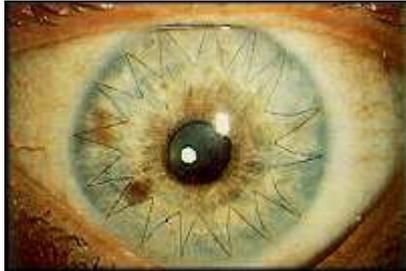


INFORMATION FOR CORNEAL GRAFT PATIENTS

Penetrating [full thickness] Graft

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Corneal graft with stitches in place

Introduction

A corneal graft is a transplant operation, involving removal of the central part of the cornea (the clear front window of the eye) and its replacement with a cornea from a donor. Although the operation itself is often reasonably straightforward, the recovery period often takes a long time and this information is to help you to understand what to expect. It is not however possible in an information

sheet such as this to provide specific information that is accurate for all patients' circumstances. The doctor looking after you will give you additional information based upon knowledge of your own case.

The information in this document concerns a full thickness (*penetrating*) corneal graft.

Why do you need this operation?

The usual reason for performing a corneal graft is to help you to see better. For some people, however, the operation may be advised to help in the treatment of chronic pain and irritation in the eye. In that case, the operation may be worthwhile even if it does not greatly improve your vision. Rarely, the operation may be advised in order to save the eye, for example if there is very severe corneal ulceration. It is very important that you understand why it is being recommended in your case, and what it is hoped the operation will achieve.

Where does my new cornea come from?

Your cornea will have come from someone who has expressed a wish that their corneas be used to help someone else to see, after their death. People who offer their organs in this way are called *donors*, and transplant operations would be impossible without their generosity. The donor's cornea will have been thoroughly tested and kept in an Eye Bank for a period, before being sent to the hospital where the operation is to be carried out. The Eye Bank is responsible for ensuring that your new cornea is in good condition. The Bank also performs checks to try and ensure that you will not catch any form of infection from the new cornea.

The operation itself.

This is usually done under a full (general) anaesthetic although if your general health is poor it may be possible to use local anaesthetic. It takes between one and two hours. During the operation the surgeon removes a circular piece of your cornea and replaces it with a similarly sized piece of the donor's cornea, which is stitched into place. In some cases other

procedures, such as cataract extraction, may be done in combination with the corneal graft. These may increase the duration of the operation. You will awaken with some soreness in the eye and a protector taped over it. You will be allowed up and about after the operation. You may be allowed home the same day or, if not, one or two days later.

After the operation.

Pain after a corneal graft is seldom severe and can be expected to settle quite quickly. The improvement in vision, however, is often rather slow. This is because the cornea takes a long time to heal, and as it does so, shape changes in the cornea lead to changes in the way it focuses light. It is unlikely that your vision will be "stable", i.e. worth prescribing new glasses or contact lenses, for at least six months after the operation, and in some people it can take a year or more.

Stitches.

The very tiny stitches (properly called *sutures*) that are put into the cornea hold the graft in place but also affect its shape and therefore the way the eye focuses. They are not dissolving sutures and will eventually need to be removed. Two main patterns of suturing are used - interrupted (or individual) suturing (figure 1) and continuous (figure 2). Some surgeons use both methods combined. These diagrams show what these suture patterns look like.

Figure 1. Diagram of a corneal graft sutured with interrupted (individual) sutures.

