

Osteo-odonto-keratoprosthesis (OOKP)



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Front cover: Watercolour of the Sussex Eye Hospital by W S Blackshaw Hon RWS.

Why have I been referred to the Sussex Eye Hospital, Brighton?

The Sussex Eye Hospital is a teaching hospital allied with the Brighton and Sussex Medical school. It is the national referral centre for osteo-odonto-keratoprosthesis (OOKP), being the only centre in the United Kingdom and is one of only a few in Europe which provides this service.

Why do I need to have an OOKP?

This operation is complex and therefore reserved for patients in whom all other surgical interventions (treatments) have been carried out or considered.

You may have had multiple failed corneal grafts; the operation is suitable for patients who have suffered irreversible corneal scarring which has significantly reduced the vision in both eyes. It is particularly suited to patients with very dry eyes.

What will an OOKP involve?

You will have an initial assessment visit at the hospital and then the surgery will be carried out on another day – on a date which is mutually convenient for yourself and the hospital. An OOKP is carried out on only one eye.

What happens at the Initial Assessment Visit?

- This visit takes place in the Eye clinic and lasts all morning (9am-12.30 pm). Because of the early start, you may need to make arrangements to come to Brighton the night before.
- Please bring all current medications with you, including any herbal or complementary medicines.

- During this visit the doctor will take a detailed history of your eye problem and discuss your general health.
- Both of your eyes will be examined to help decide which one would be most suitable for surgery.
- An ultrasound scan of your eyes will be taken which allows us to view the back of your eye. It also allows us to view the length of your eye, which is important in assessing the appropriate power (strength) for focusing of the optical cylinder onto the back of the eye in order to see clearly.
- An assessment of your teeth will then be carried out by the Maxillofacial surgeon. This is to identify a suitable tooth to hold the optical cylinder. You, as the patient, will normally provide the tooth. However, where this is not possible because there are no suitable teeth, then an appropriate donor will need to be identified. This is usually a 'first' relative (father/mother, brother/sister, son/daughter). If you do not have your own canine teeth, it is helpful if willing members of your family accompany you to the assessment visit.
- Assessment of your teeth will include having an X-ray of your teeth and jaw and examining the inside of your cheek – a piece of the cheek is transplanted on to the front of the eye and used to protect the tooth and bone.
- Following this assessment visit, your dentist (or that of the donor) will be contacted and you (or your donor) will be advised about the maintenance of good oral hygiene.
- If you smoke, you will need to stop before having the OOKP. This is because smoking delays healing and will negatively affect the outcome of the operation. Please contact your GP for help in how to give up smoking.

What happens when I come for surgery?

Your surgery will be divided into two stages: Stage 1 and Stage 2. Each stage is carried out under a general anaesthetic.

OOKP – Stage 1

- The length of stay for this stage is approximately five days. During this part of the operation, the tooth and small piece of surrounding bone are removed and prepared to the correct size and shape.
- A circular hole is drilled in the tooth and the optical cylinder is cemented in place within the tooth. This is called the lamina.
- This is then placed into a muscular pouch, which is created through an incision in the skin. This procedure is carried out beneath the opposite eye and remains in place until required in Stage 2.
- A piece of the inside of the cheek (buccal mucous membrane) is then stitched onto the front of the eye to be operated. This prepares the area for the next stage of surgery. If your relative is donating a tooth then this stage will be carried out first, before the tooth is implanted several weeks later.
- If your relative is donating the tooth, this is harvested (removed) on the same day as you receive it and you will be started on special medication to prevent you rejecting and absorbing the tooth. This medication is called immuno-suppression and needs to be monitored by your GP.
- At the end of the five days your sutures (stitches) from the skin over the muscular pouch on the opposite eye will be removed.
- There is usually a gap of about 3-4 months in between stages 1 and 2. This is to enable the tooth and bone lamina to

develop a blood supply. During this time you (or your relative donor) may wish to see your dentist to fill the gap created from the harvested tooth.

