

Test Your Knowledge - ENT Quiz

Increasing hearing Loss

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(American Family Physician, Vol 31, No 8, August 2002)

A 40-year-old man has been aware of an increasing hearing loss in the right ear. He is no longer able to use the phone on that side. There is a low grade, persistent, high-pitched tinnitus and he has recently noticed a tendency to bump into doors or walls when walking. There is no past history of ear disease.

There is very little to note clinically. The tympanic membranes are normal and air conduction right is clearly less than air conduction left but the Rinne test is positive for both sides, ie, air conduction is better than bone conduction.

The Weber test is heard centrally. When the patient stands with his feet in line and the eyes closed (tandem Romberg's test he tends to fall over.

Question 1. Is the hearing loss sensorineural or conductive?

Question 2. What is the most likely diagnosis?

Question 3. Are this patient's problems with the phone significant?

Question 4. What is the significance of the tandem Romberg's test?

Question 5. Do all patients with this condition require treatment?

Question 6. Does unilateral tinnitus have the same significance as a unilateral sensorineural hearing loss?

Answer 1. The patient's hearing loss is sensorineural. The Weber test gives the best guide to the nature of an asymmetrical hearing loss. It is best carried out with a tuning fork at 512 cycles per second. Lower frequencies transmit vibration rather than sound. If the vibrating tuning fork is placed on the forehead or the top of the skull, it will be heard in the ear with the conductive loss, even when this is very minor. This can be simulated in the observer by repeating the manoeuvre on oneself, firmly occluding the external ear with a finger.

If the hearing loss is sensorineural, the central tuning fork will be heard in the 'good' ear or in the middle of the head.

When the middle ear is working as it should, air conduction will be heard better than bone conduction, so hearing loss in the test ear in these circumstances is probably in the inner ear (sensorineural). However, because the middle ear mechanism amplifies sound to a significant degree, a conductive loss has to be marked before bone conduction becomes greater than air conduction.

Answer 2. In this patient, there is strong suspicion of an asymmetrical inner ear hearing loss. If this is confirmed by an audiogram, a tumour of the cerebellopontine angle has to be excluded, preferably by magnetic resonance imaging (MRI).

In approximately 80% of patients with asymmetrical hearing loss no cause is found. Ménière's disease is one of the recognisable causes, as is an acoustic tumour. Head trauma will occasionally produce the same effect as will ototoxic drugs applied locally.

This patient is unlikely to have Ménière's disease as he does not have the fluctuating hearing loss that characterises this condition. Also in Ménière's disease the vertigo is of the rotatory type, associated with nausea, vomiting and often prostration.

Magnetic resonance imaging is the gold standard investigation in cases such as these. CT scan can also be used, however, smaller tumours - those that project less than 1 cm into the cerebellopontine angle - may be missed. Caloric tests, ENG or other audiological tests no longer have much of a role in the diagnosis of cerebello-pontine angle tumours as MRI is so accurate.

Answer 3. Problems with using the phone are significant as tumours of this type result in a loss of ability to understand amplified speech, referred to as the speech discrimination score (SDS). An inability to understand speech on the phone, out of proportion to the degree of hearing loss, is a pointer toward an underlying tumour.

Answer 4. Romberg's and its more severe variant tandem Romberg's, is a nonspecific test which, by narrowing the proprioceptive base (feet together or in line) and closing the eyes, throws the greater part of the responsibility for keeping upright on the labyrinths. It does not tell us which labyrinth is at fault so the direction in which the patient falls has not significance. The test is invalid if there are problems with proprioception, eg, knee or hip disease or if cerebellar function is not normal.

Answer 5. As tumours in the cerebello-pontine angle are nearly all benign histologically (acoustic neuroma or schwannoma, meningioma, epidermoid cyst) many can be followed, having serial imaging at yearly intervals. This is especially so in the elderly or infirm. In younger patients, especially when contact with the brainstem is beginning, surgical treatment is required.

Answer 6. Unilateral tinnitus, which is steady and persistent, should be assessed in the same way as a unilateral inner ear hearing loss.

Tinnitus which is pulsatile (ie, pulse synchronous) has different implications. If a stethoscope on the scalp reveals a bruit, an arterio-venous malformation has to be excluded. A mass in the middle ear in these circumstances would suggest a glomus tumour.