

## Ophthalmology Department

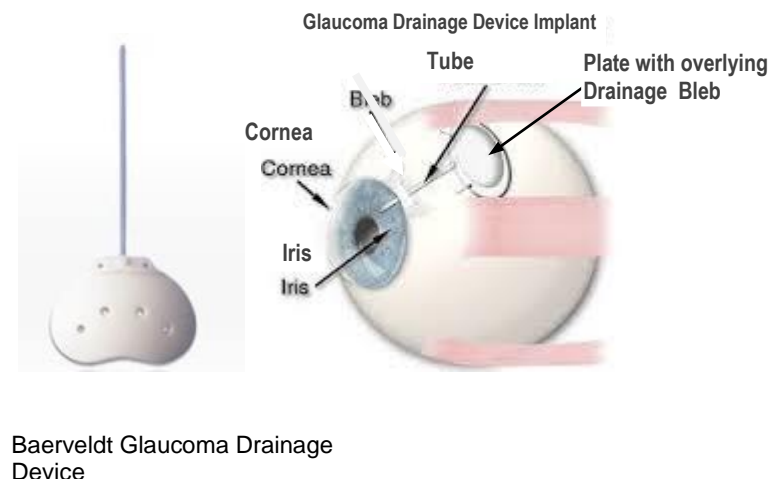
# Glaucoma Drainage Device Implantation (Glaucoma Tube Surgery)

This leaflet aims to give you information about glaucoma tube surgery.

## What are glaucoma drainage devices?

Glaucoma Drainage Devices (**tubes**) are used to reduce the intraocular pressure (eye pressure) in patients with glaucoma. They assist drainage of the fluid (aqueous humor) from inside the eye to a reservoir (bleb) behind the eyelid.

They have a small silicone tube (0.6mm in diameter) attached to a plate. The tube is inserted into the front chamber of the eye and drains fluid to a plate, which acts as a reservoir. This fluid is absorbed in the blood vessels on the surface of the eye. This reduces the pressure to reduce further damage to vision but will not restore vision already lost.



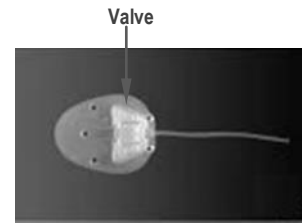
Baerveldt Glaucoma Drainage Device

The two devices commonly used are the Baerveldt glaucoma implant and the Ahmed Glaucoma Valve.



## Patient Information

Ahmed Glaucoma Valve has a type of valve that is set to open a certain minimum pressure only and helps to prevent very low eye pressure.



The Baerveldt implant does not contain valves but does have other advantages. To prevent the device from draining excessively, leading to low eye pressure, in the first few weeks after surgery it is blocked with one or more stitches (ligatures). One of these is tied around the outside of the silicone tube, and another one is threaded through the inside of the tube at the time of surgery.

### **Will having the drainage device implant affect how my eye looks?**

The eye will be a bit red and the lids will be swollen for many days but this resolves over time.

The implant plate is placed in the area underneath the upper eyelid. With the upper lid lifted, a clear or white patch (donor patch graft) that covers the tube might be noticeable. The plate portion of the device may just be visible when the upper lid is lifted. The end of the tube part of the device is placed inside the eye at the time of surgery. This is transparent and very small and cannot be seen with the naked eye.

### **Will the drainage lead to watering from the eye after surgery?**

The tube drains the aqueous humour which is a fluid inside the eye and is not related to the tears or watering from the eye. The increased drainage occurs within the tissues of the eye and is absorbed from there into the blood vessels. Your eye may water for other reasons while recovering from surgery or later.

### **What happens before the surgery?**

You will be advised to use appropriate drops and/or tablets in accordance with your treatment regimen **until the day of the operation.**

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A preoperative assessment of your general health will be carried out before surgery. Underlying medical conditions including heart disease, uncontrolled high blood pressure or diabetes will need to be addressed before scheduling the surgery. There should not be any active infection in the body at the time of surgery. If a new infection develops anywhere in the body before surgery the eye surgeon must be notified.

If you use blood thinning medications such as **Warfarin, Clopidogrel, Rivaroxaban** or **Debigratan** then **please advise your eye surgeon during the consultation and the nurse at preoperative assessment.** Some of these medications **will need to be stopped temporarily** to decrease the risk of bleeding with surgery. Patients who are taking Warfarin are advised to have their level (e.g. INR) checked regularly, ten days before surgery to ensure it is within the correct range.

## What happens during surgery?

Glaucoma drainage device surgery is often performed under general anaesthesia, though it may be possible to perform it under local anaesthesia in some cases. The surgery takes about two hours or more.

