Controlling early postoperative complications without affecting long-term efficacy is a common concern among physicians about today’s tube shunts. The potential clinical benefits of large, single-quadrant implants are substantial. I favor the Baerveldt Glaucoma Implant (Advanced Medical Optics, Inc., Irvine, CA) (Figure 1). I find its implantation technically easy. The process requires a limbal-conjunctival incision, takes less time surgically, and causes less trauma to the periocular tissue than a multiple-quadrant procedure. Although other single-quadrant devices offer these same benefits, I use the Baerveldt Glaucoma Implant because of its large surface area for filtration. Using the surgical technique described herein, I achieve more effective long-term IOP control than is possible with plates that have a smaller surface area. The Baerveldt Glaucoma Implant’s increased capacity to drain aqueous and reduce pressure better than small plates results in patients’ needing fewer postoperative glaucoma medications.

**MY EXPERIENCE**

The typical candidate for a Baerveldt Glaucoma Implant has already undergone failed standard trabeculectomy surgery, has a type of glaucoma for which standard trabeculectomy would likely be unsuccessful (eg, iridocorneal endothelial syndrome, active uveitic glaucoma), or has neovascular glaucoma. Some patients who fit these criteria have complicating factors that must be addressed prior to the device’s implantation. For example, I refer patients to a vitreoretinal specialist for retinal photocoagulation before glaucoma surgery, when possible, if they have significant posterior segment ischemia from central retinal vein occlusions, or if they have diabetes.

**IMPLANTING THE DEVICE**

**Step No. 1**

I place the lid speculum, and, because the Baerveldt shunt is commonly used in eyes that have already undergone surgery, I inspect the eye to see which quadrant appears to have the least scarring. I use additional anesthesia and balloon the conjunctiva temporally to help identify areas of conjunctival scarring. Then, I place the device superotemporally, if possible. If scarring is present, I use the inferotemporal quadrant.

**Step No. 2**

I perform a superior peritomy from 150° to 180° along the limbus. I dissect the superotemporal and nasal quadrants. If exposure is unsatisfactory, I may place a suture beneath the superior rectus tendon for traction, but this precaution is often unnecessary. I ensure the superior conjunctiva is sufficiently mobile for me to pull it back over the plate to the limbus at the end of the procedure, in order to ensure adequate coverage of the patch graft and shunt without significant tension. I free adhesions, as necessary, to advance the conjunctiva over the limbus.

**Step No. 3**

I perform cautery and achieve hemostasis. Then, I place the shunt in the superotemporal quadrant. I place the wings of the shunt beneath the adjacent recti rather than on top.
thus securing the shunt, making it less likely to extrude, and better covering it. To ensure that the shunt’s wings go underneath the adjacent muscles, I insert the shunt obliquely and rotate it in with one wing under the lateral rectus and tuck the other wing under the medial rectus tendon.

The shunt should be easy to center. I ensure that it is in a good position to enter the anterior chamber, located posteriorly to adjacent insertions of the recti. Placing the shunt farther back from the limbus is preferable, because it makes the shunt less likely to extrude by providing for better coverage.

**Step No. 4**
I pre-place the stabilizing sutures through the two anterior positioning holes for anchoring the plate to the sclera. I use 4–0 white silk sutures, although other nonabsorbable sutures are acceptable. I put the sutures through the sclera, while trying to confirm they are at least adjacent to or behind the rectus tendon insertions and that they are centered in the quadrant. Then, I tie off both sutures to anchor the plate posteriorly in the quadrant.

**Step No. 5**
I de-epithelialize the limbus superiorly. Otherwise, the conjunctiva will recede, potentially exposing the graft covering the tube or the shunt itself. I place a paracentesis track through the peripheral clear cornea and inject viscoelastic into the anterior chamber to ensure that it is deep.

**Step No. 6**
I make an entry site for the placement of the tube shunt into the anterior chamber with a 23-gauge needle. I try to create the entry site at least 1 or 2 mm posterior to the limbus. I direct the needle so that it is parallel to the iris and aimed away from the cornea. The tube should be posterior and as far from the cornea as possible.

**Step No. 7**
I cut the tube to the appropriate length with Westcott scissors so that, when inserting the tube, there is 2 to 3 mm of tube in the anterior chamber. I make sure not to cut the tube too short. Before inserting the tube in the anterior chamber, I inject viscoelastic into the tube shunt. I inject the viscoelastic through the 23-gauge needle track (through which the tube will be placed) to push the uvea back and aid in guiding the tube into the anterior chamber. The viscoelastic in the tube will provide some resistance to the outflow in the early postoperative period and, thus, reduce the risk of a flat anterior chamber and hypotony.

**Step No. 8**
Using curved Hoskins forceps, I insert the shunt through the needle track and into the anterior chamber. I inspect the tube to see if it is in a satisfactory position. Removing and trimming the tube remains an option if the tube is too long.

**Step No. 9**
Once the tube is positioned in the anterior chamber, I cut a small rectangular piece of pericardial patch graft material (Tutoplast, IOP Inc., Costa Mesa, CA) with straight iris scissors and place it over the tube and entry site. I suture the pericardial tissue with four interrupted 9–0 sutures to secure it.

If the tube remains in a good position and is well covered with the pericardial graft anteriorly, I remove the traction suture and advance the conjunctiva anteriorly to the corneal limbus over the shunt, tube, and patch graft. I suture the conjunctiva with 8–0 Vicryl sutures (Ethicon, Inc., Somerville, NJ). I place the sutures nasally and temporally through the corneal limbal tissue to provide a secure anchor on both sides. I close the wings of the conjunctival incision with a running suture. Finally, if excessive conjunctiva drapes over the cornea, I trim it with curved scissors and make sure the chamber is still deep with viscoelastic.

**POSTOPERATIVE COURSE**
Postoperative therapeutic treatment comprises an antibiotic steroid ointment and an eye patch. The patients receive Pred Forte (Allergan, Inc., Irvine, CA) and Zymar (Allergan, Inc.) q.i.d. Also, I use Acular LS (Allergan, Inc.) if the patient is diabetic or pseudophakic. I taper steroid use over 4 to 6 weeks. Generally, the residual viscoelastic in the anterior chamber prevents a flat chamber from developing. I use a viscoelastic with a high molecular weight (eg, Healon GV; Advanced Medical Optics, Inc.) during surgery, and I inject additional viscoelastics postoperatively at the slit lamp if the anterior chamber shallows. This technique is important to minimize the risk of long-term corneal decompensation, which is one of the more common long-standing complications of tube shunt procedures.

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