



Vitreotomy Surgery for Macular Hole

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Vitrectomy Surgery for Macular Hole

Your eye specialist, Andrew Luff, has diagnosed a macular hole and has recommended a surgical procedure to treat it. Without treatment this condition can worsen causing increasing distortion and central visual loss.

This booklet provides information for you to understand the condition and how it can be treated.

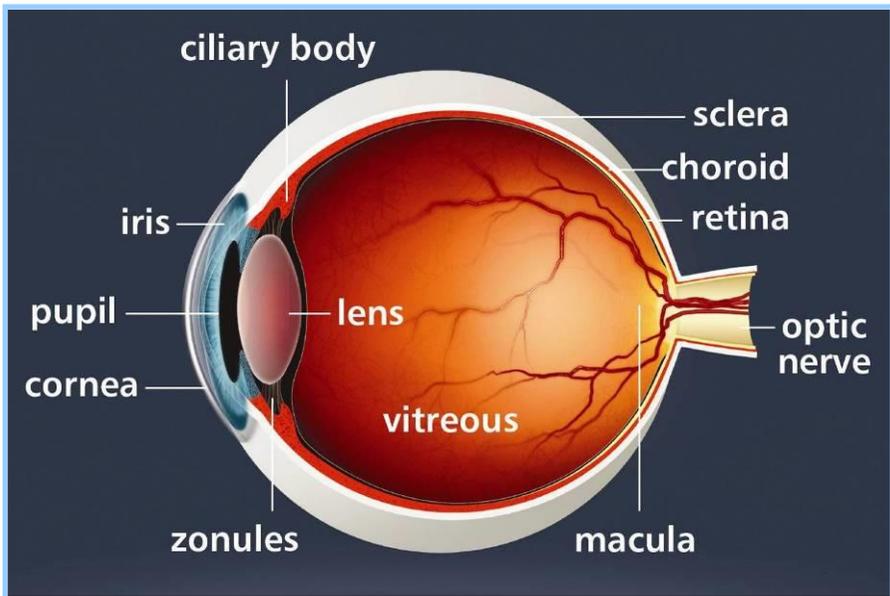
If you have questions that are not answered in this leaflet, you should ask any member of our team.

What is a macular hole?

A **macular hole** is an actual hole that develops in this highly light sensitive area of the central retina.

It is helpful to know a little about the eye and how it works in order to understand what effect macular hole has on your vision, and how it can be treated.

Anatomy of a normal eye



The **retina** is the light-sensitive nerve tissue that lines the inside of the eye. Rays of light enter the eye, passing through the **cornea**, **pupil** and **lens** before focusing on the retina. The retina contains photoreceptors which convert light into electrical impulses.

In the healthy eye these impulses are sent via the optic nerve to the brain, where sight is interpreted as clear, bright, colourful images. The retina can be likened to photographic film in a camera.

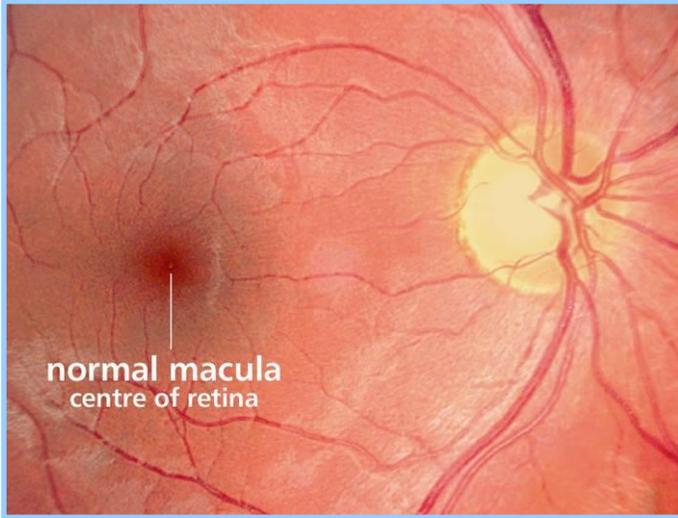
The **macula** is a small area at the centre of the retina. It is very important as it is responsible for our central vision. It allows us to see fine detail for activities such as reading, recognising faces, watching television and driving. It also enables us to see colour.

