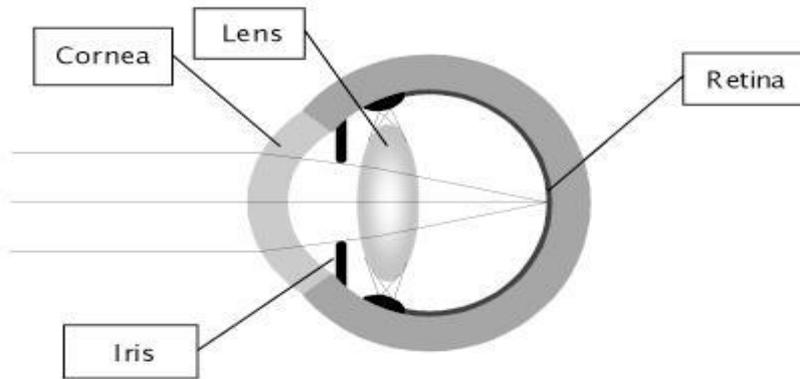
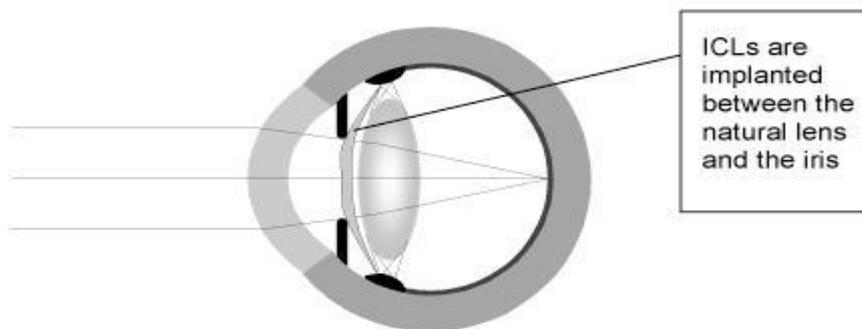


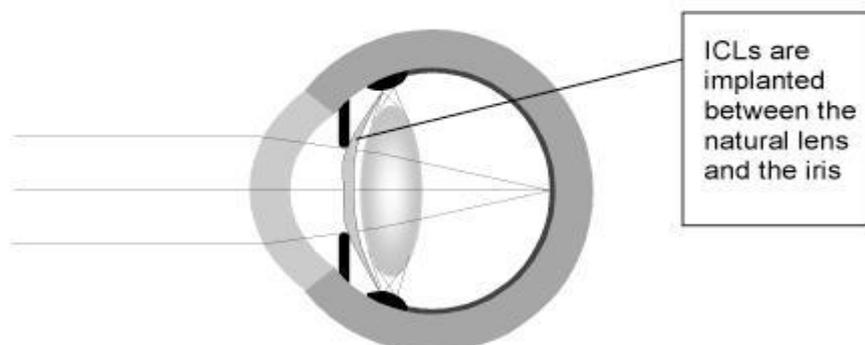
ICL Implantation



ICL implantation involves inserting a lens into the eye to treat higher levels of short-sightedness typically this is greater than -8.00DS. In high myopia (>-8.00D) the eye has too much focussing power. Without glasses, light from objects further than 1/8th of a metre away from the eye is out of focus, creating a blurred image.



The ICL for high myopia (-8.00D and above) is a lens which acts to neutralise the excessive focussing power of the eye allowing clear vision in the distance.



Very occasionally, the ICL can treat 'Longsightedness'.

The ICL for hypermetropia acts to neutralise insufficient focussing power. Astigmatism (uneven focussing power) is corrected using the toric ICL (TCL).

ICL surgery is based on techniques for lens implantation developed in cataract surgery. A 3mm self-sealing valve type wound, which does not require sutures, is used to enter the eye. The flexible ICL is then folded into a cartridge and injected through this wound. Specialised instruments are used to position the lens correctly, between the natural lens and the iris. The ICL effectively builds your contact lens or spectacle correction into the eye.

The ICL is made from a soft biocompatible gel material based on natural collagen. The first ICL was implanted in 1993. Since then, over 300,000 ICLs have been implanted.

