Glaucoma UK

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Trabeculectomy

This free booklet is brought to you by **Glaucoma UK** (formerly the International Glaucoma Association). Contact Glaucoma UK for further information or advice:

Glaucoma helpline: 01233 64 81 70
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Glaucoma UK

Glaucoma UK is a registered charity that is here for everyone living with glaucoma throughout the UK.

- We raise awareness of glaucoma so that it is detected and treated early.
- We campaign for effective services for everyone affected by glaucoma.
- We provide advice and support to help people live well with glaucoma.
- We fund vital glaucoma research.

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01 Introduction: What is a trabeculectomy?

Glaucoma is often caused by high pressure inside the eye. Trabeculectomy reduces the eye pressure by draining aqueous humour from the eye. The aqueous humour is a fluid inside the eye which is not related to the tears. Watering of the eye is caused by tears, not aqueous humour.

Trabeculectomy is a surgical operation which lowers the intraocular pressure (IOP) inside the eye in patients with glaucoma. This is achieved by making a small hole in the eye wall (sclera), covered by a thin trap-door in the sclera. The aqueous humour drains through the trap-door to a small reservoir or bleb just under the eye surface, hidden by the eyelid (see **figure 1**). The trap-door is sutured (stitched) in a way that prevents aqueous humour from draining too quickly. By draining aqueous humour, the trabeculectomy operation reduces the pressure on the optic nerve and prevents or slows further damage and further loss of vision in glaucoma. Control of the eye pressure with a trabeculectomy will not restore vision already lost from glaucoma.

The aqueous humour that drains through the trabeculectomy accumulates in a reservoir between the

sclera and the surface layer of tissue that covers the eyeball (the conjunctiva) to form a small drainage bleb that is usually hidden under the upper eyelid (**Figure 2**).

Figure 1

Diagram showing flow of aqueous through a normal trabeculectomy

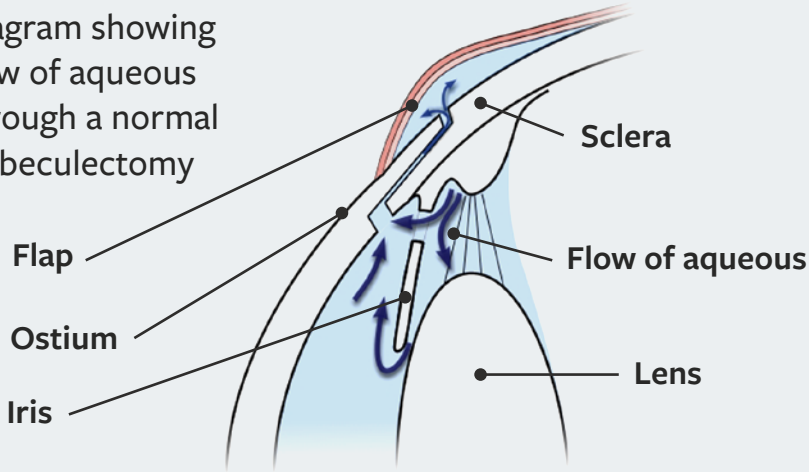
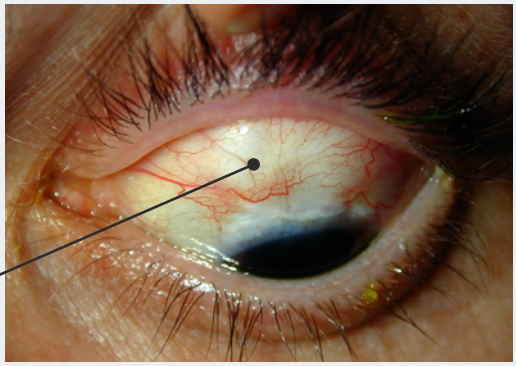


Figure 2

Drainage bleb visible on lifting the eyelid after a trabeculectomy



02 The appearance of the eye after a trabeculectomy

Initially the eye is red and swollen to a variable degree after surgery. The eyelid may also droop partially. This usually resolves over a period of weeks to months. The drainage bleb is not usually visible to the naked eye after the trabeculectomy operation. The bleb may, however, be seen if the patient looks in the mirror and raises the upper eyelid.

