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Penetrating Keratoplasty and Endothelial Keratoplasty

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Introduction

Tissue matching isn't routinely done. Cadaveric donor tissue is often used unless the donor is suspected of getting a disease.

Corneal transplantation is often done using general anaesthesia or local anaesthesia plus IV sedation.

Topical antibiotics are used for several weeks postoperatively and topical corticosteroids for several months. to guard the attention from inadvertent trauma after transplantation, the patient wears shields, glasses, or sunglasses.

If transplantation involves the complete thickness of the cornea (as in penetrating keratoplasty, or PKP), achievement of full visual potential may take up to 18 months due to changing refraction with wound healing and after suture removal.

Only the corneal endothelium must be transplanted in diseases where the corneal stromal is obvious, features a smooth stromal surface with a daily curvature and only the corneal endothelium isn't functioning well (e.g., Fuchs dystrophy, bullous keratopathy resulting from cataract surgery). In corneal endothelium transplantation, there are 2 techniques: Descended stripping endothelial keratoplasty (DSEK) and therefore the newest technique, Descended membrane endothelial keratoplasty (DMEK). DMEK uses a thinner graft than DSEK and has superior results (e.g., faster healing, fewer rejections, and better visual acuity) compared to both DSEK and full thickness corneal transplantation. However, DMEK may be a harder technique and more frequently requires additional surgery to correct complications (e.g, repositioning a graft that has slipped out of position).

Complications include the Graft rejection, Infection (intraocular and corneal), Wound leak, Glaucoma, Graft failure, High refractive error (especially astigmatism, myopia, or both)

Recurrence of disease (with herpes simplex or hereditary corneal stromal dystrophy)

Graft rejection rates are usually < 10% (e.g., in patients with early bullous keratopathy), but could also be up to 68% in higher-risk patients (eg, those with chemical injury). Rejection rates are lower for DSEK than penetrating keratoplasty and even lower for DMEK at 1 to three. Rejection symptoms include decreased vision, photosensitivity, ocular ache, and ocular redness. Graft rejection is treated with topical corticosteroids (e.g., prednisolone 1% hourly), sometimes with a supplemental particular injection (e.g., triamcinolone actinide 40 mg). If graft rejection is severe or if graft function is marginal, additional corticosteroids are given orally (eg, prednisone 1 mg/kg once/day) and infrequently IV (e.g., methylprednisolone 3 to five mg/kg once). Typically, the rejection episode reverses, and graft function returns fully. The graft may fail if the rejection episode is unusually severe or long-standing or if multiple episodes of graft rejection occur. Redraft is feasible, but the long-term prognosis is worse than for the first graft. Keratoprosthesis (artificial cornea) are often placed if grafts fail repeatedly.

Corneal limbal somatic cell transplantation surgically replaces critical stem cells at the limbus (the area where the conjunctiva meets the cornea). Host stem cells normally reside during this area. Transplantation is completed when the host stem cells are too severely damaged to get over disease or injury.

Conditions like severe chemical burns, Stevens-Johnson syndrome, and severe damage caused by chronic contact over wear may cause persistent no healing corneal epithelial defects. These defects result from failure of corneal epithelial stem cells to supply sufficient epithelial cells to repopulate the cornea. If untreated, persistent no healing corneal epithelial defects are susceptible to infection, which may cause scarring, perforation, or both. Under these circumstances, a keratoplasty, which replaces only the central cornea and not the limbus, is insufficient. Stem cells are needed to supply new surface epithelium cells which will repopulate the cornea, restoring the regenerative capacity of the ocular surface.

Corneal limbal stem cells are often transplanted from the patient's own healthy eye or from a cadaveric donor eye. The patient's damaged corneal epithelial stem cells are removed by a partial-thickness dissection of the limbus (ie, all the epithelium and therefore the superficial stroma of the limbus). Donor limbal tissue, which is ready by an identical dissection, is sutured into the prepared bed. Systemic immunosuppression is required after cadaveric limbal grafts.