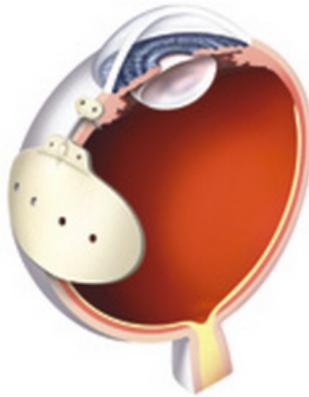




## Patient Information Leaflet – Glaucoma Procedures

### Glaucoma Tube Surgery



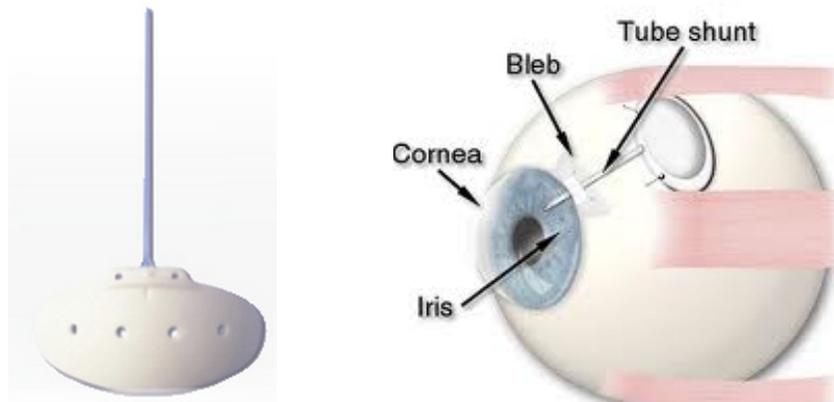
#### What is a glaucoma tube?

Glaucoma tubes are surgical devices used to reduce eye pressure (intraocular pressure) in glaucoma. They do this by allowing fluid (aqueous humour) to drain from inside the eye, through the tube, into a reservoir (or bleb) hidden under the upper eyelid. Aqueous humor is a fluid inside the eye and is not related to the tears. Reducing the pressure on the optic nerve is important to help reduce the risk of further damage to the nerve and to prevent further loss of vision from glaucoma. It is important to remember that surgery will not improve vision.

Glaucoma tubes have various other names such as glaucoma shunts, glaucoma drainage devices, glaucoma drainage implants or aqueous drainage devices. These are all names for the same thing. The two main types of glaucoma tube are named after their inventors and are called the Ahmed Glaucoma Valve and the Baerveldt Glaucoma Implant. Although these tubes work in a similar way there are some important differences.

Tubes are made from a soft silicone tube (less than 1 mm in diameter) attached to a plate.

The picture below shows a Baerveldt tube.



The tube is placed inside the front chamber of the eye. This allows fluid to drain out of the eye towards the plate. The plate sits on the white of the eye (the sclera). The plate will not be easily visible as it is buried under the skin of the eye (the conjunctiva).

The main importance difference between the Ahmed Glaucoma Valve and the Baerveldt glaucoma tube is that the Ahmed has a valve inside it that helps prevent too much fluid draining from the eye and the eye pressure going too low. The Baerveldt tube does not contain a valve but has other advantages.

As the Baerveldt tube has no valve, it must be temporarily tied off at the time of surgery by placing a stitch around the outside of the tube (ligating stitch). This stitch can prevent the pressure going too low due to fluid draining too quickly. During the first 6 weeks after surgery the eye will begin to heal around the plate and form a reservoir to collect fluid draining from the eye. If the tube were to open too soon, before the reservoir forms, the eye pressure could become too low. At about 6 weeks after surgery the ligature stitch around the tube will dissolve allowing the tube to open. As the tube is tied off it is quite normal for the eye pressure to remain a little high during the first 6 weeks after surgery.

To further reduce the risk of eye pressure dropping too low when the stitch dissolves, another stitch (called Supramid) is also put inside the tube at the time of surgery. If the pressure is still high at 6-7 weeks, once the outside stitch has dissolved, it is possible to remove the Supramid stitch to allow even more fluid to drain from the eye. In this way we can gradually adjust the pressure to a safe level

while reducing the chance the eye pressure will go too low. The Supramid needs to be adjusted in about 50% of people. Adjustments can be made in clinic using the usual microscope used to examine your eyes but is more commonly done in theatre. Adjustments are not usually done less than 3 months after the original tube surgery.

