

# Surgical Pearls and Pitfalls With a Trabecular Microbypass Stent

The challenges and my approach for success.

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The iStent Trabecular Micro-Bypass Stent (Glaukos) is approved for the treatment of patients with early to moderate open-angle glaucoma at the time of cataract surgery. The smallest FDA-approved device to be put into the human body, this stent is designed to serve as a bypass through the trabecular meshwork (TM) and facilitate physiologic outflow. The implant's advantages include postoperative healing similar to after cataract surgery alone, reduced IOP, and a decrease in the number of glaucoma medications required by the patient. The significant challenge posed by the iStent, I found, is mastering the surgical technique. This article shares my experience and my solution for successfully inserting the device.

## MY EXPERIENCE

A desire to stay on the cutting edge of glaucoma treatment and to increase my patients' surgical options led me to begin inserting the iStent in June 2013. Having successfully used the Trabectome (NeoMedix) for nearly 5 years at that point, I felt confident that I would be able to master the surgical technique for the iStent with a short learning curve. I was surprised to hear colleagues with substantial Trabectome experience discuss challenges in adopting the iStent. I myself fared well with my first few iStent procedures after training. Then, I encountered a challenging case.

## THE CHALLENGES

I am no longer surprised when colleagues tell me that they have had at least one instance, possibly several, in which they struggled to insert the iStent and complete the case. My first challenging case involved an extremely poor view due to corneal striae, a persistently shallow



Figure 1. A poor view due to corneal folds, excessive bleeding, and a shallow chamber make the iStent's insertion challenging.

anterior chamber, and bleeding that was difficult to control (Figure 1). I was constantly refilling the chamber with viscoelastic, and I had to execute multiple grabbings and attempts. After almost 30 minutes, I was about to give up, but at last, I was able to insert the iStent. My next several cases went well, but I then had similarly challenging cases. I knew I needed a different approach.

## MY SOLUTION

### Background

After struggling through about 15 cases, I discovered a consistent way to successfully insert the iStent with ease. Now, anterior chambers remain deep and stable, no hypotony with excessive bleeding occurs, the view is crystal clear (Figure 2), and the device's insertion is easy even if I have to regrab it on occasion. My solution arose from simply changing the



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Figure 2. Clear view in a typical case when the surgeon inserts the stent prior to cataract removal.

order of the procedure: I now place the iStent first before performing cataract surgery (an off-label approach).

#### Seven Simple Steps

**No. 1. Set up.** I orient the microscope at a 30° angle toward myself and then turn the patient's head away from me. I confirm angle anatomy with an ophthalmic viscosurgical device (OVD) and a gonioscope prior to making any corneal incision.

**No. 2. Incise the cornea.** I make a temporal 1.4-mm corneal incision with a 15° blade.

**No. 3. Depressurize the eye.** I depress the lip of the corneal incision with the cannula prior to inserting the anesthetic. The resultant congestion of Schlemm canal with heme can highlight a nonpigmented TM for easy identification. I use epi-Shugarcaine (15 mL balanced salt solution combined with 5 mL preservative-free lidocaine 1% 10 mg/mL and 1 mL of 1:1,000 epinephrine 1 mg/mL) for anesthetic before and after the iStent's insertion. The epinephrine acts as a vasoconstrictor and aids in reducing the backflow of heme into the anterior chamber (Figure 3).<sup>1</sup>

**No. 4. Insert a dispersive OVD.** It is important not to fill the anterior chamber more than 80%. Otherwise, the dispersive OVD can flatten the lumen of Schlemm canal, making it more difficult for the iStent to enter.

**No. 5. Insert the iStent.** In a parallel plane, through the small corneal incision, I insert the device with care so as not to dislodge the tip.

**No. 6. Place the stent.** With a 15° approach, I pierce through the TM. Next, I rotate the iStent's heel so that it is parallel to the TM, push forward to seat the device in Schlemm canal, and then press the button on the inserter to release.



Figure 3. Minimal heme after the device's insertion allows easy confirmation of its placement.

**No. 7. Confirm placement.** I tap the side of the stent to make sure that it is well seated. I tap above or below to look for recoil in order to verify proper placement.

#### THE REST OF THE CASE

After the placement of the iStent and removal of its inserter, cataract surgery begins as usual. At the end of the case, I take 30 seconds to re-rotate the microscope, have the patient look away from me, and confirm that the device is seated properly. I have never seen a dislodged iStent using this method.

#### CONCLUSION

The benefit of inserting the iStent prior to the cataract procedure is that the smaller corneal incision and the materials used are specific for the device and allow me to consistently perform microinvasive glaucoma surgery with control and ease. The small incision and dispersive OVD reduce the egress of the viscoelastic. Moreover, the technique is cost-effective in that I also use the dispersive OVD for the cataract procedure. Easier maintenance of the anterior chamber depth promotes corneal clarity due to a lack of striae in the pressurized eye. As in cataract surgery, each step is important to the success of the next.

I hope that readers will try this approach and then send an e-mail to me describing their experience. ■

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