



## Mastoid Surgery / Cholesteatoma

### QUICK FACTS

- Cholesteatoma is best treated by surgery if you are fit enough to have a general anaesthetic. A growing cholesteatoma sac can cause rare but serious problems, including meningitis, an abscess in your brain, total loss of hearing, permanent dizziness or a weak face.
- It is common to feel dizzy for a few hours after the operation. Rarely, the dizziness can last for months.
- After mastoid surgery, your sense of taste may be different on the same side as you had the operation. Permanent damage is uncommon.
- Your hearing may stay the same or improve after the operation. It could also become worse.
- Rarely, the facial muscles may be permanently weakened 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 does the ear work?

The ear consists of the outer, middle and inner ear. Sound travels through the outer ear and reaches the eardrum, making it vibrate. The vibration is transmitted through three tiny bones (the malleus, incus and stapes) in the middle ear. The vibration then enters the inner ear, where nerve cells produce signals that are carried to the brain, where they are interpreted as sound.

The ear also contains the balance system, which has semicircular canals containing fluid and hairlike sensors that help you keep your balance. The nerve that moves the muscles of the face runs through the ear. The ear sits very near to the brain, which lies just above it.

- Outer Ear
- Middle Ear
- Inner Ear

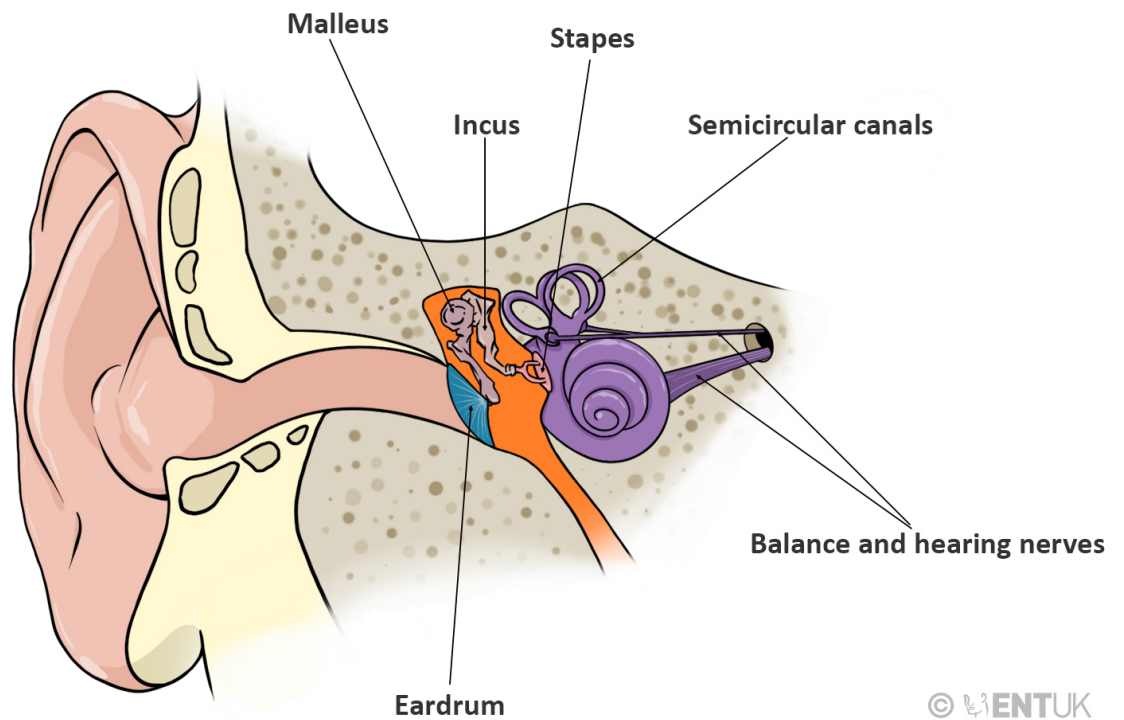


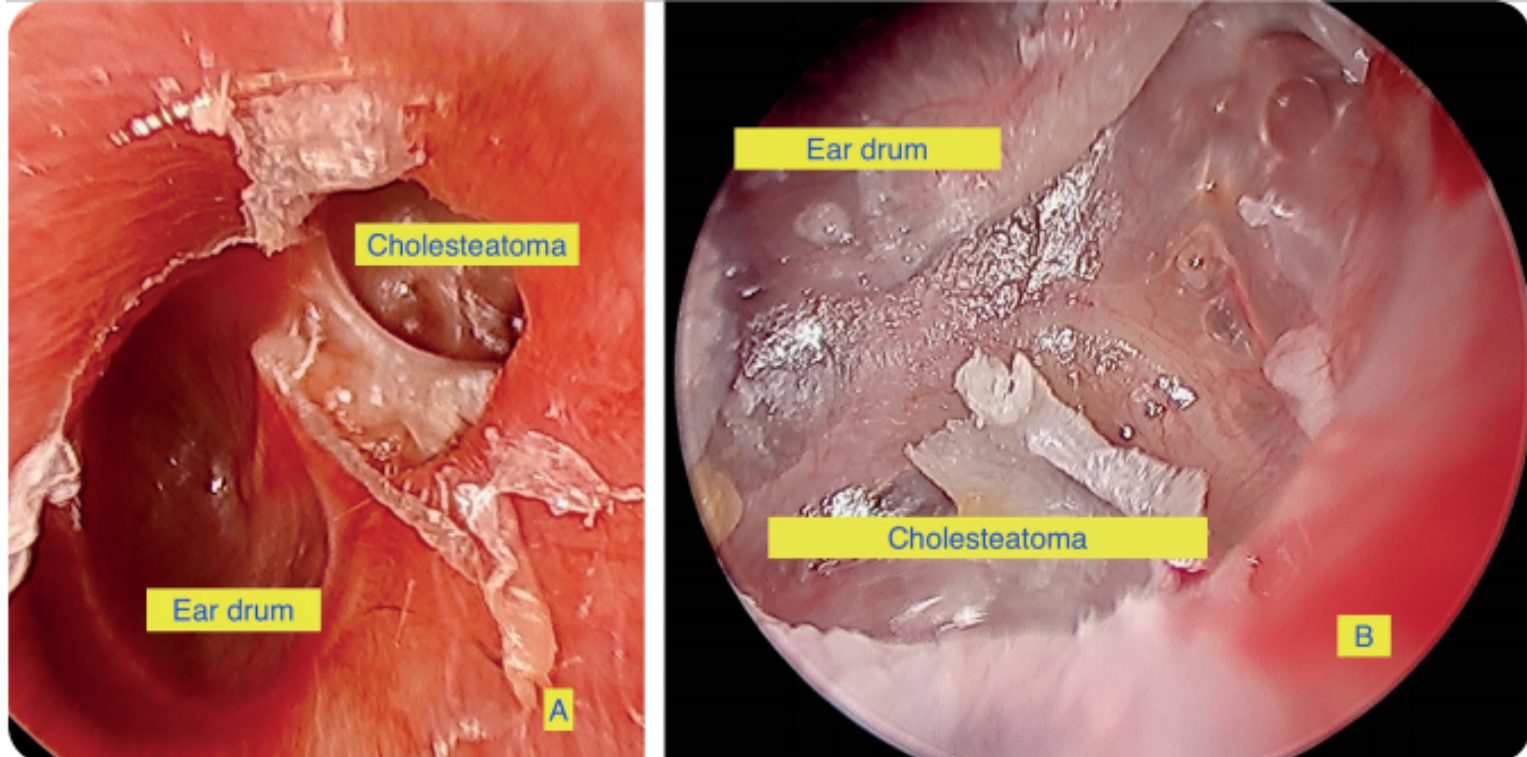
Figure 1: Anatomy of the ear

## What is the mastoid bone?

The mastoid bone is the prominent bony area that can be felt just behind the ear. It contains several air spaces and connects to the air space in the middle ear. Ear diseases in the middle ear can extend into the mastoid bone.

## Why do you need mastoid surgery?

The most common reason for mastoid surgery is a condition called cholesteatoma. This is a collection of dead skin cells that grows like a sac from the eardrum into the middle ear and mastoid bone. Sometimes mastoid surgery is performed to provide access for other operations, such as cochlear implant surgery.



