



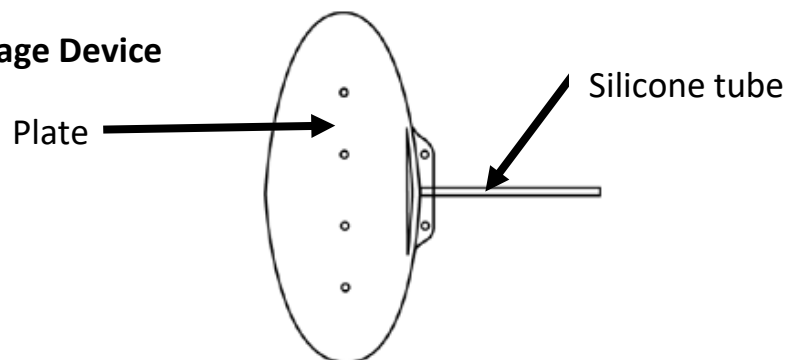
## What is a glaucoma drainage device (GDD)?

Glaucoma drainage devices, also called aqueous shunts or tubes, are small plastic devices used to lower the pressure inside the eye (intraocular pressure). The eye produces fluid (aqueous humour), which circulates around the front of the eye (anterior chamber) and then drains away through a drainage channel (trabecular meshwork). In glaucoma the drainage channel in the eye is not working.

Glaucoma drainage devices are made up of a small silicone tube (less than 1 mm in diameter) attached to a plate. The silicone tube is inserted into the front of the eye (anterior chamber) allowing the aqueous humour to bypass the blocked drain of the eye (trabecular meshwork), thus lowering the eye pressure. The fluid drains through the silicone tube to the plate, forming a small blister (bleb) under the upper eyelid. You cannot see the bleb.

There are several different glaucoma drainage devices, such as the Baerveldt tube implant. This device has no valve between the silicone tube and the plate to help control the eye pressure. To prevent the eye pressure from becoming too low, two groups of sutures are used. There is an occluding suture within the silicone tube and a ligating suture around the tube. This means that the GDD will not fully function until these sutures have been removed. You may need to continue your glaucoma medication after the operation until these sutures are removed.

### **Baerveldt 350 Glaucoma Drainage Device**



## **What are the benefits?**

The operation is often suggested because at the current level of eye pressure it is likely that the patient will lose vision in the eye. A tube implant will not restore vision already lost from glaucoma. The operation will not improve the vision. The purpose of tube surgery is to lower the eye pressure. This should stabilise the vision and prevent further damage to the vision and this is achieved in 70 to 80 % of patients. Although a sizeable proportion of patients achieve good pressure control without the need for continued glaucoma medication, many patients still require some medication to assist the tube in controlling the pressure.

## **Complications**

### **Vision**

The vision may be blurred for 1 to 2 weeks following surgery and then start to improve. It can take 2 to 3 months for the vision to stabilise and the eye to feel back to normal. You may need to update your glasses after the operation. 5% of patients have some small permanent reduction in vision after surgery. Severe sight threatening complications are rare. However, there is a small risk that the eyesight will be permanently worse after the operation. The risk of sight loss from infection or bleeding in the eye at or around the time of surgery is approximately 1 in 200.

### **Eye Pressure Control**

The eye pressure can drop too low after surgery (hypotony). The ligating and occluding sutures are there to prevent this. If the eye pressure falls too low, then either gel can be injected into the front of the eye or further surgery may be required to restore the eye pressure.

The eye pressure may rise sharply after the operation (aqueous misdirection). This usually requires further surgery. The risk is approximately 1 in 600.

## **Cataract**

If you have not already had cataract surgery, a cataract is more likely to develop after a GDD operation. This can be treated with surgery.

## **Infection**

There is a small lifelong risk that the drainage bleb may become infected, the risk of this occurring is approximately 1 in 100.

## **Erosion**

There is also a small long-term risk that the GDD will erode. The layers of tissue covering the implant can break down exposing the implant, increasing the risk of infection. To stop the GDD from becoming exposed a patch graft called tutoplast or a scleral patch graft may be placed over the tube. Please note that after receiving donor tissue you may no longer be eligible to give blood. If you wish to continue as a blood donor, please contact NHS Blood and Transplant and they will be able to advise you. Tutoplast is donated human pericardium (the tissue surrounding the heart) which is chemically treated to remove potential sources of infection and to ensure that your immune system does not react to the graft material.

## **Blockage**

Rarely the tube may block, requiring further surgery to unblock the tube.

## **Corneal damage**

There is a small risk that the tube may rub against the cornea (the transparent window at the front of the eye). Further surgery to move the tube or, in rare cases, a corneal transplant, may be required.

## **Double Vision**

5% of patients will experience double vision after tube surgery. This usually resolves with time, although in some cases further surgery may be needed.

## **Droopy Eyelid**

The upper eyelid may droop a little (upper lid ptosis). The risk of this occurring is approximately 5%. This usually recovers, but if not it can be corrected with surgery.

## **Before surgery**

Continue all your eye drops and tablets as per normal. You will need to be able to lie flat for the duration of the operation. If you are unable to lie flat, please let us know before the day of surgery.

