

## **RISKS OF CORNEAL GRAFT SURGERY**

### **For penetrating and lamellar grafts**

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#### **Penetrating corneal grafts (*lamellar corneal grafts in italics*)**

##### **Complications during surgery:**

**Choroidal (expulsive) haemorrhage** – usually results in loss of useful vision or loss of the eye. Estimates vary from 1:200 to 1:100 (compared to 1:600 for cataract surgery) However it is general it is thought to be less than 1:1000. Risk factors are thought to be: hypertension, glaucoma, previous ocular surgery, old age and coughing or straining during surgery under local anaesthetic.

*Not with lamellar grafts unless conversion to a penetrating graft is needed.*

**Intraocular bleeding during surgery** – rarely requires additional therapy but may result in prolonged visual recovery until blood reabsorbs. Occasionally may require emergency surgery to control raised pressure due to a massive clot in the front chamber of the eye or vitreous removal after several weeks to remove blood in the posterior chamber of the eye.

*Very rarely with lamellar grafts unless conversion to a penetrating graft is needed.*

**Cataract** – is uncommon early usually resulting from minor injury to the lens during surgery. Late cataract is more common probably due to the effect of steroid drops needed to prevent rejection in the early post-operative period. Cataract rarely develops in younger patients without any pre-existing cataracts but is common in patients with early cataract before surgery (these are usually offered combined cataract and graft surgery).

*Less common with lamellar grafts unless conversion to a penetrating graft is needed.*

**Iris trauma** – is common but is rarely identifiable after surgery. However an irregular pupil may occur and it is sometimes safer for the surgeon to remove part of the iris (peripheral or broad iridectomy).

*Very rarely with lamellar grafts unless conversion to a penetrating graft is needed.*

## **Early postoperative complications**

**Dislocation of donor transplant** – uncommon except after deep endothelial lamellar keratoplasty (DLEK or DSEK) when it may occur in half the patients in the first 24 hours; it can usually be replaced successfully after a minor procedure.

**Endophthalmitis** – the risks of severe infection after surgery is probably commoner after graft surgery than other forms of surgery at about 1:500 cases. It can usually be treated effectively with prompt early therapy. Late endophthalmitis can follow suture infection or removal.

*Very rarely with lamellar grafts unless conversion to a penetrating graft is needed.*

**Primary donor transplant failure** – when the donor cornea does not function after transplantation.

*Not with lamellar grafts unless conversion to a penetrating graft is needed.*

**Glaucoma (raised eye pressure leading to some loss of vision)** – is very common in patients with pre-existing glaucoma and after previous cataract surgery (about 30-50%) and will require additional glaucoma therapy, or surgery (laser, drainage or tube surgery) to control it. In patients with no problems except for the corneal disease (ie keratoconus) it is rarely a long term problem although short term glaucoma in the immediate post operative period (related to inflammation) or later (due to the need for steroid drops to prevent rejection) is common but usually easily controlled and does not affect vision or require long term therapy.

*Not with lamellar grafts unless conversion to a penetrating graft is needed.*

**Wound leaks leading to loss of fluid from the inside of the eye** – are uncommon and usually settle without the need for re-stitching which is rarely needed. A post-operative appointment either the morning after surgery or within the first week is required to exclude and manage this problem.

*Rarely with lamellar grafts unless conversion to a penetrating graft is needed; however re-suturing is sometimes needed when the sutures loosen after the peri-operative tissue swelling reduces.*

**Excessive inflammation after surgery** – inflammation is normal and usually controlled by the use of steroid drops alone. Severe inflammation may occur in patients who have severe allergy, have had previous graft surgery, or previous scleritis (ie after Acanthamoeba infection or in Rheumatoid arthritis). This type of severe inflammation is uncommon, unpredictable but controllable with immunosuppressive therapy by mouth. Although this type of treatment commonly has short term side effects the treatment is usually only necessary for 3-4 months.

*This can occur with lamellar grafts also.*

**Persistent corneal ulcer** – known as persistent epithelial defect by surgeons is an uncommon problem in eyes which are healthy apart from a corneal disease. All the skin on the surface of the donor cornea is normally replaced within a few days to a year after the operation. This process is complex and occasionally fails. Use of non-preserved eye drops, ointments, therapeutic contact lenses and other measures may be needed to achieve healing. This problem is much more common in eyes which have been injured before surgery, are dry, or inflamed and can be predicted.

*This can occur with lamellar grafts also.*

**Corneal graft infections** – occur in 1:20 to 1:50 of patients often related to the stitches or herpes (in previously infected patients). Infection may be acute or chronic (infectious crystalline keratopathy) and is always serious. Loose stitches are one of the commonest causes of this which is why regular visits are needed after surgery.

*This can occur with lamellar grafts also.*

Corneal graft rejection is commoner in penetrating grafts after infection.

**Corneal graft rejection** – occurs in up to 20% of low risk grafts and up to 80% of high risk grafts (corneas with blood vessels or that are inflamed at the time of surgery). Rejection requires prompt therapy and patients need to contact me or attend the A&E Dept at Royal Derby Hospital or their local eye unit within 24 hours. Most rejection episodes can be treated with steroid drops alone. In a few cases oral steroids may be needed. In low risk cases, such as keratoconus, about 3-5% of grafts will fail in 10 years largely due to rejection.

*Lamellar grafts rarely fail as a result of infection and probably never after 12 months from surgery.*

**High astigmatism** – is normal after graft surgery for uncomplicated corneal disease (keratoconus and Fuch’s dystrophy) with average astigmatism of 4 dioptres (units). About 10% of cases require further surgery (astigmatism surgery) to permit useful spectacle vision and this is usually carried out between 15-24 months after the initial operation. Irregular astigmatism is uncommon following suture removal but occasionally occurs and can only be corrected with a contact lens.

In complicated cases (repeat-grafts) astigmatism is a much more common problem.

*This problem occurs with lamellar grafts also.*

**Cystoid macular oedema** – is uncommon in patients having uncomplicated grafts without lens extraction. In uncomplicated grafts combined with cataract surgery the risk is probably the same as for cataract surgery alone (about 3%) and usually resolves spontaneously but drops or tablets may sometimes be helpful. In patients who are having grafts following complicated cataract surgery or trauma this problem occurs much more commonly in 4-65% of patients and may be intractable. It is a common cause of disappointing outcomes after graft surgery in these situations.

*This problem is very rare after lamellar grafts.*

**Epithelial downgrowth** – when the skin from the surface of the eye grows inside the eye is very difficult to treat and always requires further surgery and may eventually lead to loss of vision. It is fortunately rarer than the other conditions.

*After lamellar graft surgery the downgrowth can enter the space between the grafts and the remaining recipients corneal tissue leading to the need for a regraft; because it cannot enter the eye the risk of loss of all useful vision is negligible.*

Modified from: Litoff D, Krachmer J. Complications of corneal surgery. Int. Ophthalmol. Clin. 1992; 32(4): 79-95.