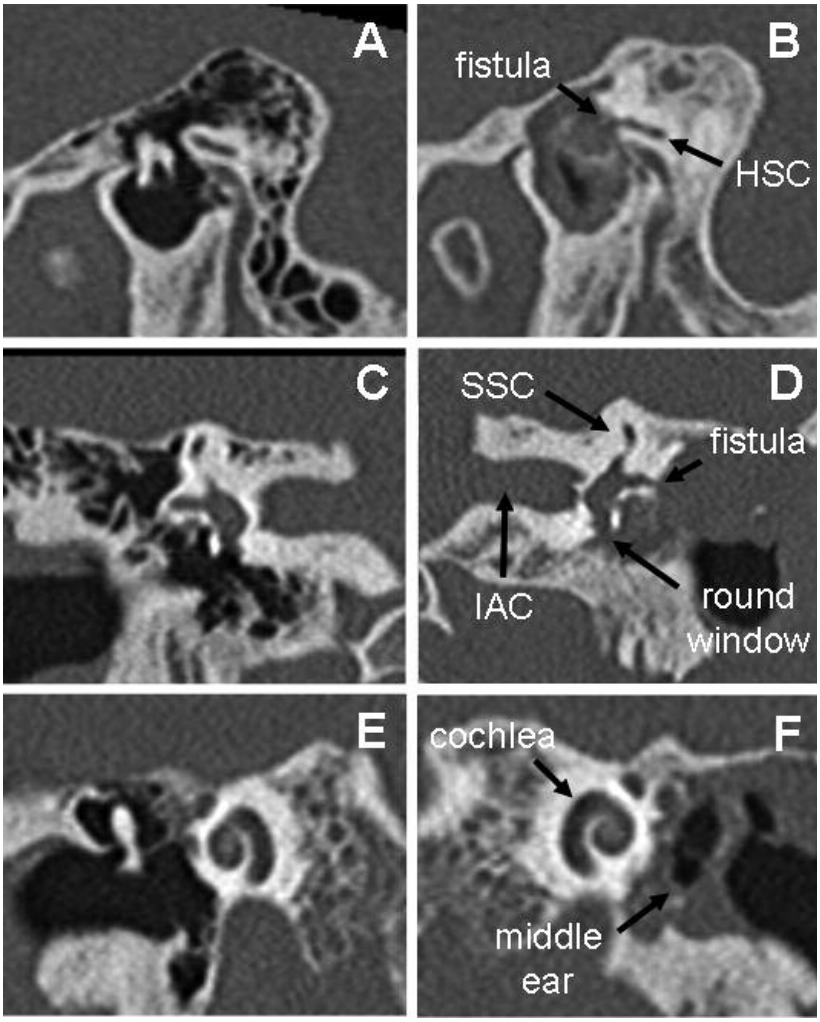

Figure 1. Computed tomography (CT) images of the right (A, C and E) and of the left ear (B, D and F). Oblique sagittal images (A and B) show soft inflammatory tissue in the left middle ear and loss of integrity of the HSC wall in B. Compare panel B vs. panel A. Coronal images (C-F) confirm the fistula of the HSC (D). Compare panel D vs. panel C. No differences between right and left side are seen at the level of the cochlea. Note erosions of the ossicular chain on the left side. HSC = horizontal semicircular canal; IAC = internal auditory canal.

of a fistula. Any alteration of the middle ear compliance might alter the dynamics of the external auditory canal pressure, and consequently, the inner ear fluids, reducing test sensitivity. Up to date, the diagnosis of PLF is often presumptive and remains unconfirmed until surgical exploration and treatment[4], although temporal CT scan could be useful to localize the PLF. PLF test pushing the tragus should be an integral part of vestibular examination[5].

In the next future, the development of electrophoretic assays of the middle ear fluid for the presence of B2 transferrin as well as the improvement of CT and MR imaging will allow a prompt diagnosis[6].

Conflict of Interest

The Authors declare that there are no conflicts of interest.

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