If you have surgery under local anaesthesia, you will be awake during the operation during which time you will need to lie relatively flat. The anaesthetic injection is given around the eye and may cause some discomfort; a slight sensation of pressure as the anaesthetic is delivered. The injection prevents pain and excessive eye movement during surgery. For many hours you may either see nothing out of the eye or have very blurred vision.

During surgery your face will be covered by a sterile sheet. You will be aware of the surgeon working around the eye, but should not feel pain.

Somebody will usually be holding your hand during surgery and in the event of any pain or discomfort; you should squeeze the hand holder's hand. This will allow the surgeon to be alerted. As this is a long procedure you might need a top up of the anaesthetic during the operation. You are also likely to hear the surgeon speaking to the scrub nurse and other members of the surgical team.

## **What special medications and materials are used during the operation?**

During the surgery, an anti-scarring drug called Mitomycin C may be applied to the surface of the eye to reduce the chances of failure due to scarring.

A course of intravenous steroid infusion may be prescribed in appropriate cases to reduce inflammation immediately after surgery.

A patch made from donor tissue is used to reinforce the tissues lying over the tube. This could be either donor cornea, sclera, the white outer layer of the eye or Tutoplast sterilised pericardium tissue which is taken from tissue around the donor heart. This reduces risk of exposure of the tube and infection leading to loss of vision. Donor tissues are tested to rule out infectious diseases such as Syphilis, Hepatitis B and C and HIV (the AIDS virus). It is currently not possible to test for Creutzfeldt-Jakob disease (CJD), otherwise known as mad cow disease or Bovine Spongiform Encephalopathy (BSE). The risk of transmission of this disease at present appears to be extremely low.

**\*\*Please note that after receiving donor tissue patients are currently no longer eligible to donate blood in the United Kingdom\*\*.**

## **What happens after the operation?**

Usually, you will be able to go home after a few hours when you have recovered from the general anaesthetic and feel well enough to go home. Your eye will be covered with a dressing which stays in place overnight.

Patients are advised to ask a friend or relative to accompany them home after surgery, especially patients who have poor sight in the un-operated eye or those who have had general anaesthesia.

Your eye may begin to feel sore once the anaesthetic starts to wear off. The pain isn't usually too bad and you can take your normal pain relief, such as paracetamol or ibuprofen, to help. You should take off the dressing the following morning at home and start drops after cleaning the eye.

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All patients need to be examined one day after surgery so a further visit to the hospital the following day is required for those having day case surgery.

### **How should I expect to feel during the postoperative period?**

It is normal for the vision to be blurred and the eye to be uncomfortable and red after surgery. The vision may be particularly blurred for two to four weeks following surgery, and then usually starts to improve.

Your eye will be watery and sore for some time after surgery, usually for one to two weeks. Soreness in the eye after surgery is partly due to surface stitches. These stitches are usually removed in few weeks. It can take two to six months for the eye to feel normal and the vision to stabilise near to the level before surgery.

### **Do I have to use eye drops after surgery?**

Eye drops will be prescribed after surgery.

These start the morning after surgery and are to be used regularly.

The postoperative eye drops will usually consist of:

- **An antibiotic (e.g. Chloramphenicol)** four times a day.
- **An anti-inflammatory steroid (e.g. Predforte or Maxidex or Dexamethasone)**. This will initially be required every two hours for a few weeks.
- **A drop** to keep the pupil dilated for about two weeks (**mydrilate or atropine**) may be prescribed if needed.
- **A course of oral steroid tablets** is likely to be prescribed in most cases.

The postoperative eye drops will normally need to be taken for three to six months. Patients are advised at each post-operative visit whether a change in the dosage of drops is required. Some patients will also need to continue their pre-operative glaucoma drops – your surgeon will tell you which drops you need to take.

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**It is important that any eye drops for the un-operated eye are continued as before unless advised otherwise.**

**The drops should not be stopped or the dosage changed without consulting your eye surgeon.**

### **How often will I need to be seen after surgery?**

After the first review on the day after surgery, all patients are seen a week later and regularly for some weeks following the operation. Some patients may require additional injections of steroids or 5-Fluororacil, an anti-scarring medication. You may need to go theatre to have additional stitches.

### **What happens to the eye pressure immediately after surgery?**

The eye pressure will take many weeks to settle down after surgery. It can vary both predictably and unpredictably and will need to be controlled as required.

### **High pressure after surgery**

If you have had a Baerveldt implant it may have a ligature as previously described. This could lead to high pressure for a few weeks requiring glaucoma medications to continue. The external ligature may be a self-dissolving suture that absorbs between four to eight weeks after surgery or a suture that can be lasered as required. The suture inside the tube will usually need to be removed after two to three months and occasionally sooner. This requires a small operation to have it removed. It is normal for the device to start draining after the ligatures have been absorbed or removed.

In some cases, particularly with the Ahmed valve, the pressure may go up after a few weeks of surgery. This is called the hypertensive phase and is due to the healing response of the body. This is usually controlled with pressure lowering drops.