The operation can be performed under either local or general anaesthetic as a day case procedure (you do not need to stay in hospital overnight). You can normally see quite well within 2 days of the surgery. The eyes are operated on one week apart. After care is simple: drops 4x per day for 1 month.

Outcomes

85% of patients with no other eye problems are able to see at the level of a normal non-spectacle wearer (6/6 or 20/20) after ICL (or TCL) implantation at Moorfields Eye Hospital. Over 95% are able to see at the driving standard or better, and simple enhancement procedures are available for many patients who are not initially at this level. The quality of vision for most patients is similar to that obtained in contact lenses.

Some patients with high myopia or hypermetropia do not see at the driving standard in one or both eyes even with spectacles on. This is pre-existing limitation on vision, called amblyopia ('lazy eyes'), is usually a consequence of poor focus as a very young child when the connections with the visual areas Whilst ICL implantation can dramatically reduce spectacle dependence for patients with additional eye problems such as amblyopia, it is important to understand that surgery may not allow you to see further down the testing chart than you can see in your spectacles or contact lenses before the surgery.

A realistic aim is to have vision that is good enough to participate in most sports and to socialise without glasses on. Many patients are spectacle free after surgery, but spectacles may still be required for some purposes – particularly for reading in patients over 40 years of age.

Side effects

Approximately 20% of patients (1 in 5) notice increased light scatter (haloes around lights, starburst rays shining around point light sources) at nights. These symptoms tend to diminish with time, but night driving ability may be affected. ICL implantation is reversible: the implants can be removed if necessary. Intolerable light scatter symptoms are uncommon however, and reversal of ICL implantation is rarely requested.

ICLs do not cause discomfort and are not visible in the eye.

Risks

Permanent serious loss of sight <1/5000

Because ICL surgery involves placing an artificial lens inside the eye, there is a risk of introducing infection, which may result in serious loss of sight. Current research indicates that the risk of endophthalmitis (infection inside the eye) after ICL implantation is approximately 1/5000. An array of precautions is taken to prevent infection, and we aim to ensure that one eye is recovering without any signs of infection before performing surgery on the other. This is the reason why lens implantation operations, unlike LASIK, are not performed on both eyes on the same day. We normally wait a minimum period of one week between ICL operations for the right and left eye.

Cataract

Contact between the natural lens and the ICL may, in some cases, cause the natural lens to lose clarity. If lens opacification progresses to interfere with vision, the cloudy lens is called a cataract. Recent studies suggest that the chances of developing a cataract within 5 years of ICL surgery are less than 2%, and that cataract formation is rare in ICL recipients under 40 years of age. Pre-clinical studies indicate that the risk of cataract may be even lower for the latest (v4c) version of the ICL, which acts to maintain normal fluid flow over the natural lens after implantation. But the long-term risk of cataract formation after ICL implantation remains unquantified. Cataract surgery is common in later life anyway (1 in 3 people have cataract surgery at some stage) and high myopia is an independent risk factor for cataract formation. But it is probably safest to assume that ICL implantation may bring forward the age at which you might require cataract surgery. ICL implantation does not make future cataract surgery more complicated. ICL removal can be combined easily with cataract surgery in which a new artificial lens, equivalent in focussing power to the ICL, is implanted to take the place of the natural lens. Good distance vision is normally maintained.

Revision surgery = 1/50

One of the key advantages of ICL surgery is reversibility. If any signs of an adverse reaction to ICL implantation are observed at review visits, the ICL can be removed relatively easily. More commonly, revision surgery involves replacing one ICL with a smaller or larger lens to improve the fit in the eye, or repositioning the ICL within the eye. If revision surgery is required, there is no additional charge. The operation feels much the same as the original implantation, with a similar rapid recovery.

Retinal detachment

Retinal detachment is a sight-threatening problem, which is more common in people with high myopia. Cataract surgery, in which the natural lens is replaced with a new lens, is known to increase the risk of retinal detachment in highly myopic patients. ICL implantation is less invasive, and does not increase the risk of retinal detachment above the background rate (the rate of retinal detachment in highly myopic patients who have not had surgery).

