

Ophthalmology

Ab interno trabeculotomy for glaucoma

What is trabeculotomy surgery?

Ab interno trabeculotomy (AIT) is a minimally invasive surgical procedure used to treat glaucoma. It aims to lower your eye pressure by increasing drainage of fluid out of your eye. It aims to prevent your glaucoma from getting worse. It does not improve your vision. In some cases, it reduces the need to use eye drops to treat glaucoma.

A small device enters the eye through a tiny incision at the edge of the cornea and is used to remove part of the trabecular meshwork (the roof of drainage channel). Various instruments such as a Trabectome or a TrabEx can be used to achieve this and they differ mainly in the way they remove the part of the trabecular meshwork (roof of drainage channel). As the trabecular meshwork is removed from within the eye, it is called an ab interno approach.

This procedure can be combined with cataract surgery. This will add around 15 minutes total onto the procedure.

How is this procedure different from other glaucoma surgery?

The benefits of ab interno trabeculotomy (AIT) over the traditional glaucoma surgery include:

- Internal approach instead of external creation of an external drainage channel
- It is minimally invasive due to the size of the incision made for procedure, as opposed to significant surgical trauma from some other surgical options.
- It may easily be combined with cataract surgery.



Is trabeculotomy suitable for everyone?

Not all patients with glaucoma are suitable for trabeculotomy surgery. Typically, this procedure is more effective in the early to moderate stages of glaucoma but it may be offered to suitable patients with more advanced glaucoma.

Will trabeculotomy surgery cure my glaucoma?

Trabeculotomy surgery aims to prevent your glaucoma from getting worse by lowering your eye pressure.

As with all other glaucoma treatments, it cannot cure glaucoma. It cannot reverse any damage already caused by glaucoma, or bring back any lost vision.

Trabeculotomy surgery does not always work alone and glaucoma medications or additional glaucoma surgery may be needed.

What are the risks and complications of trabeculotomy?

Trabeculotomy has been assessed by the National Institute of Health and Care Excellence (NICE).

The trabeculotomy procedure is designed to be less traumatic than the conventional glaucoma surgery (trabeculectomy ab externo). Damage to eye structures is expected to be less than conventional surgery.

The risk of complication varies with the type and stage of glaucoma, the patient's age, other health conditions and previous surgery.

Potential complications include:

Bleeding: small amount of postoperative bleeding inside the eye (hyphaema) is very common. It almost always stops on its own within days or weeks. This can lead to delay in vision recovery after surgery. Very uncommonly, bleeding in the eye may need to be washed out surgically. Bleeding can also occur some months after surgery, but this is uncommon.

Infection: infection can happen after any eye operation. Usually the risk of severe infection causing loss of vision is considered to be about 1 in 500.

While infection is very uncommon, it may be very serious and can result in irreversible visual loss, or rarely, the loss of an eye.

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Inflammation: all eye operations lead to some inflammation. Usually this is controlled by the medications given after the operation. Inflammation can be severe and may require prolonged treatment, but this is uncommon.

High eye pressure after surgery: sometimes your eye pressure may remain high after surgery. This is usually controlled with pressure lowering drops and additional procedures to control the pressure may need to be explored.

Over time, the drainage channels may undergo scarring which may close the opening that was created during surgery. This can lead to increased eye pressure after your procedure.

Low pressure after surgery: more rarely, your eye pressure may be too low after surgery. This is usually detected during clinic appointments and is often remedied by stopping any pressure-lowering eye drops and reducing the use of steroid eye drops. Sometimes, an injection of viscoelastic (a jelly-like material) in the front chamber of the eye is required to raise the pressure.

Corneal damage: corneal decompensation may occur (clouding of the normally clear front window of the eye). This is very uncommon.

Iris damage: the procedure may very uncommonly lead to damage to the iris tissue.

Cataract formation: if you have not had a cataract surgery before, and are not having one combined with trabeculotomy, trabeculotomy can lead to cataract formation in the eye. Cataract formation may need surgery in the future.

Cystoid macular oedema: inflammatory fluid may collect in the centre of the retina. If this occurs it is usually mild and is treated with a course of anti-inflammatory eye drops. It can be severe and may require prolonged treatment and affect vision, but this is uncommon.

Loss of vision: some degree of blurred vision is expected for a few weeks after surgery. Uncommonly, complications can lead to irreversible loss of vision, or rarely, loss of an eye.

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Sympathetic ophthalmia: Very rarely, the other eye may be affected. This is caused by simultaneous inflammation in the two eyes causing loss of vision.

Please seek urgent advice if there is a significant sudden change in your vision at any time after your surgery.