## **If you are taking blood thinning agents**

Aspirin 75mg should be continued as per normal. If you are taking a higher dose of aspirin or clopidogrel, you may need to stop these 10 days before your operation and advice will be provided on alternative blood thinning options. If you are on warfarin please have your INR checked within 7 days before your surgery to ensure that it is below 2. Please have your anticoagulant booklet containing your blood results with you on the day of surgery. If your therapeutic range is above 2 we will advise you in collaboration with your doctor on alternative blood thinning options.

### **If you are taking Rivaroxaban, Dabigatran or Apixaban**

Rivaroxaban – Please do not take the morning dose on the day of surgery, take that day's dose 4 hours after your operation and take the next day's dose at the normal time.

Dabigatran or Apixaban – Please do not take the morning dose. Take the evening dose 4 hours after the operation and take the next day's dose at the normal time.

### **If you are Diabetic**

If your blood glucose is greater than 13 mmol/L, your operation may be cancelled. Your GP can help you improve control of your blood sugar levels.

### **Anaesthesia**

Most tube operations are performed under local anaesthesia with sedation. Please do not eat or have a drink that contains any milk for 6 hours before your appointment. You may have a drink without milk e.g. water, black tea or black coffee up to 2 hours before your appointment time. This drink must not contain any milk. Please do not drink anything for 2 hours before your appointment.

### **On the day of your operation**

All medicines, including eye drops, should be used on the day of surgery unless you are otherwise instructed. Tube surgery typically lasts 1½ hours, but please allow 3 to 4 hours for your appointment. This is a day surgery procedure and you will be discharged from hospital on the same day as your operation. The eye is normally covered with an eye pad after surgery and this is removed in clinic the next day. You are advised to have a friend or relative to accompany you home after surgery.

## **Anaesthesia**

After the eye has been anaesthetised with drops, an injection of anaesthetic will be administered around the eye. This will prevent any pain and excessive eye movement during surgery. Sedation will be administered to relax you during the operation, although you will still be awake.

## **After Surgery**

You will be seen one day after surgery and then weekly for the first 4 weeks following the operation. You may be seen more frequently if the eye pressure is too high or too low. Please avoid rubbing your eye. You will be asked to wear a clear plastic eye shield at night for the first 2 weeks, to prevent accidental injury whilst you sleep.

## **Eye Drops**

It is important that any eye drops for the unoperated eye are continued. You will be advised on the day after the operation if acetazolamide tablets and any glaucoma drops that you are already using for the operated eye should be stopped or continued. A steroid (dexamethasone) one drop to the operated eye every 2 hours / 8 times a day and an antibiotic (chloramphenicol) one drop to the operated eye every 4 hours / 4 times a day will be given to you after the operation. It is not necessary to use these eye drops the first night after surgery. These post-operative drops will normally need to be used for 2 to 3 months after surgery. Although initially the drops are used very often this will soon be reduced at clinic visits. Do not stop the dexamethasone or chloramphenicol drops until you have been told to by the doctor in clinic. Repeat prescriptions for these drops will need to be obtained from your GP.

## **Post-operative clinic visits**

These visits are very important to secure the long-term success of the operation.

There are two groups of sutures helping to control the eye pressure: ligating sutures around the silicone tube and an occluding suture within the tube. Depending on the eye pressure, the ligating suture may be cut, using a laser, to enable the GDD to partially work. This procedure is performed in clinic.

The occluding suture is usually removed after 3 months. This will allow the GDD to fully function. Removing the occluding suture requires a short operation, under local anaesthesia, in the operating theatre.

## **Activity after Surgery**

Reading, using a computer and watching TV are all permissible after surgery. These will not harm your eye. Please avoid heavy lifting, gardening and housework for 2 weeks. For the first 2 weeks ensure no water enters the eye whilst showering / hair washing. Please avoid strenuous activity eg tennis, jogging, gym, contact sports or swimming for at least 6 weeks after surgery. Please consult the doctor in clinic before recommencing strenuous activities. Gentle exercise eg walking is fine. For patients who wish to pray, you may kneel, but please do not bow your head down to the floor for the first 2 weeks. Similarly, activities eg yoga that involve a head down posture should be avoided during this time. Avoid using eye make up for the first 4 weeks. When you resume using eye makeup please use new makeup to reduce the risk of infection.

Driving: The time when you can return to driving is dependent on a number of factors. Please discuss this with your doctor in clinic.

## **Returning to Work**

The duration of time off work will depend on a number of factors such as your employment, the vision in the other eye and the eye pressure in the operated eye. Typically, someone working in an office requires 2 weeks off work. Occupations involving heavy manual work eg construction work may require 4 weeks off work.

## **Contact lens wear**

It is usually possible to restart contact lens wear around 4 weeks after tube surgery.

## **Travel**

You may fly following the operation, but you need to attend many outpatient appointments in the first 2 months, which are crucial to the success of the operation. It is best not to plan to travel within the first two months following surgery.

## **Emergency contact**

Contact us immediately if you have: loss of vision or your eye becomes increasingly red and painful.