

## **Oculentis Lens exchange for Opacified lens- patient information leaflet/ Scleral Haptic Fixation (SHF)**

I have advised you to read this leaflet because you have a lens that needs to be removed because it has frosted. Although this is not common surgery, as a VR surgeon I tend to be referred these cases and so my hope is to explain the surgery in terms of the process, risks and benefits as in many other more common procedures for which much information is available and from many sources. It is very difficult to truly 'evidence base' this advice as these are not common procedures and each is different and so I will use personal outcome data and experience to inform the information. I have currently completed just over 170 cases at the time of writing and the information is based on my prospective audit of these cases. (i.e. my outcomes as I go along)

### **Why do I need my plastic lens (IOL) removed?**

After all cataract surgery an IOL is placed into the capsular bag of your natural lens. Unfortunately, this new lens has become cloudy. Without surgery the vision will continue to get worse although in the early stages vision can be very good in optimal lighting conditions with poor vision noticed with bright lights, low sun or strong overhead lighting.

### **Why has my lens has frosted?**

We are unsure to the exact mechanisms involved when lenses frost however it may be due to the storage solution or surface qualities of certain lenses.

### **What is the aim of surgery?**

The aim is to restore distance vision OR near vision without spectacles and reduce complications from having a lens moving around within the eye. The replacement lens will be a single vision lens not a multifocal or toric lens

### **Why can't I have a multifocal put back in?**

In theory you could as long as the bag remains intact and able to take a new lens however for a variety of reasons myself and others tend not to put a multifocal back in for a few reasons. It is difficult to calculate the required lens given the previous surgery. The bag has been operated on and may be loose or unstable and the lens might sit off centre which effects multifocals significantly but not the aspheric lens I put in. Astigmatism may be exacerbated by the incisions required to remove the existing lens and this may also interfere with the performance of a multifocal lens. If the bag becomes unstable during removal of the lens there would be nowhere to place the multifocal lens, this happens around 60% of the time including patients who have had previous YAG laser.

### **How is surgery done to remove an IOL?**

Surgery is local anaesthetic day case surgery. It will be comfortable and you will see and feel nothing. Surgery can take around 30 minutes but sometimes over an hour to complete. It is 'Off Piste' surgery and I have to respond to how the eye behaves in each case as each case presents slightly different scenarios and challenges. You will lay flat as you did for your cataract surgery. Your eye will be numbed with an injection by my anaesthetist or by myself and you may or may not wish to have some sedation to reduce anxiety if you are feeling anxious and I usually have an anaesthetist present. In the private sector I will mostly have an anaesthetist present, in the NHS I may not. Either way you will be comfortable.

#### Plan A

Sometimes the lens capsule is intact and the support strong and I am able to remove the lens from the bag and place the new lens into the bag. (See the video-Eye conditions and treatments/ Oculentis tab-'Plan A'). However, frequently either the bag is damaged or the support is poor after manipulation of the old lens such that the bag cannot support a new lens. In this scenario I proceed to vitrectomy and Scleral Haptic Fixation (SHF). (See video-Eye conditions and treatments/ Lenses tab/ Scleral Haptic Fixation) The Oculentis lens is a large plate haptic and can be challenging to remove. I have to lift half the lens out of the bag and then cut it to avoid damage to the angles of the eye. With the smaller three piece or one piece 'C loops' the lenses can be rotated out of the bag with less trauma.

