Otosclerosis and Stapedotomy

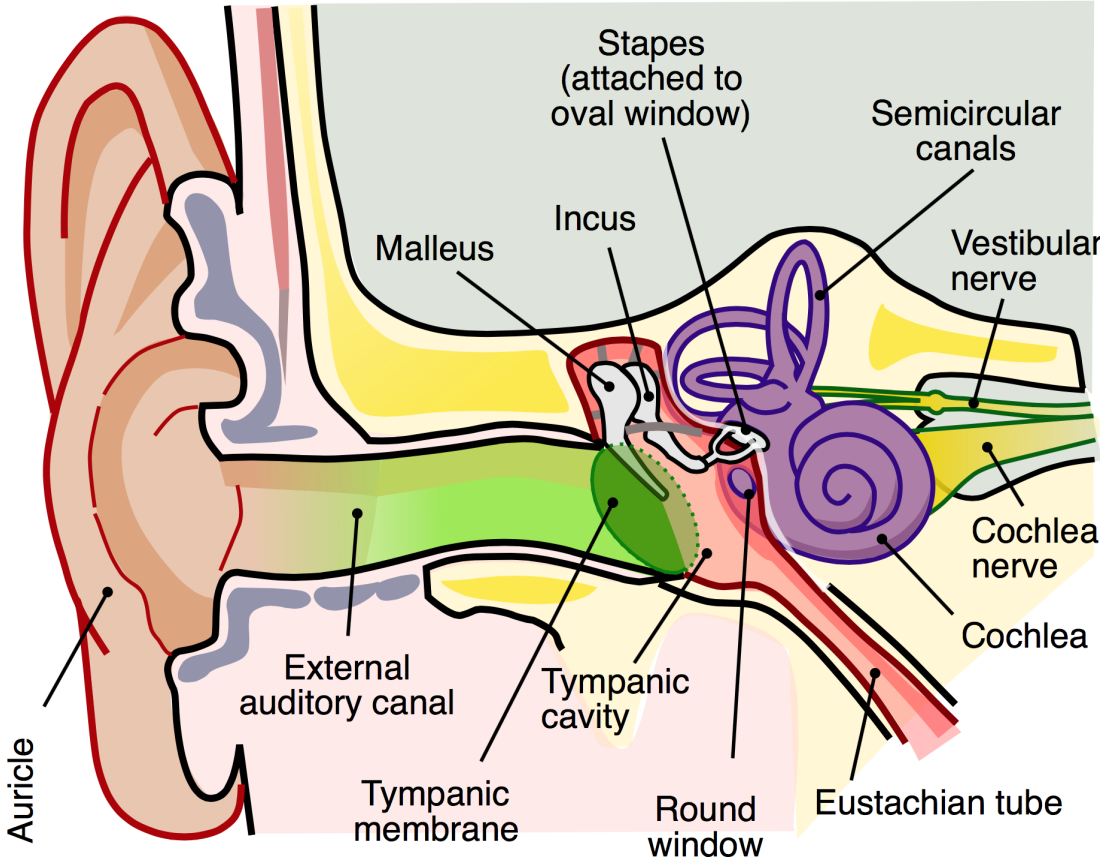
QUICK FACTS

- Otosclerosis may not need any treatment. Hearing loss can also be treated with a hearing aid.
- Feeling dizzy for a few hours after the operation is common. Rarely, dizziness may last for months.
- After stapedectomy your sense of taste may be different on the same side as the operation. Permanent damage is uncommon.
- Your hearing may stay the same or improve after the operation. Your hearing may also become worse after the operation. You may have no hearing (a dead ear) after surgery.
- Very rarely the facial muscles may be permanently weak after the operation. Sometimes the weakness is temporary and recovers.
- Tinnitus can develop after the operation.
- You may have an allergic reaction to the medication in the ear dressings.

ABOUT THE CONDITION

How do we hear?

The ear consists of the outer, middle and inner ear. Sound travels through the outer ear and reaches the eardrum, causing it to vibrate. The vibration is then transmitted through three tiny bones in the middle ear called the ossicles. These three ossicles are called the malleus, incus and stapes (also known as the hammer, anvil and stirrup bones). The vibration then enters the inner ear which is a snail-shaped bony structure filled with fluid. The nerve cells within the inner ear are stimulated to produce nerve signals. These nerve signals are carried to the brain, where they are interpreted as sound.



Anatomy of the ear

What is otosclerosis?

Otosclerosis is a condition affecting the bone surrounding the inner ear. It can cause hearing loss when abnormal bone forms around the stapes causing fixation of the bone, reducing the sound that reaches the inner ear. This is called conductive hearing loss. Less frequently, otosclerosis can interfere with the inner ear nerve cells and affect the production of the nerve signal. This is called sensorineural hearing loss or inner ear hearing loss.