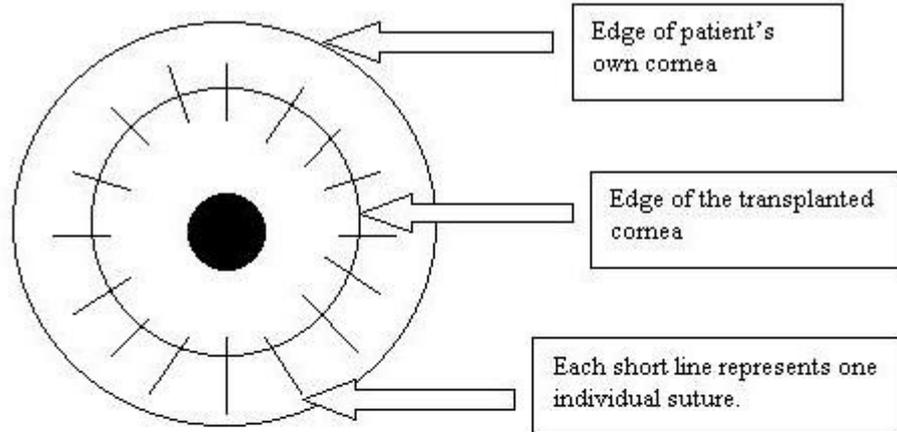
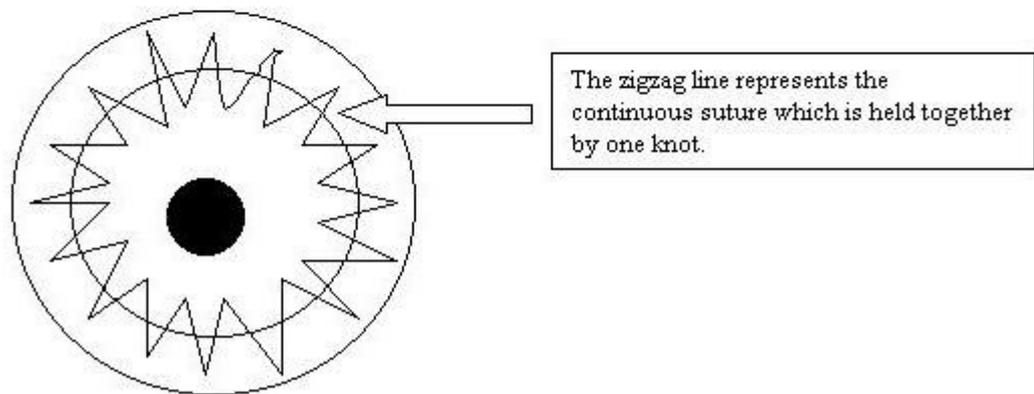


Figure 2. Diagram of a corneal graft sutured with a continuous suture.



In some patients it becomes apparent after the operation that the sutures are causing sufficient distortion of the cornea (astigmatism) for it to interfere significantly with the quality of vision. It may then be necessary to adjust or remove sutures to reduce the astigmatism.

Adjustment of continuous sutures may be very helpful for some patients. Adjustment may be done in the clinic or in the operating theatre, depending upon circumstances. It enables the cornea to sit more snugly in place, allowing it to focus better.

The exact timing of suture removal varies greatly between individual patients and has to be decided on an individual basis. Removal of sutures too early after the operation could result in the graft coming apart and requiring resuturing. Eventually, however, approximately 12 to 24 months after the operation, all your remaining sutures will be removed.

Seeing clearly after the operation.

You are most unlikely after a corneal graft to be able to see perfectly without some assistance. All corneal graft patients have some degree of distortion of their cornea (astigmatism) which needs to be corrected, usually with spectacles, for them to see clearly. Some patients have larger amounts of astigmatism, or are rather long- or short-sighted, in the eye that has been grafted. They may need to

wear contact lenses for the best level of vision, or to avoid clashes between their two eyes, and the wearing of contact lenses is certainly possible for many corneal graft patients. However, a small proportion of corneal graft patients (around 10%) need to have a further operation of some kind on their corneas, in order to improve their focussing, and enable them to see better. There are four main different types of this "secondary refractive surgery" - keratotomies ("relaxing incisions"), resuturing (i.e. replacing sutures or putting extra ones), lens implant surgery and lamellar surgery with the excimer laser (LASIK). A full discussion of them is outside the scope of this document.

Grafts, work and activity.

After a corneal graft, your eye is at first very vulnerable to blows on it and to the effects of severe straining (bending down, pushing or lifting). You should not take any more exercise than a brisk walk for the first six weeks after the operation. You should avoid lifting heavy objects, and if you have to bend down, do so slowly from the knees, keeping your head up. It's a good idea to get help with hair washing, and do it with your head back, avoiding soap and shampoo in the eye. You should wear an eye shield at night until you are used to not sleeping on the side of the operated eye. It's a good idea to wear glasses or sunglasses simply for protection, even if they don't help the vision. Above all, don't poke or rub the eye!

If you do a desk job, you can usually go back to work after about two weeks, but if your job is more strenuous, you will be advised to stay off work for at least a 6 weeks, or in some cases even longer. If you drive, you can usually start again after your first check-up, provided that the vision in the other eye remains satisfactory.

