Dissection technique in lamellar keratoplasty

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The literature indicates that lamellar keratoplasty is used much less than perforating grafts; this is because full-thickness keratoplasty is technically easier and much better visual results are obtained than with lamellar grafts.

It is also generally accepted, however, that the lamellar operation is followed by fewer complications because it does not entail opening the globe. The other advantage is that the donor material does not have to be as fresh as that required in full-thickness keratoplasty. It is therefore important to attempt to improve the visual results of the lamellar operation, which should be the procedure of choice if the endothelium is found to be healthy.

Definite indications for the lamellar operation are:

- (1) Therapeutic, for active or recurrent herpetic keratitis;
- (2) Optical, when the opacity is very superficial;
- (3) Tectonic, *i.e.* to build up the corneal thickness before a further full-thickness procedure is carried out;
- (4) Sectoral, in cases of marginal degeneration and pterygium.

An improved technique in dissecting the lamellar disc will improve the poor post-operative visual results which sometimes follow even when a contact lens has been properly fitted.

Fig. 1 illustrates the causes of unsatisfactory visual acuity.

FIG. 1 *Irregular refraction by corneal micro-ridges*

The diagram shows that a contact lens would obviate the irregularity of the anterior corneal surface, but that deep micro-ridges and scarring cause scattering of the incoming rays at the host-graft interface; this results in poor image formation although the graft appears to be optically transparent and clear.

The uneven dissection of the corneal bed may be avoided by the use of an electrokeratome with an oscillating razor blade, but this has the disadvantage that good fixation is lacking so that it is difficult to control the depth, shape, and size of the disc being dissected. Manual dissection is superior because direct visual control is possible throughout the operation. To improve the visual results one must pay particular attention to the following points in the dissection of a lamellar disc:

- (1) The operating microscope should be used.
- (2) The field should be kept "dry" as this helps to differentiate the landmarks more clearly than if fluid is present on the cornea while dissection is being carried out. Fluid fills the gaps and uneven dimples so that there is little difference in the refractive index of the two media (Fig. 2).

FIG. 2 Anterior view shows minute corneal strands between two layers

Lateral view shows collection of fluid obscuring fibres and landmarks

- (3) Once the plane of cleavage has been found between the corneal lamellae, the corneal disc is kept very taut and one can see fine strands passing between the superficial and deep corneal layers (Fig. 2). It is important to dissect in this plane. These strands are more easily identified on the recipient cornea than on the donor site.

FIG. 3 Dissection of lamellar disc, showing micro-ridges

- (4) Particular attention must be paid to achieving a smooth dissection in the axial 3 mm. of the corneal disc.
- (5) In dissecting the corneal disc, the knife should be used in large, bold, sweeping movements, because careful, nibbling movements produce micro-ridges (Fig. 3).

(6) The surgeon must work quickly to minimize the duration of the exposure of the graft bed to airborne particles, as these may cause further scattering of light and result in blurred image formation. The particles should be thoroughly washed away from the graft bed by a jet of normal saline from a syringe with a cannula, before the donor disc is placed for suturing.

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