After surgery, most patients feel no sensation from the presence of the drainage bleb. In the rare event that the patient is aware of the drainage bleb, steps can be taken to make the bleb more comfortable; this is discussed further under complications (see page 16).

03 Medication prior to surgery

Prior to undergoing surgery, patients are asked to continue all drops and tablets in accordance with their normal treatment regimen until the morning of the operation. Blood thinning medications such as Aspirin, Warfarin and Clopidogrel should also be continued.

Nevertheless, your clinician may ask you to stop taking blood thinning medication prior to surgery to ensure it is within the correct therapeutic range.

If patients opt to have the surgery performed under general anaesthesia, a pre-operative assessment of their general health will be carried out just before surgery. Underlying medical conditions including cardiac disease, uncontrolled high blood pressure and diabetes are addressed prior to scheduling of surgery.

04 The surgery itself

Trabeculectomy surgery typically lasts around 45 to 60 minutes.

Anaesthetic

Trabeculectomy surgery is often performed under local anaesthetic, though it may also be performed under general anaesthetic.

Patients who have their surgery under local anaesthetic are awake during the operation but will have the option of requesting light sedation. The eye is anaesthetised first with eye drops and then an injection of anaesthetic is administered around the eye. The injection itself may cause some mild discomfort: a slight sensation of pressure as the anaesthetic is delivered. The injection numbs the eye, preventing not only pain but also excessive eye movement during the operation.

During surgery patients are covered by a sterile sheet, or drape, which keeps the operation site sterile and also prevents patients from seeing any of the surgery.

Patients will be aware of the surgeon working around the eye but should not feel pain. In the event of any pain or discomfort, the patient may calmly raise a hand and the

surgeon will stop the surgery and top-up the anaesthetic if needed. Patients might also hear the surgeon speaking to the scrub nurse and other members of the surgical team.

Mitomycin C (MMC) and Avastin

Mitomycin C is a 'cytotoxic' agent (anti-cancer drug) that is applied to the surface of the eye to reduce scarring. Usually it is applied on a sponge to the outside surface and then washed off with saline solution so that none remains. Sometimes a very small amount is injected beneath the outer layer of the wall of the eye and spread over the area to be treated.

The use of Mitomycin C in glaucoma surgery is 'off licence' which simply means that the manufacturers have never applied for this use to be registered. Over many years Mitomycin C has been shown to be safe and effective, although as with all treatments there are some small risks (in this case the eye pressure going too low).

Avastin is another drug that was developed to treat cancer but has now been widely used in treating eye conditions. Some surgeons inject it into the eye at the end of surgery to help reduce scar formation.

05 After surgery: post-operative care

Patients are usually discharged home from hospital either the same day as the surgery or the day after. 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.

Some hospitals may provide overnight accommodation for patients travelling from afar.

The eye is normally padded after surgery and the eye pad is removed the following day. If the unoperated eye does not see well, then the operated eye may have the pad removed early. Instead, a clear shield will be placed on the operated eye so that it is still possible to see after surgery. The eye may be bloodshot for a few days following surgery.

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

It is usually best to avoid wearing make-up for approximately four weeks after surgery, depending of course on individual reactions to surgery. When

beginning to wear make-up again, purchase new products and throw previously used products away, to help limit infection.

What should I expect to feel during the post-operative period?

It is normal for the vision to be blurred and the eye to be uncomfortable after surgery. The period of blurring is variable. The vision may be particularly blurred for one to two weeks following surgery, and then start to improve. It can take two to three months for the eye to feel completely normal and the vision to stabilise completely.