#### Plan B

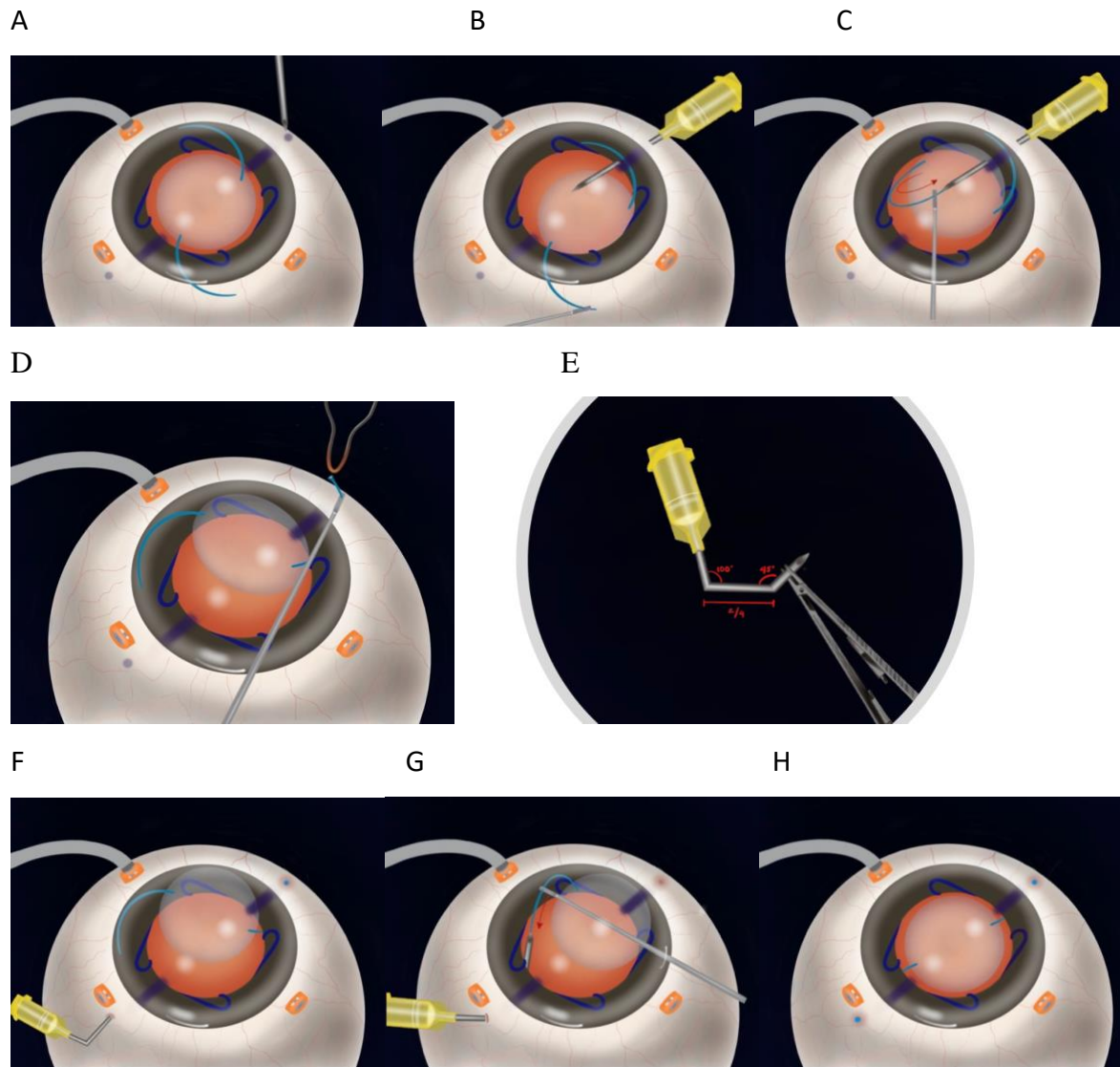
If there is a previous YAG laser opening and a connection to the Vitreous or if the bag becomes unstable, I will need to proceed to vitrectomy surgery to remove the jelly from the eye and place the lens by Scleral Haptic fixation (See below). The eye is full of jelly and this is attached to the retina at the very edge. As a result, any movements within the eye can pull on the jelly and cause a tear on the retina. The retina is the 'film in the camera' of your eye, it is the 'wallpaper' on the wall, and if it gets damaged it can come off the wall of the eye (a retinal detachment) and this can result in loss of sight. Because of this risk the first thing I will do is place three little ports into the wall of the eye through which I will work. I am then able to remove the jelly from your eye (Vitrectomy) reducing the risk of damage. The procedure itself has a risk of retinal detachment at around 1 to 2 in 100 but this is much less than the risk of not doing vitrectomy. Once the jelly is removed I will search around the retina to look for any tears and repair them if found. Videos are available at [www.stephenlasheyesurgery.com](http://www.stephenlasheyesurgery.com) as detailed above.

In either case, the lens I put back in is determined in the same way as a normal lens would be, using the length of the eye and the curve of the eye and then a calculation is made to determine the lens power. Just as in normal cataract surgery it is impossible to determine the exact power of the lens when it sits in the eye but the aim will be good distance vision erring on the side of a short-sighted outcome, or arm's length vision. As I always place the lens either in the bag or supported in the white of the eye in an 'in the bag position' I use the same power lens in both techniques.

**Scleral Haptic fixation (SHF) Used when no support available for new lens.**

The lens is introduced into the eye with the trailing haptic left outside the eye (The haptic is the blue arm in the diagram). I then use a needle from the outside of the eye tunneled through the white of the eye and into the front of the eye. The Haptic is then grasped and fed into the needle. The needle is withdrawn and the end of the haptic is burned to form a bulb so it does not fall back into the eye. The same is repeated on the other side and then both Haptics are pushed into the tunnels and the lens centres. Full details and a video can be found on my website [www.stephenlasheyesurgery.com](http://www.stephenlasheyesurgery.com) under treatments/lenses/Scleral Haptic fixation.