Severe complications are uncommon and steps are taken to prevent them, but it may not be possible in all cases.

What are the risks of not having the procedure?

There is a risk that your vision will deteriorate if your eye pressure remains elevated despite medical therapy. Vision loss from glaucoma is irreversible and permanent. The rate at which vision may deteriorate varies vastly between different patients.

Are there any alternatives to this procedure?

There are many ways to treat glaucoma. Treatments include, eye drops, conventional surgery like trabeculectomy, laser trabeculoplasty, and other procedures like iStent implantation and Preserflo.

Your surgeon recommends options for your glaucoma treatment after assessing a number of your specific characteristics. These include:

- eye pressure
- stage and type of disease
- state of your eye tissues
- other eye conditions, your general health and risks of different procedures

Your doctor will be able to discuss this with you further.

What happens before your operation?

Before the operation you will be asked to attend a preoperative assessment appointment to check that you are fit for the procedure and the anaesthetic.

Please bring to your appointment:

- an up-to-date list of your medications
- a brief summary of your medical history

If you are unsure of anything, please, check with your GP before your appointment.

During your preoperative assessment, your general health and suitability for anaesthetic will be assessed. Any investigations will also be undertaken as appropriate (e.g. blood tests).

Do you use blood thinning medication?

Please tell your eye surgeon during the consultation and tell the nurse at your preoperative assessment if you use:

- blood thinning medications such as **aspirin, warfarin and clopidogrel**
- new blood thinning medications such as **rivaroxaban or dabigatran**

Some of these medications **will need to be stopped temporarily** to decrease the risk of bleeding with surgery.

The safety and duration of this will be done in discussion with your doctor/haematology team, and you will be advised accordingly.

Warfarin: patients who are taking warfarin are advised to have their level (e.g. INR) checked at one week and at three days before surgery to ensure it is within the correct therapeutic range.

Do you use eye drops?

You should continue using any eye drops and tablets for your glaucoma as directed by your ophthalmologist until your operation. In some cases, you may be asked to stop using eye drops before your operation.

This is to reduce the risk of your eye pressure going too low after the operation.

What happens during the procedure?

The procedure is usually performed under a local anaesthetic. This means that you will be awake, but your eye will be numbed so you will not feel any pain during the operation.

The eye will be anaesthetised first with eye drops and then an injection of anaesthetic will be administered around the eye. The anaesthetic injection itself may cause some discomfort (a slight sensation of pressure as the anaesthetic is delivered). The injection prevents pain and eye movement during surgery.

For many hours you may either see nothing out of the eye or have very blurred vision. Your anaesthetist will discuss this with you before the surgery.

During surgery your face will be covered by a sterile sheet. This keeps the operation site sterile and also prevents you from seeing any of the surgery. You will be aware of the surgeon working around the eye, but you should not feel pain.

A member of staff will usually be holding your hand during surgery. You should squeeze their hand in the event of any pain or discomfort. This will alert the surgeon so that they can stop the surgery and top-up the anaesthetic if needed. You are also likely to hear the surgeon speaking to the nurse and other members of the surgical team.

Sometimes general anaesthetic may be considered to put you to sleep during the operation. This can happen if local anaesthetic is not considered suitable for you or if you specifically choose so.

What happens after the operation?

After the operation, your eye will be covered by a protective plastic shield and an eye pad which stays in place overnight. An appointment will be arranged to review you on the following day. Usually you will be able to go home after a few hours. In some circumstances, such as if you had a general anaesthetic; you may need to stay in hospital overnight.

Your eye may begin to feel sore once the anaesthetic starts to wear off. The pain is not usually too bad and you can take a painkiller tablet which you are used to (e.g. paracetamol or ibuprofen). Your eye is likely to look red and have bruising around it.

You will be advised to start eye drops on the same evening of your surgery after cleaning your eye.

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Patients are advised to ask a friend or relative to accompany them home after surgery.

How should I expect to feel after the operation?

It is normal for the vision to be blurred and the eye to be uncomfortable and red after surgery. The period of blurred vision varies, usually lasting 3 to 14 days. Patients may also observe that their vision is worse in the morning, but gets better upon getting out of bed. This happens as blood moves in the eye due to gravity.

Your eye may be watery and sore for some time after surgery. This usually is the case for a few days. It can take 2 to 4 weeks for the eye to feel normal and for vision to stabilise after surgery.

Will I have to use eye drops after surgery?