The **choroid** is the underlying vascular (blood vessel) layer of the eye, from which the retina receives oxygen and nutrients.

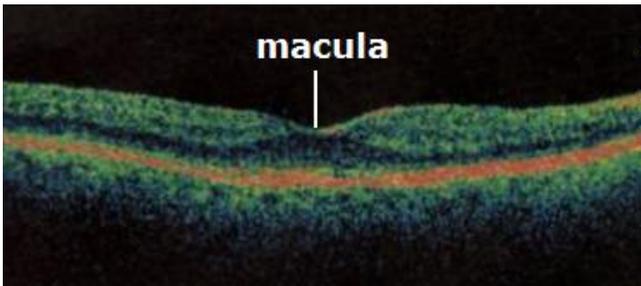
The **vitreous** is the clear jelly-like substance which fills the hollow space behind the lens.

As we age this vitreous gel opacifies and shrinks away from the retina. This is very common, occurring in about seventy-five per cent of people over the age of sixty-five.

Separation of the vitreous gel from the retina is known as posterior vitreous detachment or "PVD". It does not itself cause any permanent loss of vision although floaters may be troublesome.



Fundus
image of a
normal
macula

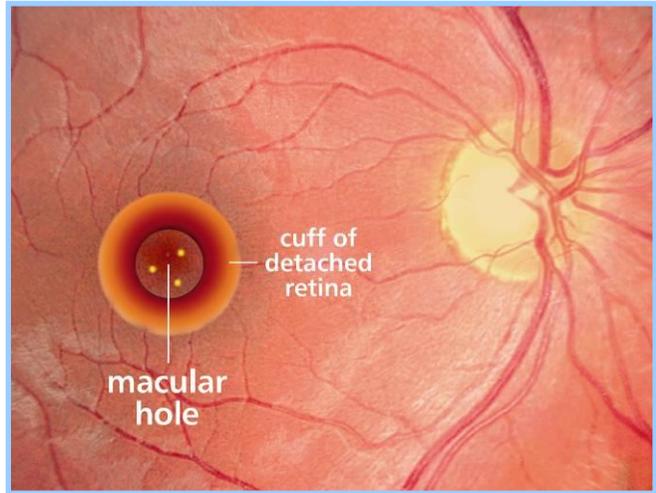


— vitreous
— retina
— eye wall
OCT image of a
normal macula

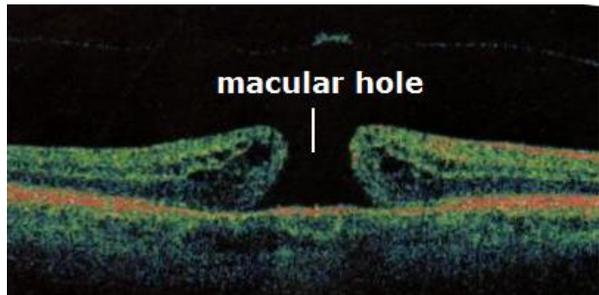
Occasionally when shrinkage of the vitreous jelly within the eye fails to result in separation, the vitreous pulls on the central macular area of the retina, causing swelling and development of a **macular hole**.

Optical Coherence Tomography (OCT) is a non-invasive imaging technique which provides a cross-sectional image of your retina, as part of your diagnosis.

Fundus image of a macular hole



OCT Image of a macular hole showing the swollen retina around the hole lifting away from the eye wall.



What causes a macular hole?

Most macular holes occur spontaneously in women around the age of seventy. The actual cause is unknown (idiopathic). It is thought that shrinkage of the vitreous jelly within the eye pulls on the central macular area of retina resulting in an initial swelling followed by the development of a full thickness hole. Occasionally, a macular hole is associated with myopia (short-sightedness) or trauma.

