Cerebrospinal fluid otorrhea

Cerebrospinal fluid (CSF) otorrhea, is a cerebrospinal fluid leakage through the ear structures.

Routes

Mastoid air cells

Petrus ridge or internal auditory canal.

The site of the leak is characterized by one or more defects measuring 2-5 mm in the dura mater and adjacent bony plate, usually in the area of the petrous ridge. About 25% of defects are associated with small meningoceles or meningoencephaloceles. Computed tomographic and magnetic resonance imaging, as well as testing with fluorescein dye, provide confirming diagnostic data.

Types

Spontaneous cerebrospinal fluid otorrhea

Traumatic cerebrospinal fluid otorrhea

May occur from a operative defect in the skull, tumor, cholesteatoma, following vestibular schwannoma surgery or congenital anomalies. A case of repeated CSF otorrhea is uncommon.

Mastoid fractures

Secondary to radionecrosis of the petrous temporal bone. This was successfully repaired via craniotomy and repair of the middle cranial fossa floor.

Cholesteatoma

Partial resection of petrous bone and ear canal closure could be effective solution for challenging cerebrospinal fluid otorrhea with large dural defects and protecting vital neuromuscular structures.

Diagnosis

Its diagnosis is suspected through otorrhea, hearing loss and aural fullness, while computed tomography and magnetic resonance help us to locate the defect. Surgery is the preferred technique, and its success is based on multilayer technology with 2 or more support materials.

Recurrent meningitis

Treatment

The two main approaches used are the transmastoid and middle fossa ones.

A repeated CSF otorrhea which occurred a decade after the first middle ear surgery for chronic otitis media. The first CSF leakage, which might have been due to bone defects in the tegmen at the first middle ear surgery, was surgically repaired using a transmastoid approach. However, CSF leakage with a meningoencephalocele occurred again 8 years after our first surgery for the CSF and the fistula was repaired using a transmiddle cranial fossa approach. Although 2 years have passed since the surgery, the CSF leakage has not recurred.
A modified middle fossa approach with a vascularized temporalis muscle flap to create a barrier between the repaired dural and bone defects in fifteen consecutive cases of CSF fistulas treated at the authors' institution were retrospectively reviewed. All patients presented with otorrhea. Eleven patients had previously undergone ear surgery. A middle fossa approach was followed in all cases. The authors used a thin but watertight and vascularly preserved temporalis muscle flap that had been dissected from the medial side of the temporalis muscle and was laid intracranially on the floor of the middle fossa, between the repaired dura mater and petrous bone. The median follow-up period was 2.5 years. None of the patients experienced recurrence of otorrhea or meningitis. There was no complication related to the intracranial temporalis muscle flap (for example, seizures or increased intracranial pressure caused by muscle swelling). One patient developed hydrocephalus, which resolved after the placement of a ventriculoperitoneal shunt 2 months later. The thin, vascularized muscle flap created an excellent barrier against the recurrence of CSF fistulas and also avoided the risk of increased intracranial pressure caused by muscle swelling. This technique is particularly useful in refractory cases.

Tympano meatal flap and obliteration of the middle ear.

References