Ophthalmic Viscosurgical Devices in Filtering Surgery

Glaucoma Today asked four ophthalmologists to describe how they use OVDs to maximize surgical outcomes.

BY LOUIS B. CANTOR, MD; F. JANE DURCAN, MD; MOHAMMED ELMALLAH, MD; AND SANDRA M. JOHNSON, MD

LOUIS B. CANTOR, MD
Ophthalmic viscosurgical devices (OVDs) play a critical role in my glaucoma filtering procedures. During a trabeculectomy, I prefer to permit steady leakage from the sclerotomy site and generally place only two sutures in the scleral flap. In order to prevent an early shallow anterior chamber or hypotony (Figure 1), I therefore inject a high-molecular-weight OVD (Healon5; Abbott Medical Optics Inc., Santa Ana, CA) at the conclusion of the procedure. The OVD maintains the anterior chamber while the eye recovers from surgery and begins to heal and while the glaucoma medications wear off. If I augment trabeculectomy surgery with an Ex-Press mini glaucoma shunt (Alcon Laboratories, Inc., Fort Worth, TX), I still use an OVD in the anterior chamber, but I generally choose a viscoelastic that is not of high viscosity in order to maintain the anterior chamber and minimize the risk of a pressure spike.

For shunt surgery, I favor the Baerveldt glaucoma implant (250 mm²; Abbott Medical Optics Inc.) and prefer not to ligate the tube. In order to prevent early overfiltration, I will place a high-molecular-weight OVD (Healon GV; Abbott Medical Optics Inc.) in the anterior chamber at the end of the case and will also inject the OVD into the tube itself. Even when I use a valved shunt such as the Ahmed Glaucoma Valve (New World Medical, Inc., Rancho Cucamonga, CA), I will leave some viscoelastic in the anterior chamber.

I also find a high-molecular-weight OVD (Healon GV) to be of primary importance when I perform a canalo-plasty combined with a deep sclerectomy.

The use of OVDs is pivotal to minimizing early postoperative complications and enhancing the long-term outcomes of glaucoma surgery.

F. JANE DURCAN, MD
OVDs are an essential tool in filtering surgery. I frequently use an OVD to deepen the anterior chamber...
and protect the lens in a phakic eye. After making a paracentesis, I inject the OVD into the anterior chamber. I place enough to deepen the chamber and achieve an adequate IOP to facilitate the incision and prevent the forward movement of the iris and lens. In a pseudophakic eye, this step often is not necessary. I usually favor a cohesive viscoelastic such as Healon (Abbott Medical Optics Inc.) for this maneuver for the ease of its removal. I evacuate the OVD with irrigation through the paracentesis prior to making the final adjustments to the tension of the flap sutures. This timing allows the fine-tuning of flow through the fistula to ensure adequate drainage and maintain the anterior chamber depth. In a very shallow eye, a dispersive agent such as Viscoat (Alcon Laboratories, Inc.) may be needed to maintain depth. In rare instances when I cannot maintain its depth by adjusting tension on the suture, I will leave the OVD in the anterior chamber.

In the case of a postoperatively flat anterior chamber, an OVD can be injected through the paracentesis at the slit lamp to deepen the chamber. I prefer to start with Healon, as it is the easiest to remove in the case of a pressure spike. If it proves inadequate to maintain the anterior chamber depth, I will inject Healon GV or Healon5. I am careful not to overinflated the eye and the bleb, because severe pressure spikes are a real risk with this maneuver.

I also use an OVD to protect the cornea against epithelial breakdown during filtering surgery if there is some already open on the field.

MOHAMMED ELMALLAH, MD
I do not routinely use OVDs in filtering surgery. I have adjusted my technique to minimize shallowing of the anterior chamber intraoperatively. I incorporate an Ex-Press shunt, typically the P-50 model, into my filtering procedures. I preplace two 10–0 nylon sutures in the scleral flap prior to entering the anterior chamber. I then make a temporal paracentesis with a 15º blade. I use a 25-gauge needle to enter the anterior chamber. The needle is occluded so that there is no fluid reflux out of the anterior chamber until I remove the needle from the eye. I then insert the Ex-Press using the manufacturer’s insertion device. Immediately, I tie off both 10–0 nylon sutures holding the flap. Although the anterior chamber will become shallow during this process, it rarely becomes flat. I then reform the anterior chamber with balanced salt solution instilled through the paracentesis and check aqueous flow at the flap, at which time I will place more sutures if necessary. When I first started using the Ex-Press, I would leave Healon in the anterior chamber to avoid early postoperative hypotony. I have found that this precaution is no longer necessary.

I use OVDs in two specific situations when inserting tubes into the anterior chamber. During the tube’s placement, if I find that it is getting caught in the iris, I will remove the tube and inject Healon through the sclerotomy to push iris tissue out of the way. Alternatively, I will inject Healon through the paracentesis and, either with my Healon cannula or a cyclodialysis spatula, will free up the distal end of the tube from the iris. The second situation in which I use an OVD is in the case of bleeding from the angle/iris root when I make the sclerotomy or insert the tube. Bleeding can occur in eyes with peripheral anterior synechiae or neovascular glaucoma. In these cases, I inject Healon through the paracentesis right next to the area of bleeding to provide a tamponade. I do not routinely leave an OVD in the anterior chamber at the end of the procedure.

SANDRA M. JOHNSON, MD
Viscoelastics can be a helpful adjunct to glaucoma filtering surgery. I leave OVDs like Healon, Amvisc (Bausch + Lomb, Rochester, NY), and ProVisc (Alcon Laboratories, Inc.) in the anterior chamber of these eyes, especially if the IOP was high (ie, over 30 mm Hg in general).
Surgical Pearls

This technique helps to maintain the integrity of the globe during the first several days after surgery. The goal is to lower the risk of hypotony and its complications by allowing the IOP to decrease gradually.1

The OVD exits the tube or trabeculectomy slower than aqueous. It takes about 2 days to clear. Viscoelastics are also helpful in uveitic eyes, which often hyposecrete aqueous during the early postoperative period. OVDs can be reinjected into the anterior chamber as needed during the postoperative period should the anterior chamber become shallow and present the risk of lens-cornea touch. Instilling an OVD can also temporarily elevate the IOP to assist in the resolution of choroidal effusions. I often use Viscoat in the clinic.

For all filtering surgeries, I check the digital pressure after injecting an OVD in the OR in order to leave the pressure in the range I want at the end of the case—a goal titrated to the status of the optic disc and taking into account the preoperative IOP. I would not want a high IOP in an eye with low-tension glaucoma or severe cupping, but an eye with an IOP that has been in the 30s or that has a sufficient nerve reserve can be left firmer.

During glaucoma implant surgery, I use an OVD to push back the iris if needed to facilitate a tube’s insertion and to tamponade bleeding or even to move the blood to allow visualization. I only make an effort to remove the OVD if the IOP feels elevated when the cornea is compressed with a cannula. Generally, if the iris moves when I compress the cornea, I assume the IOP is in the normal range.

During combined surgery, after implanting the IOL, I make no effort to remove the OVD to lessen the hypotony while I complete the trabeculectomy and place sutures. In any trabeculectomy, I check the flow under the flap and the anterior chamber depth before I add more OVD at the end of surgery (Figure 3). I want the eye to maintain its own chamber without viscoelastic.

Some of the uses of OVDs discussed in this article are off label.

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