Management of Pediatric Traumatic Glaucoma After a Scleral Buckle

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CASE PRESENTATION

A 7-week-old girl sustained an open-globe injury when her right eye was struck directly by a car key. The large, full-thickness corneal-scleral laceration extended from the central visual axis to the temporal corneal-scleral limbus. Vitreous and iris prolapse through the wound laceration were noted at the time of the globe's initial repair. The surgeon reapproximated the laceration with nonabsorbable sutures and fibrin tissue glue (Figure 1).

The patient underwent a pars plana vitrectomy 1 week after the open-globe repair and was noted to have suffered complete traumatic aniridia and aphakia. A scleral buckling procedure was performed, with placement of a 360º silicone band (240 style).

Six weeks after the original injury, the patient underwent an examination under anesthesia. The IOP measured 30.5 mm Hg OD by pneumotonometry. The corneal diameter of her right eye was 12.5 mm horizontally by 11.5 mm vertically, and the axial length was 22.5 mm. The cup-to-disc ratio in the patient's right eye measured 0.3. She was started on topical latanoprost (Xalatan; Pfizer, Inc), timolol, and dorzolamide (Trusopt; Merck & Co., Inc). At a follow-up examination under anesthesia 2 weeks later, the patient's IOP measured 29.5 mm Hg OD.

HOW WOULD YOU PROCEED?

In a 13-week-old patient who sustained previous ocular trauma with corneal scarring and traumatic aniridia and aphakia, and has a prior history of scleral buckle placement, what surgical options would be appropriate to better manage her uncontrolled IOP and enlarging globe?

Figure 1. External photograph of the injured eye 1 week after open-globe repair.

- Would you consider an angle-based surgery such as trabeculotomy?
- Would you perform a trabeculectomy with or without an antifibrotic agent?
- Would you implant a glaucoma drainage device?
- Would you perform a cyclodestructive procedure?

SURGICAL COURSE

We decided to pursue a modified Schocket procedure, which consists of an anterior chamber silicone tube connected to an encircling band that is designed to shunt aqueous to the surrounding encapsulating fibrous tissue.[1] We used the previously placed encircling scleral buckle as the aqueous shunt reservoir for the procedure.