The patient will also be asked to wear a shield at night for the first two weeks or so; this is to prevent any accidental harm to the operative site whilst sleeping.

Soreness in the eye after surgery is partly due to the surgery itself, and partly due to the sutures (or stitches). The sutures do not dissolve and are usually removed in the clinic two to three weeks after surgery (this takes two to three minutes in clinic with the eye anaesthetised using eye drops). The eye usually starts to feel more comfortable after the sutures have been removed.

Eye drops after surgery

Eye drops will be prescribed to use regularly after surgery. These start the day after surgery, after the post-operative examination. It is not usually necessary to use eye drops the first night after the surgery. Acetazolamide (Diamox)

tablets or any glaucoma medication to the operated eye should also be stopped following surgery unless advised otherwise.

It is important that any eye drops for the unoperated eye are continued unless advised otherwise.

The post-operative eye drops will usually consist of an antibiotic (e.g. Chloramphenicol) and anti-inflammatory steroid (e.g. Dexamethasone). The steroid eye drop will initially be used intensively (every two hours or about eight times daily) and the antibiotic four times daily. During the period of intensive usage preservative-free drops are normally used. When drops are prescribed to take intensively after surgery, it is usually intended that they are taken during the day only. If overnight intensive use is intended, the patient will be advised separately.

Patients are given a supply of post-operative eye drops on leaving the hospital; these should last one month. The post-operative eye drops will normally need to be taken for two to three months. Patients are advised at each post-operative visit whether a change in the dosage of drops is required. The drops should not be stopped, nor the dosage changed without consulting the doctor.

Post-operative clinic visits

Patients are usually seen once weekly for the first four weeks but may be seen more frequently if the eye pressure is either too high or too low.

During this time sutures may be removed to adjust the pressure and additional injections of steroids or 5-fluorouracil (a drug that reduces healing), may be given around the eye to counteract the body's natural healing process. The injections are performed after the administration of anaesthetic eye drops, during the clinic appointment.

It is sometimes necessary to massage the eye or carry out a procedure called needling if it appears that the wound is healing too much. Needling is performed after the instillation of local anaesthetic eye drops in the out-patient department. It is considered to be safe and an effective way of reopening the drainage tube. The procedure can be repeated if necessary. Patients have reported only minimal discomfort with this procedure.

Patients who live a long distance from the hospital will likely be able to alternate post-operative appointments between their surgeon and a local ophthalmologist.

Contact lens use after trabeculectomy surgery

It is usually possible to restart contact lens use around four weeks after trabeculectomy surgery, and sometimes sooner.

However, not everyone can continue to wear contact lenses after trabeculectomy surgery, so this is something to consider before having a trabeculectomy operation. If contact lens wear is essential, then other alternatives to

trabeculectomy should be considered.

Whether or not contact lenses can be worn after surgery depends on the appearance and shape of the drainage bleb. The surgeon will usually be able to advise on this by six to eight weeks after surgery.

When is the eye back to normal?

It can take two to three months for the eye to feel completely normal and the vision to stabilise completely.

Patients should avoid changing their spectacles for at least three months whilst the eye continues to adjust and heal.

Activity after surgery

It is important to avoid strenuous activity during the early post-operative period including swimming, tennis, jogging and contact sports.

It is fine to watch television and read, as these will not harm the eye. For patients who wish to pray, it is better to kneel but not to bow the head down to the floor in the first two to three weeks. Bending over can cause significant pain when the eye is still inflamed after surgery. Similarly, activities such as yoga that require head-down posturing should be avoided.

As patients will be monitored closely following surgery, it is recommended that they consult their surgeon before commencing strenuous activity. 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.

When can I go back to work/school?

The duration of time off work/school will depend on several factors such as the nature of the patient's employment, 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 two weeks off, if the post-operative course is smooth. Someone whose occupation involves heavy manual work or being in a dusty environment may require a month or more (e.g. builders, farmers). This can be discussed with your consultant.