Who gets otosclerosis?

The cause of otosclerosis is not fully understood, although it tends to run in families and can be hereditary. People who have a family history of otosclerosis are more likely to develop the condition. Otosclerosis affects the ears only and not other parts of the body. Both ears are usually involved to some extent. However, in some individuals, only one ear is affected. It usually begins in the teens or early twenties. Some research suggests a relationship between otosclerosis and the hormonal changes associated with pregnancy.

What are the symptoms of otosclerosis?

The commonest symptom is hearing loss which may take many years to become obvious. The degree of hearing loss may range from mild to severe. It can be conductive, sensorineural or both. In addition to hearing loss, some people with otosclerosis may experience tinnitus or noise in the ear. The intensity of the tinnitus is not necessarily related to the degree or type of hearing loss. Very rarely, otosclerosis may also cause dizziness.

How is it diagnosed?

An examination by a specialist ENT surgeon is needed to rule out other diseases or health problems that may cause the same symptoms. The specialist may use a special light called otoscope or a microscope to check the ear drum. The amount of hearing loss and whether it is conductive or sensorineural can be determined only by a hearing test called an audiogram and a test to measure the air pressure in the middle ear called a tympanogram. Your otolaryngologist may order a CT scan of the ear to assess the extent of otosclerosis.

What treatment may I need?

If the hearing loss is minimal, then you may not need any treatment. Monitoring your hearing with audiograms may be useful.

If the hearing loss is affecting you, then you can consider hearing aids which can amplify sounds so that you can hear better. The advantage of hearing aids is that they carry no risk to you. Your specialist can discuss the various types of hearing aids available and make a recommendation based on the specific needs.

Not everyone with hearing loss due to otosclerosis may be suitable for surgery. Generally, if the inner ear function is good and you a significant conductive type of deafness then we might be able to improve the hearing. On the other hand, if you have a significant inner ear type of hearing loss, then the operation may not help to let you hear without a hearing aid and will not be useful.

ABOUT THE OPERATION

What is the benefit of having surgery?

A successful stapedectomy operation usually enables you to hear without a hearing aid in that ear. If one ear is affected, the operation may help to locate the direction of the sound and hear better in a noisy background. If both ears are affected, the operation is usually done on the poorer ear. You might still need a hearing aid in the opposite ear.

Can I have surgery on both sides?

In case of bilateral otosclerosis, many surgeons may offer surgery on the second side once the surgery has been a success on the first side. This is usually considered after a period of observation which can be up to one year after the first surgery.

What does surgery involve?

The operation is called stapedotomy or stapedectomy and usually takes about an hour. You might be asleep although some surgeons prefer to do the operation with only your ear anaesthetised so that they can monitor your hearing during the operation. Your surgeon should discuss the type of anaesthetic with you before the operation. A cut may be made above the ear opening or only inside the ear canal. The operation is done with the help of a microscope and some surgeons perform this with a telescope called an

endoscope. The top part of the stapes is removed with fine instruments. A small opening is then made at the base, or “footplate”, of the stapes into the inner ear. Some surgeons use a LASER to perform this procedure but it is not essential. A small piece of vein may be taken from the back of the hand to use as a graft inside the ear. It will not cause permanent harm to the hand. A plastic or metal prosthesis is then put into the ear to conduct sound from the remaining ossicles into the inner ear. You may have packing placed in the ear canal. All modern metal prostheses are not affected by MRI or airport scanners, should you need one in the future.

What will happen if I do not have the operation?

If you don’t want to undergo surgery you can consider a hearing aid or chose to undergo monitoring of your hearing level by regular hearing tests. Studies show that conductive hearing loss can very gradually get worse over a long period of time without surgical treatment.

How successful is the operation?

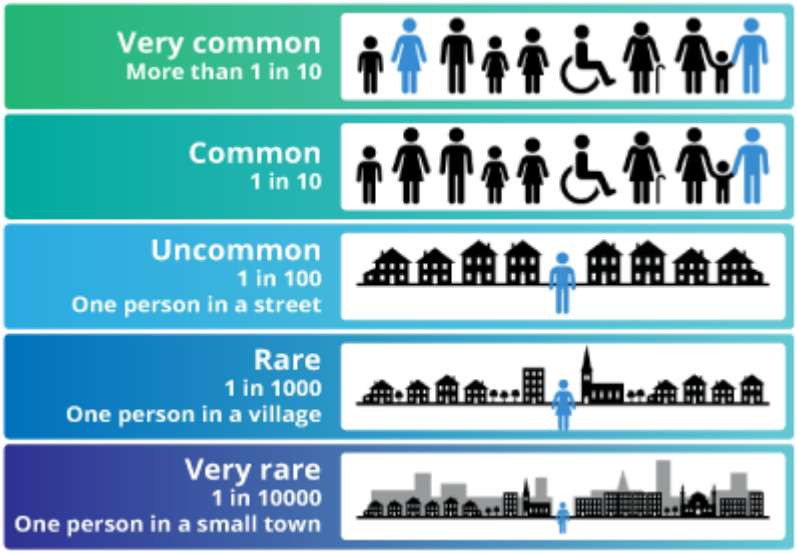
The chances of obtaining a good result from this operation by experienced surgeons are over 80%. This means that eight out of ten patients will get an improvement of hearing nearly up to the level at which their inner ear is capable of hearing. You should enquire personal success rate of stapedotomy from your surgeon. Many surgeons keep a database of their results.