Vision worsens as a small disc-shaped area of retina around the hole detaches from the eye wall. It is this localised area of detached retina which causes many of the troublesome symptoms and which surgery will address.

How does a macular hole affect your sight?

Common symptoms of a macular hole are:

- blurred central vision;
- objects appearing “pinched in” and reduced in size;
- distortion of straight lines.

Should you have surgery for a macular hole?

The procedure to treat this condition involves filling the eye with an inert gas to push back the small area of retinal detachment around the macular hole. The hole will effectively “close” with a potential improvement in visual function.

Untreated, nearly all macular holes are progressive and early surgery offers the best chance of long-term visual success. Occasionally, a hole is detected as a chance finding, for example when covering the good eye or when being examined by an optometrist.

Even when few symptoms are present, surgery may be considered to prevent further worsening and to give the best long-term chance of success.

When a macular hole has formed in one eye the fellow eye may also be at risk. In the situation where vitreous gel remains attached to and pulling on the central macula, the chance of a macular hole developing in the fellow eye can be as high as one in six.

As cataract is often present along with macular hole, and inevitably worsens following vitrectomy surgery, it is routine for us to offer a combined cataract and vitrectomy procedure.

What do you need to consider prior to surgery?

It is important that we have knowledge of any prescribed medications you are taking. You will probably be asked to continue taking these in the usual way, but some medications can cause complications during any ophthalmic procedure.

These include warfarin, an anti-clotting agent; and tamsulosin (Flomax) or similar preparations given to some men with prostate problems. If you normally take either of these it is important that you let us know prior to admission. If you take a diuretic (“water tablet”) and are having surgery on a morning operating list, you may wish to postpone taking it until after your operation.

As most vitrectomy surgery is carried out under local anaesthesia, there are usually no restrictions on what you may eat and drink prior to admission. If the use of sedation during surgery has been discussed, you should avoid eating a heavy meal during the two hours prior to hospital admission.

Occasionally the operation may be carried out under general anaesthesia and if this is the case you will be advised of the need to fast prior to surgery.

Repair of a macular hole involves filling the vitreous cavity (the hollow space behind the lens of the eye) with an inert gas, the purpose of which is to reattach the cuff of detached retina around the central hole.

The day after surgery the eye will be almost completely full of gas, which makes vision so blurry that it is almost useless.

Vision gradually returns as the gas bubble re-absorbs and the vitreous cavity of the eye refills with naturally produced aqueous fluid.

It is important to remember that many activities of daily living will be compromised by the poor vision in your operated eye and for the first couple of weeks it will be impossible to drive. Your ability to cope with everyday tasks will at that point depend upon vision in the fellow eye.

For those patients whose central vision in the fellow eye is compromised, it is important to think about planning meals and arranging some help about the house for the first couple of weeks.

For those having combined cataract and vitrectomy surgery

Cataract is a clouding or opacity of the eye's natural lens.

Surgery involves removing your cloudy lens and replacing it with a clear, plastic implant lens which you cannot feel and which remains permanently in your eye.



For all patients undergoing cataract surgery, biometry measurements will be taken to ensure that an implant lens of the correct power is selected.

This involves sitting at a machine that, without touching the eye, takes various measurements. We can then calculate the most appropriate lens power for you.

Most patients can be assessed on the day of surgery, but occasional a pre-assessment is required. This will be discussed at your initial consultation.

What happens next?

Once a decision has been made to proceed with surgery, our secretarial team will liaise with you to arrange a convenient date on one of our operating lists. This will be at one of the private hospitals in the your local area.

You will receive confirmation of your admission date from the hospital bookings department, together with a health questionnaire and some general information about your chosen hospital.

Surgery is usually carried out as a day case, with a hospital stay of a few hours.

Remember, you should not drive yourself to the hospital. You may want a relative or friend to accompany you, or to drop you off and return to collect you when you are ready to go home.

Alternatively, if you find getting to and from the hospital difficult, we may be able to offer assistance. Please alert the secretarial team if this is the case as the hospital bookings office is not able to help with transport arrangements.

How do you pay for surgery?

