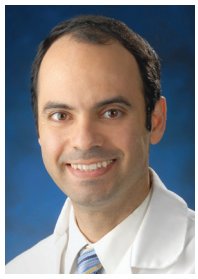


Symptom: Ear Plugging

By Hamid R. Djalilian, MD

A 59-year-old woman comes into the office with a three-day history of ear plugging. The patient, who has had pressure sensation before and says it feels similar to water in the ear, wants to make sure that she doesn't have excessive earwax.

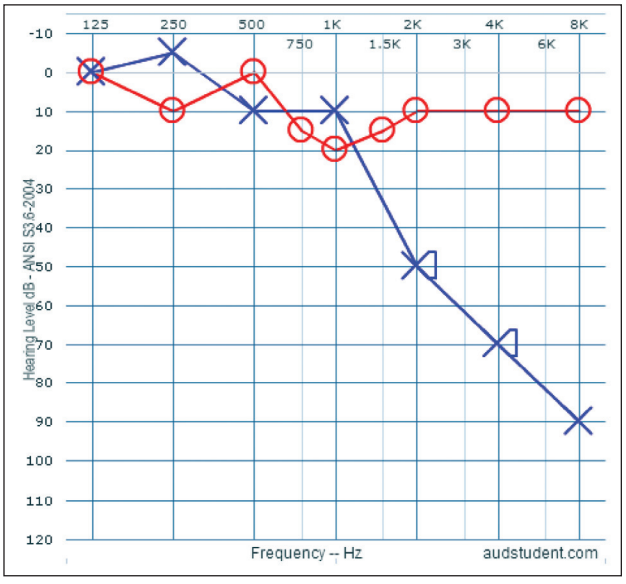
She has had no recent flights, upper respiratory infections, or trauma to her head or ear. When the patient tries to "pop" the ear, the pressure doesn't change, but she feels clicking in her ear, she says.

The patient is a nonsmoker and doesn't have vertigo or tinnitus, she reports. Her medical history is significant for hypertension.

The patient's audiogram is shown on the right.

What is your diagnosis? See p. 22.

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



This image shows our patient's audiogram.

Diagnosis: Sudden Sensorineural Hearing Loss

By Hamid R. Djalilian, MD

Continued from p. 20

The patient is exhibiting signs and symptoms of sudden sensorineural hearing loss. Sudden hearing loss is a medical emergency that affects approximately 50,000 patients a year in the United States.

The various theories for the etiology of this condition include vascular causes, viral infection of the cochlea, and autoimmune inner ear disease, among others.

Recently, evidence has been published on the relationship between migraine and sudden hearing loss.

In a nationwide cohort study in Taiwan, patients with migraine were 1.8 times more likely to develop sudden hearing loss than those without migraine (***Cephalalgia* 2013;33[2]:80-86**). This finding suggests a vascular etiology to sudden hearing loss.

Another study from Taiwan found that patients were two times more likely to develop a myocardial infarction in the five years after developing sudden hearing loss (***Audiol Neurotol* 2013;18[1]:3-8**), indicating an association between sudden hearing loss and atherosclerosis.

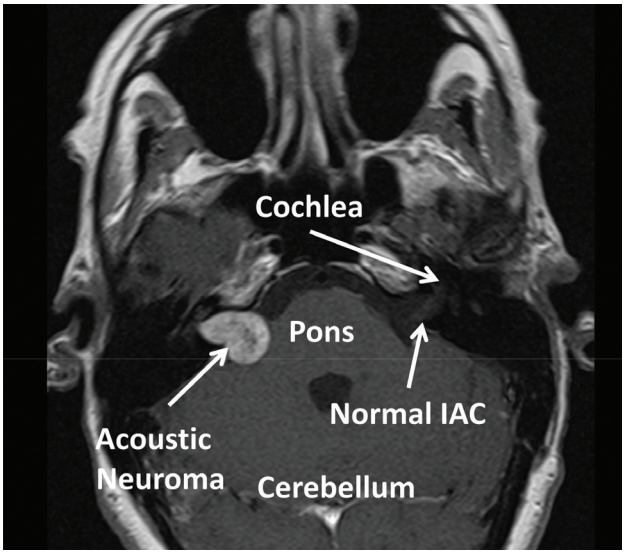
On the other hand, no increased risk of sudden hearing loss was found in the two months following a herpes zoster infection (shingles), indicating that the herpes zoster virus likely does not play a role in this condition (***Acta Otolaryngol* 2012;132[2]:167-172**).

