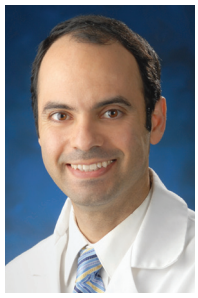


Symptom: A Surfer with Ear Drainage

By Hamid R. Djalilian, MD

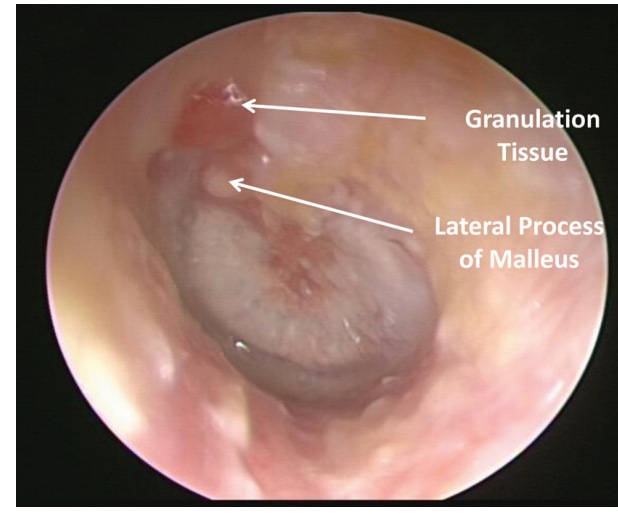
A 47-year-old patient presents with a history of drainage from the ear after surfing. The drainage has occurred every time he's gone surfing over the past six months.

He thinks he has exostoses, or surfer's ear, the patient said. His surfer buddies have had a similar problem, requiring antibiotics for it every time, and some have needed surgery.

The patient also thinks he has bony growths in his ear canal, and he wants to get the "Roto-Rooter" done.

His audiogram shows a moderate conductive hearing loss in the affected ear. His ear, which is filled with debris, is cleaned. The otoscopic image taken after cleaning is shown on the right.

Dr. Djalilian is director of neurotology and skull base surgery and associate professor of otolaryngology and biomedical engineering at the University of California, Irvine.



What is your diagnosis? See the next page.

Diagnosis: Cholesteatoma of the Pars Flaccida

By Hamid R. Djalilian, MD

Patients often present with a diagnosis that they may have come up with themselves. In cases like this, caution is advised. That diagnosis should certainly be considered in the differential, but not exclusively. A wide differential diagnosis must always be considered in order to prevent tunnel vision when evaluating the patient.

While many surfers develop exostoses because of the water temperature and the wind that blows into and cools the ear canal, not all surfers will develop them right away. Usually, many years of exposure are required for this problem to occur.

The same relationship holds true for otitis externa. Many patients with exposure to contaminated ocean water can develop otitis externa secondary to manipulation of the ear. However, all drainage from the ear after water exposure is not otitis externa.

VISUALIZATION OF THE MEMBRANE

When ear drainage is present, cleaning the ear canal is of the utmost importance. Using suction, the clinician should remove debris all the way to the level of the tympanic membrane in order to fully visualize the membrane. The diagnosis can be considered only after a full visualization of the ear canal and tympanic membrane.

After this patient's ear canal is thoroughly cleaned, it becomes evident that the ear canal itself is normal and not edematous, erythematous, or the likely source of the drainage.

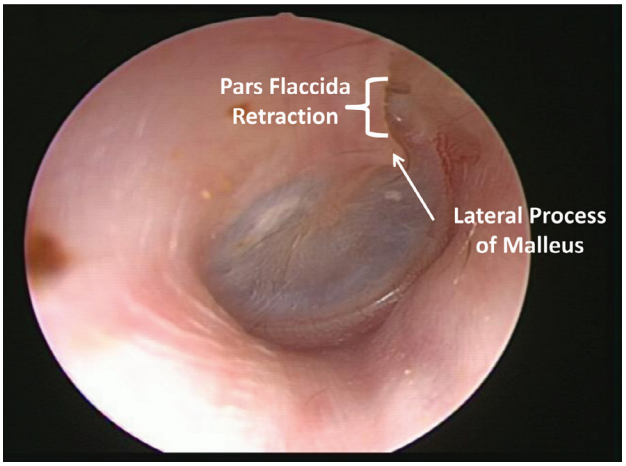
Visualization of the tympanic membrane shows a small section of granulation tissue, which appears as red beefy tissue, in the area of the pars flaccida. The pars flaccida is located superior to the lateral process of the malleus. It is bound superiorly by the ear canal, which can sometimes be eroded in this setting.