If you belong to a private health insurance scheme you may be obliged, under the terms of your policy, to undergo surgery at a particular hospital. It is therefore important that you notify your insurer of the intended procedure and check whether you are fully covered for admission to the hospital of your choice.

If you do not have private health insurance, you may choose any of the local hospitals and attend as a self-funding patient. Please ask for details of the costs involved as prices may vary between hospitals and are subject to change.

The fixed cost covers all procedures carried out on the day of surgery, additional surgical correction within one month and the first post-operative check. Additional costs may be incurred for more prolonged follow-up and subsequent treatments such as laser capsulotomy.

What to expect on admission to hospital

You will be welcomed at the hospital and shown to the ward where you will be settled in. A nurse will carry out routine investigations including checking your pulse and blood pressure. The nurse will also record details of any medications you are taking and ask questions about your general health. If you are having the combined procedure and your biometry measurement was not carried out prior to admission this will be performed soon after your arrival.

Once this has all been completed the nurse will instil the drops which dilate your pupil in readiness for the operation. The Ophthalmic Nurse will come to see you on the ward to explain what will happen during and after the operation, and to answer any further questions you may have.

You will be asked to sign a consent form to state that you have been provided with, and understand all the information given relating to the operation (including the risks and benefits of surgery) and that you agree to the proposed treatment.

You will be taken to the operating theatre in your own clothes, so it is important to wear something comfortable.

What happens during surgery?

The surgical procedure to correct a macular hole begins with a **vitrectomy**.

Vitrectomy means removal of the vitreous, the jelly-like substance that fills the eye behind the lens; this is a necessary part of the treatment for a number of conditions affecting either the retina or the vitreous itself.

In your case, vitrectomy allows access to the macula for the peeling of any scar tissue (which frequently forms around a macular hole) and creates space for the gas bubble.

After the operation, the gas bubble re-absorbs and the vitreous cavity fills with natural aqueous fluid that is produced by your eye.

Surgery is usually carried out under local anaesthesia, which involves gently injecting anaesthetic around the eye. The anaesthesia will numb the eye and allow it to remain still during the procedure. You may be offered sedation if you are particularly anxious, which will help you relax whilst the procedure is carried out.



You will be awake during the operation and will be aware of some movement and touch, but the procedure will be painless.

You will be made comfortable on the operating couch, following which the skin around your eye will be thoroughly cleansed and a sterile cover (“drape”) will be placed over your eye and face. The cover will be lifted off your mouth so you can talk and breathe easily. Your eyelids will be gently held open, although your eye will feel closed.

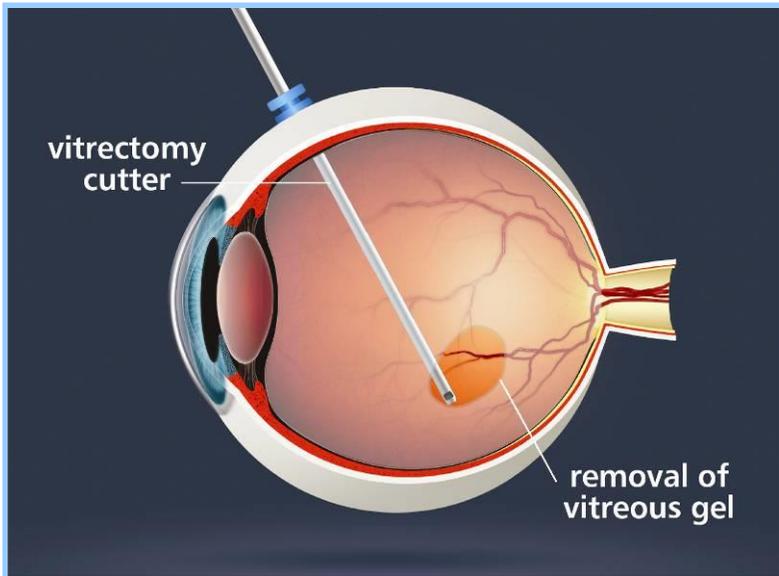
You will see little of what is happening during surgery but we will explain what we are doing as the operation goes along. The theatre staff will make sure you are comfortable and help you relax. Someone will be there to hold your hand if you wish. The operation usually takes about forty-five minutes, but in some cases may take longer.