**Schematic Illustration of SHF**



## **Fig 2. Schematic Illustration of the surgical technique.**

(A: First needle entry, B: Trailing haptic grabbed outside the eye, C: Trailing haptic threading into the 1<sup>st</sup> needle, D: Trailing haptic flange creation, E: 2<sup>nd</sup> needle Double-Bend, F: 2<sup>nd</sup> needle entry at the 2 o'clock position, G: Leading haptic threading into the 2<sup>nd</sup> needle, H: Both haptics buried and IOL centered in position.)

### **Are there alternative methods?**

Yes, many and I have used most of them in the past. Over the years the most common method would be to place a large lens into the front of the eye- an Anterior chamber lens. These work well but require a large corneal incision and as they sit in front of the coloured part of the eye and so they can cause problems with the cornea (the clear part) in terms of becoming waterlogged and hazy and they can also interfere with drainage of the eye resulting in glaucoma. These lenses need to be special ordered. The other type of lens is an iris clip lens. These lenses clip to the iris and can cause inflammation at the back of the eye and again have to be special ordered. I like scleral haptic fixation because I can use lenses we have in stock and that lens ends up in the best position in the eye behind the iris and in the plane of the natural lens.

### **What can go wrong with SHF?**

At the time of writing, I have completed over 400 cases with an audit of my first 200 cases completed by an independent source and being prepared for publication. This is a new technique as an adaptation to similar techniques that have been around for many years. Like any technique there is a learning curve and so the figures I will give are from the first 200 cases. The complications are certainly getting less with time and I will be looking to reaudit the work going forward. Being based on the first 200 cases these figures would represent a 'worst-case scenario' as the technique has improved in my hands.

As with any surgery there is a small risk of infection at around 1 in 1000. Vitrectomy surgery carries a 1-2 in 100 risk of retinal detachment. The most common issue encountered is astigmatism or odd shape of the eye. This is usually due to the corneal incision made to remove and replace lenses but can also be due to slight tilting of the lens. It is more likely you will need spectacles to achieve your best vision than with standard cataract surgery. Swelling of the macula (Cystoid macular Oedema or CMO) which is present in around 2 in 100 people in standard cataract surgery is much more common with SHF. Initial results suggested a rate of around 20%. Following this high rate I have now introduced a small hole in the peripheral iris at the time of surgery and this seems to have reduced the rate of CMO dramatically from around 20% to less than 5%. Raised pressure has been seen in around 2 in 100 patients and low pressure in 2 in 100 although all settled with drops. Bleeding into the eye was seen in around 3 in 100 and all settled without intervention and capture of the iris behind the lens was seen in 3 in 100 and this was treated with a laser procedure to the iris. I have not had a single case of iris capture in the last 300 cases. Two patients in the total 400 cases have required corneal surgery to treat corneal swelling. The risk of this goes up with every surgery performed on an eye as cells are lost from the back surface after each surgery and cells are also lost year on year as we age regardless of surgery. 1 lens was replaced due to decentration and tilt and one lens required refixing a haptic due to slip.

The case mix was complex with nearly half of the patients having other problems with their eyes but vision improved on average 5 lines. I will continue to audit results and update the risks accordingly.

## **Summary**

If you do nothing the vision will get slowly worse. Initially your ability to read down the test chart in optimal lighting conditions will be preserved (Quantity of vision) and you will only notice issues in sub optimal lighting, strong overhead lighting or light from the side or front as in headlights (Quality of vision). With time both will deteriorate. With surgery most patients seem very pleased with the improvement in the quality of the vision even if the quantity of vision requires a boost with spectacles.

### Appendix- Summary results from paper submitted (12/23) on first 200 cases

Two hundred eyes of 194 patients underwent ISHF surgery during a 5-year period. The most common indications for ISHF surgery were a dislocated IOL (35.5%), an opacified IOL (24.5%), and complicated cataract surgery (19.0%). One hundred twenty-one eyes (60.5%) had a significant ocular comorbidity, including previous retinal detachment (18.0%), macular pathology (14.5%), and previous ocular trauma (11.5%). Median postoperative follow-up duration was 7.6 months. The most frequent postoperative complications were cystoid macular oedema (CMO, 19.5%), ocular hypertension (6.0%), corneal oedema (4.0%), and iris capture (3.5%). Haptic slip occurred in 5 eyes (2.5%) during the follow-up period. Twelve eyes (6.0%) underwent revision or re-do surgery. Median final postoperative visual acuity was 0.26 logMAR (20/36). In eyes without ocular co-morbidity, median final postoperative visual acuity was 0.16 logMAR (20/29).