CONDITION

Acoustic neuroma

Learn about acoustic neuroma symptoms, diagnosis, monitoring, treatment options, possible complications, and when to seek urgent care.

WHAT IT IS
Usually noncancerous hearing and balance nerve tumor

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
One-sided hearing loss, one-sided tinnitus, poor balance, difficulty understanding speech

WHAT CAUSES IT
Usually unknown, rarely inherited

HOW IT IS DIAGNOSED
MRI, usually with contrast

MAIN TREATMENT
Observation, focused radiation, or surgery

CAN IT BE CURED?
Sometimes - surgery can completely remove it

IS IT AN EMERGENCY?
Sometimes - stroke-like symptoms or sudden severe headache

LONG-TERM OUTLOOK
Often slow-growing, but permanent hearing loss can occur

Overview

An acoustic neuroma is a usually noncancerous tumor that grows on the nerve connecting the inner ear to the brain. Doctors often call it a vestibular schwannoma . It begins in Schwann cells, which form the protective covering around nerves.

The affected nerve, the vestibulocochlear or eighth cranial nerve, carries hearing and balance information. The tumor usually starts on its balance portion and often grows slowly. Some tumors show no measurable growth during years of monitoring.

An acoustic neuroma is not brain cancer and generally does not invade nearby tissue or spread elsewhere. However, as it enlarges, it can affect hearing, balance, facial sensation, and nearby nerves. A large tumor may press on the brainstem or disrupt fluid flow around the brain.

Treatment is not always needed immediately. Depending on tumor size, growth, symptoms, hearing, and overall health, management may include MRI monitoring, focused radiation, or surgery. Hearing and balance rehabilitation may also help.

Symptoms

Symptoms often develop gradually. Hearing changes are the most common concern.

Typical symptoms include:

Hearing loss does not always reflect tumor size. A small tumor may cause marked hearing problems, while a larger one may cause fewer early symptoms. Some people have sudden rather than gradual hearing loss.

True spinning sensations, called vertigo, can occur but are less typical than general imbalance. The brain may gradually adapt to reduced balance signals from one ear, making symptoms subtle.

A larger tumor may cause facial numbness, tingling, pain, or weakness. Less commonly, substantial tumors may contribute to persistent headaches, double vision, swallowing problems, voice changes, or poor coordination.

Sudden hearing loss in one ear needs urgent medical assessment, ideally as soon as possible. It has several possible causes, and early treatment may matter. Do not assume it is caused by earwax or an acoustic neuroma.

Call emergency services for sudden facial drooping, arm or leg weakness, trouble speaking, severe new loss of coordination, confusion, or an abrupt severe headache. These may indicate a stroke or another emergency.

- Hearing loss in one ear or hearing that is worse on one side
- Ringing or buzzing in one ear, known as tinnitus
- Unsteadiness or poor balance
- Difficulty understanding speech, especially in noisy places
- A blocked or full feeling in the affected ear

Causes and risk factors

Most acoustic neuromas occur without a known cause. Changes within Schwann cells allow them to grow into a tumor, but there is usually no identifiable action, exposure, or lifestyle

choice responsible.

Most tumors are sporadic , meaning they occur without an inherited tumor syndrome, and are found on only one side.

A small proportion are associated with NF2-related schwannomatosis , a rare genetic condition formerly called neurofibromatosis type 2. Affected people are more likely to develop vestibular schwannomas on both sides, often at a younger age, as well as other nervous system tumors.

Genetic evaluation may be considered when tumors affect both ears, diagnosis occurs at an unusually young age, or personal or family history suggests an inherited condition. One typical, one-sided acoustic neuroma does not by itself indicate NF2-related schwannomatosis.

Current evidence has not established mobile phones as a cause. No diet, supplement, or lifestyle change is proven to prevent acoustic neuroma.

Diagnosis

Evaluation often begins after an abnormal hearing test or an unexplained difference between the ears. A clinician will ask about hearing, tinnitus, balance, facial symptoms, symptom timing, and family history, then may perform ear and neurologic examinations.

An audiogram measures the quietest sounds a person can hear at different pitches and may test speech understanding. Acoustic neuromas usually cause sensorineural hearing loss, meaning the problem involves the inner ear or hearing nerve rather than an ear-canal blockage.

MRI is the main imaging test. It shows the internal auditory canals, hearing and balance nerves, and nearby brain structures. MRI with contrast is commonly used, although specialized high-resolution sequences without contrast may sometimes provide enough information. Tell the imaging team about pregnancy, kidney problems, implanted devices, metal fragments, allergies, or previous reactions to contrast so they can confirm that MRI and contrast are appropriate.

