Limbal incision with conjunctival continuous key-pattern suture in squint surgery

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This paper describes an improvement in the technique of limbal incision of the conjunctiva in squint operations.

The limbal incision was first described by Zugsmith (1959) as a peritomy incision, but Massin and Hudelo (1962) were the first to show its full advantage in squint surgery, and von Noorden (1968, 1969) improved the technique.

The limbal incision has the merits of providing a scarless bulbar conjunctival incision and facilitating the performance of the surgical steps on Tenon’s capsule and the muscle. It is made well away from the site on which the resection or recession of the muscle is performed and renders the suturing of Tenon’s capsule easier by avoiding unwanted adhesions (Swan and Talbot, 1954; Ingram, 1966).

Method

This improved technique consists of two steps:

(1) Radial incisions in the conjunctiva at 2 and 4 o’clock (or at 8 and 10 o’clock). These are 1.5 cm. long, making the operating field comfortably wide.

(2) The final limbal suture is made by a double loop knot reinforced by a third simple knot of 5-0 double-ended needle catgut thread.

The two ends of the 5-0 catgut are passed in a continuous key-pattern suture and knotted 1.5 cm. away from the limbus. This avoids irritation of the limbal corneal surface by the ends of the limbal conjunctival knot, secures the limbal conjunctival knot (which otherwise often comes loose), and approximates the conjunctival lips of the radial incisions in a perfect linear closed wound. There is no need to remove the conjunctival catgut suture—an important advantage in children.

Advantages

(1) The 1.5 cm. long radial incisions widen the operative field;

(2) The approximation of the two lips of the wound in Tenon’s capsule is facilitated and the strength of the limbal conjunctival knot is secured;

(3) Post-operative irritation of the limbal corneal surface from the ends of the catgut knot is avoided;

(4) A perfect apposition of the radial conjunctival incisions is obtained, the final knot being 1.5 cm. away from the limbus.
Operative technique

The steps of the operation, including the improvement described above, are:

1. Stay suture at 12 and 6 o'clock with 4-0o black silk (Hugonnier and Clayette-Hugonnier, 1969).

2. The conjunctiva is pinched with fine forceps and a radial incision 1.5 cm. long is made at 4 or 8 o'clock.

3. The inferior tip of the scissors is inserted under the conjunctiva, 1 or 1.5 mm. from the limbus, at 4 or 8 o'clock and a cut parallel to the limbus is made towards 2 or 10 o'clock, where the superior conjunctival radial incision is made (Fig. 1).

4. One double-armed 5-0 catgut suture is passed through the angle of the conjunctival flap at 4 or 8 o'clock. The two ends are pinched in a small bulldog clamp.

   The second double-armed 5-0 catgut is passed through the superior edge of the conjunctival flap at 2 or 10 o'clock and the ends are secured in another bulldog clamp. The two catgut 5-0 are everted outside the operative field.

   With blunt scissors the prepared conjunctival flap is dissected from the subconjunctival Tenon's capsule adhesions (Fig. 2).

5. The squint operation is then performed.

6. The operative wound on Tenon's capsule is closed with one or two simple catgut 5-0 sutures.

7. One needle of the inferior double-armed catgut 5-0 is now passed under the perilimbal conjunctiva at 4 or 8 o'clock and a double knot and a third single knot are tied (Fig. 3). Both ends of the double-armed catgut 5-0 are then passed in a key-pattern suture (Stallard, 1965). A final knot is made 1.5 cm. from the limbus (Fig. 4). The same procedure is performed with the double-armed catgut thread from 2 or 10 o'clock.

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**Fig. 1** Stay suture at 12 and 6 o'clock. Limbal incision and superior and inferior radial incisions (dotted lines) 1.5 cm. long.

**Fig. 2** Double-ended needle 5-0 catgut passed through superior and inferior angles of conjunctival flap. The catgut threads are secured in bulldog clamps and the flap is everted outside the operative field.
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FIG. 3 Inferior conjunctival suture is shown in the process of making a double knot reinforced by a third simple knot.
The superior conjunctival incision is shown already sutured in a key-pattern suture.

FIG. 4 Superior conjunctival suture completed, and inferior conjunctival suture nearly completed.

Summary

This technique permits a wide exposure of the operative field, facilitates the steps of the squint operation, results in a good apposition of the lips of the conjunctival incisions, and avoids the limbal conjunctival knot touching the cornea. The author has used this technique in forty cases with uniformly good results.

References

NOORDEN, G. K. von (1968) Arch. Ophthal. (Chicago), 80, 94
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