Surgery is performed with the aid of an operating microscope and special lenses which give the surgeon a clear image of the vitreous and retina.



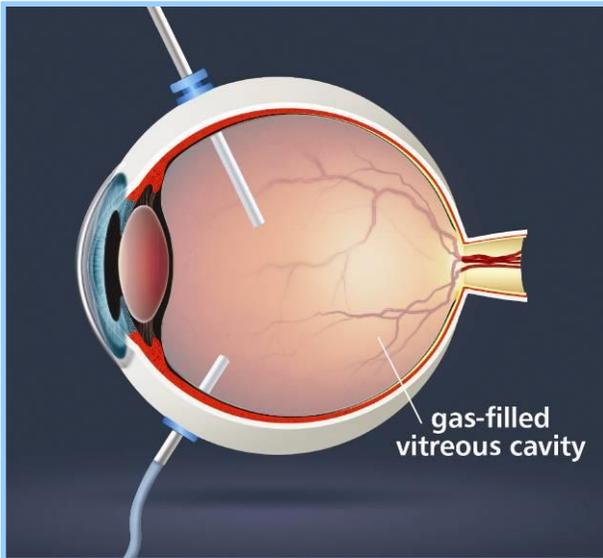
Three tiny incisions are made in the sclera (the white of the eye) to enable instruments to be passed into the vitreous.

First of these is a saline infusion (a “drip”) to replace fluid in the eye, maintaining the pressure and therefore the shape of the eye during surgery; the second is a fibre-optic light to illuminate inside the eye; and the third is for the operating instrument, starting with a vitrectomy cutter which enables safe removal of the vitreous gel from inside the eye.



Following removal of the gel we use extremely fine forceps to peel away any membrane from around the macular hole. A dye is used to stain this membrane to enable better visualisation of areas to be peeled.

The primary aim of vitrectomy surgery for macular hole is to fill the vitreous cavity of the eye with an inert gas. The water which has filled the eye during the removal of the vitreous jelly is first replaced with air.



Although this can occasionally be sufficient to repair the macular hole, air only lasts a few days within the eye and in most cases the final event of the surgical procedure is to replace the air with an inert gas. This gives a longer lasting fill (taking up to eight weeks to disappear completely from the eye) and improving the chance of macular hole repair by successfully re-attaching the small cuff of detached retina around the central tiny hole.

It is re-attachment of this macular tissue which constitutes “closure” of the macular hole.

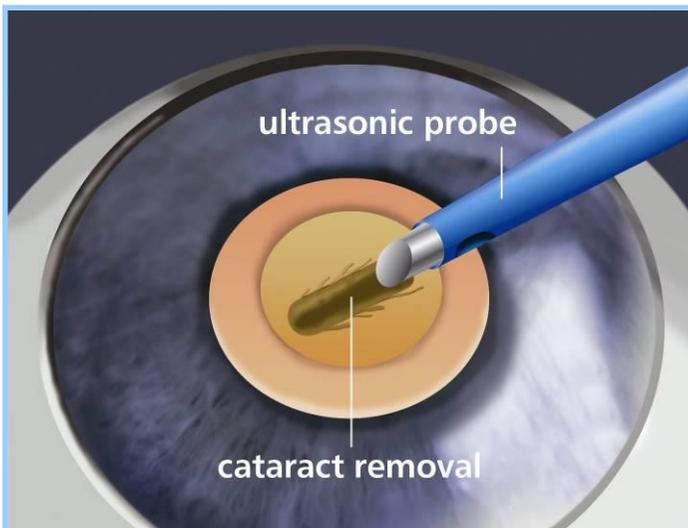
Traditionally the three scleral incisions are sutured at completion of the operation but, with the finer instruments now available, most patients will benefit from a “sutureless” technique and self-sealing incision sites.