Although glaucoma tubes are covered by the eyelid and skin of the eye (conjunctiva), they also need to be covered with a patch of transplant tissue. This is needed to reduce the chance of the covering over the tube eroding and exposing the tube or plate. The transplant patch is made from either sclera (from an eye bank) or a material called tutoplast (processed pericardium from a commercial source). These tissues come from people who have donated their eyes to benefit others. The transplant material is not like other transplants though as it is dead tissue, with no risk of rejecting. It is simply used to reinforce the surface of the eye. If donor tissue is not used, breakdown of the conjunctival surface of the eye over the implant can occur in 10-14% of cases. When donor tissue is used the risk of breakdown is less than 3%.

The tissues are tested for infectious diseases such as Syphilis, Hepatitis B and C and HIV (the AIDS virus) but it is not possible to test them for prion disease (otherwise known as mad cow disease or v-CJD), however there have been no reported cases of people catching this disease from glaucoma surgery. Unfortunately after receiving donor tissue patients are no longer eligible to donate blood in the United Kingdom.

## **What should I do before surgery?**

Prior to undergoing surgery, patients are asked to continue all drops and tablets up until the morning of the operation. Blood thinning medications such as Aspirin, Warfarin and Clopidogrel should also be continued. Patients who are taking Warfarin are advised to have their level (INR) checked in the week prior to surgery to ensure it is within their usual treatment range. If patients opt to have the surgery performed under general anaesthesia, a preoperative assessment of their general health will be carried out prior to the surgery.

## **What can I expect during the operation?**

The surgery is done as a day case procedure so you are unlikely to need to stay in hospital overnight, however if you live alone or have a long way to travel it may be best to stay in one night. Many people are able to be awake during the surgery and can manage well using local anaesthetic (an injection around the eye)

with or without a light sedation to help you relax. Depending on the circumstances a general anaesthetic is sometimes preferred. The operation lasts about 1 to 1½ hours.

## **What happens after the surgery?**

Immediately after the operation a clear plastic shield will be placed over your eye to protect it from accidental knocks. Keep the eye shield on overnight but remove it first thing in the morning.

### ***Eye Drops***

You will be discharged with two sets of eye drops (a steroid – usually dexamethasone, and an antibiotic – usually chloramphenicol). The steroid drop will help reduce the redness in the eye and should be used every 2 hours from about 7 am to 11pm for the first week. The frequency of the steroid drop will be reduced gradually over about 2 months. Don't stop using this drop until your eye doctor advises you to so if you think you are running low please get some more from your GP. The antibiotic drop is used 4 times per day for 2-3 weeks and can then be stopped. Usually you will also be given a steroid ointment to put in the eye at bedtime. This allows the steroid to work during the night. The ointment can also be used during the day as a lubricant if the eye feels gritty.

### ***The Other Eye***

You should continue to use any drops you have for the non-operated eye and may need to continue glaucoma drops to the operated eye. You will be advised about this by your doctor. If you were using Diamox (acetazolamide) tablets before surgery for glaucoma you should stop these.

### ***Follow up visits***

You will usually need to return the day after surgery for an examination. Typically you will also be seen at one week, two weeks and 6 weeks following surgery. For the first few weeks after surgery, it is normal for the eye to appear red and it may feel prickly, like something is in the eye. It is also normal for the vision to feel a little blurred. The period of discomfort and blurring varies but generally gets better each day after surgery. If you feel the vision is worsening or the eye is becoming more uncomfortable please contact us using the information below.

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

It may take 2 to 3 months for the eye to feel completely normal and sometimes a little longer in complicated cases. At this point you will be able to have a glasses test as the operation may have altered your prescription slightly.

## **High Pressure after surgery**

High pressure may occur during the first weeks after surgery as the tube will not be fully open due to the stitch tied around the outside of it (the ligating stitch). During this period it is quite likely to need to continue with drops to lower pressure. If the pressure does not drop when the ligating stitch dissolves, the Supramid stitch inside the tube can be removed after 3 months and occasionally before. It is important to note that these sutures do have an important purpose to protect the eye from the effects of low pressure in the first few weeks after surgery. If the pressure is high in the first weeks after surgery this does not mean that the tube will not work. It is normal for the tube to start working after the stitch dissolves or the Supramid is removed.

