

Stab Incision Glaucoma Surgery

This inexpensive technique has significant advantages.

BY SOOSAN JACOB, MS, FRCS, DNB

Two years ago, while discussing a case with postgraduates, I was asked to outline the practical surgical problems glaucoma surgeons face and how to tackle them. I found myself with a lengthy wish list of ways to make glaucoma surgery easier. At the top of my list were the wishes to eliminate the need to dissect large conjunctival flaps, eradicate the need to apply mitomycin C (MMC) under these large flaps, and reduce subconjunctival scarring and failure. Also near the top of my list, I wished not to have to worry about the following: a shallow anterior chamber on the first postoperative day, placing releasable and adjustable sutures, and having to micromanage patients

in the postoperative period. The list seemed endless!

As I reflected on this list, I realized that I could create a sclerocorneal tunnel straight through the conjunctiva and into the anterior chamber by using a simple 2.8-mm bevel-up keratome, the same instrument used for creating phaco incisions. This tunnel would allow access to the anterior chamber through a 2.8-mm conjunctival cut (Figure).

CONJUNCTIVA-SPARING SURGERY

As I performed this procedure for the first time, I determined that, if I pushed the conjunctiva toward

(Continued on page 81)

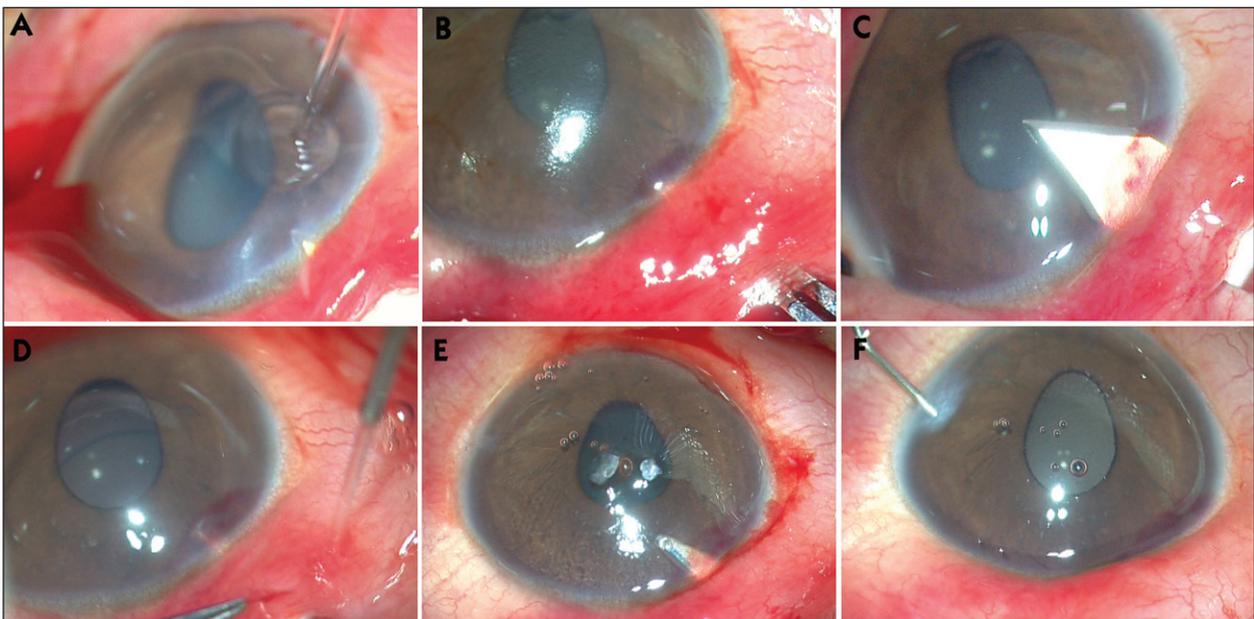


Figure. Posttraumatic glaucoma with traumatic sphincter tears in a 14-year-old boy. The keratome is used to create a sclerocorneal tunnel; the anterior chamber is not entered at this stage (A). A sponge soaked with 0.03% MMC is applied to the tunnel for 2 minutes, and then the tunnel is washed (B). Ophthalmic viscosurgical device (OVD) is instilled into the tunnel to allow the keratome to glide in easily, and the anterior chamber is then entered (C). A 1-mm Kelly Descemet punch is used to punch the posterior lip of the incision (D). The punched tissue is seen lying on the cornea (E). OVD is washed out with a Simcoe cannula, the wound is tested for leakage, the conjunctiva is sutured, and the bleb is hydrostatically elevated with balanced saline solution irrigation (F).

(Continued from page 82)

the limbus before entering the lamellar sclera (just as vitreoretinal surgeons do when inserting a trocar), the result would be a small conjunctival incision that would not overlap the scleral tunnel and therefore would decrease the chance of fibrosis between two overlapping incisions. I found that, with a Kelly Descemet punch, I could punch the posterior corneal lip of the tunnel and thus compromise the incision. Additionally, I did not need to perform a peripheral iridectomy in eyes with primary open-angle glaucoma and wide open angles, as the iris root lay far from the ostium. A demonstration of the procedure can be viewed at eyetube.net/?v=agede.