OOKP – Stage 2

- Again, the length of stay for this stage is approximately five days. However, the surgery to the eye is more complex than it was at Stage 1.
- Surgery involves retrieving the tooth and bone lamina from the pouch under the other eye.
- The eye to be operated upon is then further prepared for surgery. The piece of cheek which was stitched to its front is partially removed. This stage involves removing part of the cornea, the iris (the coloured part of the eye), the lens and the vitreous (gel inside the eye).
- The tooth and bone lamina is then stitched to the front of the operated eye and then covered with the piece of the cheek skin.
- Air is injected into the eye at the time of surgery and will reduce vision for the first couple of days post-operatively (after the operation).
- Following this, assuming the back of the eye is normal, you should notice an improvement in your vision.
- Please note: new spectacles cannot be worn for at least a month or two following Stage 2 surgery.

What happens after the operation?

- You will be provided with post-operative instructions before you are discharged. Please ask any questions which you feel remain unanswered. You will need someone to accompany you home and stay for the first several weeks. Care needs to be taken washing the face and hair should be washed with a rinse from front to back so that shampoo does not enter the eye. Driving is not recommended due to the reduced field of vision after the operation.
- You will require life-long follow up at the Sussex Eye Hospital, which is usually every three months.
- At each visit you will be examined for the development of any complication that may arise, but in particular retinal detachment (where the light sensitive layer of the eye comes away), development of glaucoma (retinal nerve damage due to elevated pressure in the eye) and absorption of the lamina (tooth and jaw bone plate dissolves away).
- Each year a special CT-scan of the lamina may be carried out as an additional way of assessing if the lamina is being absorbed. If you are taking immuno-suppression medication for a donated lamina then this will need to be monitored with the Eye Department and your General Practitioner.

What are the benefits of OOKP?

- OOKP can significantly improve vision in approximately 65% of patients. This improvement will remain. However, the improved vision comes with a reduced field of vision due to the implanted optical cylinder providing less area to see through. This is not large enough for driving.

What are the risks of OOKP?

As with all surgery there is a degree of risk associated with this procedure.

Risks at Stage 1:

- Infection and bleeding of the eye, mouth or muscular pouch. (Bleeding is a common complication on the outside of the eye or from the cheek. This does not adversely affect the operation.)
- Perforation as we stitch the piece of cheek to the front of your eye. This can lead to retinal detachment and bleeding, which can reduce vision and/or cause blindness (this risk is very small).
- Damage to adjacent teeth and possible fracture of the jawbone as the tooth and bone are removed (this risk is small).
- Damage to the opening of a large salivary gland (parotid gland) when the piece of cheek is removed. This may reduce the amount of saliva produced or increase the risk of infection to the gland (this risk is very small).
- When the inside of the cheek is healing, this can limit the mouth opening so exercises are required to maintain good jaw opening (this happens to all patients).

Risks at Stage 2:

- In addition to the risk of infection, bleeding and perforation, there is a risk of severe bleeding in and around the eye, which can result in a permanent loss of vision and blindness (risk is 11%).

- As the optical cylinder and tooth are stitched onto the front of the eye, there is a risk that it may be decentred or tilted which can reduce vision (this is rare).
- Due to the surgery on the front of the eye, there may be a need to operate on the eyelids if scarring is excessive.

How will my eye look after the operation?



Main risks following the operation:

- Development of glaucoma. This occurs in 50% of patients. If uncontrolled this can cause progressive loss of vision. This can generally be controlled with oral medication but may necessitate further surgery.
- Retinal detachment. If this does occur then urgent surgery is required with a risk of permanent loss of vision (risk is 11%).
- As the tooth and bone lamina are in an unnatural position on the front of the eye, there is a risk of absorption of the lamina, so not providing a stable platform for the optical cylinder. This absorption is made apparent by a change in spectacle prescription, change in vision and instability of the optic (the optic may tilt). The risk of this occurring is 24%.

If left, the lamina or optic can fall out (extrude). This risk is greater if the lamina is not the person's own (ie. donated). To reduce this risk, immuno-suppression medication is taken if the lamina is donated. If significant lamina absorption does occur, then repeat surgery needs to be carried out.

- There is a persistent risk of infection of the protective mucous membrane covering the lamina but this is reduced by regularly using antibiotic ointment. If the membrane thins and shrinks then there is a risk of infection to the bone and bone lamina (risk of 5%).

Any of the above risks can lead to a permanent loss of vision (risk of 16%).

Are there any alternative options?

The alternative option is to choose not to have this operation as this operation is only conducted where all other options have either been carried out or considered.

Who should I contact if I have any questions?

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