Corneal Graft or Transplantation: Endothelial Keratoplasty (EK)

Patient Information

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Illustrations courtesy of Medical Illustration, Countess of Chester Hospital

The information herein should help supplement the consultation with your doctor in clinic. Should you have further or specific questions these should be discussed with your eye doctor.

The cornea is the clear window at the front of the eye (Figure 1A), that allows light to enter for you to see. The cornea consists of several layers and your vision has deteriorated due to a failure of the innermost layer of the cornea – the endothelium (Figure 1B). The other layers of your cornea are thought to be healthy, and therefore do not require replacement / transplantation at this stage.

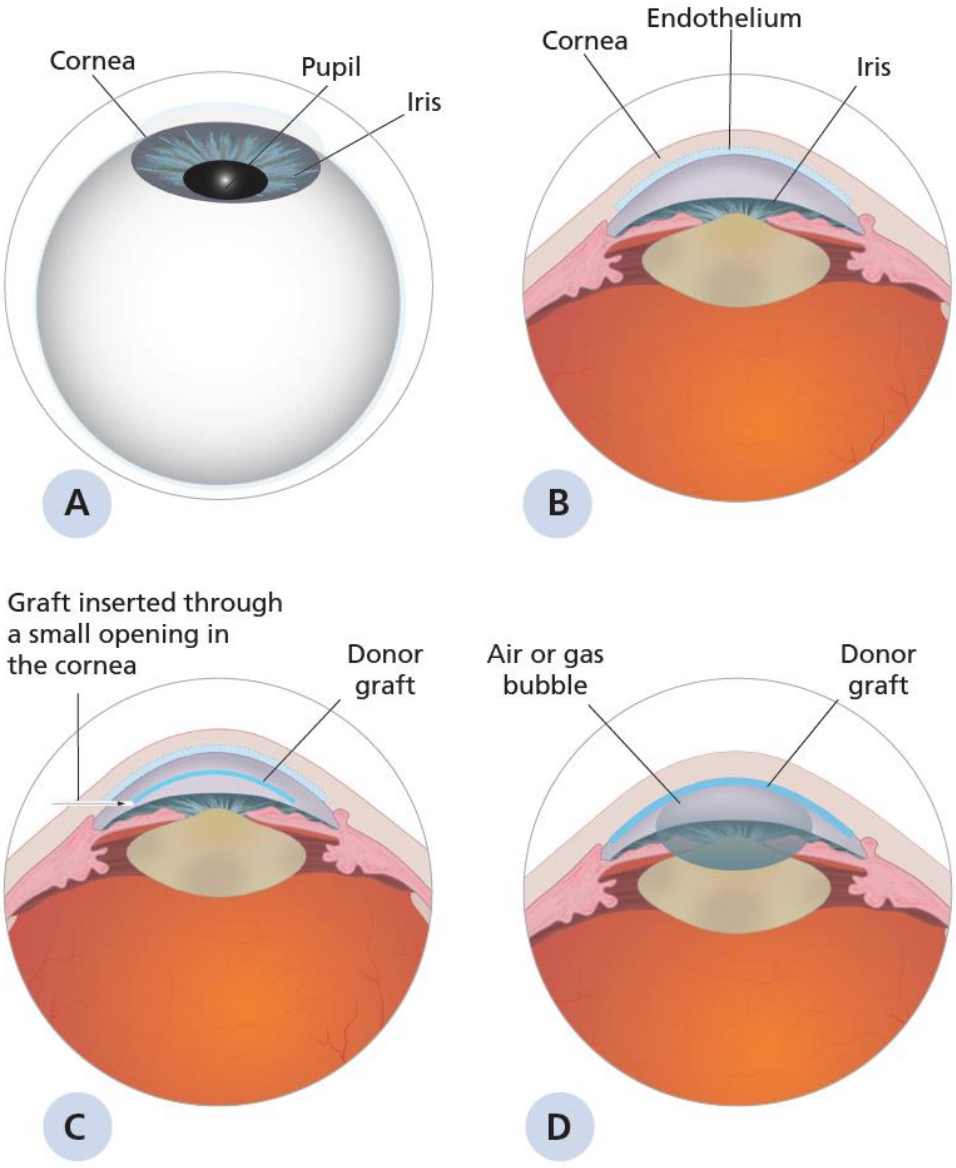

Figure 1. *The cornea (light blue) is the window that allows light to enter the eye (A). The unhealthy inner cornea - the endothelium - will be carefully removed (B). The donor cornea will be introduced and positioned (C), and floated into position and supported by an air or gas bubble.*

Modern surgical techniques allow your surgeon to replace only this inner layer and to improve your vision, with several advantages over more traditional "full-thickness" corneal transplant surgery. Other forms of corneal transplant are possible to replace the different layers, but are not discussed here.