For those having combined cataract and vitrectomy surgery

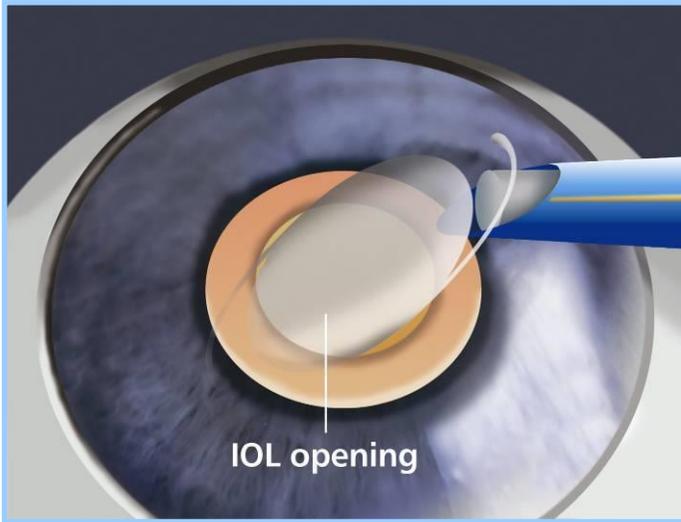
For those patients who have not yet had implant lens surgery, a combined cataract extraction and vitrectomy operation is performed. Your lens is removed by the process of “phaco-emulsification”.

A very small incision is made in the peripheral cornea (the clear part at the front of the eye covering the iris and pupil) through which a tiny probe is inserted. The incision is self-sealing and does not require sutures.

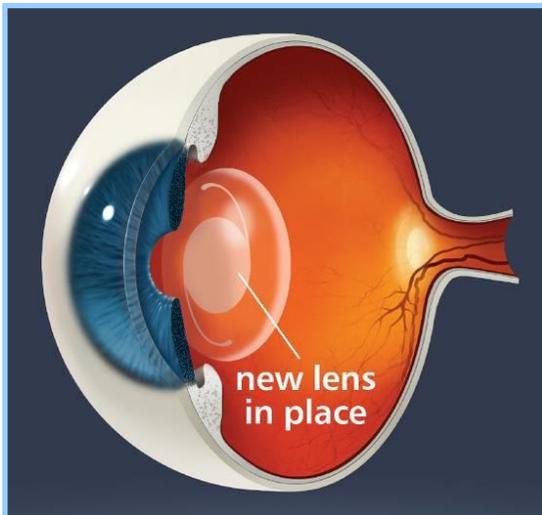
The natural lens of the eye is contained within a “capsular bag”. The aim of surgery is to remove the lens contents whilst leaving the capsular bag intact, apart from a circular hole on the front surface through which we work. An ultrasonic probe breaks up and then vacuums away the cataract material, leaving a cavity into which the new implant lens is inserted.



The rolled-up implant lens slips into the eye through the tiny corneal incision and once situated within the capsular bag, unrolls and is adjusted into position. You will not be able to feel this new implant lens.



An easy way to visualise this process is to think of the cataract as a smartie, the chocolate being removed to leave an empty case in which the new implant lens will sit.



Immediately after your operation

After the operation you will return to the ward with a pad and plastic shield covering the operated eye. This remains in place overnight.



You will be given a combination antibiotic and anti-inflammatory eye drop and a pressure-lowering drop to take home, with written instructions on how to instil these and the frequency with which they should be used.

We will make sure you know how to care for your eye when you get home.

Whilst resting after the operation you will be offered refreshments. You may leave the hospital when you feel ready.

During the first few hours after your operation the eye may feel sore. This is nothing to worry about and your normal headache tablets should settle any discomfort.

The day after your surgery

The pad covering your eye should be removed the morning after your surgery. You do not need to use it thereafter, although some patients prefer to wear the clear plastic shield for the first few nights for peace of mind.

You may find the eye a little sticky and there might have been a slight discharge overnight. This is quite normal and you should cleanse the eye only if necessary, by wiping gently across your closed eyelids with cotton wool dampened with clean water.

