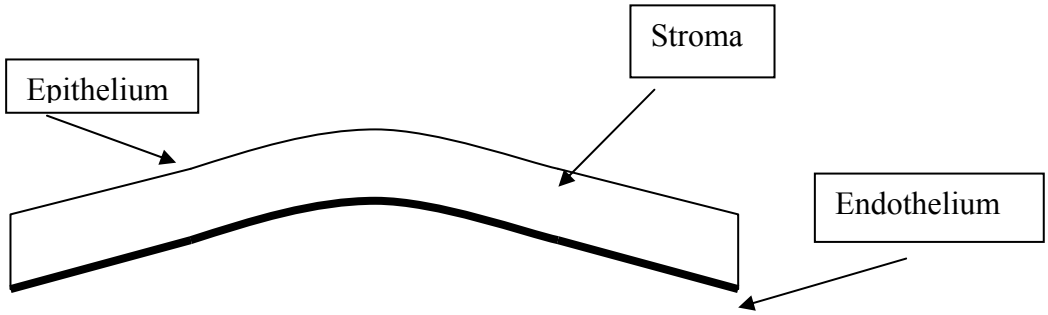
Deep Lamellar Endothelial Keratoplasty (DLEK)

Maghizh Anandan

Deep Lamellar Endothelial Keratoplasty (DLEK) is a new technique for corneal transplantation as an alternative to penetrating keratoplasty for patients who have diseases affecting the corneal endothelium (posterior corneal layer) whose cells pump fluid out of the cornea to keep it clear. The technique will not work for corneal disease causing scarring or opacity of the thick middle layer of the cornea (the stroma).

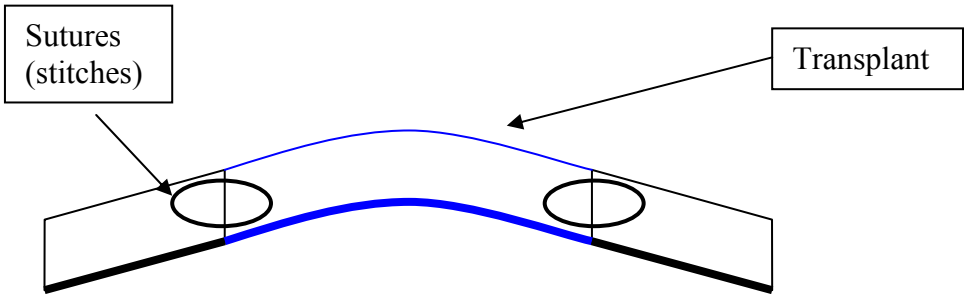
It is designed to reduce or eliminate some of the problems associated with conventional penetrating (full thickness) transplant surgery. The main differences between the new corneal transplantation technique (DLEK) and conventional corneal transplantation (penetrating keratoplasty or PK) are explained overleaf.

Which part of the cornea do I need to replace?



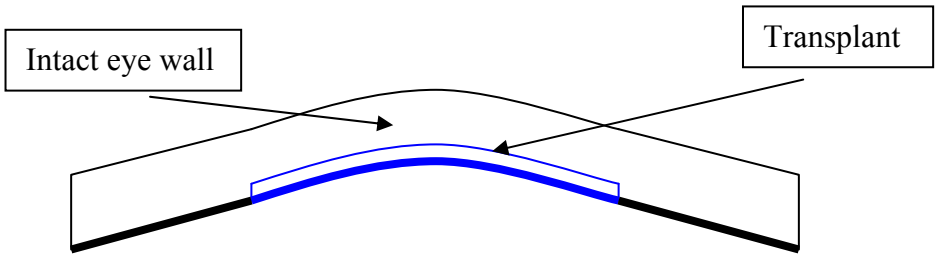
The drawing above is a section through the cornea, which is the clear front part of the eye wall. An important cell layer called the corneal endothelium lines the inside of the cornea. Endothelial cells continuously pump fluid out of the cornea. If these cells are not working well, the cornea becomes waterlogged and cloudy. A corneal transplant is then required to replace the endothelium. This transplant can be done in two ways.

Conventional corneal transplantation (penetrating keratoplasty)



In conventional corneal transplantation, the full thickness of the front of the eye wall is replaced by a disc shaped piece of donor corneal tissue which is sewn into place. The circular wound heals gradually, and the sutures are normally removed 14 to 36 months after surgery.

DLEK (Deep lamellar Endothelial Keratoplasty)



In DLEK, a new method of corneal transplantation, a healthy new endothelium is transplanted on a thin layer of donor corneal tissue which is floated into place and adheres without sutures. The front 4/5ths of the eye wall is left intact. This helps to preserve a normal corneal shape and a normal focussing power for the eye.

What are the advantages and disadvantages of the new technique?

This is a new operation and the technique is changing all the time. Lamellar corneal transplant surgery has been performed for many years to replace the front part of the cornea and has been successful.

What is different about DLEK is that the surgical procedure involves replacement of the back layers of the cornea rather than the front layers of the cornea. This replacement is done through a small incision to avoid **both** weakening the eye **and** causing astigmatism that is a common problem with penetrating transplant surgery. By leaving the front surface in the cornea without sutures or incisions it offers an advantage in healing and recovery time for the patient.

The main risks that are unique to split thickness surgery DLEK are:

1) Dislocation or dislodgment of the lamellar corneal transplant tissue within the eye. This has been a problem within the hours after surgery, but very rarely later. Should the tissue dislocate or dislodge then it is repositioned usually under local anaesthesia. If the tissue does not remain in position, then a full thickness corneal transplant will be done.

2) Splitting the cornea may reduce its clarity and this may mean your final vision is not as clear. Early results for the technique in this study (DLEK) and recent results for the more common form of split thickness corneal grafting in which the front layer of the cornea is replaced indicate that some of loss of vision does occur but that the visual recovery is often much faster. At present this technique may not be suitable for people wishing to drive a car.

3) Because this is a new technique the longevity of the DLEK is uncertain; initial studies are not showing any difference in the survival of DLEK's compared to conventional penetrating transplants but this is not yet certain.

The principal benefits are:

1) Patients with endothelial tissue transplanted with a split thickness lamellar corneal transplant have been shown, so far, to have less irregularity to the corneal surface than patients that have a full thickness standard corneal transplant. This benefit is achieved because your own natural surface of the cornea is not replaced so the focusing power of your cornea remains more natural than with a full thickness corneal transplant.

2) A smoother surface for focusing should allow you to see better in a matter of weeks in this study as compared to several months with a standard full thickness corneal transplant.

3) The partial thickness wound in the white of the eye should preserve the strength of your eye wall better than the full thickness wound in the cornea created in a standard full thickness corneal graft. This will help to preserve your sight if you are unlucky enough to have a direct blow to the eye after surgery.

Contact Mr Anandan via his private secretary, Sue Da Silva on Tel. 07900210191