An auditory brainstem response test may be used when MRI is unavailable or cannot be performed, but it can miss small tumors. CT provides less detail and is not usually preferred for confirming the diagnosis.

MRI determines tumor size and whether it extends toward the brainstem. Earlier scans are useful because one MRI cannot show whether the tumor is growing. Testing also helps exclude other causes of one-sided hearing loss, tinnitus, or dizziness.

Treatment and management

Management should involve clinicians experienced in acoustic neuroma care. The team may include a skull-base ear, nose, and throat surgeon, neurosurgeon, radiation oncologist, audiologist, and balance therapist.

The main approaches are observation, radiation, and surgery. Decisions depend on tumor size, location and growth; hearing in both ears; symptoms; age; general health; personal priorities; and the treatment center's experience.

Observation

Observation, or "watch and scan," involves scheduled MRI scans and hearing tests. It may suit a small or stable tumor, mild symptoms, or a person for whom treatment risks outweigh likely benefits.

Observation does not mean ignoring the tumor. Treatment may be reconsidered if it grows, symptoms worsen, hearing changes, or imaging shows increasing pressure on nearby structures.

Focused radiation

Stereotactic radiosurgery directs highly focused radiation at the tumor without an incision. Treatment may be delivered in one session or divided across several sessions.

The goal is usually to stop or limit growth rather than remove the tumor. It is generally considered for selected small or medium tumors and for some people who are not good candidates for open surgery.

Hearing may continue to decline even when growth is controlled. Other possible effects include temporary swelling, balance symptoms, and injury to nearby facial or sensory nerves. The radiation team should explain individual benefits, risks, and follow-up needs.

Surgery

Surgery removes all or part of the tumor. It may be recommended for a large tumor, brainstem pressure, continued growth, significant symptoms, or when removing the mass offers a clear advantage.

The surgical route depends on tumor size and location, remaining hearing, and treatment goals. Some approaches may preserve the possibility of useful hearing; another may pass through the inner ear when hearing is already poor. Protecting facial nerve function is an important goal.

Complete removal is not always safest. A surgeon may leave tissue attached to the facial nerve or another critical structure to reduce permanent injury. The remainder can be

monitored and treated later if necessary.

Symptom and hearing support

Options for hearing support include a conventional hearing aid, a device that routes sound to the better-hearing ear, or a bone-conduction system. In selected cases, a cochlear implant or auditory brainstem implant may be considered.

Balance rehabilitation uses guided exercises to help the brain adapt to unequal balance signals. Tinnitus care may include hearing support, sound therapy, sleep measures, and counseling-based strategies. These treatments do not remove the tumor but may improve daily functioning.

Complications

The tumor can cause permanent hearing loss, tinnitus, and chronic imbalance. Pressure on nearby nerves may lead to facial numbness or weakness, altered tear production, or difficulty protecting the eye if the eyelid cannot close fully.

A very large tumor may compress the brainstem or block cerebrospinal fluid flow, causing hydrocephalus and raised pressure inside the skull. These complications require prompt specialist care but are uncommon with a small, monitored tumor.

Surgery may affect hearing, balance, facial movement or sensation, swallowing, or voice. Other risks include bleeding, infection, and cerebrospinal fluid leakage. Radiation can cause delayed hearing decline, nerve symptoms, or tumor swelling. Rare long-term risks should be discussed with the treating team.

One-sided hearing can make it difficult to locate sounds or follow conversations in crowds. Tinnitus and imbalance may also affect sleep, work, driving, and social activities.

Follow up

Follow-up usually includes MRI, hearing tests, and symptom review. Timing depends on the management approach, tumor size and growth, and whether any tumor remains.

People under observation often have closer imaging at first, with longer intervals if scans remain stable. Long-term monitoring may still be necessary because growth can begin after stability.

After radiation, MRI assesses long-term tumor control. Temporary swelling can make a treated tumor appear larger, so results must be interpreted over time. After surgery, follow-up

depends partly on whether removal was complete.

Contact the treating team for gradual hearing changes, worsening tinnitus, increasing imbalance, new facial tingling, or rehabilitation questions. Seek urgent medical assessment for sudden hearing loss, new persistent facial weakness, repeated vomiting, or a major new change in walking.

Call emergency services for stroke-like symptoms, loss of consciousness, a seizure, or a sudden severe headache with neurologic changes.

Sources

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