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Mastoid Revision Surgery

(Mastoid Obliteration)

Mastoid cavities are made at the time of surgery by drilling out the bone around the ear in order to remove a cholesteatoma or severe infection. These cavities open up backwards from the original ear canal.

Most mastoid cavities do not cause problems but patients need to keep them dry and not get water into them to try to prevent ear infections. Sometimes this means not being able to swim.
Some mastoid cavities cause problems for patients. They may collect a lot of skin debris as the skin cannot migrate out of the ear canal as it normally does. This dry skin debris will need to be removed periodically in order to make sure patients can hear and to prevent infection occurring in the dead skin.

Some mastoid cavities never settle down properly and remain moist inside. These cavities get infected and this results in a smelly discharge. These cavities need to be cleaned out frequently and have antibiotic ointments or powders put in to try to stop them getting infected. This can be quite distressing for patients.

Suction cleaning can also cause significant Vertigo (spinning sensation) for patients. This is because the balance organ (lateral semicircular canal) has been exposed by the drilling of the bone and is now only covered by a thin layer of skin. Therefore, when the sucker is used, the rapid movement of air over the Lateral canal causes a spinning sensation and sometimes associated nausea too. This can make it very difficult to clean a mastoid cavity thoroughly. Sometimes patients can experience Vertigo on exposure to the wind or extreme cold for the same reason.

Because of these problems, some patient have real problems using hearing aids too.

What can be done about this?

Revision surgery may be contemplated in order to get rid of these issues. I perform mastoid obliteration surgery in which the infected tissue is removed and then the mastoid cavity is filled in with a prosthetic material (Bon Alive granules) in order to get rid of the cavity. The granules are lined with pieces of cartilage taken from your own ear in order to reconstruct a smooth, new, ear canal wall. This will mean that the majority of ears will not need to be cleaned and patients can get them wet without getting ear infections. The operation is successful in more than 90% of cases.

At the same time as the mastoid is obliterated, if it is possible, a Tympanoplasty can be performed to try to improve any conductive hearing loss that may be present. With a dry ear it is also easier to use a hearing aid.

What does the operation involve?

The procedure is essentially the same as all your other ear operations.

Before the operation:

Arrange for 3 weeks off work.
Check that you have a friend or relative who can take you home after the operation.
You must not drive for at least 24 hours after a general anaesthetic.
Make sure that you have a supply of simple painkillers at home.

The day of the operation:

Admission is almost always on the day of surgery. The nurses will complete some routine paperwork and tests. You will be asked to change into a gown ready for theatre. The anaesthetist will come to see you and discuss the anaesthetic side of things. A member of the ENT team will also see you before your operation.

The anaesthetic:

The operation is performed under general anaesthetic.

The operation itself:

The operation is performed with you asleep (under general anaesthetic), and takes 2-3 hours in all.

Normally one of two possible approaches to the mastoid bone is used. In the first, the posterior approach, the incision is made in the skin crease behind the ear. In the second, anterior approach, the incision is made from the roof of the ear canal upwards into the hairline. All incisions through skin involve cutting through some of the smaller nerves in the skin and result in some skin numbness. The numbness generally improves with time but it may take weeks or months because the nerves re-grow very slowly.

The bone of the mastoid is gradually removed with a fine drill, working from the hole or pocket in the eardrum backwards and upwards, gradually widening the ear canal as far as is needed to clear out the infected tissue. Often some areas of the eardrum need to be removed as well as some of the small bones that transmit sound from the eardrum to the inner ear if they are also diseased and infected. If it is possible an attempt at reconstructing the hearing will be made (a Tympanoplasty).

The area of bone bare in the mastoid that has resulted from the drilling (the cavity) is then covered with a thin sheet of graft tissue taken from the covering of a flat muscle in the area. The cavity and ear canal are packed with an antiseptic dressing. This may be a long piece of gauze bandage soaked in a yellow antiseptic ointment containing iodine or a dissolving sponge dressing soaked in antibiotics. If you are allergic to iodine please let us know before the operation. In some cases the wall of the ear canal can be preserved (Combined Approach Tympanoplasty) or reconstructed (Mastoid Obliteration) to some degree at the end of the operation so that there is no cavity left after the surgery. Dressings will be placed in the ear canal after this procedure.

The skin wound is closed with some stitches and a pressure dressing is wrapped around the head to reduce any swelling or bruising around the ear over the next few hours. This dressing is removed prior to you going home.
The stitches used to close the skin may be buried and do not need to be removed as they will dissolve. If the stitches are not buried you will be given instructions on when to have them removed. Steristrips may be placed over the wound to protect it and these can be peeled off after 5 days.

