York and Scarborough Teaching Hospitals
NHS Foundation Trust

Glaucoma Surgery
Aqueous shunt device

Information for patients, relatives and carers

ⓘ For more information and advice if experiencing problems, please contact:

Ophthalmology Department

Willow Ward, Scarborough Hospital
Woodlands Drive, Scarborough, YO12 6QL
Tel: 01723 342215

Or

The Eye Clinic, York Hospital
Wigginton Road, York, YO31 8HE
Tel: 01904 726758

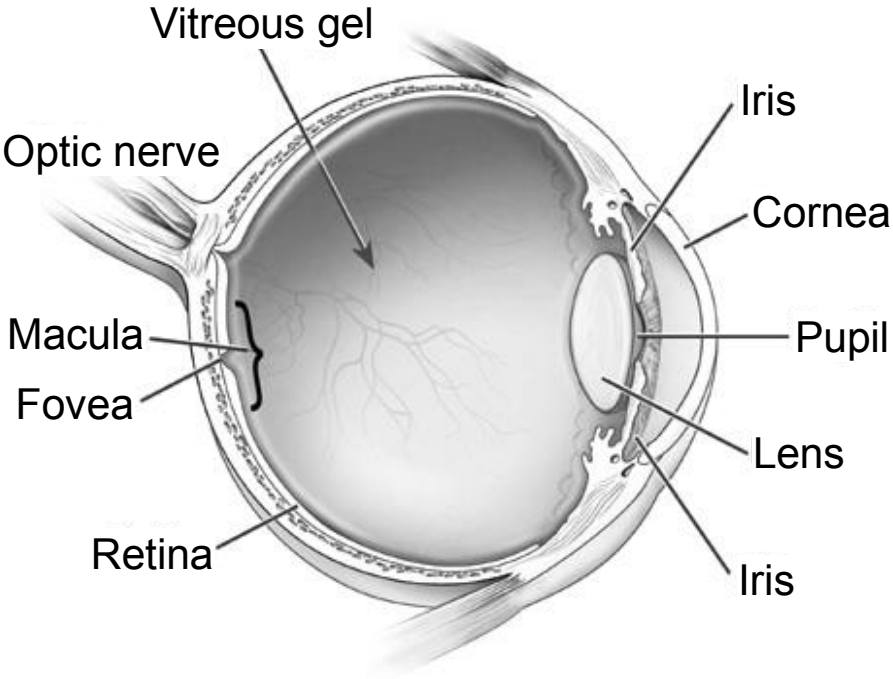
Weekdays after 5pm, Weekends and Bank Holidays
Tel: 01904 631313
Ask for ‘operator’ and then ask for the ophthalmic nurse or doctor on call

Contents **Page**

What is Glaucoma?

The optic nerve carries images from the retina (light-sensitive layer at the back of the eye) to the brain; allowing you to see (see figure 1). Glaucoma is the name given to a group of conditions that cause damage to the optic nerve where it leaves the eye. It affects 1 in 50 people over the age of 40. Glaucoma can cause loss of vision.

Figure 1: side view of the eye



Your Ophthalmologist will assess you and let you know if glaucoma surgery is suitable for you. However, it is your decision to go ahead with the operation or not.
This document will give you information about the benefits and risks to help you make an informed decision.

How does Glaucoma happen?

Glaucoma can be caused by an increase in pressure in the eye. Fluid (aqueous) is constantly being made in the eye and drains out slowly into the bloodstream. The pressure in the eye can increase if the fluid does not drain properly.

Sometimes the optic nerve can be damaged, even though the pressure in your eye is within the normal range.

Most people do not realise there is a problem in the early stages. This is because it is usually painless, and peripheral (side) vision is usually affected first.

What is an aqueous shunt or tube?

An aqueous shunt or tube is a tiny device that is used to decrease the pressure inside the eyes of people with high eye pressure or uncontrolled glaucoma.

The device is put into the eye during an operation that allows excess aqueous humour (fluid inside the eye) to drain. Your surgeon will place a plate towards the back of your eye where it will form the small blister or ‘bleb’ where the fluid will drain to. You cannot see the bleb as it is too far back behind your eye to see. By draining away the excess fluid inside the eye, the amount of pressure within the eye is reduced.

