Eye Care Centre

Deep Anterior Lamellar Keratoplasty (DALK) Surgery and Penetrating Keratoplasty (PK) Surgery

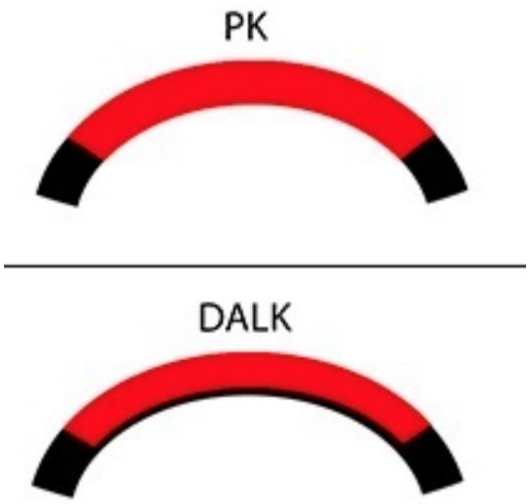
Important information for patients

The cornea

The cornea is the transparent window at the front of the eye which allows light to travel to the back of the eye. It is around half a millimetre thick and is formed of several layers. The cornea can become damaged and scarred by causes including trauma; diseases, including keratoconus; or infection. These can all result in cloudy or reduced vision.

What is DALK surgery?

DALK is a form of corneal transplant operation in which the central part of the cornea is replaced with a healthy cornea from a donor eye. This helps to make the cornea transparent again so that the vision becomes clear. The healthy cornea has come from an eye which has been donated by someone who has died. The donor cornea is carefully prepared by the NHS Blood and Transfusion Eye Bank and transported to the hospital.



In DALK surgery the back layer of the cornea (the endothelium) is left as it is, and only the front layers are replaced with the donor cornea. This has the advantage that there tends to be less transplant rejection (see page 5). However, during the surgery it is not always possible to leave the back layer as it is, and it may be necessary to replace all the layers with the donor cornea. In this case, the surgery is called a Penetrating Keratoplasty (PK). You will only know after the operation whether a DALK or a PK was performed. The two types of surgery are very similar, the eye feels and looks the same afterwards. All the following information from this point on refers to both PK and DALK surgery.

Why do I need this operation?

This operation is usually performed to help you see better, your vision will not improve by itself. Occasionally, the main reason for this operation is to make the eye whole and intact if there is a leak from an injury or disease. The operation may also be done to reduce pain.

About the operation

The operation is performed with you asleep under a general anaesthetic and takes around one to two hours to perform. A central disc of your cornea is removed, around 1cm in diameter, and is replaced with a disc from a healthy cornea. The healthy cornea is held in place with sutures (stitches). Normally, you will be able to go home on the same day after the operation, but sometimes people need to stay in the hospital overnight.

Are there alternatives to DALK surgery?

At the moment, the only way to make your cornea clear again is to undergo an operation.

What are the risks of DALK surgery?

Most cases of DALK surgery go well and the vision is improved afterwards. However, there are a number of possible complications with DALK surgery. It is possible that your vision may not improve. It is possible that you could lose vision in the operated eye as a result of the operation, either partially or (rarely) completely.
In straight-forward cases, we would hope for over 90% of transplants to be working well after five years, with a clear cornea. However, this does depend on the condition of your eye before surgery and may not apply in your case.

Possible complications are explained below and on page 3. Your vision, either short or long-term, may be impaired as a result of these:

- **Bleeding** - while this is usually not a problem, and can be dealt with during surgery, a bleed can occur at the front or back of the eye, which may affect the vision.
- **Infection** - we use sterile instruments in the operating theatre and you will receive antibiotic drops after the operation to prevent infection.
- **Inflammation** - this can occur after any operation in the eye. You will be given steroid drops after the operation, which helps to reduce the inflammation. Some people need the frequency of these to be increased, or a longer course of drops. Occasionally, it can be difficult to control the inflammation.

- **Pain** - it is normal for the eye to be uncomfortable or sore after the operation. This should settle down over one to two weeks, and regular painkillers can be used, however long-term discomfort is occasionally a problem.
- **Corneal astigmatism** – one of the major issues after PK surgery is that the cornea may not have the normal, round shape, but instead have a more irregular shape which will blur the vision. There are a number of ways of overcoming/treating astigmatism, including adjusting the sutures, putting in further sutures, making small incisions/cuts in the cornea, and wearing spectacles or contact lenses.
- **Transplant loosening and/or broken sutures** – loose or broken sutures can cause discomfort and inflammation. These would need to be removed, and may need to be replaced if the transplant becomes loose.
- **Cataract** - the lens in the eye may develop a cataract more quickly than normal and often requires a cataract operation in the future. If you have previously had a cataract operation, then this is not an issue.
- **Retinal detachment –** this can occur when the thin lining at the back of your eye called the retina begins to pull away from the blood vessels that supply it with oxygen and nutrients. Another operation may be required for this.
- **Macular oedema** - there may be some swelling/waterlogging at the back of the eye as a result of the operation. Further interventions, such as eye drops may be needed.
- **Rejection or failure of the transplant** - you will receive steroid drops after the operation which helps to reduce the risk of rejection (see page 5). Rejection can still occur, in which case your vision will become cloudy again. Sometimes this can be treated successfully with eye drops, but not always. Even without rejection the transplant may, for some reason, stop working and the vision become cloudy.
- **Glaucoma or high pressure in the eye** - This may require drops or further treatment.
- **Disease transmission** - there is a theoretical risk of a disease being transmitted from the donor eye to you, although this would be very rare. Donors are carefully selected to minimise this risk. Blood tests are performed for known diseases, and the volume of tissue which is transplanted is small.
- **Further surgery, procedure or other treatment** - this may be needed for any of the complications that are listed.
- **Other complications** - the eye is a very complex and delicate structure. It is not possible to always predict or anticipate what might happen when an operation is performed. Very rarely, a complication with permanent implications can occur, such as a very serious bleed or infection, which means that you could lose the operated eye altogether and need an artificial eye.