You will then need to start your eye drops, following the detailed written instructions given to you before you left the hospital.

Advice will be given on when to reduce and stop your eye drops.

At that stage you will be advised of any change to your drop regime. For the first three days we may ask you to take a Diamox tablet morning and night to help control the pressure within the eye.

If you are running out of drops before your appointment at the clinic, your GP will be able to provide you with a repeat prescription (usually without the need for you to be seen at the Practice).

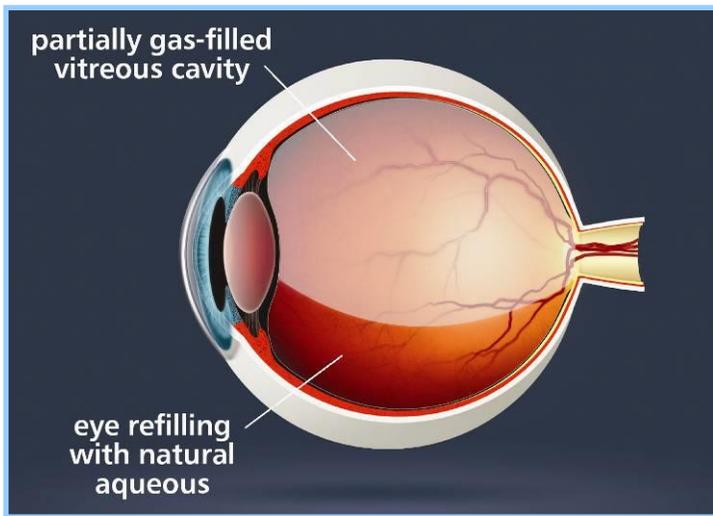


The operated eye may be sore for the first few days and feel gritty for a couple of weeks.

You will receive a telephone call from the Ophthalmic Nurse on the day after your surgery to check all is well. If you have any concerns before this, please do not hesitate to contact us via the telephone number at the back of this booklet.

How quickly will your vision improve?

No Clear vision is possible in the first few days as the gas bubble completely fills the eye. As the gas bubble is absorbed, vision returns giving the impression of a horizon gradually working its way down from the top.



It can take as long as three weeks for the gas bubble to clear from half of the eye, (the upper half of your world appearing normal and the lower half blurred and wobbly) depending on the type of gas required.

The bubble is actually floating to the top of the eye although you will perceive it as being in the lower part of your visual field.

It can take up to eight weeks for the bubble to disappear completely. Occasionally, we will use a shorter acting gas that re-absorbs more quickly. This will be explained if applicable to you.

Your final visual result may not be known for several months following surgery. An average patient regains two or three lines on the optician's chart but more importantly, as distortion is minimised, the two eyes can work together effectively.

When can you resume normal activities?

It is vitally important that you **do not fly** until the gas bubble has re-absorbed, as altitude can cause a pressure rise within the eye and irreparable damage.

If for any reason you are admitted to hospital whilst the gas bubble is present, you must mention this to your surgeon and anaesthetist as certain anaesthetic agents can be absorbed into the eye, causing a dangerous pressure rise. Alternative anaesthetics are available.

You may return to your normal daily activities as soon as you feel ready to do so. As a guide however, for the first two weeks you should refrain from swimming, strenuous activities, high impact sports, heavy lifting and wearing eye make-up.

You will be unable to drive for the first two or three weeks. Following this post-operative period, your ability to drive will depend upon a number of factors including the vision in your other eye and the level of your vision when using both eyes together. The field of vision will be impaired and the movement of the gas bubble very distracting.

If you are in any doubt regarding your visual status you should refrain from driving until you have been seen for review in the clinic.

Please also remember that you will need to continue putting drops in the eye for approximately three to four weeks after surgery.

What can you do to help make the operation a success?

Closure of the macular hole can be assisted by correct posturing to help the bubble press against the macula. Usually this is done simply by avoiding lying flat on your back at night. You may have heard that some patients are advised to posture “eyes down” but this is not usually necessary with our technique.