You can’t feel the bleb and tube, and you cannot feel the fluid flowing through them.

There are shunts with a small valve incorporated (Ahmed valve) and shunts with no valve (Baerveldt tube). Those with no valve incorporated, will require a stitch (suture) to be placed in the tube to restrict fluid flow, preventing eye pressure becoming too low. This may have to be removed later on depending on resultant pressure readings.

Why do I need to have an aqueous shunt?

Your eye surgeon has recommended a tube operation because:

- medical treatments (drops), or previous surgery have not controlled your condition properly; and/or
- drop treatment is unsuitable.

In some cases, this may even be the first choice of treatment. Your doctor makes the decision to operate after assessing your progress and condition. Normally, you do not need any eye drops or treatment after the aqueous shunt/tube operation.

What are the benefits of surgery?

The aqueous shunt/tube will reduce the pressure inside your eye, preserving the sight you still have. It will not restore any sight you may have already lost or improve your sight, but aims to prevent further loss of vision.

Are there any alternatives to surgery?

You can use eye drops to lower the pressure. If they do not work, surgery is usually recommended. Laser treatment may be suitable for you but is less effective than surgery.

What will happen if I decide not to have the operation?

The optic nerve at the back of your eye will become increasingly damaged. If you leave it untreated you are likely to lose vision in your eye. Surgery will not improve your vision but may stop it getting worse.

What does the operation involve?

The tube operation usually takes around one to two hours under a general anaesthetic.

Your surgeon will also insert a small silicon tube (less than 1 mm in diameter) into the front chamber of your eye. It is so small you would need a microscope to see it.

To stop the tube from moving around and becoming exposed through the conjunctiva, your surgeon will stitch a patch made from donor eye tissue onto the surface of your eye, over the tube.

The donor tissue comes from the UK transplant service after tests for infections such as:

- Hepatitis B and C
- Syphilis
- HIV.

There is no test for v-CJD (Mad cow disease) at the moment, but the risk of transmission from transplanted eye tissue appears to be extremely low.

Sometimes the surgeon may use a suture to stop too much fluid draining during the first few months. This means that your eye pressure could still be high until this suture has been removed

The surgeon may apply anti-scarring drugs onto the surface of your eye to improve the chances of the long-term success of the operation.

A variety of anaesthetic techniques are possible, including a general anaesthetic or a local anaesthetic that is injected around the eye to numb it. Your anaesthetist or surgeon will discuss the options with you and recommend the best form of anaesthesia for you.

It may happen that after the operation you will be able to reduce or completely stop your eye drops.

What happens after the operation?

After the operation, the inside of the eye is often inflamed (swollen). You will have anti-inflammatory drops to reduce this. You may need to use them as often as every hour. Your doctor or nurse will give you specific instructions about this, as every patient is different. The anti-inflammatory drops most commonly used in the hospital following aqueous shunt/tube are dexamethasone (Maxidex®).

You will also have antibiotic drops. These drops are used to prevent infection following the operation, and usually you need to use them four times a day. The antibiotic drop most commonly used in the hospital following an aqueous shunt/tube is called chloramphenicol. Your doctor or nurse will give you specific instructions about this, as every patient is different.

You will also have a plastic shield to wear at night. This is to prevent you accidentally rubbing your eye during the night. You should wear the shield for four weeks following the operation, unless otherwise instructed. You should wash and thoroughly dry the shield before covering your eye each night. You may also wear it during the day if you are concerned.

Will I have a follow-up appointment?

You will have an appointment in the outpatient department the following day to make sure the operation is working well.

You must attend the clinic follow-up visits as requested. In the initial period following the operation we need to regularly check that the operation is working well and there are no complications. You may have to attend the clinic every week or two for the first four weeks after the operation. You will start to visit less often after this. Your doctor will decide exactly how often you need to be seen, as every patient is different.

If you use glaucoma drops, you will usually stop putting them into the eye operated on after the operation. If you continue to use them, the eye pressure could drop too low, and this can be dangerous. Please check with the nurse or the doctor whether or not you need to continue using them if you are unsure.

If you are using glaucoma drops to the untreated eye, please continue to use them unless clearly instructed otherwise.

