New Ideas

Combined No-Stitch Phacoemulsification Cataract Extraction With Foldable Silicone Intraocular Implant and Holmium Laser Sclerostomy Followed by 5-FU Injections

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ABSTRACT
In an attempt to overcome some of the problems associated with combined cataract extraction and glaucoma filtration surgery, we attempted a new combined procedure: a small-incision phacoemulsification cataract removal with placement of a silicone foldable implant and no-stitch closure combined with a holmium laser sclerostomy in an adjacent quadrant, followed by injections of 5-fluorouracil.

Many surgeons report poor long-term bleb formation after combined cataract extraction and glaucoma filtration surgery. Small-incision cataract surgery with no-stitch or one-stitch closure appears to minimize postoperative astigmatism. When attempting to combine small-incision cataract surgery with phacoemulsification and glaucoma filtration surgery (trabeculectomy or posterior-lip sclerectomy), most surgeons find it necessary to use a relaxing incision in the scleral tunnel, converting it to a scleral flap similar to the standard trabeculectomy flap. Typically, the flap is closed with several sutures and the suture tension adjusted postoperatively with laser suture lysis or adjustable suture removal. This scleral flap arrangement may allow for a large postoperative astigmatism after 5-FU injections. Furthermore, these combined phacoemulsification-trabeculectomy procedures depend on bleb formation in the same area in which the conjunctival flap was dissected.

In an attempt to overcome some of the problems of these combined procedures, we attempted a new combined procedure: a small-incision phacoemulsification cataract removal with placement of a silicone foldable implant and no-stitch closure combined with a holmium laser sclerostomy in an adjacent quadrant, followed by injections of 5-FU.

CASE REPORT
A 73-year-old man had been followed for 9 years with open-angle glaucoma. When initially examined in 1982, he had a visual acuity of 20/20 in both eyes; a family history of glaucoma; intraocular pressures (IOPs) of 28 mm Hg RE and 42 mm Hg LE; an afferent pupil defect LE; cup/disc ratios of 0.8 RE and 0.9 LE; minimal field loss RE; and severe field loss to 5° with a temporal island LE. Gonioscopy showed open angles in both eyes. Medical therapy was implemented, but a 180-degree...
argon-laser trabeculoplasty plus 180° in the left eye was required in 1986. Meanwhile, the patient’s central visual acuity slowly fell below corrected 20/30 RE and 20/80 LE, presumably because of cataract. Dense cataract rendered visualization of the fundus LE poor. With mild glare, visual acuity was 20/50 RE and hand movement LE. The patient felt his visual function was impaired because of a severe blur LE. Visual acuity with super pinhole LE was 20/30. Preoperatively, he was using pilocarpine 4% four times a day LE; timolol maleate (Timoptic) 0.5% two times a day in both eyes; and methazolamide (Neptazane) 50 mg two times a day. Intraocular pressure was between 19 and 23 mm Hg in both eyes.

After he had given his informed consent, the patient underwent surgery in June 1991. The surgery consisted of a 4-millimeter, no-stitch phacoemulsification cataract removal using a 5-millimeter superonasal fornix-based conjunctival flap, scleral tunnel dissection, capsulorhexis, and an endocapsular cracking technique (Alcon Series 10,000 Master Phacoemulsification Unit), followed by insertion of a silicone foldable implant AMO Style S18¥NBG, utilizing the Fine folder under viscoelastic. After exchanging the viscoelastic in the anterior chamber with balanced salt solution, the wound was found to be watertight; the IOP was approximately 16 mm Hg (measured by the intraoperative tonometer designed by Clifford Terry).

The gLase 210 Holium Laser System (Sunrise Technologies, Freemont, Calif.) was then calibrated and the sterile laser tip was advanced under the nasal edge of the cut conjunctival flap into the superotemporal quadrant, and the laser tip was oriented at the anterior limbal border and directed toward the anterior chamber. Attempts to create a laser thermal sclerostomy were at first unsuccessful, due, in our judgment, to the relative lack of anterior chamber pressure that allowed the sclera to “push away” from the laser tip as energy was delivered superficially. The anterior chamber was then reinfated with viscoelastic, and a laser sclerostomy was then easily performed. A total of 87 lesions at 120 mJ were required to create the thermal sclerostomy. Approximately 30 of these lesions were used in the first (unsuccessful) attempt, another 57 in the second (successful) attempt. No iridectomy was performed at either the cataract incision site or the laser sclerostomy site.

The viscoelastic was then exchanged for balanced salt solution, and the conjunctival flap was closed using 8-0 polyglactin (Vicryl) suture. Postoperatively, the patient received three 5-milligram 5-FU injections. The 5-FU injections were discontinued because of an astigmatism shift from 2.00 diopters with the rule on the 1st postoperative day, to 2.00 D against the rule at 2 weeks postoperatively. Preoperative astigmatism was 1.00 D against the rule. Seven weeks postoperatively, the patient refracted to 20/30 with 2.00 D against-the-rule cylinder. Intraocular pressure was 12 mm Hg on only timolol 0.5% two times a day, and he had a quiet superotemporal filtration bleb.

I am both encouraged and discouraged by different aspects of this case. Encouraging was the ease of creating the laser sclerostomy once the anterior chamber was stabilized with viscoelastic. Also encouraging was the good short-term IOP control and bleb formation. The bleb was formed in an area separate from the cataract and yet no further conjunctival cutting or dissection were required. The holmium laser sclerostomy should add only about 5 minutes to the procedure.

I was discouraged by the apparent wound gape or wound slippage following the 5-FU injections in spite of having started with a 4-millimeter watertight no-stitch closure. I have noted no more than 0.50 D against-the-rule cylinder shift postoperatively in approximately 100 4-millimeter-wound no-stitch cataract surgery cases not combined with filtration surgery and 5-FU injections. The 3.00 D of cylinder shift from a preoperative 1.00 D against the rule to 2.00 D with the rule 1 day postoperatively may indicate excessive cautery at the cataract wound site.

Obviously, this approach to combined cataract removal, intraocular lens implantation, and filtration surgery subjects more of the conjunctival area at the limbus to potential scarring than combined phacoemulsification and trabeculectomy. If the filtration bleb fails with this procedure, 8 to 10 mm of the superior conjunctival area could scar down. Only 5 to 6 mm of conjunctival scar would be expected with combined phacoemulsification and trabeculectomy.

I recognize that the follow up on this case is extremely short. I submit it only to demonstrate the potential benefit of holmium laser sclerostomy and combined cataract-glucoma surgery and to encourage further investigation.

REFERENCES