WHAT ARE THE RISKS?

Are there any complications?

There are some risks that you must consider before giving consent to this treatment. You should consult your surgeon about their complication rate.

Complications and risks are grouped into the following categories:



- **Loss of hearing:** In about one in 10 people undergoing operation the hearing may not improve much. In a small number of cases the hearing may be further impaired due to damage to the inner ear. The chance of this happening is about one in 20. It can even result in a severe or total loss of hearing in the operated ear (dead ear). This may be to the extent that one cannot obtain benefits from a hearing aid in that ear. For experienced surgeons, this complication happens in around one in 100 patients. Therefore the poorer hearing ear is normally selected for surgery first.
- **Dizziness:** Dizziness is common for a few hours following stapedotomy and may result in nausea and vomiting. Some unsteadiness can occur during the first few days following surgery; dizziness on quick head movement may persist for several weeks. On rare occasions, dizziness is prolonged.
- **Taste disturbance:** The taste nerve runs close to the eardrum and may be stretched or occasionally is damaged. This can cause an abnormal taste on one side of the tongue and is common. This is usually temporary but it can be permanent in one in ten patients.
- **Tinnitus:** Sometimes you may notice noise in the ear called tinnitus (in particular if the hearing loss worsens after surgery). There are some people with otosclerosis who may have had tinnitus even before the operation and most of them improve after surgery. But there is also a small chance of developing new onset of tinnitus after surgery. For more information about tinnitus, you can read ENT UK's tinnitus information leaflet.
- **Facial Paralysis:** The nerve which moves the muscles of the face runs through the ear. There is therefore a slight chance of temporary facial paralysis after ear surgery. However permanent facial paralysis following a stapedectomy operation is very rare. The facial paralysis affects the movement of the facial muscles helping to close the eye, smiling and raising the forehead. The paralysis could be partial or complete. It may occur immediately after surgery or have a delayed onset. Recovery can be complete or partial.
- **Allergic Reaction:** Allergic reaction to the medication in the ear dressings: Some patients may develop a skin reaction to the ear dressings. If your ear becomes itchy or swollen, you should seek advice from your surgeon. The ear dressings contain medication to prevent infection.
- **Other important aspects to consider:** The uncommon risk of total loss of hearing, disturbance of balance or taste could have a serious implication to certain employments. You should discuss with your specialist about these concerns. Some specialists also advise against scuba diving, sky diving or use of firearms following a stapedotomy operation.
- **General anaesthetic:** The operation is usually performed under general anaesthesia. Complications include blood clots in the legs (deep vein thrombosis) or lungs (pulmonary embolism), heart attack, chest infection, stroke and death. The pre-assessment team and anaesthetist will explain what occurs

during a general anaesthetic and the associated risks that are relevant to you. This link summarises the common events and risks.

AFTER THE SURGERY

After the operation, you will be transferred to the recovery area. When your anaesthetic has worn off, you will be taken back to the ward or day case unit.

How long will I stay in hospital?

You will be discharged once your Surgeon is satisfied with your progress and you are not feeling dizzy. You will either go home on the same day of the operation, or the day after. If there is a complication following surgery, then you might need to stay in hospital for longer.

What else will I expect after surgery?

A slight amount of dizziness is normal after the operation. Any stitches will be removed one to two weeks later. There may be a small amount of discharge from the ear canal. This usually comes from ear dressings. Any packing in the ear canal will be removed after two or three weeks. You should keep the ear dry for the first few weeks. Plug the ear with a cotton wool ball coated with Vaseline when you are having a shower or washing your hair. Avoid straining (no heavy lifting) for the first few weeks after surgery. Only blow the nose gently if necessary. Avoid air travel until cleared by your surgeon. The hearing may not return to normal for up to three months. You should consult the surgeon if there is a sudden onset of deafness, dizziness or severe pain after you are discharged from the hospital. You are advised to avoid diving or flying when you have a cold if possible. Follow-up will be arranged by your surgical team.

What is the recovery period?

We recommend a couple of weeks to recover from this surgery.

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