You will have a patch placed over your eye before we discharge you. A nurse will remove this when you come in for your outpatient appointment. If you have poor vision in the eye not operated on, you will have a clear shield instead of a patch over your operated eye so that you can still see and move around after surgery.

As with any operation, the affected part of the eye will take a little time to settle back to normal. It is normal that some patients find their vision is blurred. This may fluctuate from day to day for some weeks to months.

Once the eye has settled, a visit to your optometrist/optician for new glasses will usually improve your sight to very similar, if not the same, as it was before the operation. Your doctor will inform you when the right time for a glasses check is – usually around three months after the operation.

What should I do about my medication?

You should make sure your surgeon knows the medication you are on and follow their advice.

You may need to stop taking Aspirin, Warfarin or Clopidogrel before your operation.

If you are diabetic, it is important that your diabetes is controlled around the time of your operation. Follow your surgeon's advice about when to take your medication.

If you are on Beta-Blockers to control your blood pressure, you should continue to take your medication as normal.

What can I do to help make the operation a success?

Keeping in the same position

If your operation is being performed under a local anaesthetic, you will need to lie flat and still during the operation. If you cannot lie still and flat, you should let your surgeon know.

Your face will be covered with a cloth to allow your surgeon to work on a clean surface. Air will be blown gently towards your nose. If you are claustrophobic you should let your surgeon know.

Lifestyle changes

If you smoke, stopping smoking several weeks or more before an operation may reduce your chances of getting complications and will improve your long term health.

Try to maintain a healthy weight. You have a higher chance of developing complications if you are overweight.

Regular exercise should help prepare you for the operation, help with your recovery and improve your long-term health. Before you start exercising, ask a member of the healthcare team or your GP for advice.

Activity following aqueous shunt/tube operation

You should avoid stooping, bending and strenuous activity during the first couple of weeks, or until your doctor tells you otherwise. You should also avoid swimming and contact sports. However, it is safe to watch TV and read as normal.

If you work, you should arrange to be away from work for approximately two weeks, but this can depend on the:

- nature of your employment; and
- level of vision in your other eye.

You may need more time off if you do heavy manual, or dirty/dusty work.

In the long term, if you plan to travel abroad, you should let your doctor know, as you should take an adequate supply of drops with you. You should check with the eye doctor before travelling.

What complications can happen?

The healthcare team will try to make your operation as safe as possible. However, complications can happen. Some of these can be serious. You should ask your doctor if there is anything that you do not understand.

Any numbers which relate to risk are from studies of people who have had this operation. Your doctor may be able to tell you if the risk of a complication is higher or lower for you.

Occasionally after the operation, your **vision may not** be **as sharp** as before the operation. You may be concerned that your sight seems worse afterwards. However, if your doctor feels you need this operation, it is because he or she feels you are in danger of losing your sight altogether if the glaucoma is not controlled.

Your eyelid position might change after the operation and you may require another operation to correct this later on.

Infection is a complication that can occur after any operation, but serious infection is uncommon.

Certain symptoms that occur after the operation could mean that you need prompt treatment, including:

- excessive pain.
- sticky eye that continues to produce sticky discharge after gentle bathing with cooled boiled water.
- a sudden or very obvious worsening or darkening of your vision.
- shadows, veil or ‘spider web’ shadow of your vision.
- flashing lights.
- increasing redness of your eye.

Contact the hospital immediately using the numbers on the front cover if you have any of these symptoms. It could lead to you losing your sight altogether.

- Very rarely, the **eye pressure can drop too low** or fall low too quickly. Low eye pressure is the biggest risk after the operation. Low eye pressure can result in bleeding at the back of the eye, which is a very severe complication. This is why it is important for you to attend your follow-up appointments as scheduled.

- If your eye pressure is too low, a surgeon may need to inject some gel into the front of your eye. The doctor may also recommend increasing or decreasing certain eye drops.

- Occasionally you may need **another operation** to reduce the amount of fluid draining through the tube.

- Very rarely haemorrhage (bleeding) can occur inside the eye after the operation. This may permanently damage your vision.

1. Complications of anaesthesia

Your anaesthetist or surgeon will be able to discuss with you the possible complications of having an anaesthetic.