### **Low pressure after surgery**

Sometimes the pressure may be too low after surgery as every eye behaves differently. This is usually detected during clinic appointments and is often remedied by stopping any pressure-lowering eye drops and reducing steroid eye drops. Sometimes an injection of a jelly like material (viscoelastic) in the front chamber of the eye is required to raise the pressure. Occasionally, a further operation is needed to reduce the drainage from the tube.

### **What activities can I do after tube surgery?**

It is very important to avoid strenuous activity during the early post-operative period. If the eye pressure is very low after surgery the surgeon may suggest refraining from all exertion and remaining sedentary until the pressure is restored. Please consult your surgeon before commencing strenuous activity.

### **What can I usually do after the operation?**

- ✓ Most normal non strenuous daily activities
- ✓ Walking (be careful on the stairs)
- ✓ Watching television
- ✓ Reading
- ✓ Move around the house and bend carefully
- ✓ Wear sunglasses outside in windy weather and/or bright sunlight
- ✓ Sexual relations should be limited to a kiss and a cuddle until the eye is healed

### **What should I avoid after the operation?**

- X Rubbing your eye
- X Any vigorous activity including contact sports, squash, badminton, swimming, gardening and vacuum cleaning.
- X Driving for a minimum of four weeks after the operation or until the eye has settled, whichever is later. Before started driving please confirm with the surgeon that your eye pressure has stabilised. You



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should be able to read the new style car number plate at 20 metres and your eye should be comfortable.

- X Eye make-up for three months.
- X Splashing water into the eye. (Please shower from the neck down.
- X Back-wash your hair for the first week. This is to avoid getting soap or shampoo in the eye)
- X Dusty atmospheres.

## **What eye care is required following tube surgery?**

You may clean the eyelids with lid wipes available from your local pharmacy. Soft clean cotton wool soaked in sterile water can be a very useful alternative. Do not apply significant pressure to the eye and take care not to scratch it. You will also be asked to wear a protective clear eye shield at night for the first one to four weeks.

## **When can I go back to work?**

The duration of time off work will depend on nature of your work, the state of the vision in the other eye and the pressure in the operated eye. Typically someone working in an office environment would require at least two weeks off. Someone whose occupation involves heavy manual work or work in a dusty environment may require one to two months or sometimes more (for example construction workers, farmers). Patients are advised individually.

## **Can I wear contact lens wear after surgery?**

Not everyone can continue to wear contact lenses after glaucoma drainage device surgery, so this is something to consider before having the operation.

## **Can I travel abroad after the operation?**

Going on an aircraft after a few weeks is safe. It would be wise not to travel abroad until things have stabilised, in case an emergency should arise. Please ensure you are available for regular follow up for at least three months after the surgery.



## **What are the success rates of this type of surgery?**

The success rate of glaucoma drainage device surgery varies according to the type of glaucoma, previous surgery, race, age and other conditions. However studies suggest that 70% of patients will achieve a control of eye pressure over three to five years. There may be a need for additional glaucoma medication or surgery.

## **What are possible complications after surgery?**

Severe complications are uncommon and steps are taken to prevent these but it may not be possible to prevent these in all cases. Complications can include:

### **Infection**

As there is an implant in the eye, there is a long-term increased risk of infection. While infection is uncommon, it may be very serious and can result in irreversible visual loss or rarely loss of eye.

### **Bleeding**

The eye does not like sudden changes in pressure and this can cause a sudden bleed in the eye. Severe bleeding in the eye is very uncommon and is more likely to occur when the pressure before surgery is very high, or in eyes that are very short sighted, or have had previous retinal detachment surgery.

### **The pressure may go too high**

Everyone has some degree of scarring following surgery as the body has a natural healing reaction around any opening. In some cases this may result in a return to high pressures.

### **Low eye pressure (Hypotony)**

If the pressure is too low in the eye, swelling may occur at the back of the eye and the vision may become significantly blurry. Very low pressure or a sharp drop in pressure can result in bleeding at the back of the eye (choroidal haemorrhage) and prolonged low pressure can result in a permanent reduction in vision.

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About 1 in 20 Glaucoma drainage device surgery patients are likely to require a return to the operating theatre in the first month after surgery for adjustment, either because the pressure is too low or too high or for additional stitches to the wound. Most patients with a Baerveldt tube will require removal of the internal stitch in due course.

### **Discomfort**

It is very common to have a gritty sensation following eye surgery. In most cases this settles as the eye heals. In some patients drainage bleb or the donor graft may disturb the tear film on the eye surface, and can create a long term feeling of discomfort or drying of the eye. This is usually relieved with ocular lubricating eye drops. Occasionally, the discomfort is more severe and requires surgery to revise the implant.

### **Cataract**

All eye surgery increases the risk of cataract formation in the eye or can hasten progress of a pre-existing cataract. If the cataract becomes symptomatic it can be dealt with surgically.

