VESTIBULAR DISORDERS ASSOCIATION

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Acoustic Neuroma

What is an acoustic neuroma?
An acoustic neuroma (also known as vestibular schwannoma or acoustic neurinoma) is a benign (nonmalignant), usually slow-growing tumor that develops from the balance and hearing nerves supplying the inner ear. The tumor comes from an overproduction of Schwann cells—the cells that normally wrap around nerve fibers to help support and insulate nerves.

How does it develop?
As the acoustic neuroma grows, it compresses the hearing and balance nerves, usually causing unilateral (one-sided) hearing loss, tinnitus (ringing in the ear), and dizziness or loss of balance. As it grows, it can also interfere with the facial sensation nerve (the trigeminal nerve), causing facial numbness. It can also exert pressure on nerves controlling the muscles of the face, causing facial weakness or paralysis on the side of the tumor. Vital life-sustaining functions can be threatened when large tumors cause severe pressure on the brainstem and cerebellum.

Unilateral acoustic neuromas account for approximately eight percent of all tumors inside the skull; one out of every 100,000 individuals per year develops an acoustic neuroma. Symptoms may develop in individuals at any age, but usually occur between the ages of 30 and 60 years. Unilateral acoustic neuromas are not hereditary.

How is it diagnosed?
Early detection of an acoustic neuroma is sometimes difficult because the symptoms related to its early stages may be subtle, if present at all. Diagnosis can be complicated because similar symptoms are common for many middle and inner ear problems.

Once the symptoms appear, a thorough ear examination and hearing test (audiogram) are essential for proper diagnosis. Computerized tomography (CT) scans, enhanced with intravenous dye for contrast, and magnetic resonance imaging (MRI) are critical in the early detection of an acoustic neuroma. These tests are helpful in determining a tumor's location and size and in planning its microsurgical removal.

How is it treated?
Early diagnosis of an acoustic neuroma is key to preventing its serious consequences. The three treatment options are surgical removal, radiation, and monitoring. Typically, the tumor is surgically removed. The exact type of operation involved depends on the size of

the tumor and the level of hearing remaining in the affected ear.

If the tumor is very small, hearing function may be preserved and accompanying symptoms may improve. As the tumor grows larger, however, surgical removal becomes more complicated because the tumor may have damaged the nerves that control facial movement, hearing, and balance, and may also have affected structures of the brain. When the tumor has affected these nerves, its surgical removal can worsen a person's symptoms because sections of the nerves themselves may also need to be removed. In this case, vestibular rehabilitation may help promote central nervous system compensation for the inner-ear deficit.

As an alternative to conventional surgical techniques, radiosurgery with a gamma knife or linear accelerator may be employed to reduce the size or limit the growth of the tumor. Alternately, radiation therapy is sometimes the preferred option for elderly patients, patients in poor health, patients with bilateral acoustic neuroma (a tumor affecting both ears), or patients whose tumor is affecting their only hearing ear. In some cases, usually involving elderly or medically infirm patients, it may be preferable to "watch" the tumor with repeated MRIs to monitor the tumor for any growth.

This document is adapted from materials available from the National Institute on Deafness and Other Communication Disorders, National Institutes of Health, www.nidcd.nih.gov/health/hearing/acoustic_neuroma.asp.

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