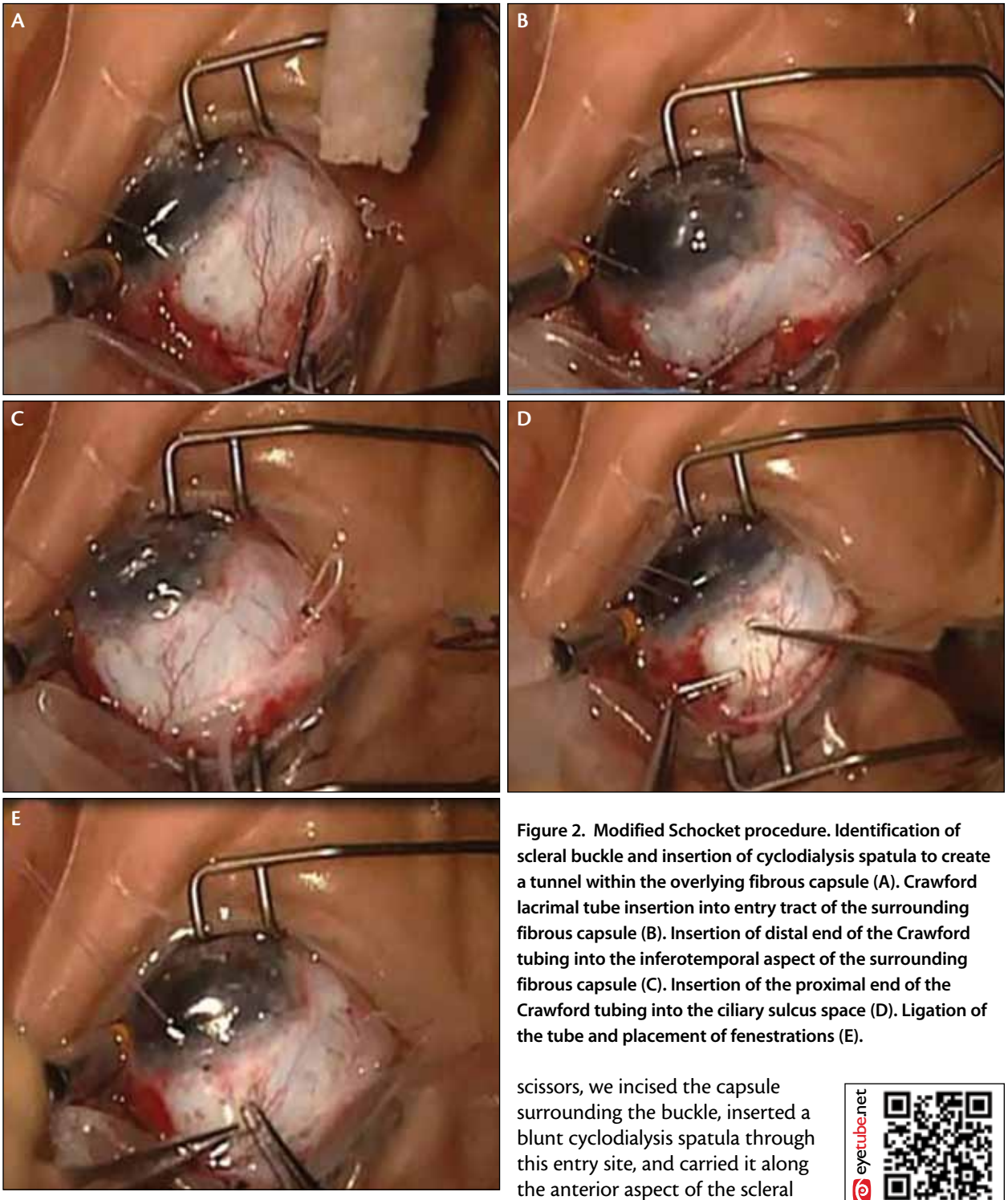

Figure 2. Modified Schocket procedure. Identification of scleral buckle and insertion of cyclodialysis spatula to create a tunnel within the overlying fibrous capsule (A). Crawford lacrimal tube insertion into entry tract of the surrounding fibrous capsule (B). Insertion of distal end of the Crawford tubing into the inferotemporal aspect of the surrounding fibrous capsule (C). Insertion of the proximal end of the Crawford tubing into the ciliary sulcus space (D). Ligation of the tube and placement of fenestrations (E).

We repeated the pars plana vitrectomy and carefully shaved the vitreous base. Next, we incised the conjunctiva at the corneal limbus for approximately 5 clock hours. After carrying out posterior dissection, we identified the preexisting scleral buckle. With a sharp Vannas scissors, we incised the capsule surrounding the buckle, inserted a blunt cyclodialysis spatula through this entry site, and carried it along the anterior aspect of the scleral buckle to create a tunnel within the capsule (Figure 2A). Next, we inserted silicone tubing connected to a Crawford lacrimal stent into this entry tract. We performed a cutdown over the distal end of the Crawford stent, which

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we externalized from the fibrous capsule (Figure 2B).

After creating an adjacent entry site into the fibrous capsule, we used a cyclodialysis spatula to make a tunnel within the inferotemporal aspect of the scleral buckle. Next, we cut the distal end of the tubing and inserted it through this entry tract (Figure 2C). The proximal end of the Crawford tubing was then cut from the stent. We used a 23-gauge needle to create an incision and entry into what was estimated to be the ciliary sulcus space of the globe. We then inserted the tube through this tract and visualized it as it entered the globe (Figure 2D). We ligated the tube with a 7–0 polyglactin suture and placed three fenestrations across the tubing (Figure 2E). We secured the tube to the sclera with nonabsorbable sutures and sutured a processed pericardium tissue patch graft over the tube. The conjunctiva was then reapproximated to the corneal limbus and closed. A subconjunctival injection of a steroid and antibiotic was administered at the end of the case.

OUTCOME

Three months after the modified Schocket procedure, the patient's IOP measured 11 mm Hg OD, and the corneal diameter was 12 mm horizontally by 11.75 mm vertically. The axial length of the right eye measured 22 mm.

DISCUSSION

The options for IOP control in this pediatric patient with traumatic glaucoma and prior scleral buckling were limited. Without corneal limbal anatomical landmarks in this traumatized eye, a trabeculotomy might have had limited success. Goniotomy was not possible due to corneal scarring and the lack of a clear gonioscopic view of the anterior chamber angle structures. Due the patient's age, aphakic status, and history of trauma and scleral buckling, we deemed a trabeculectomy to be at high risk of failure. Due to limited orbital space after scleral buckling in this pediatric patient, we deferred conventional tube shunt surgery using either the Ahmed Glaucoma Valve (New World Medical, Inc.) or the Baerveldt device (Abbot Medical Optics Inc.).

Connecting the anterior chamber tube shunt to an encircling band (ACTSEB) was originally described by Schocket et al in a series of adult eyes suffering from uncontrolled neovascular glaucoma.[1] Postoperatively, IOP control was achieved in 18 of the 19 eyes over an average follow-up period of 59 weeks. Postoperative complications included a prolonged flat chamber, hyphema, and probable acceleration of cataract formation.[1] Other complications included tube exposure, corneal decompensation, blockage of the proximal and distal ends of the tube, and choroidal detachment.[2]

Lee et al described their results using a modified ACTSEB in eight eyes with uncontrolled IOP after scleral buckle.[3] The ACTSEB was modified by the placement of fenestrations in the tube, tubal ligation, and securing of the tubing to a preexisting scleral buckling element. These changes were similar to the surgical modifications we performed in our case. The overall success rate was 87.5% (seven eyes), with one case of an exposed tube 9 months after the initial surgery. All eyes had a reduction in IOP and improvement in visual acuity 1 year postoperatively. ■

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