*Figure 2: Photo A shows cholesteatoma in the top of the eardrum. Photo B shows cholesteatoma in the back of the eardrum.*

## What problems can develop from cholesteatoma?

Over a few years, as this sac of skin grows, it can cause repeated ear infections. As it gets bigger, the sac can also start to gradually wear away the surrounding structures in and around the middle ear. These include the small bones which transmit vibrations to the inner ear, the bony covering of the inner ear, the bone protecting the facial nerve, and the bone between the ear and the brain.

## What symptoms may I develop?

Repeated ear infections can cause pain and a smelly discharge from your ear. Structures in and around the ear wearing away can cause hearing loss. Your balance may be affected and you could develop tinnitus, which is a sound, such as buzzing, hissing or ringing, in your ear. Very rarely, the infection can cause complications such as meningitis and abscesses. This infection can also cause fever, severe pain and swelling around the ear, and a stiff neck.

## Will I need any tests?

Your consultant will examine your ear with a handheld instrument called an otoscope, which has a magnifying lens and a light. They may use a microscope to examine your ear more thoroughly and a suction tool to remove any earwax to give them a better view. This is very safe but can sometimes cause mild discomfort and dizziness. You will have an audiogram to check your hearing levels. Your consultant may also want you to have a CT scan or MRI scan.

## What treatment may I need?

Ear suction and treatment with antibiotics will only provide temporary relief from your symptoms.

The only safe and effective way of treating cholesteatoma is to have an operation to remove it.

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## ABOUT THE PROCEDURE

### What is the benefit of having surgery?

The main benefit of removing cholesteatoma is stopping ear infections. It can also prevent complications that might arise if the cholesteatoma grows.

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### What does surgery involve?

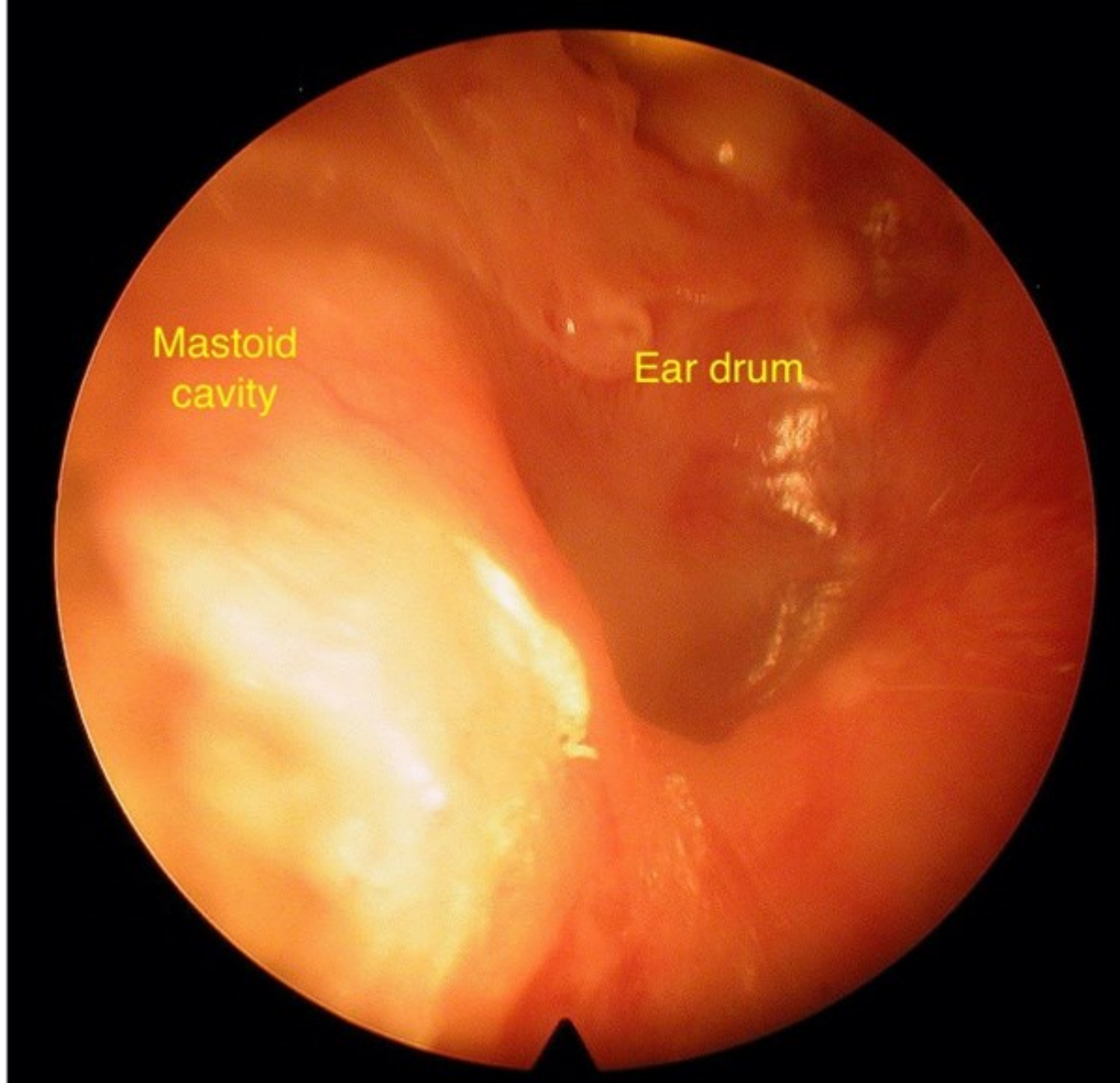
Mastoid surgery is also called mastoidectomy. There are different types of mastoidectomy, often depending on the size of the cholesteatoma. Other terms for this surgery include atticotomy, atticostomy and combined-approach tympanoplasty.