Flying after surgery

Although it is safe to fly after surgery, patients should bear in mind that their surgeon will wish to see them for a number of post-operative visits to ensure that the eye pressure is at the correct level.

06 Success rates and complications

Success rates

Long-term studies suggest that most people will achieve a low eye pressure without the need for additional glaucoma medication after trabeculectomy surgery. In clinical trials, trabeculectomy has proven consistently more successful at lowering intraocular pressure than either medication or laser.[1,2]

The success rate of trabeculectomy at controlling the pressure varies according to a number of risk factors including the type of glaucoma, previous surgery, ethnicity, age and other conditions.

In one study of trabeculectomy success, after 20 years almost 90 per cent were still successful.[3] Just under two thirds of these required no glaucoma medication to control the pressure, whereas one third still required medication. In the author's practice, roughly 10-12 per cent will require further surgery for uncontrolled pressure.

Uncommonly, a patient will develop a pressure that is too low, requiring further surgery to elevate the pressure.

Complications

Severe complications are uncommon and may happen either if the eye pressure drops very low or very quickly during the early post-operative period, or if the eye becomes infected. Very low eye pressure is the biggest risk in the early post-operative period. Although it is often painless, it may be associated with a dull aching feeling or a throbbing sensation within the operated eye.

Patients who notice severe blurring of vision, distortion or a fluctuating curtain in their visual field should attend the eye casualty department as soon as possible for further assessment. Very low pressure or a precipitous drop in pressure can result in bleeding at the back of the eye (choroidal haemorrhage). This is a very severe complication but rare. In order to ensure that this does not happen the surgeon will often suggest further intervention if the pressure becomes very low.

Such intervention may consist of a return to the operating theatre to have the trap-door sutures tightened. Sometimes the surgeon will inject a viscoelastic gel into the eye and wait to observe the result before deciding on further adjustment of the trap-door sutures, as the eye pressure will often stabilise by itself.

Sometimes a simple adjustment of medication is sufficient, in which case neither of the above will be required.

In the author's experience, about five per cent of

trabeculectomy patients require a return to the operating theatre in the first month after surgery for adjustment, either because the pressure is too high or too low.

The risk of serious infection or serious bleeding in the eye from trabeculectomy is rare (approximately one in 250).[4]

Longer-term risks

The longer-term risks of trabeculectomy are infection, discomfort, cataract and change in glasses prescription.

Low pressure occasionally develops in the longer term, but generally the risk of low pressure is highest in the early post-operative period rather than later.

Infection

While the risk of infection after surgery is rare, there is a very small on-going life-time risk that the drainage bleb might become infected.

If a patient who has had a trabeculectomy subsequently develops a red, sticky or painful eye, it is important they have their eye examined immediately by an ophthalmologist, as this may be a sign of an infection.

While infection is rare, it may be very serious and can result in visual loss. The earlier any infection is treated, the better the outcome for the eye.

Discomfort

The drainage bleb may become large. Occasionally this

may extend below the eyelid or cause the eyelid to be raised or droopy.

A large drainage bleb may cause interference with the tear film on the eye surface, and can create a feeling of discomfort or drying of the eye. This occurs in about 10 per cent of patients and is usually treatable with artificial tear drops. Occasionally, the discomfort is more severe and requires surgery to make the drainage bleb smaller.

Cataract

In patients who have not had cataract surgery, there is a risk that trabeculectomy may worsen an existing cataract.[3]

Raised eye pressure and glaucoma medications have been shown in research to cause cataract. In a study of 607 patients, the likelihood of needing cataract surgery within 7.7 years of a trabeculectomy operation was 20 per cent, compared to 12 per cent in those treated with eye drops only.[2]

Astigmatism and other changes in glasses prescription

Most patients require a small change in their glasses prescription after trabeculectomy.

Patients should refrain from changing their glasses until at least three months after the surgery and only once the eye pressure has stabilised. It is advisable to check with the doctor before changing glasses. Rarely, a patient who does not require glasses before surgery develops a need for them after surgery.

