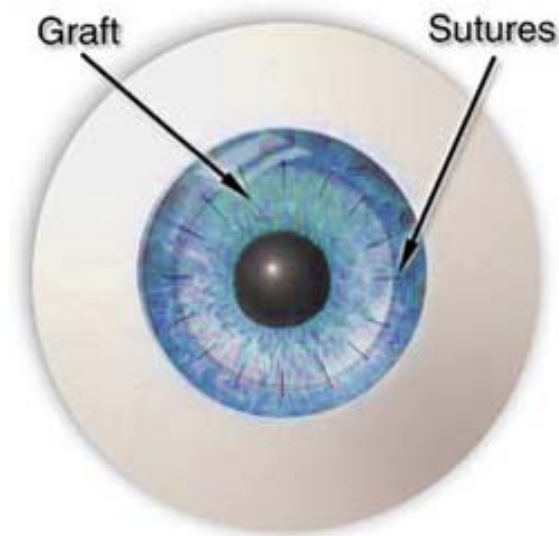


New Corneal Transplant Techniques Evolve

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The vast majority of corneal transplants performed in the U.S. are what are termed penetrating keratoplasties (PKs). A PK involves a full-thickness removal of the central cornea, leaving a small rim of the patient's cornea onto which the donor cornea is attached with stitches. When the diseased portion of the cornea is only in the superficial or outer layers of the cornea, a partial-thickness or lamellar transplant can sometimes be performed. Lamellar transplants have the advantage of not being susceptible to rejection and leave the cornea with better structural integrity. They have the disadvantage of being more technically challenging to perform and can result in overall poorer vision than full-thickness transplants because of potential scarring in the corneal interface (zone between the patient's cornea and the donor cornea).

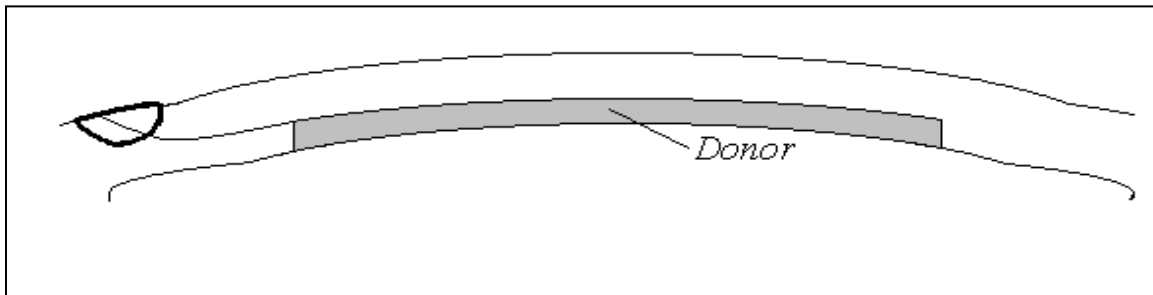
Certain corneal diseases such as Fuchs' dystrophy result from abnormalities of the most inner surface of the cornea – termed the corneal endothelium. When the corneal endothelium becomes severely affected by these conditions, the upper layers of the cornea will swell causing a loss of clarity of the normally clear cornea with subsequent blurred vision. Until recently, corneas with diseased endothelium required full thickness PKs in order to transplant healthy corneal endothelium onto the eye.



Full Thickness Penetrating Keratoplasty

Ideally, if only the diseased back surface of the cornea could be transplanted, there would be great advantages to such a procedure. Such a procedure would eliminate the need for

stitches in the cornea. It would leave the cornea with greater structural integrity. Additionally, it would eliminate the large amounts of astigmatism and near-sightedness that are induced with traditional full-thickness procedures. Such a technique is currently undergoing evolution and refinement and is termed a posterior lamellar keratoplasty (PLK).



Schematic Representation of a Posterior Lamellar Keratoplasty

In the PLK procedure, the back surface of the patient's diseased cornea is removed through a small incision. A donor cornea is then dissected so that the back or posterior surface can be fashioned, folded, and inserted through a small 5 mm incision. The donor transplant is then positioned and sticks in place without the need for stitches other than 1 or 2 sutures to close the incision. The PLK procedure has the advantage of much faster visual recovery compared to traditional transplants without the potential suture and wound complications. Induced astigmatism and other refractive errors are minimal. The disadvantage of the PLK technique is that the ultimate visual acuities may not be as good as traditional transplants but with the lower amounts of induced astigmatism the trade off may be worthwhile. The other disadvantage is that the PLK technique is much more technically challenging to perform. Both PLK and traditional corneal transplants can suffer from rejection but the advantages of the PLK procedure may make it the preferred technique for transplanting corneal endothelium in the future – especially if improvements in the technique continue to evolve.