Following your macular hole surgery it is very important that you instil the eye drops as instructed, as this will help prevent complications such as infection or inflammation in the eye.

You should avoid knocking or rubbing your eye, but you may touch the surrounding area. Although it is safe to have a shower or bath, take care when washing your hair to avoid getting soapy water in your eye.

What are the risks and complications?

The aim and potential outcome of vitrectomy surgery for macular hole will be discussed with you in clinic and again prior to your operation.

Our team operates from modern private hospitals where the equipment and products used in the operating theatre are of the highest standard. Every effort is made to minimise risk and ensure your operation is safe.

Serious problems during or after surgery are rare, however every surgical procedure has risks and potential complications.

Complications early in your recovery:

- **Initial poor vision.** It is not possible to see clearly through a gas bubble and vision will be compromised until spontaneous re-absorption occurs.
- **Bruising of the eye or eyelids.** The local anaesthetic may cause some bruising around the eye, particularly on the lower lid. The sclera may be red where the tiny incisions are made into the eye. This usually resolves completely within the first month.
- **A temporary increase in the intra-ocular pressure in the eye.** This necessitates an additional course of eye drops or tablets. If a gas bubble is used, these treatments are given routinely as a precaution.
- **Allergy to eye drops.** Ocular allergy typically causes lid swelling, itching or redness. If this happens, please let us know and we can prescribe an alternative.

Some patients are allergic to the preservative used in eye drops and if you have previously had a reaction, please inform us prior to surgery so that we can prescribe a preservative-free option.

- **Endophthalmitis.** Infection in the eye is a very rare, but potentially devastating complication affecting fewer than one in a thousand cases. Increasing discomfort, increasing redness of the eye or worsening discharge should be reported immediately.
- **Cystoid macular oedema.** Swelling of the central macular area of the retina causes blurred vision. This usually resolves within a few weeks of using additional eye drops.

Complications late in your recovery:

- **Failure of hole closure.** The success rate for first time closure of a macular hole is between eighty and ninety per cent, depending upon a number of factors including duration of symptoms and the size of the hole. If the first procedure fails, there is still a high chance that a second attempt will be successful.
- **Retinal detachment.** Vitrectomy surgery involves the insertion of instruments into the vitreous cavity of the eye which carries a small risk of tearing the peripheral retina. Although normally identified and treated at the time of surgery, retinal detachment can occur months or even years later. Any increase in floaters and flashing lights, or the appearance of a shadow spreading inwards from the edge of vision, should be reported urgently.

- **Glaucoma.** Any ocular surgery can increase the risk of glaucoma in later years. Glaucoma is damage to the main optic nerve of the eye, caused by an unsuitably high pressure. It can nearly always be controlled with eye drops, although prolonged or even indefinite use may be required.
- **Dry eyes.** This is a common symptom with increasing age, for which many sufferers use simple lubricating drops. Interfering with the conjunctiva on the surface of the eye can upset the production of mucus, which is an important constituent of the tear film. In most cases this is temporary, responding to simple measures such as ocular lubricants and warm compress bathing. We will advise you on a treatment regime if required.

Getting advice after surgery

If you experience any deterioration in your vision, increasing discharge from the eye, continual aching or worsening pain, please contact us immediately.

NUFFIELD HEALTH WESSEX HOSPITAL

To speak to Mr Luff's medical secretary at Nuffield Hospital in Chandlers Ford, please telephone 0845 652 2414 or 02830 258405

Out of office hours, please telephone the on-call nurse on 023 8026 6377

OPTEGRA SURREY EYE HOSPITAL

To speak to Mr Luff's medical secretary at Optegra's Surrey Eye Hospital in Guildford, please telephone 01483 903004

Out of office hours, please telephone the on-call nurse on 07912 406 463

OPTEGRA HAMPSHIRE EYE HOSPITAL

To speak to Mr Luff's medical secretary at Optegra's Hampshire Eye Hospital in Whiteley, please telephone 01329 316700

Out of office hours, please telephone the on-call nurse on 07540 703 741