The operation is almost always performed under a general anaesthetic. It can take between one and three hours.

Cuts will be made above the opening of your ear or behind your ear and in your ear canal. If the disease is limited, some surgeons might do the operation through the ear canal, using a type of telescope (called an endoscope) to guide them. Surgeons will sometimes use a drill to open up the mastoid bone so that they can get to the disease. Sometimes other combined techniques with an endoscope and laser are used.

Once the bone covering the infection within the mastoid cells is removed, you will be left with a space known as a mastoid cavity. Some surgeons leave the mastoid cavity open into the ear canal. This allows them to inspect the mastoid cavity easily. Others close the mastoid cavity with bone, cartilage or muscle from around the ear. Sometimes the opening of the ear is made bigger to make it easier for the ear to be examined and cleaned in the outpatient clinic. You should discuss with your surgeon which approach you and they would prefer. At the end of the operation, packing will be placed in your ear. The packing can be left for up to three weeks while your ear heals, before it is removed at a clinic. Some surgeons use packing which does not need to be removed. Any stitches can be removed at your GP surgery after seven to 10 days. You may also need a bandage on your head for up to 24 hours.





*Figure 3: Picture of a mastoid cavity with larger ear canal and eardrum*

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## What are the alternatives to surgery?

Sometimes surgery might not be the best option for you. This is a decision you will make together with your surgeon. Having your ear cleaned regularly with suction at an ear, nose and throat clinic and using antibiotic drops when necessary may stop the disease from spreading, but will never cure it completely. There will still be a risk that you could develop a complication from the cholesteatoma growing. These rare complications include meningitis, brain abscess, facial weakness, dizziness and total loss of hearing.

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## Other things to consider

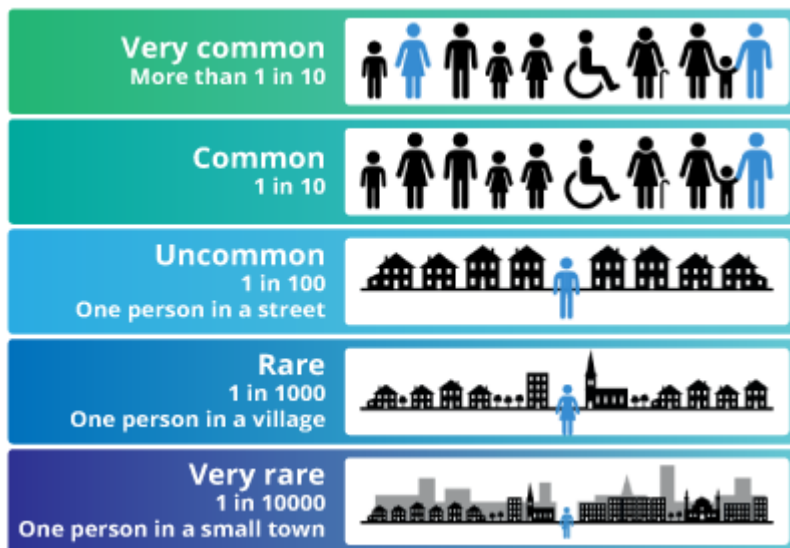
Mastoid surgery can cause problems if your job involves swimming, needs you to have an intact eardrum (for example, military jobs) or depends on your sense of taste (such as preparing food). You must discuss this with the surgeon before the operation.