What will happen after the operation?

After the operation, it is important that there is someone to help look after you. There should be someone who can help transport you home, and who will be with you at home, at least for the first night. Please let us know if this is not the case.

If you go home on the same day as the operation you will usually need to return the next day for us to examine the eye. Please let us know if you will have difficulty returning the next day. There will be a pad on the eye when you come out of the operating theatre, this will be removed when we see you the next day. For the first week we recommend that you wear the clear plastic shield you will be given over the eye, to help protect it. After the first week the shield only needs to be worn at night, for a further two to three weeks.

You will have one or more sutures in the eye after the operation. These are important to keep the transplant in place. They do not usually cause any irritation to the eye and are left in place for at least a year, and often much longer than that.

You will have several different drops after the operation. You may like to practise using eye drops before the operation or ensure that there is someone who will be able to put the drops in for you. You will need to take drops frequently for the first month, and drops are continued for months after the operation, sometimes indefinitely.

If you need to, you can take simple painkillers such as paracetamol, to help with pain relief.

How quickly the vision improves after the operation can vary. It may take over a year for the vision to fully stabilise, and you will likely need to wear spectacles or contact lenses to get the best vision possible. However, we hope that within weeks to months after the operation the vision will be better than it was before the operation.

You will be seen in the Eye Care Clinic around one week after surgery and will also need regular visits after that.

Instructions on how to use the eye drops

Before instilling eye drops, hands should be washed with soap and water, and then dried.

Always check the expiry date on your medication and write down the date when the bottle was opened. If you have more than one eye drop to apply, you should wait about five minutes before applying the next one. Do not worry if some of it overflows, you can wipe off the excess with a clean tissue.

Corneal transplant rejection

This needs to be treated urgently to stop the transplant failing. You should come immediately to the Emergency Department if you notice any of symptoms below. If you are in any doubt, call the contact numbers at the end of this leaflet.

R red eye
S sensitivity to light
V visual loss/blurring
P pain

When can I go back to normal activities?

Be careful to avoid any trauma or knocks to the eye after the operation. This is especially important in the first few weeks after surgery.

We suggest that as a rough guide you plan to take four weeks off work, but this depends on your type of work and you should discuss this with us.

Avoid getting water in the eye for four weeks after the operation. Your hair can be washed by someone else if you are able to lean your head back and keep your eyes closed to avoid water going in the eye. After four weeks normal washing can resume, but be careful not to poke or put pressure on the eye.

Avoid lifting heavy objects or bending down for two months after the operation and you should be careful even after this. It is best to avoid any sports for several months after the operation, we suggest you discuss with us before resuming any sports. Contact sports at any time after the operation will always carry some risk to the eye.

If you would like to drive after the operation, the length of time you will need to wait before starting is variable. You need to be able to read a car number plate from 20 metres and have no other reason not to drive (such as impairment of your peripheral vision) for you to fulfil the legal requirements for driving (also see DVLA guidance). You may be able to meet this requirement with your other eye. However, we also recommend that you wait until the operated eye feels comfortable, and that you have got used to what your vision is like after the operation before driving. How long this will take is very variable between individuals. You may prefer, or it may be necessary for you, to wait until you have got updated glasses, or been fitted for contact lenses, before driving. However, it may be weeks or months after the surgery until this is possible.
It is possible to take flights at any time after surgery. However, you will need to be seen regularly after the operation. If you are travelling you need to ensure you can access good services for eye care wherever you go, and that whoever sees you has the necessary information about your operation.

Contact telephone numbers

In case of urgent problems telephone Leighton Hospital Switchboard on 01270 255141 and ask for the Emergency Ophthalmology Triage Nurse on call.
Available Monday to Friday, 9.00am – 5.00pm (excluding Bank Holidays)

Out of these hours, telephone Leighton Hospital Switchboard and ask for the Ophthalmologist on call.

Secretary for Mr Hu (Consultant, Ophthalmologist):
Tel: 01270 612306
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Leighton Hospital
Middlewich Road
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This information is available in audio, Braille, large print and other languages. To request a copy, please ask a member of staff.

Reviewed by Readers' Panel January 2018

Printed March 2018 Review March 2020 Ref: SC/ECC/0470318