After the operation:

After a short time in the recovery area you will be taken back to the ward. You will be encouraged to drink and then eat as soon as the anaesthetic has worn off. You will be given painkillers as required but the operation is not usually painful.

Your discharge from hospital:

You may be able to go home from hospital on the day of surgery (day case surgery). Following general anaesthesia, you will need to arrange for a responsible adult to pick you up from hospital, take you home and stay with you for 24 hours after discharge. Depending on how fit and active you are before your operation, you may need to arrange for someone to stay with you for a few days.

What should I do when I leave hospital?

Activity: Be sure to keep the ear dry and do not go swimming. The best way to achieve this is with cotton wool and Vaseline to the outer ear canal. The wound behind the ear can get wet. Pat it dry with a towel but do not rub it as you might open up the wound.

Flying: You should not fly until your surgeon is happy that the ear has healed. This is because changes in the ear pressure especially during take-off and landing can push the graft out of place. Healing can be confirmed by your surgeon in out- patients. This is usually at around 6 weeks after the surgery.

Driving: You should not drive for at least 24 hours following your operation. You can then drive when you are able to perform an emergency stop safely.
Work: You may feel rather tired for a week or so, but this will steadily improve. Returning to work will depend on your circumstances and type of work. You would normally need to be off work for 3-4 weeks. If your work requires heavy manual labour, then your surgeon may recommend that you have more time off to allow the ear to heal.

Wound care: There is often some bloodstained ear discharge over the next few days from the packing in the ear. This is to be expected and can be dealt with by placing some cotton wool in the outer ear. Do not use any ear buds in the ears as you will cause damage.
The cotton wool in the outer ear must be removed prior to putting in antibiotic drops if you were given some on discharge. A fresh piece of cotton wool can be put back in the ear if there is a lot of leaking. The operation is not usually particularly painful. There may be some discomfort around the ear and in the jaw joint area on chewing, but this is usually controlled by simple painkillers.

Some patients will have Steri Strips (thin, sticky plasters) on the wound. These can be removed by yourself after a week.

Stitches are usually buried under the skin and will dissolve but if you have stitches that are visable on the surface, they need to be removed a week after the operation, usually at the G. P.'s surgery. You will be informed by your surgeon which stitches you have.

Patients are asked to return to the E.N.T. clinic about 3 weeks after the operation for removal of the gauze bandage from the ear canal. This is normally a straightforward procedure but in some very young children, it may be performed under a short day case anaesthetic. If a large piece of dressing was to fall out of the ear soon after the surgery please contact your surgeon for advice as a new dressing may be necessary.

At the 3 week stage the mastoid cavity is beginning to heal itself, and you may be given some antibiotic and steroid eardrops to use for a week or two to keep the ear clean. Over the next few weeks it is hoped that the mastoid cavity will line itself completely with skin. Patients generally attend the clinic at intervals for the cavity to be cleaned if necessary. The frequency of the visits varies from every few months to every year or two.

Are there any risks involved in this operation?
The risks of revision surgery and obliteration are essentially the same as for your original surgeries on the ear.

Although modern surgery and anaesthetics are considered to be safe, all medical procedures carry some risks. The surgeon will discuss all these risks with you.

Risks associated with the operation are:

Taste disturbance: The taste nerve runs close to the eardrum and may occasionally be damaged. This can cause an abnormal taste on one side of the tongue. This is usually temporary but occasionally it can be permanent.

Numbness of the ear. Temporary loss of sensation to the ear (pinna). This may last a few weeks until the nerves recover.

Dizziness (loss of balance): Dizziness is common for a few hours following surgery. On rare occasions, dizziness is prolonged. There is an increased risk of this post operatively if there is already erosion of the inner ear structures.

Tinnitus: Sometimes the patient may notice noise (ringing or buzzing) in the ear, in particular if the hearing loss worsens. This may be temporary or permanent and is more likely to be permanent if it was present before the surgery.

Facial Paralysis: The nerve for the muscle of the face runs through the ear. Therefore, there is a slight chance of a facial paralysis (<1 in 1000patients). The facial paralysis affects the movement of the facial muscles for closing of the eye, making a smile 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.

There is a slightly increased risk of this if you have had a facial palsy in the past or if there is significant erosion of the bone over the facial nerve or disease around the nerve.

Reaction to ear dressings: Occasionally the ear may develop an allergic reaction to the dressings in the ear canal. If this happens, the pinna (outer ear) may become swollen and red and you may experience intense itching and a profuse watery discharge from the ear. You should consult your surgeon immediately so that he can remove the dressing from your ear. The allergic reaction should settle down with treatment after a few days.

