

Imaging Case of the Month An Arachnoid Cyst of the Fallopian Canal

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Arachnoid cysts comprise 1% of all intracranial space occupying lesions. They are benign pockets of cerebrospinal fluid (CSF), which produce neurologic symptoms by compression of adjacent neural structures or by impedance of CSF flow. Such cysts are mainly congenital and are diagnosed in young children. The cysts may occur secondary to trauma or infection (1,2).

Congenital cysts are thought to develop from splitting of the arachnoid membrane in two layers, forming an essentially intra-arachnoid space filled with CSF. An arachnoid cyst may expand either by accumulation of

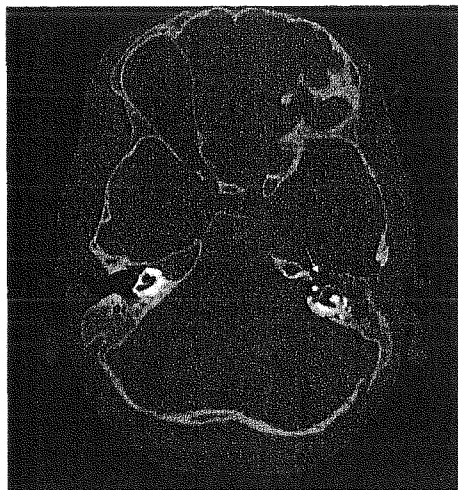


FIG. 1. Preoperative axial CT scan, without contrast: abnormal broadening of the labyrinthine part (*asterisk*) of the facial canal on the left side with bony destruction of the middle cranial fossa due to the enlarged geniculate ganglion (*arrow*). The other cells are clouded (CSF).

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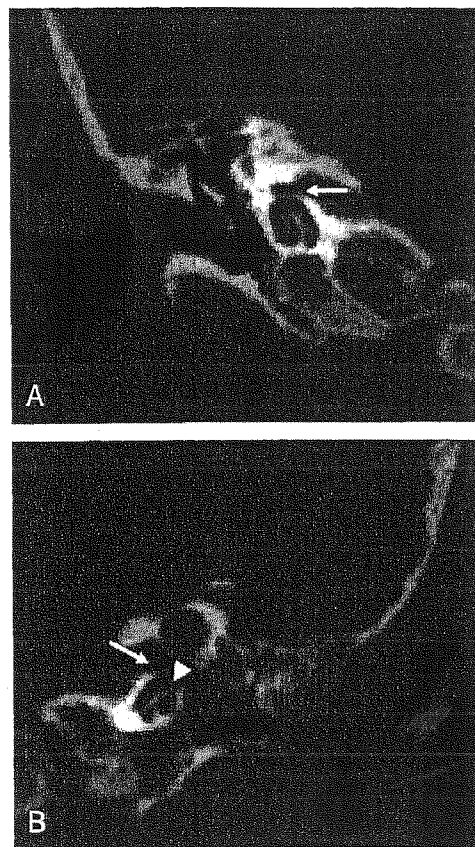


FIG. 2. Preoperative coronal CT scan, without contrast. A, Right ear: normal, movement artefact. B, Left ear: broadening of the labyrinthine portion of the facial canal (*white arrow*) and cochlear destruction (*white arrowhead*).

CSF secreted by their inner lining cells or by functional unidirectional (ball-valve) CSF flow in the cysts (1,3).

The clinical presentation depends on their location and size. In the present case, the patient presented with CSF otorrhea, facial nerve paralysis, and sensorineural hearing loss at the age of 6 years.

An arachnoid cyst appears on the computed tomographic (CT) scan as a noncalcified, low-density, extra-axial mass with regular borders that does not

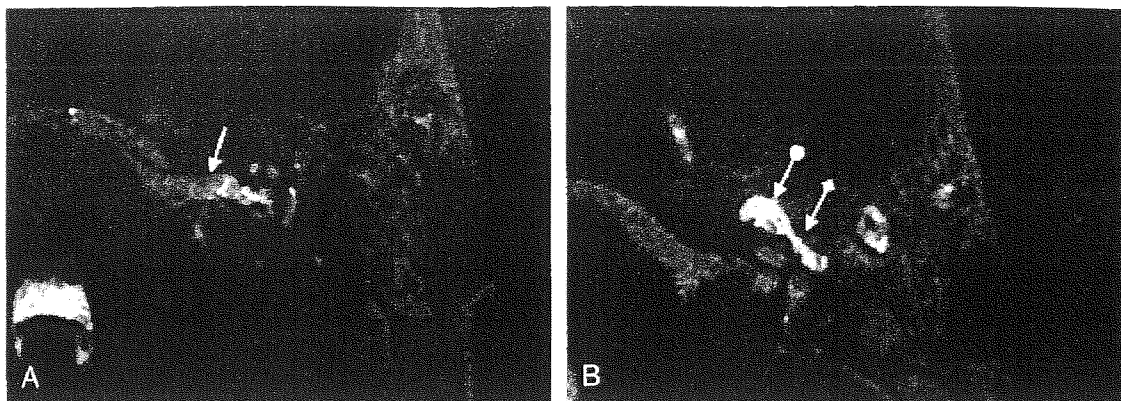


FIG. 3. A, B, Preoperative T2-weighted axial magnetic resonance constructive interference in steady-state three-dimensional image, without contrast: cerebrospinal fluid in the enlarged facial canal in the fundus of the IAC (white arrow), geniculate ganglion (arrow round dot), and tympanic portion of the fallopian canal (arrow diamond dot).

enhance with the administration of contrast media (1). On the magnetic resonance imaging (MRI), the contents of arachnoid cysts have the same signal characteristics as CSF on both T1-weighted and T2-weighted images. It appears as a nonenhancing lesion, and the fluid appears hypointense on T1-weighted images and hyperintense on T2-weighted images (1,2,4).

In the present case, CT and MRI scans showed a destructive process at the apex of the left petrous bone. The fallopian canal was dilated in the labyrinthine section, the geniculate ganglion, and the tympanic section (Figs. 1–3). The tegmen tympani was eroded. It was radiologically difficult to differentiate between a primary cholesteatoma (epidermoid) and an arachnoid cyst.

Magnetic resonance imaging has better potential to show that the signal of arachnoid cysts more closely parallels that of CSF. In fluid-attenuated inversion recovery imaging, which uses a special heavily T2-weighted image, free water such as the CSF of an arachnoid cyst has a low-signal intensity, whereas a cholesteatoma would have a high-signal intensity. This can facilitate the diagnosis, but is not routinely used (2,4). Nowadays,

an MRI-diffusion scan is the preferred imaging technique to identify cholesteatoma.

Arachnoid cysts of the fallopian canal are extremely rare. Preoperative diagnosis is difficult, and the constellation of findings on both CT and MRI scans may lead to confusion with a cholesteatoma. The differentiation can be facilitated by performing an appropriate radiologic investigation such as a fluid-attenuated inversion recovery/MRI-diffusion scan.

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