In the vast majority of patients, it is difficult to ascertain the true etiology of sudden hearing loss because it's impossible to access the cochlear fluids without further damaging the cochlea.

Given the uncommon nature of sudden hearing loss in the primary care setting, the patients are often diagnosed with Eustachian tube dysfunction.

Also, ultrafine structures of the inner ear are difficult to image using conventional systems. In addition, there are very few temporal bone histopathology examples from patients with sudden hearing loss who died shortly after developing the condition.

Any patient presenting with sudden hearing loss needs to be evaluated emergently, with the patient seen, tested, and started on treatment. Most commonly, these patients will present with a sudden onset of ear plugging, believing that the associated hearing loss is caused by the plugging.



The acoustic neuroma was found on imaging in a patient with sudden hearing loss. IAC=internal auditory canal.

Also, patients oftentimes will attribute the symptoms to an upper respiratory infection or allergies, not to the inner ear. Sometimes, they think their condition is due to cerumen and try flushing their ear, to no avail.

Most commonly, patients present to a primary care physician or an urgent care clinic with these complaints. Given the uncommon nature of sudden hearing loss in the primary care setting, the patients are often diagnosed with Eustachian tube dysfunction.

Less often, the patient may initially present to an otolaryngologist or audiologist.

A MATTER OF TIME

When a patient is seen for sudden hearing loss, it is of the utmost importance to establish when the condition started, as treatment initiated in the first two weeks after onset is much more effective than therapy begun later.

The treatment of sudden hearing loss is the subject of a large number of studies. In the past, multiple treatment modalities were used, including intravenous, oral, and intratympanic steroids; intravenous and oral antivirals; intravenous and oral vasodilators; 95-percent oxygen (carbogen); and hyperbaric oxygen.

The central problem with many of the studies on this topic is that the patient populations are not uniform. Mixing these

patient groups creates great difficulty in establishing whether or not the treatment modality is successful.

Most recently, there was a large, multi-institutional, randomized study to compare intratympanic steroids with oral steroids for sudden hearing loss therapy (*JAMA* 2011;305[20]:2071-2079). The conclusion of the study was that the two modalities are equivalent in efficacy when used to treat this condition.

The central problem with many of the studies on sudden hearing loss is that the patient populations are not uniform.

A separate study, from Kaiser Permanente in Southern California, showed that the combination of intratympanic steroids and oral steroids led to better outcomes compared with the use of oral steroids alone (*Otol Neurotol* 2008;29[4]:453-460).

The current state of the art in the treatment of sudden hearing loss is the combination of high-dose oral steroids (prednisone, 1mg/kg, up to 80 mg) and intratympanic steroid injections. Some clinicians use intratympanic steroids as salvage therapy, whereas others will use them concurrently.

If the patient presents with a mild level of hearing loss within three days of developing the condition, then oral steroids can be tried first, with a short follow-up appointment conducted within two to three days to check for improvement.

Various medications and regimens for intratympanic steroids have been described. The injections generally are given two to three times a week.

Higher-dose (10 mg/mL) dexamethasone has been found to be effective, while, generally, low-dose (4 mg/mL) dexamethasone has not.

Methylprednisolone also has been used and found to be effective. However, the agent does tend to burn when placed in the middle ear and is less commonly used.

Antivirals and hyperbaric oxygen do not have a significant role in improving patient prognosis.

Poor prognostic factors in sudden hearing loss include profound or high-frequency loss, and vertigo.

All patients with a sudden hearing loss must undergo an evaluation for an acoustic neuroma or other retrocochlear lesion.

Approximately 10 percent of acoustic neuroma patients present with sudden hearing loss, and three percent of patients with sudden hearing loss have an acoustic neuroma. The figure on page 22 shows an acoustic neuroma that was discovered on imaging in a patient with sudden hearing loss.