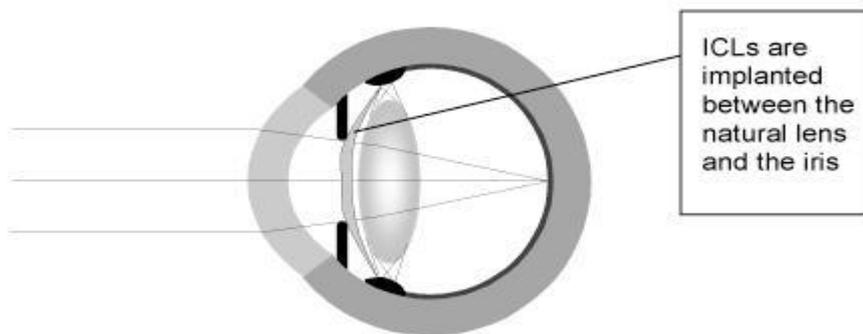
Retinal detachment is a condition you should be aware of if you have high myopia regardless of whether or not you have refractive surgery. Danger signs are flashing lights within the eye, a sudden new shower of floaters, or the sense that part of your visual field is shadowed or missing (flashes, floaters and field loss). Myopic patients experiencing any of these changes in vision should seek an

urgent eye examination. 9 out of 10 retinal detachments are successfully repaired at the first attempt, and the likelihood of success is increased by catching the problem at an early stage. Careful examination of your eye before ICL surgery will help to identify any predisposition to retinal detachment, and the need for preventative laser treatment.

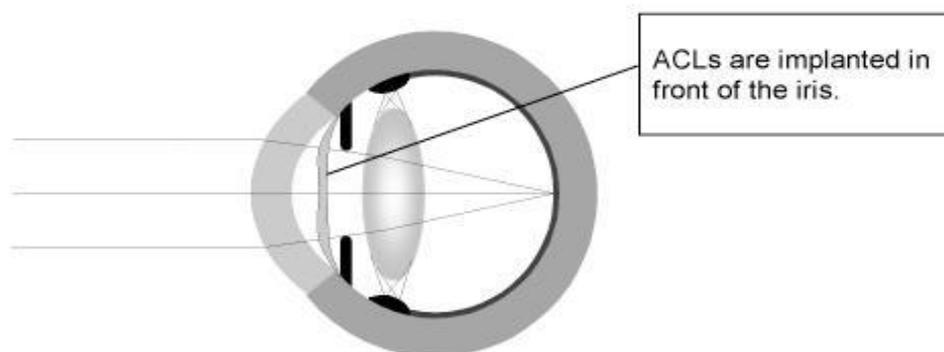
Alternatives to ICL implantation

The risks and benefits for ICL implantation must be set against those for alternative techniques, contact lens wear, and glasses. Glasses are risk free, but 'bottle-bottom' lenses required to correct high myopia, and thick magnifying lenses required to correct high hypermetropia, have inherent optical limitations including a reduced visual field, edge distortions, and altered image size. Contact lenses produce excellent visual correction for most patients, but may be persistently uncomfortable or inconvenient, and are associated with an increased risk of sight threatening infection. This risk is low provided hygiene is good and overnight wear is avoided. The annual risk of serious infection in contact lens wearers adhering to safe lens wear advice is approximately 1/3000.

Alternative surgical techniques for the correction of high myopia include refractive lens exchange (RLE) and anterior chamber lens (ACL) implantation



RLE is exactly the same as cataract surgery. But, as the name suggests, the operation involves the removal of a clear natural lens rather than a cataract. An artificial lens is implanted to provide refractive correction. The main advantage of this technique is its familiarity to surgeons - cataract surgery is the commonest operation of any type performed today. Loss of the natural lens means loss of accommodation, or the ability to read without glasses. Accommodation and lens clarity both decline with age. So RLE is often preferred for patients over 50. For younger patients, ICL or ACL implantation are normally preferred since both techniques preserve natural accommodation and may be less likely than RLE to precipitate a retinal detachment.