07 Remember

If you have glaucoma in both eyes you must inform the DVLA.

Prescribed drops should be used as recommended by your specialist, on a daily basis unless and until otherwise informed.

If you develop side effects you are concerned about, you should inform your specialist as soon as possible.

08 Further help and information

from Glaucoma UK

Glaucoma UK is here for anyone affected by glaucoma. For help and advice:

Call us

If you would like to find out more about any of the information contained in this booklet, or you would like to discuss any concerns you may have about glaucoma, you can call our helpline. Out of office hours there is an answer phone service where you can leave a message and you will be called back.

01233 64 81 70

Monday - Friday 9.30am - 5.00pm

Visit our website:

glaucoma.uk

for information and advice. You can also order a range of free booklets online and use the user forum to ask

questions and share experiences with other people living with glaucoma

Email us

info@iga.org.uk

A full list of references and information sources used in the compilation of this leaflet is available on request by phone: **01233 64 81 70** or by email: **info@iga.org.uk**

Glaucoma support groups

We have many support groups around the country run by hospital staff for the benefit of people with glaucoma. A list of these, along with contact details, can be found in our newsletter or on our website at **glaucoma.uk**

Buddies

If you are due to have surgery or laser treatment for your glaucoma, you may feel that you would benefit from speaking to someone else who has already had that experience. We have a list of people who are willing to do this. You may find that after your own experience that you decide that you too would like to become a buddy.

For further information on either of the above, please contact our helpline on **01233 64 81 70** or **info@iga.org.uk**

09 Other free advice booklets

that may be helpful

- Glaucoma - A Guide
- Eye Drops and Dispensing Aids
- Secondary Glaucomas
- Dry Eye Syndrome - A Guide
- Driving and Glaucoma
- Glaucoma and Your Relatives
- Eye Clinic Referral
- Cool Wallet for Eye Drops

All our information booklets are free and can be downloaded or ordered at **www.glaucoma.uk**

10 Glossary

Aqueous humour
Fluid inside the front portion of the eye. This fluid is pumped into the eye by tissue called the ciliary body, and normally escapes via drainage channels called the trabecular meshwork. This fluid is nothing to do with the tears and excessive tearing does not mean that the aqueous humour is draining well.

Conjunctiva
A thin transparent layer of skin covering the surface of the white of the eye.

Cornea
Transparent tissue at the front of the eye in front of the iris and lens.

Intraocular pressure
The pressure inside the eye. In glaucoma, high intraocular pressure is the main cause of damage to the optic nerve. This is usually measured in units known as mmHg (millimeters of mercury).

Mitomycin C
Mitomycin C is an anti-scarring drug that was originally used to treat cancer.

Optic nerve
The large nerve connecting the eye to the brain. The optic nerve carries all of the visual impulses from the eye. These are then translated by the brain into the images that we see.

Ostium
Mouth-like opening much like a tube or blood vessel.

Sclera
The wall of the eyeball itself. This is seen from the front as the white of the eye.

11 References

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Notes

About Glaucoma UK

- **We fund sight-saving research into the early detection and treatment of glaucoma**
- **We campaign to raise awareness of glaucoma so that no one loses their sight needlessly**
- **We provide support that helps people to live well with glaucoma**

Each year in the UK over 11,000 people are diagnosed with glaucoma. We are passionate about supporting them and are committed to providing our services free of charge to anyone who needs them. It is only through the generosity of our supporters that we can do this.

Help us save sight and fund research

- make a donation by calling **01233 64 81 64**
- donate online at **www.glaucoma.uk**
- become a member for £17.50 a year. Join online or call **01233 64 81 71**

Your support will make a difference to people with glaucoma today and will protect future generations from unnecessary glaucoma sight loss.

Glaucoma UK

The information in this leaflet was correct at the time of printing (printed 06/2020).

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