If you play sports, it is essential to wear eye protection **at all times** after a corneal graft. Eye protectors for racket sports are available in sports shops. If you swim you should wear goggles (primarily for protection from injury, not contact with water) and you should not dive in. If you play football there is a small risk of serious injury, particularly when heading the ball. Again you should consider eye protectors. **You are strongly advised not to play major contact sports** such as rugby, judo etc., at any time after a corneal graft, and not to recommence sports until you have been told that it is safe to do so.

In the long term, a corneal graft is strong enough to stand the rigours of ordinary life, but an eye with a corneal graft is never as strong as a normal eye and may be split open by a severe blow such as a punch in the eye. **Such an injury can cause blindness.**

Treatment and supervision.

Everyone must use steroid eye drops after the operation. These are necessary to ensure that your eye doesn't get too inflamed, which would cause you pain and might damage the graft. They are also the most important protection against rejection. Steroid drops can have side effects, which must be watched for. They can cause pressure rises inside the eye, they reduce resistance to infection and, with very prolonged use, can cause cataracts. Therefore it is very important that you are examined regularly to monitor the treatment, and that you report promptly to your doctor if you think you have a problem. The steroid drops are slowly reduced in strength and frequency and are usually stopped between three and six months after the operation, although some people may need to use them for longer.

Most patients can expect to have to attend Out-patients between eight and ten times over the first year after a graft, with gradually increasing gaps between

appointments. Patients are generally kept under review for several years after the operation.

Complications of the operation.

There are risks attached to any operation, involving the operation itself and the anaesthetic given in order to carry it out. These are some of the most important risks of corneal grafts.

Minor complications happen from time to time but do not usually affect the result. They include brief periods of raised pressure or leaks of fluid between the stitches from within the eye. These generally settle within a few days of the operation. However, occasionally it is necessary to replace a stitch, or put in an extra one, if a leak doesn't seal up on its own.

Major complications of the operation itself are rare, but when they occur they can threaten sight or even possibly cause the loss of the eye. They include bleeding within the eye and infection entering the eye. They may require further operations if they occur.

Disease transmission is a possible complication of any transplant - in other words, the recipient could possibly catch a disease from the donor. All corneal donors are tested for the viruses that cause hepatitis and AIDS. However there is no test which will detect the germ which causes Creutzfeld-Jakob disease (CJD) and unknown viruses may also exist for which there is currently no test. The risk of catching such a disease is unknown, but likely to be very small.

Rejection is a major complication, which can affect any transplant. It happens when your body detects that a piece of tissue from another person has been put into you, and your immune system then tries to destroy it. About one in seven patients who have a corneal graft will have a rejection attack at some stage, although some patients are at a much greater risk than others. Rejection can start as soon as two weeks after a graft, but is commonest several months afterwards, and may occur years later. The quicker rejection is diagnosed, the better the chance of recovery. If your eye gets red, watery or gritty, and develops cloudiness of the vision, then rejection may be the cause and you are advised to **attend your eye casualty department immediately**. If rejection is found, it is treated with very frequent, strong steroid drops, and occasionally with steroid tablets or drip feeds. Most corneal grafts do recover from their rejection attack, but a lot of patients will need to go on with the steroid drops for a long time afterwards, sometimes permanently.

Patients who are in the "high rejection risk group" may be advised to have a "tissue matched" graft, which has a tissue type as similar as possible to their own. However, this is never an exact match and some patients have to wait a long time for a suitable cornea to become available. Tissue type is determined by a blood test. The degree of benefit from tissue matching is unclear but is the subject of further research at present.

Causes of failure of corneal transplants.

A failed corneal transplant generally looks cloudy and dull, making the vision very blurred. This list gives the commonest reasons why a corneal transplant may eventually fail. Most patients with a failed transplant can be offered another one, but individual circumstances will dictate what is recommended in each case.

Rejection (discussed above) may lead to failure of the transplant, which may happen immediately or sometimes may happen some time later.

Failure of the endothelium (or decompensation) means that the graft no longer has enough cells on its inner surface to keep it clear, and so it must be replaced.

Recurrence of the original disease can happen to people whose corneal graft was done because of a genetic disease (corneal dystrophy) or an infection (viral keratitis).

Infection causing ulceration leading to scarring, may occasionally cause graft failure.

Unacceptable refractive result means that the graft cannot be made to focus satisfactorily for its recipient, perhaps because of marked astigmatism. Such a graft may have to be considered as a failure, and replaced