4 Operations on the Conjunctiva

4.1 General Problems of Surgical Technique

From a surgical standpoint, the conjunctiva is composed of three layers: the epithelial layer, consisting of epithelial cells and a thin supporting layer of connective tissue; a subepithelial fibrous layer; and the episcleral space (Fig. 4.1).

The epithelial layer is closely interwoven with the underlying fibrous layer and presents as a separate layer only when dissected. It is then found to be compliant but of low resiliency, tending to retain any position assumed. The dissected epithelium then also displays its extensive surface area, which is necessary to follow the excursions of the eyeball (Fig. 4.2). Ordinarily the true extent of the epithelium is not apparent due to the constricting effect of the subepithelial fibers. Unlike the epithelium, these fibers are resilient and can keep the redundant epithelium from crimping during ocular movements.

Directly adjacent to the globe is the episcleral space, which contains a network of fibers loosely connected to the sclera. This space allows for motion of the conjunctiva relative to the scleral surface. About 1–2 mm from the corneal margin the episcleral space terminates at the perilimbal zone, where the conjunctiva is connected directly and firmly to the sclera (Fig. 4.3).

With regard to surgical technique, it is useful to distinguish mobile zones where the conjunctiva is freely movable from fixation zones where the conjunctiva is firmly adherent to the sclera (e.g., at the limbus or at scars). Because the tissue can evade cutting edges in the mo-

Fig. 4.1. Surgical anatomy of the conjunctiva. E The superficial epithelial lamella is continuous with the corneal epithelium. F The subepithelial fibrous layer extends as far as the limbus. S The episcleral space terminates a short distance from the limbus

Fig. 4.2. Separating the epithelial lamella from the subepithelial fibrous layer (dissection of large sliding flaps). When dissected from the contractile fibrous layer, the epithelial lamella can be expanded to its full size

Fig. 4.3. Separating the subepithelial fibrous layer from the sclera (exposure of the globe surface). After the loose connective fibers in the episcleral space (V) are detached and the perilimbal fibrous zone (F) is divided, the conjunctiva can be elevated to expose the sclera. The conjunctival flap may contract according to the elasticity of the subepithelial fibers
bile zones, its sectility is low, and it is difficult to dissect these zones with much precision. On the other hand, the low sectility is an important safety factor in that it protects the delicate conjunctival tissue from inadvertent injury. This protection is lacking in fixation zones. The closer manipulations are carried to these sites, the greater the danger of inadvertent injury, and the greater the caution that must be exercised when performing the manipulations.

In conjunctival incisions the shape and position of the cut are determined by the shifting tendencies of compliant, resilient tissue described earlier (see Figs. 2.62–2.64). The direction of the incision line (in cuts made perpendicular to the tissue surface) is affected by the fixation zones at the limbus, at scars, and at immobilizing instruments (Fig. 4.4). A cutting edge tends to push the tissue in the direction of these fixation zones, and the resulting incision progressively deviates away from the zones.

Fixation zones that affect the depth of the dissected layer (in dissections parallel to the tissue surface) are sites where the subepithelial fibers attach to the epithelium and to the sclera. The stronger fixation at a given location determines the direction in which the cut tends to deviate. Thus, the scleral attachment is stronger in the region of the perilimbal zone, so the cut tends to deviate toward the surface (Fig. 4.5–1). A downward deviation tends to occur over the episcleral space, where the fiber attachment to the globe is so tenuous that the epithelial fixation predominates. This tendency becomes more pronounced toward the fornix, where there is no deep fixation at all (Fig. 4.5–3).

When the conjunctiva is grasped and stretched with a forceps, the tissue is both deformed and displaced. If it is incised in this condition, the incision will acquire a different shape and position when the tissue is released (see Fig. 2.64). Thus, the special properties of compliant, resilient tissue must be taken into account in grasping as well as cutting. Dissection of the conjunctiva may be performed on a superficial or deep plane. In superficial dissection the epithelium is separated from the resilient subepithelial tissue. This yields large sliding flaps (Fig. 4.2) that can be used to repair defects in the conjunctiva or superficial corneal layers (epithelial transposition). Deep dissection exposes the episcleral space and gives access to the sclera, the adnexa, and the interior of the eye (Fig. 4.3). The desired plane is approached from the limbus to obtain fornix-based flaps or from the epibulbar zone to obtain limbus-based flaps (Figs. 4.6–4.8).