## **Low Pressure after surgery**

Too low a pressure may occur if there is too much drainage of fluid through the tube. If the pressure is too low this can affect vision and increases the risk of bleeding in the eye. Very occasionally when pressure is too low it is necessary to go back to the operating room to have the tube tied again.

## **What is the success rate of surgery?**

The success rate of glaucoma tube surgery is between 70 and 80% over 5 years. Some patients are able to stop glaucoma eye drops and still have good pressures but many still require some medication to assist the tube in controlling the pressure. In one recent study the average patient achieved a pressure of 14 mmHg on an average of 1 glaucoma eye drop medication. Most implants that are functioning successfully at 5 years continue to do so over longer periods of time.

## **What are the risks of surgery?**

Glaucoma tube surgery has become more popular over recent years partly because of improved safety, but also because success rates have improved. Severe complications are uncommon but are most likely to happen if the eye pressure drops very low or very quickly soon after surgery. A sudden drop in eye pressure can result in bleeding at the back of the eye (less than 1% of tube operations). About 5% of patients need to return to the operating theatre in the first month after surgery for adjustment of the tube, either the pressure is too high or too low.

The tube can sometimes develop a blockage, which may need further surgery to unblock the tube. Very rarely the tube can rub against the cornea (the window into the eye) requiring further surgery to move the tube and stop it rubbing or in extreme cases needing an operation to replace the damaged cornea.

### *Other risks*

#### 1. Infection

While the risk of infection after surgery is rare, there is a very small on going risk that the drainage reservoir might become infected. The risk of this happening with a tube operation is probably less than with other types of glaucoma surgery such as trabeculectomy. Due to the small risk of infection it is important to see an eye doctor promptly if you have had a glaucoma tube operation and develop a red or sticky eye.

#### 2. Double vision

The glaucoma tube is placed on the white coat of the eye (the sclera) very close to the muscles that control eye movement. Occasionally this can lead to double vision. This will usually settle but in rare cases may need treatment, usually with prisms added to glasses.

#### 3. Cataract

In patients who have not had cataract surgery there is a small risk that tube may worsen an existing cataract.

After any major eye surgery the eyelid can become slightly droopy. This usually resolves over weeks to months. The glaucoma tube is usually hidden under the upper eyelid so should not be visible to other people, except when looking very closely. The edge of the white transplant patch may be visible but this is buried under the skin of the eye and usually becomes less noticeable with time.

## **What are the risks of not having surgery?**

If your doctor is discussing glaucoma tube surgery with you then it is likely that you have had some progression of your glaucoma or you have high pressure within your eye. If this is not treated then there is a risk of gradual, irreversible loss of vision.

## **Activity after surgery**

It is important to avoid strenuous activity during the early period after your operation. This includes most sports such as swimming, jogging and contact sports. Watching television, using a computer and reading will not harm the eye and can be continued without worry. If the intraocular pressure is very low your doctor may ask you to refrain from all exertion until the pressure is restored. Please wear the eye shield during sleep for the first week after surgery. As patients will be monitored closely following surgery it is recommended that they consult their doctor before commencing strenuous activity. It is safe to fly after surgery but it is best not to travel in the first weeks after surgery as your surgeon will need to see you fairly frequently during this time. If you wear contact lenses it is normally possible to start wearing them again about 4-5 weeks after surgery and sometimes sooner.

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

The duration of time off work depends on a number of factors such as the nature of your job and the vision in your other eye. Typically, all being well, someone working in an office environment would require 2 weeks off. If your work requires heavy labour, or work in a dusty environment you will need longer.

### **I have been listed for a glaucoma tube, what happens next?**

Before you have the operation you will need to have a preoperative assessment with one of our eye nurses. The purpose of the pre-assessment is to identify if there are any problems with your general health that we need to consider when you come for the operation. Please bring a list of any medications you are using at home along to your pre-assessment.

### **Contact information**

The information in this leaflet is intended as a guide only as each patient's experience will be different. If you require any further information or are concerned about your eye following surgery, please contact my secretary at Princess Alexandra Eye Pavilion, the telephone number is 0131 536 4160. If you are unable to speak with my secretary please contact the Acute Referral Clinic (ARC) at the Eye Pavilion on 0131 536 3751. The Acute Referral Clinic is open weekdays from 9.00 am to 5.00 pm. At weekends or out of hours please contact your GP, optometrist, or Accident and Emergency at the Royal Infirmary who should contact a member of our on call ophthalmology team for further advice.