### **Changes in eye-lid position**

This surgery may cause the upper eyelid to droop or retract a bit. This is due to number of factors including steroid drops, anti-scarring agents, the drainage bleb and the implant. In majority of cases this settles with time but in some cases it may need surgical correction.

### **Changes in prescription of glasses**

Most patients require a small change in their glasses prescription after glaucoma drainage device surgery. Patients should wait for at least 3 months after the surgery or until the eye pressure has stabilised and check with the eye surgeon before changing glasses. Sometimes, a patient who does not require glasses before surgery develops a need for glasses after surgery.

### **Loss of vision**

Uncommonly irreversible loss of vision may happen after surgery (< 1:100), or very rarely, loss of the eye may occur. The risk varies with the

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type and stage of glaucoma, patient's age, race, other eye conditions and previous surgery.

## Sympathetic Ophthalmia

The other eye may be very rarely affected by surgery in one by simultaneous inflammation in the two eyes causing loss of vision.

**Important note:** Glaucoma drainage device surgery does not prevent your eye from developing other eye diseases like macular degeneration, blood vessel abnormalities or other optic nerve problems in the eye. Some of these are not uncommon in patients with glaucoma and can develop anytime independent of the surgery.

## What are the risks of not having surgery?

If eye pressure remains high then there is a risk of gradual, **irreversible** loss of vision.

## When do I need to contact the hospital or eye casualty?

**Contact the hospital or eye casualty urgently if:**

- Your eye becomes more painful or more red than on the day you went home.
- Your eye develops a sticky discharge.
- Your lids start to swell.
- Your vision begins to deteriorate
- You get sudden floaters or flashes in your vision

## Further Questions

If you have any further questions about your surgery or aftercare, please do not hesitate to discuss the matter with a doctor or member of staff before proceeding with your surgery.

Any queries about information in this leaflet please contact:

## Patient Information

**Mr Atul Bansal** (Consultant with special interest in Glaucoma and Cataract surgery) through

Glaucoma secretaries: Michelle Donnelly / Jackie Banwell : Tel: 024 76 96 6502 or

Resha Wilmot, Failsafe Officer/Glaucoma Support Team: 024 7696 6528

## Useful contacts for further information

### International Glaucoma Association

Woodcote House, 15 Highpoint Business Village Henwood,  
Ashford, TN24 8DH

Telephone: **1233 64 81 70** Email: [info@iga.org.uk](mailto:info@iga.org.uk)

Website: <http://www.iga.org.uk>

### Royal College of Ophthalmologists

17 Cornwall Terrace, London NW1 4QW t: 020 7935 0702

Website: [www.rcophth.ac.uk](http://www.rcophth.ac.uk)

### Royal National Institute of Blind People

105 Judd Street, London WC1H 9NE t: 0303 123 9999

Email: [helpline@rnib.org.uk](mailto:helpline@rnib.org.uk) Website: [www.rnib.org.uk](http://www.rnib.org.uk)

## Important Disclaimer

The information provided in this booklet is designed as an adjunct to, and not a substitute for, professional healthcare advice by a qualified eye surgeon, doctor or other healthcare professional, which will be tailored to a patient's individual circumstances.

While every step has been taken to compile accurate information and to keep it up to date, its correctness and completeness cannot be guaranteed. Patients are encouraged to seek further information and or opinion, as they feel necessary, in making decision about their surgery and not rely solely on the information in this booklet.

## Patient Information

The Trust has access to interpreting and translation services. If you need this information in another language or format please ask and we will do our best to meet your needs.

The Trust operates a smoke free policy.

To give feedback on this leaflet please email [feedback@uhcw.nhs.uk](mailto:feedback@uhcw.nhs.uk)

### Document History

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# Emergency eye appointments: New booking system

If you have an urgent eye problem, you can now book an on-the-day telephone consultation via the Eye Emergency Referral Service (EERS).



Scan the QR code or visit [www.uhcw.nhs.uk](http://www.uhcw.nhs.uk) and search Eye Emergency Referral Service. You can book a telephone consultation via this link.

You will be spoken to by an expert clinician who will give you specialist advice on the next steps to take.

Please provide a phone number which you can be contacted on for the consultation. Please also be aware that you will be phoned as close to the allotted time as possible, although at busy times unfortunately there may be a delay.

**In the event that you feel you cannot wait to speak to someone or do not have online access then you may call 0247 696 4800.**

**This phone line is open 9am - 1pm; 1.30pm - 5pm (Monday - Friday, excluding bank holidays) and 9am - 12pm (Saturday).**

Please only attend the Eye Outpatient department if you have had a telephone consultation in advance and have been advised to attend.

In the event of an eye emergency out of hours, please attend the Minor Injuries Unit/Emergency Department.