What are the other names for this operation?

Endothelial keratoplasty (EK) is the general name of the operation. DSAEK, DSEK, DMEK all refer to a variety of modern surgical techniques available to replace the endothelium.

How is this operation performed?

The operation is performed in an operating theatre. The unhealthy inner layer of your cornea will be surgically removed (Figure 1B), and will be replaced by the innermost layers of a donor corneal graft (Figure 1C). The donor corneal graft (the transplant tissue) has been generously donated by a patient that has died.

A small air or gas bubble is then used to support the donor graft to help it to attach to your cornea (Figure 1D) – this is a critical step in the operation. **It is not unusual for this step to be repeated in the days following the operation, meaning that you may be required to attend the hospital frequently in the first days or weeks after surgery.**

Will I be awake during the operation?

The vast majority of eye operations are performed with local anaesthetic, which means you will be awake, but pain free. In certain cases, a general anaesthetic may be used.

What are the Pros and Cons of endothelial keratoplasty over a 'full thickness' corneal transplant?

Pros

- Faster visual recovery
- Fewer stitches
- Less chance of tissue rejection
- Preservation of the eye's mechanical strength

Cons

- Surgically more challenging
- Strict bed rest with posturing flat on the back after the operation for at least 2 hours

- Further surgery to reattach the graft

What are the risks of endothelial keratoplasty?

This is generally a safe operation, with a high success rate, however it is important that you understand the risks below.

Rare but serious complications

- Sight-threatening infection (1 in 1000)
- Severe haemorrhage causing loss of vision
- Retinal detachment
- Loss of the eye

Corneal transplant rejection

Your body (it's immune system) may try to "reject" the graft, as it recognises that it has come from another person. Early treatment with steroid drops can often reverse the rejection. Steroids may occasionally need to be given as tablets or as an injection.

Graft failure

With time, or following a severe rejection episode, your graft may fail. If the graft fails then your vision will become cloudy / blurry. If your graft fails, it may be possible to repeat the corneal transplantation surgery.

Transmission of disease

Whilst it is impossible to exclude the possibility of certain communicable disease, the donor cornea and donor blood has been rigorously tested, and the chances of contracting a communicable disease are exceedingly low.

Graft detachment / dislocation

It is not uncommon for the graft to fail to attach to your cornea the first-time around, or to 'slip' from its central position. It may require repositioning and / or a further air or gas bubble to float the graft back into place. This may be done in clinic, but often needs to be done in the operating theatre.

Raised intraocular pressure

This can usually be managed with drops, and if required, surgery.

Cataract

You may develop an early cataract. This can be removed if necessary.

What can I expect after the operation?

You will need to lay flat on your back for 2-4 hours immediately after the operation to help the air or gas bubble support the graft. You may be required to continue posturing at home for a few days.

Your vision will be blurry initially, and will take several weeks to months to improve.

You will be sent home with a shield over the eye. It is recommended that you keep this shield on overnight, and remove it the next morning, when you should start using your eye drops. You should continue to use the shield at night for the first 2 weeks, unless otherwise indicated.

NEVER stop your drops without consulting your eye doctor. You will be prescribed both antibiotic and steroid drops after the surgery. *Your steroid drops are your anti-rejection medication and need to be used regularly for several months.* They will be reduced gradually as instructed by your eye doctor, but often continued indefinitely.

Several small sutures (stitches) will be used at the end of surgery. These are typically removed 2-3 months after surgery.

What about driving immediately after the operation?

You will require some rest after the operation. You may be able to resume driving after surgery if you meet the minimum driving standards (being able to read a number plate at 20m, with no other reasons for not being able to drive) and you feel comfortable to do so. If you are unsure whether you meet the standards, please check the DVLA guidance or check with your eye specialist at your next visit.

When can I return to playing sports?

Avoid strenuous exercise, especially contact sports for at least 1 month. Beyond this, your doctor will guide you, depending on your progress.

What should I avoid after the operation?

- Do not rub or poke your eye.
- Avoid any heavy lifting or bending forward strenuously.
- Avoid wetting the eye for the first 2 weeks after surgery.
- Eye make-up should also be avoided for at least 4 weeks.
- Do not fly in a plane while there is still air or gas in your eye. This normally takes 1-2 weeks, after which time you can fly again.

If you require a general anaesthetic whilst there is still gas in your eye, you must inform your anaesthetist, as it will affect the type of anaesthetic which they are able to use. If gas has been left in your eye, you will leave the hospital with a wristband to warn the anaesthetist of this in case of an emergency, and you should only remove this wristband once your eye doctor has confirmed that the gas bubble has gone.

What are the symptoms of graft rejection?

- **R**ed eye
- **S**ensitivity to light
- Loss of **V**ision
- **P**ain

These can be remembered using the acronym **RSVP**