This first time I performed stab incision glaucoma surgery (SIGS), it was a success. The more I performed the technique, the more I realized the advantages that it offers. SIGS is much easier to perform than cutting and dissecting a flap; I do not have to agonize over whether the flap is too large or too small. I save surgical time by not having to cut, cauterize, and dissect. Additionally, time spent on placing sutures is minimized. It is easy to do a peripheral iridectomy in cases in which it is indicated (ie, angle-closure glaucoma, shallow anterior chamber, or iris peaking toward ostium).

In my first 68 cases, my outcomes were better with SIGS than my previous experience with traditional filtering surgery, and I achieved good IOP control. A large

amount of virgin conjunctiva was preserved, which is important to facilitate potential future surgery in glaucomatous eyes. The biplanar tunnel provided a controlled leak, and my incidence of shallow anterior chambers postoperatively was almost negligible.

With SIGS, the flow through the tunnel is posteriorly directed, unlike with trabeculectomy, eliminating overhanging blebs and bleb dysesthesia. The almost negligible use of subconjunctival dissection decreases the risk of failure from scarring. The subconjunctival drainage channels are almost entirely uncut and intact, and the biplanar tunnel is less likely to seal than a triplanar flap. I do not have to worry about suture management, and in indicated cases, SIGS can easily be combined with phacoemulsification. The icing on the cake is that, in this era of expensive devices and instruments for microinvasive glaucoma surgery, SIGS can be performed with a simple disposable metal blade and a Kelly Descemet punch.

It was most gratifying when colleagues at my hospital adopted this method and when I started receiving e-mails from doctors around the world who have adopted this technique.

HOW TO AVOID POTENTIAL PROBLEMS

Just as with any surgery, technique is important. Through practice, I realized that I need to perform techniques precisely to achieve the best result. I know I am at the right depth and will avoid premature entry if I can see my metal blade through the overlying sclera and conjunctiva. If the tunnel is too deep, I refrain from pressing downward with the blade while entering the anterior chamber to avoid creating a trapdoor hinge on the lower lip.

It is important to test for the adequacy of the punch by irrigating balanced saline solution from the sideport incision and testing for a leak. If required, it is easy to convert SIGS into a trabeculectomy by cutting the edges of the tunnel to convert it into a flap. In high-risk cases, if required, MMC can be applied to the tunnel.

The questions I pose are:

- Do you think that the minimal conjunctival dissection employed in this technique might be advantageous?
- Do you think that this simplified technique would be easy to adopt? ■

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1. Do you think that the minimal conjunctival dissection employed in this technique might be advantageous?
 - Yes
 - No
 - Unsure
2. Do you think that this simplified technique would be easy to adopt?
 - Yes
 - No
 - Unsure