Contemporary ACLs are flexible and can be folded for implantation through a small incision as with ICLs. ACLs are associated with an increased risk of and damage to the delicate cell layer lining the back of the cornea (the corneal endothelium), which is vital to corneal clarity. ACLs do not contact the natural lens, and are less likely than ICLs to cause cataracts. But recent data suggests that ACLs may also affect lens clarity.

A newer ACL, the CACHET lens (www.alcon.com) is supported in the anterior chamber angle – the annular recess in the front of the eye where the iris meets the cornea. Advantages are that the lens is very easy to implant and sizing is also relatively easy. The lens cannot be used to correct astigmatism.

Bioptics

Patients with a normal cornea who are ineligible for laser correction (LASIK) prior to ICL or TCL implantation can safely undergo LASIK treatment to correct any refractive error remaining after ICL implantation. For patients with very high starting levels of myopia (over -17.00D), a staged approach in which ICL implantation is followed up with LASIK one month later is commonly used. This 2 stage approach is often referred to as 'bioptics'.

ICL implantation

ICL implantation can be performed under either general or local anaesthetic. For people with no general health problems that could complicate anaesthesia, there is usually a choice. Modern general anaesthesia is safe, and does not prevent same day discharge. But a period of six hours without food and drink is normally required prior to surgery. This is not required for surgery under local anaesthetic. The operation usually lasts around 30 minutes.

After the operation

At the end of the procedure, the surgeon will remove the adhesive drapes, and place a plastic shield over the eye. This protective shield is normally worn for the journey home and during sleep for the first 7 days after surgery. Visual recovery after phakic IOL implantation is rapid. Patients can commonly see at the driving standard or better within 2 days of surgery. Mild gritty discomfort is normal, and eye may be relatively light sensitive in the first few days after surgery. Beyond this, any post-operative discomfort should be minimal. Antibiotic and anti-inflammatory drops are normally instilled four times a day for the first 3-4 weeks after surgery.

Review schedule

Visual rehabilitation is rapid after ICL implantation, and any problems requiring revision treatment are normally apparent soon after surgery. Most patients are discharged after a 1 month post-operative check. We then normally ask that patients stay in touch with their local optometrist for an annual vision and eye health check. Although there is no evidence that ICL implantation increases the risk of glaucoma, high myopia is an independent risk factor. So the eye health check should normally include a glaucoma test.

General advice

Time off work

Although a return to most work activities is possible by the Monday following Thursday evening surgery, you may wish to take time off, particularly in the week between the first and second eye operations. Leaving one eye blurred (either wearing spectacles or leaving them off) may be uncomfortable, but does not strain or damage either the operated or the unoperated eye. Taking one spectacle lens out does not work (the unequal image sizes created feel very uncomfortable). Wearing a contact lens in the non-operated eye is the best solution where this is possible.

Preparation for the initial consultation

You should attend your initial consultation wearing an up-to-date spectacle prescription. Although we do not rely on this for choosing the ICL power to be implanted, this will facilitate your assessment. Read this information as carefully as possible, and prepare a list of questions to help cover any areas you are uncertain of at the initial consultation. Temporary changes in corneal shape are commonly associated with contact lens wear. If you are a contact lens wearer, you should not wear your contact lenses for 1 week (soft lenses) or 2 weeks (gas permeable hard lenses) before the preparatory visit. This will enable an accurate measurement of the corneal surface shape - important both in selecting your ICL and excluding abnormalities in corneal shape which might influence the result of surgery.

Preparation for surgery

Do not wear any eye or facial make up on the day of surgery. Ordinary non-prescription sunglasses are useful whilst your eyes are mildly light sensitive in the early recovery period and are ideal for travelling home after surgery. Bring these with you. Finally, if you are having a general anaesthetic, remember you should have nothing to eat or drink from 11.30am on the day of surgery.

After surgery

Swimming is not recommended in the one month after surgery (because of a theoretical risk of infection), but other forms of exercise and flying are no problem. Try not to open your eyes under the shower for the first 3 days, and avoid eye bathing - just use the prescribed drops and clear any mucus build up from the eyelid margins using a cotton wool bud moistened in boiled water which has been left to cool to a comfortable temperature.