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## ABOUT THE RISKS

### What are the risks of mastoid surgery?

Complications fall into one of the following categories.



- **Altered taste:** It is very common to find that food and drink taste different following surgery. This is because the nerve responsible for taste runs very close to the eardrum and may sometimes be injured during surgery. This abnormal taste happens on the same side of the tongue as the ear you had surgery on, and is usually temporary (although it can sometimes be permanent).
- **Facial weakness:** There is a rare complication of facial weakness following surgery. The risk is higher if you need a second operation on the same ear. The facial nerve, which controls movement of the face, runs through the mastoid bone and middle ear. Sometimes the nerve swells after surgery, but this is temporary and you will get back any loss of facial movement. If the nerve is damaged, there may be permanent weakness of the face muscles.
- **Allergic reaction:** The ear dressings contain medication to prevent infection. Some patients may develop a skin reaction to the medication in the ear dressings. If your ear becomes itchy or swollen, you should ask your surgeon for advice.
- **The disease coming back (recurrence) or not being completely cured (residual disease):** The risk of the disease coming back or not being completely cured is common to very common. The risk is higher with more extensive cholesteatoma because small areas of cholesteatoma may be close to important structures, such as the facial nerve or large blood vessels.
- **Loss of hearing:** Most patients will have some hearing loss before the operation. It is uncommon to lose your hearing completely after the operation. If the disease has damaged your inner ear or your balance system, there is a higher risk of total and permanent hearing loss.
- **Dizziness:** This is normally temporary but can last longer if the disease has damaged your balance system.
- **Tinnitus:** You may already hear a buzzing, hissing or ringing noise in your ear before your operation, but this can sometimes get worse after surgery. You may continue to experience tinnitus, especially if you have hearing loss.
- **Mastoid cavity:** If your surgeon creates a mastoid cavity, this may need to be cleaned regularly to avoid a build-up of wax. Infections can develop, causing a discharge from the ear. This can sometimes be a long-term problem.

## AFTER SURGERY

What should I expect after the operation?

After the operation, you will be transferred to the recovery area. When your anaesthetic wears off, you will be taken back to the ear, nose and throat ward. You will have a dressing over your ear and may have a bandage on your head.

Your ear will be sore after the operation and you will be given painkillers to take while you are in hospital, and some to take home. This discomfort often lasts for up to two weeks. You will have packing in your ear for up to three weeks, and this will make your ear feel blocked. You can expect a bit of bleeding due to the packing or your wound. You can use cotton wool and a dressing until the bleeding stops, but remember to change these regularly. If you have stitches, these will be removed by your GP practice nurse after seven to 14 days. If your packing starts to fall out, you can trim the loose end with a pair of clean scissors and leave the rest in place. You should keep your ear dry for as long as your surgeon advises.

If you have any concerns about your ear, please get in touch with the ear, nose and throat department at your local hospital.

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## How long will I stay in hospital?

You can sometimes go home the same day, but be prepared to stay in hospital overnight. If there is a complication following your surgery, you might need to stay in hospital for longer.

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## What is the recovery period?

How quickly you recover depends on the extent of your operation. You may be able to go back to work after two weeks, but you will have to keep your ear dry. Most people will fully recover after six to eight weeks.

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## Follow-up care

You will need an outpatient appointment at the hospital a few weeks after surgery. If you have packing in your ear, it will be removed at this appointment. Following mastoid surgery, it is common to need long-term follow-up care, especially if you have a mastoid cavity.

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