Unlike the rest of the tympanic membrane, which is called the pars tensa, the pars flaccida has a more disorganized fibrous layer, causing it to be more flaccid–hence the name.

Most commonly, a drop in middle ear pressure secondary to Eustachian tube dysfunction will initially cause the pars flaccida area to retract. The retraction may progress, leading to the formation of a pocket. Accumulation of dead skin, called squamous debris, in this pocket results in cholesteatoma formation.

GRANULATION TISSUE PRESENT

This patient has a cholesteatoma of the pars flaccida area. The presence of granulation tissue in the pars flaccida is considered to indicate cholesteatoma until proven otherwise. The granulation represents the intense inflammatory response of the surrounding tissue to inflammation or infection caused by the cholesteatoma.



Otoscopy of the patient's other ear shows a retraction of the pars flaccida as well, indicating poor Eustachian tube function.

Workup of cholesteatoma includes a CT scan of the temporal bones to evaluate the degree of bony destruction and the anatomy of the temporal bone prior to surgery.

Occasionally, an MRI is obtained when the diagnosis of cholesteatoma is in question. Diffusion-weighted images can be used to distinguish a cholesteatoma from other types of pathology in the temporal bone. Modern software and imaging techniques, termed non-coplanar diffusion weighting, can be used to identify a cholesteatoma as small as 3 mm.

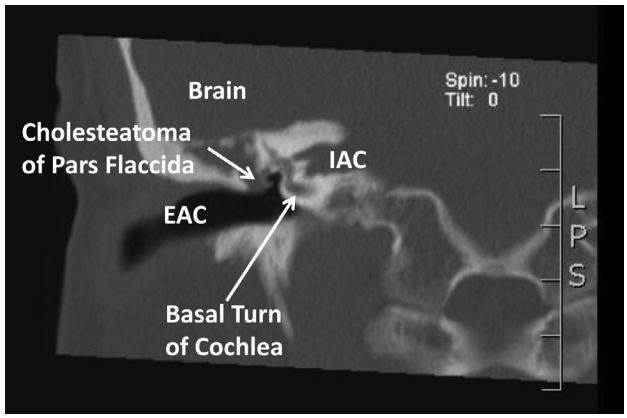
Patients with cholesteatoma should undergo surgical treatment in order to avoid the potentially disastrous complications of cholesteatoma, including meningitis, brain abscess, bony labyrinth destruction (and resultant deafness), and facial nerve paralysis, among others.

Extremely rarely, observation may be performed in very old patients or those with significant medical problems and an open cholesteatoma that can be debrided.

LIFELONG FOLLOWUP NEEDED

The choice of surgical approach depends on the patient's cholesteatoma and anatomy. Most commonly, cholesteatomas are treated using tympanoplasty with mastoidectomy.

The adjunctive use of otoendoscopy has allowed surgeons to have a much lower residual cholesteatoma rate. Though it's not widely used by surgeons yet, we believe that otoendoscopy is an invaluable tool for looking around corners of the temporal bone to ensure that all portions of the cholesteatoma have been removed.



This coronal CT of the right temporal bone of a different patient demonstrates bony destruction and opacification (indicated by the gray area) starting in the superior aspect of the medial canal (pars flaccida) and growing into the mastoid. IAC=internal auditory canal. EAC=external auditory canal.

Despite the surgeon's best efforts, though, it is possible for part of the cholesteatoma to remain behind. This happens because of the extensively infiltrative cholesteatomas that can penetrate even the deepest areas of the temporal bone.

In the presence of inflammation, which almost always exists with a cholesteatoma, it is not always possible to identify residual areas. For these patients, a second surgery is scheduled between six and 12 months after the first surgery to evaluate for any residual cholesteatoma. Reconstruction of the ossicles is performed during the second surgery.

At our institution, we use annual MRIs for the first few years to look for residual cholesteatoma. A second-look operation is reserved for those who have very infiltrative cholesteatomas—approximately 10 percent of patients.

Cholesteatoma patients will continue to have Eustachian tube dysfunction postoperatively and will be at a higher risk of developing a cholesteatoma in the future. Therefore, lifelong follow-up is needed for these patients on a yearly basis, at least, to identify recurrence early.

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