Failure of the repair: The graft may not work and there may still be a perforation after surgery. This occurs in about 20% of patients. A further operation may be necessary.

Recurrent perforation. The ear drum may perforate again in the future after an infection etc. This may require further surgery to repair the hole.

Failure to improve hearing. An improvement in hearing may not be apparent despite the surgery being successful in repairing the perforation or removing disease or reconstructing the chain of bones. Abnormal scar tissue formation. This may result in a thickened, wide, red scar in front of or behind the ear. This may require further surgery.

Hearing loss: The number one priority of the operation is to make the ear safe. The hearing may not be any better after the operation, and may well be worse because some of the middle ear bones may have been infected and will have been removed. Even successful reconstruction of the ossicular chain (tympanoplasty) may not result in normal hearing. In a very small number of patients total deafness can occur if there is injury to the inner ear. This can also occur without any apparent injury to the inner ear as the hearing mechanism is very sensitive. Hearing loss is more likely to occur if the bone covering the inner ear is eroded by cholesteatoma or exposed by previous surgery. If there is complete hearing loss post operatively, the hearing loss in this case is not curable. A cochlear implant may be necessary to restore hearing.

Recurrent cholesteatoma and chronic middle ear disease. Cholesteatoma can recur in 10 to 20 cases in 100 even after successful removal. Patients therefore need regular follow up with their

surgeon who can identify an early regrowth. Further surgery will be necessary. This is also the case in chronic middle ear disease where persistent discharge and poor hearing occurs. This is more likely in children and several operations may be needed to treat the condition.

Mastoid discharge. It is not possible to guarantee that the mastoid cavity will be completely dry following surgery. Sometimes the healing of the cavity is incomplete and the lining remains moist and sometimes discharges. If this were to happen then the ear would need to be kept dry and plugged to stop water getting in when showering or swimming. Further surgery may be needed.

The Meatoplasty. As the ear canal is a little wider and there is less bone covering the balance organ in the ear, cold air blowing into the ear or cold water in the ear can make you feel dizzy for a short while, usually no more than a minute or two. A similar thing can happen in the clinic if the ear is cleaned using a fine suction tube. Occasionally as scar tissue forms, the ear canal may narrow down. Further surgery may be necessary.
Intracranial complications are very rare. These include CSF leaks, Meningitis and small brain hernias (encephalocoeles). These complications usually only occur after removal of very extensive cholesteatomas.

Jaw pain: the jaw joint in front of the ear canal may become inflamed due to drill vibrations or the opening of the mouth to insert the breathing tube for the general anaesthetic. This may cause spasm, pain and difficulty opening the mouth. This usually settles within a few days.
Delayed healing of ear canal skin: this is possible especially if there has been chronic infection of the skin prior to surgery. This requires careful cleaning and application of drops or ointment to prevent infection.

Risks associated with a general anaesthetic are rare and include:

Infection can occur, requiring antibiotics and further treatment.
Bleeding can occur and may require return to theatre. Bleeding is more common if you are on blood thinning drugs.
Chest infection. Small areas of the lung can collapse, increasing the risks of chest infections. This may need antibiotics and physiotherapy.
Blood clots in the legs (DVT) can cause pain and swelling of the legs. Rarely pieces of the clot can break off and can travel to the lungs (pulmonary embolism). This is a particular problem in obese patients. Patients may wear tight stockings and are advised to keep moving their legs to help the circulation. Blood thinning injections are often given to prevent this.
Heart attack or stroke could occur due to the strain on the heart.
Increased risk in obese patients of wound infection, chest infection, heart and lung complications and thrombosis (DVT).
Death as a result of a general anaesthetic/ this procedure is possible.

Are there any alternatives to this operation?

The only way to remove the infection completely is with an operation. In patients who are unfit for surgery, the only alternative is regular cleaning of the ear by an ear specialist and the use of eardrops. Sometimes the ear will have been examined and cleaned fully under a short day case anaesthetic to see if this will improve things.This would at best only reduce the ear discharge and would not deal with the underlying problem.
If you would like a second opinion about the proposed surgery please ask your G.P or Surgeon to arrange this.

Are there any risks of not having this operation?
If you decide not to have surgery your symptoms may persist or worsen.

Where can I find out more about the operation?

ENT UK have a patient information leaflet:
https://entuk.org/docs/patient_info_leaflets/09009_mastoid_surgery
or just Google ‘mastoidectomy information leaflet’ and many ENT departments around the country have produced their own patient information leaflets.
If you have any questions about general anaesthetics, the Royal College of Anaesthetists website has a lot of information:
http://www.rcoa.ac.uk/patientinfo