2. General complications of any operation

a. **Pain**

Pain after valve implantation should only be mild and is usually easily treated with simple painkillers such as paracetamol. You may feel pressure or mild discomfort. If you are in severe pain you should let your surgeon know as this is unusual.

b. **Bleeding during or after surgery**

Any bleeding should be mild and your eye may be slightly red. If it is red and painful, you should let your surgeon know, as this is unusual.

c. **Infection**

Can result in blurred vision or even permanent loss of vision (risk 1 in 300). Most infections usually happen in the first week after the operation but can happen later. If your eye becomes red and painful, and your vision becomes blurred, you should let your surgeon know straight away. You may need other procedures to control the infection.

4. Specific complications of this operation

a. Severe bleeding inside the eye during surgery which may cause permanent loss of vision (risk 1 in 2,000).

b. Bleeding at the front of the eye which makes vision worse (risk 1 in 4). This usually settles after a week.

c. Inflammation in the other eye (sympathetic ophthalmia) (risk: less than 1 in a million). This is a potentially serious complication which may be treatable. If you develop pain or blurred vision in your other eye, let your surgeon know.

d. Too much fluid draining (risk 1 in 5) which usually settles on its own. A tight eye pad or contact lens may be used. If it does not settle you may need a further operation.

e. Sharp rise in eye pressure causing sickness, pain and headaches (risk 1 in 600).

5. Late complications of this operation

a. Developing a cataract (lens becomes cloudy).

b. Reduced vision over time (risk 1 in 10). This is caused by glaucoma.

c. Valve exposure which may end up with infection and therefore has to be treated surgically.

d. Valve blockage.

e. You may need eye drops or further treatment to control the pressure.

How soon will I recover?

In hospital

After the operation you will be transferred to the recovery area and then to the ward or day-case unit. You should be able to go home a few hours after the operation. A responsible adult should take you home in a car or taxi and stay with you for at least 24 hours. You should be near a telephone in case of an emergency. Your surgeon will need to check your eye the day after the operation. They will see you several times in clinic during the first few weeks after your operation.

Your surgeon may massage the area around the drainage hole, inject anti-scarring drugs into the surface of the eye, and scrape away any scar tissue. These procedures are normally painless and are performed after your eye has been numbed with anaesthetic drops. If you are worried about anything, in hospital or at home, contact a member of the healthcare team. They should be able to reassure you or identify and treat any complications.

Returning to normal activities

You should not drive, operate machinery (this includes cooking) or do any potentially dangerous activities for at least 24 hours and not until you have fully recovered feeling, movement and co-ordination. If you had a general anaesthetic or sedation, you should also not sign legal documents or drink alcohol for 24 hours. Your surgeon will tell you when you can return to normal activities. Most people will need about two weeks off work.

For the first four to six weeks it is best to avoid activities such as swimming that will expose your eye to infection.

It is important to look after your eye to reduce the risk of complications.

Do not swim, lift heavy objects, or bend so your head is below your waist until you have checked with your surgeon.

Regular exercise should help you return to normal activities as soon as possible.

Before you start exercising, you should ask a member of the healthcare team or your GP for advice.

Do not drive until you can read a number plate from 20.5 metres (67 feet) and always check with your surgeon and insurance company first.

The future

Most people make a good recovery from the operation, with their glaucoma under better control.

Summary

- Glaucoma is a common problem, causing damage to the optic nerve where it leaves the eye.
- It usually affects people over the age of 40.
- If eye drops do not help enough, glaucoma surgery can be performed to stop further damage to the optic nerve. If traditional glaucoma surgery (trabeculectomy) does not work, aqueous shunt device implantation may be offered.
- Surgery is usually safe and effective. However, complications can happen. You need to know about them to help you make an informed choice about surgery. Knowing about them will also help to detect and treat any problems early.

This document is intended for information purposes only and should not replace advice that your relevant health professional would give you.

Tell us what you think of this leaflet

We hope that you found this leaflet helpful. If you would like to tell us what you think, please contact: Sister, Ophthalmology, The York Hospital, Wigginton Road, York, YO31 8HE or telephone 01904 726758.

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An answer phone is available out of hours.

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