

What is otosclerosis?

The term otosclerosis describes a condition of abnormal growth in the tiny bones of the middle ear, which leads to a fixation of the stapes bone. The stapes bone must move freely for the ear to work properly and hear well.

Hearing is a complex process. In a normal ear, sound vibrations are funneled by the outer ear into the ear canal where they hit the ear drum. These vibrations cause movement of the ear drum that transfers to the three small bones of the middle ear, the malleus (hammer), incus (anvil), and stapes (stirrup). When the stapes bone moves, it sets the inner ear fluids in motion, which, in turn, start the process to stimulate the auditory (hearing) nerve. The hearing nerve then carries sound energy to the brain, resulting in hearing of sound. When any part of this process is compromised, hearing is impaired.

Who gets otosclerosis and why?

It is estimated that ten percent of the adult Caucasian population is affected by otosclerosis. The condition is less common in people of Japanese and South American decent and is rare in African Americans. Overall, Caucasian, middle-aged women are most at risk.

The hallmark symptom of otosclerosis, slowly progressing hearing loss, can begin anytime between the ages of 15 and 45, but it usually starts in the early 20's. The disease can develop in both women and men, but is particularly troublesome for pregnant women who, for unknown reasons, often experience a rapid decrease in hearing ability.

Approximately 60 percent of otosclerosis cases are genetic in origin. On average, a person who has one parent with otosclerosis has a 25 percent chance of developing the disorder. If both parents have otosclerosis, the risk goes up to 50 percent.

What are the symptoms?

Gradual hearing loss is the most frequent symptom of otosclerosis. Often, individuals with otosclerosis will first notice that they cannot hear low-pitched sounds or whispers. Other symptoms of the disorder can include dizziness, balance problems, or a sensation of ringing, roaring, buzzing, or hissing in the ears or head known as tinnitus.

How is it diagnosed?

Because many of the symptoms typical of otosclerosis can also be caused by other medical conditions, it is important to be examined by an otolaryngologist (ear, nose and throat doctor) to eliminate other possible causes of the symptoms. After an ear exam, the otolaryngologist may order a hearing test. Based on the results of this test and the exam findings, the otolaryngologist will suggest treatment options.

How is it treated?

If the hearing loss is mild, the otolaryngologist may suggest continued observation and a hearing aid to amplify the sound reaching the ear drum. Sodium fluoride has been found to slow the progression of the disease and may also be prescribed. In most cases of otosclerosis, a surgical procedure called stapedectomy is the most effective method of restoring or improving hearing.

What is a stapedectomy?

A stapedectomy is a surgical procedure done under local or general anesthesia through the ear canal with an operating microscope. (No outer incisions are made.) It involves removing the immobilized stapes bone and replacing it with a prosthetic device. The prosthetic device allows the bones of the middle ear to resume movement, which stimulates fluid in the inner ear and improves or restores hearing.

Modern-day stapedectomies have been performed since 1956 with a success rate of over 95 percent. In rare cases (about one percent of surgeries), the procedure may worsen hearing.

Otosclerosis affects both ears in eight out of ten patients. For these patients, ears are operated on one at a time; the worst hearing ear first.

Examples of alternatives include: Using a hearing aid or choosing not to have treatment and living with your hearing loss. You should ask your doctor about these choices.

How do I prepare for a stapedectomy?

Plan for your care and recovery after the operation, especially if you are to have

general anesthesia. Allow for time to rest and try to find people to help you with your day-to-day duties.

Follow any instructions your doctor may give you. If you are to have general/local with sedation anesthesia, eat a light meal, such as soup or salad, the 6 hours before the procedure. Do not eat or drink anything 6 hours before the procedure. Do not even drink coffee, tea, or water.

What happens during the procedure?

You will receive a local or general anesthetic. A local anesthetic is a drug that should keep you from feeling pain during the operation. If you have a local anesthetic, you may also be given a sedative to help you relax. A general anesthetic will relax your muscles and make you feel as if you are in a deep sleep. It will prevent you from feeling pain during the operation.

The doctor will open the eardrum, explore your middle ear, remove all or part of the stapes, and insert an artificial stapes. The doctor will then repair the eardrum.

What should I expect after a stapedectomy?

Most patients return home the next day evening after surgery and are told to lie quietly on the un-operated ear. You may be in the hospital for a day, depending on your condition. Rest for one week while your ear is healing. Ask your doctor what other steps you should take and when you should come back for a checkup. Oral antibiotics may be prescribed by the otolaryngologist. Some patients experience dizziness the first few days after surgery. Taste sensation may also be altered for several weeks or months following surgery, but usually returns to normal.

Following surgery, patients may be asked to refrain from nose blowing, swimming, or other activities that may get water in the operated ear. Normal activities (including air travel) are usually resumed two weeks after surgery.

What are the risks associated with this procedure?

There are some risks when you have general anesthesia. Discuss these risks with your doctor.

A local anesthetic may not numb the area enough and you may feel some minor discomfort. Also, in rare cases, you may have an allergic reaction to the drug used in this type of anesthesia. Local anesthesia is considered safer than general anesthesia.

After the operation, you may be dizzy or have ringing in your ear.

If a nerve in your ear is bruised or damaged, you may have a limited sense of taste or a metallic taste on your tongue. These symptoms last longer than 6 months in about 5% of the people who have a stapedectomy.

Your hearing may not significantly improve.

You may have infection or bleeding.

You may need surgery again in the future to tighten the artificial stapes and improve your hearing.

Rarely, you may lose all hearing in that ear.

You should ask your doctor how these risks apply to you.

When should I call the doctor?

Notify your ENT surgeon immediately if any of the following occurs:

- Sudden hearing loss
- Intense pain
- Prolonged or intense dizziness
- You develop a fever.
- You have drainage from your ear
- Any new symptom related to the operated-on ear

Since packing is placed in the ear at the time of surgery, hearing improvement will not be noticed until it is removed about a week after surgery. The ear drum will heal quickly, generally reaching the maximum level of improvement within four weeks.