Corneal transplant surgery

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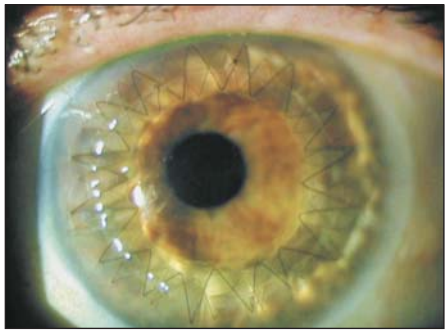

Fig 1: Six months post-op.

Full thickness corneal transplantation is now the most commmonly performed and successful transplantation procedure. This has been largely due to improved techniques in microsurgery, donor storage and screening. In WA, approximately 120 transplants are performed annually, but there is a much greater market. Like any operation that depends on donor material, the supply and demand are not always in equilibrium. The eyes are considered by some to represent windows to the soul so many relatives of the deceased begrudge consenting to donate such a "sensitive" organ.

Indications

1. To improve vision – lost to (a) corneal scarring (e.g. ulcers, Herpes simplex keratitis), (b) corneal oedema, (c) keratoconus, (d) corneal dystrophies/degenerations, and (e) previously failed/rejected grafts.
2. Provide support - in cases of corneal perforation or thinning.
3. Remove diseased tissue – fungal ulcers not responsive to standard treatment, or neoplasia.
4. Cosmesis.

Donor selection

Since the cornea is avascular, tissue matching is not as critical. The entire globe is procured, ideally within 12 hours post mortem. Modern storage techniques allow tissue to be stored for one week. Longer storage (cryopreservation) is available in some centres. Donor age has no restriction and donation is worked out on a case-by-case basis, with a blood sample required.

Donor exclusion criteria are – unknown death, CNS disease (Creutzfeld-Jacob, encephalitis, rabies), infectious diseases (HIV, HepatitisB/C, septicaemia, syphillis, endocarditis), malignancy (lymphoma, leukemia, metastatic, ocular retinoblastoma, melanoma), some previous eye surgery, and uveitis.

The tissue is inspected under the slit lamp by a surgeon and the corneal endothelial cells are graded with regards to their number and morphology. Tissue with less then 1500 cells/mm^2 is not used.

Technique and post-op care

Most corneal transplants are performed under local anaesthetic with a retro/peribulbar block. Some surgeons prefer general anaesthesia. The donor tissue is trephined as a circular button intraoperatively. The host cornea then is trephined in a circular fashion 0.25 to 0.5 mm in diameter smaller than the donor cornea and excised. The donor material is sutured into the circular defect with monofilament sutures e.g. running 10 O nylon (see Figure 1).

Post operative care is just as important as the surgical technique. Any mild redness or discomfort that a patient experiences in the post operative period could herald the start of a rejection episode. Graft rejection is easily treated and essentially reversible if caught early. Rejection can occur as early as two weeks and as late as 20 years post operatively.

Looking ahead

Replacing only the posterior aspect of the cornea with no or only few sutures – called Deep Lamellar Endothelial Keratoplasty (DLEK) – has gained interest worldwide as a safer procedure than full thickness transplantation with the potential for even better visual outcomes (see Figure 2).

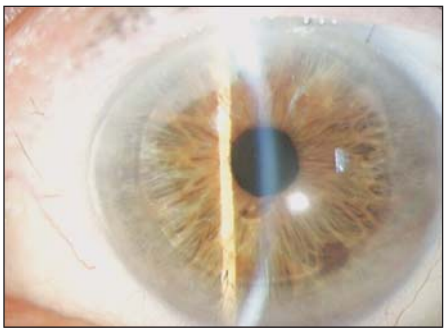

Fig 2: DLEK post op