Special postoperative eye drops are given to every patient and are to be used regularly. These are:

- an antibiotic (e.g. chloramphenicol)
- an anti-inflammatory steroid (e.g. dexamethasone) for a few weeks.
- drops to keep the pupil small (e.g. pilocarpine) for 3-4 weeks.
- glaucoma medications will need to continue and may be reduced in some cases.

The postoperative eye drops will normally need to be taken for many weeks. Any changes to your eye drops will be discussed with you each time you attend the outpatient clinic.

If you are running out of eye drops you will need to get a repeat prescription from your GP before you run out.

It is important that eye drops are not stopped, or the dosage changed, without consulting your eye surgeon.

It is important that any eye drops for your other eye are continued as before unless advised otherwise.

What happens to the eye pressure after surgery?

Your eye pressure is expected to drop in the majority of the cases but this will not cause any effect on your vision or how your eye feels.

Each patient is different and the exact eye pressure result will vary between patients. Uncommonly, pressure may increase after surgery.

How often will I need to be seen after surgery?

After the first review on the day after surgery, you will be seen 1 week later and then 3-4 weeks following the operation. In individual cases it may be necessary to see you more often.

It is very important that you attend all your clinic appointments and use your eye drops as prescribed.

What can I 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?

For at least four weeks after the operation please avoid:

- rubbing your eye
- any vigorous activity including contact sports, squash, badminton, swimming, gardening, vacuum cleaning, hot tub, whirlpool
- pilates or similar exercises that include inversion
- high-resistance wind instruments, weightlifting and breath holding
- driving for a four weeks after the operation or until the eye pressure has settled, whichever is later. Before starting to drive please confirm with the surgeon that your eye pressure has stabilised. You should be able

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

- eye make-up
- splashing water into the eye (please shower from the neck down). Back-wash your hair for the first week; this is to avoid getting soap or shampoo in the eye.
- Dusty atmospheres

When can I go back to work?

Normally, someone working in an office environment would require 2 weeks off if there are no complications.

If your job involves heavy manual work, or work in a dusty environment, you may require four weeks or more before you go back to work (e.g. construction workers, farmers). This will depend on a number of factors and you will be advised individually.

Fitting new glasses

A new prescription for glasses should only be determined once you have finished taking pilocarpine eye drops for at least 14 days.

Usually, your prescription does not change if you have had cataract surgery prior to trabeculotomy.

Can I travel abroad after the operation?

Going on an aircraft after a few weeks is safe. It would be preferable not to travel abroad until things have stabilised, in case this leads to complications. This period depends on how your eye recovers after the operation and advice is given individually. Please ensure you are available for regular follow up for at least 6 weeks after the surgery.

Can I wear contact lenses after surgery?

It may be possible to restart wearing contact lenses around 6 weeks after surgery. Not everyone can continue to wear contact lenses after trabeculotomy surgery. This is something for you to consider before having the operation.

When do I need to contact the hospital?

Contact the hospital or eye casualty urgently if:

- your eye becomes more painful or red than on the day you went home.
- your eye develops a sticky discharge.
- your eye lids start to swell.
- your vision begins to deteriorate.

Emergency contact information

For emergency/very urgent concerns please contact our department on 024 7696 4800 or the hospital switchboard on 024 7696 4000.

Open Monday to Thursday 8.30am to 4.30pm

Friday 8.30am to 4.00pm

Saturday 8.30am to 12.00pm

Outside of these opening times please attend the Emergency Department at University Hospital Coventry which offers a 24hr service.

Further information

Any queries about information in this leaflet please contact:

Mr Atul Bansal (Consultant with special interest in Glaucoma and Cataract surgery) through glaucoma secretaries:

Michelle Donnelly: Tel: 02476 966502

National Institute for Health and Care Excellence

10 Spring Gardens, London, SW1A 2BU

Telephone: 0300 323 0140

Email: nice@nice.org.uk

Web link: www.nice.org.uk/guidance/ipg397/informationforpublic

Please refer to NICE Publication: Understanding NICE guidance: Treating open angle glaucoma by removing a small strip of tissue to reduce pressure within the eye

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International Glaucoma Association

Woodcote House, 15 Highpoint Business Villages, Ashford, Kent, TN24 8DH

Telephone: 01233 64 81 70

Email: info@iga.org.uk Website: www.glaucoma-association.com

Royal College of Ophthalmologists

17 Cornwall Terrace, London, NW1 4QW

Telephone: 020 7935 0702

Website: www.rcophth.ac.uk

Important disclaimer

The information provided in this information booklet is not a substitute for, professional healthcare advice by a qualified eye surgeon, doctor or other healthcare professional. 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 decisions about their surgery and not rely solely on the information in this booklet.

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