

UNEXPECTED CHALLENGES WITH COMBINED MIGS AND CATARACT SURGERY

The best way to avoid complications is to prevent them.

BY CONSTANCE O. OKEKE, MD, MSCE



Microinvasive glaucoma surgery (MIGS) is gaining significant attention from glaucoma specialists and anterior segment surgeons alike, because these procedures provide a safe and effective way by which to lower IOP that is easily combined with cataract surgery. As with any new procedure, a learning curve on patient selection and for acquiring necessary surgical skills is required. The good news with MIGS procedures is that the intra- and postoperative complication rates are remarkably lower than those of traditional glaucoma surgical techniques.^{1,2} The bad news—or the reality—is that it takes a period of feeling uncomfortable before one can truly see the beauty of what MIGS can offer.

Two main MIGS procedures that focus on the angle are ab interno trabeculotomy (Trabectome; Neomedix) and trabecular microbypass (iStent Trabecular Micro-Bypass Stent; Glaukos). This article focuses on preventing complications during iStent surgery, but many of my tips can be applied to both procedures.

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POSSIBLE COMPLICATIONS

There are not many intraoperative complications that I have encountered with the iStent, but here are some to be aware of.

No. 1. The stent cannot be inserted.

This situation can occur for a number of reasons, often due to poor visualization related to a cloudy cornea, corneal striae, or heme. Also, if several attempts at insertion have been made, a lack of available trabecular meshwork (TM) in which to insert the iStent can pose a problem.

No. 2. The device is inserted in the wrong location.

Familiarity with the angle anatomy is important because not all TMs are alike. Nonpigmented TMs can often be highlighted by decompressing the chamber to elicit a reflux

of blood in Schlemm canal (SC). Even when the surgeon is comfortable with the angle anatomy, however if the view is distorted or hazy, the device could be placed in the wrong location such as the ciliary body band or posterior corneal tissue, thus affecting the results.

No. 3. The device is inserted but not properly seated.

The goal of insertion is to pierce through the TM and enter SC. If the entry is too shallow, the iStent may have weak insertion within the spongy tissue of the TM, which could lead to inadequate stent function and/or easy dislodgment. If it is placed too deep, the stent may enter the scleral wall and damage unseen collector channels, which, again, may lead to inadequate stent function.

No. 4. The iStent is inserted initially but then dislodges.

After the iStent is properly seated in SC, the injector button is depressed to release the stent. If the button is not completely depressed, the prongs holding the iStent may not open fully. If the surgeon begins to pull the injector away



Figure 1. A clear view of the trabecular microbypass stent.

before full release, there is the potential to dislodge the heel of the iStent. At this point, doing so is still possible to tap it into the proper position with the tip of the injector, but it is also likely to dislocate the iStent even more, requiring a regrab of the stent and another insertion attempt. It is also possible to perfectly place the iStent into SC and then dislodge the device while trying to tap the exposed snorkel of the iStent into position when checking for adequate placement.

HOW TO AVOID COMPLICATIONS

In my 6 years of performing MIGS procedures, I have found several ways to decrease the risk of complications.

No. 1. Become familiar with intraoperative gonioscopy.

Gonioscopy at the slit lamp in the clinic setting is very important to perform and master, but intraoperative gonioscopy is very different. Although all cataract and glaucoma surgeons are accustomed to using two hands to perform surgery, holding the gonioprism in the non-dominant hand with the fine movements in the x, y, and z planes in order to gain the most optimal view under high magnification is a skill in and of itself to conquer. It is best to practice this maneuver before a surgeon's first MIGS case at the end of a cataract-only patient. Doing so will allow the surgeon to gain familiarity and comfort with properly positioning the microscope, his or her hands, and the patient's head, which should be turned away from the surgeon. (For more on positioning the microscope and the patient's head during MIGS, visit www.youtube.com/watch?v=R_yggmt8hNU.)

No. 2. It is all about the view.

Because the iStent implant is only 1 mm in length, optimal views under high magnification are paramount. Several factors can distort the view, making MIGS surgery more difficult. Corneal clouding can occur if there has been prolonged cataract surgery or in the setting of Fuchs dystrophy (Figures 1 and 2). Corneal striae can occur with excessive pressure from the gonioprism on the cornea's surface when the anterior chamber (AC) does not have enough viscoelastic, creating a hypotonous eye. Blood can be an issue both inside and outside of the eye. If the temporal corneal incision is made too posterior and cuts conjunctival vessels, the heme can migrate over the cornea and under the gonioprism, causing a hazed view. Blood inside the AC is more problematic when it obscures the view of the angle, which can happen when the AC is not well pressurized, causing egress of heme through collector channels once the TM has been pierced. I have found that I can avoid the majority of these factors if the iStent is inserted prior to cataract removal.³ (For more on Dr. Okeke's technique for placing the iStent before cataract surgery, visit www.youtube.com/watch?v=cz1B17g2pHU.)

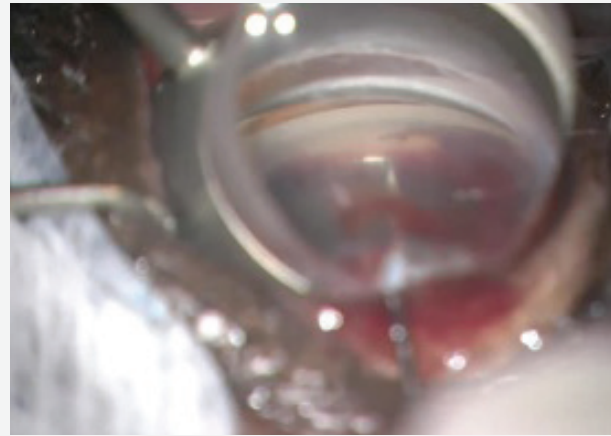


Figure 2. A cloudy view of the trabecular microbypass stent.

No. 3. Maintain anterior chamber pressure

The AC can be a problem if the eye is hypotonous due to a lack of pressurization with viscoelastic, as previously mentioned. Overfill of the AC with viscoelastic can also present a problem. The lumen of SC can collapse in a highly pressurized eye, making inserting the iStent difficult. The surgeon can easily pierce through the TM and quickly enter the scleral wall. I recommend checking the firmness of the eye by tapping the cornea with a cannula and releasing some viscoelastic if it is too firm.

CONCLUSION

Combined MIGS and cataract surgery can provide better options for patients that result in a win-win scenario of improvement in both IOP and vision. As in any ocular surgery, each step is important to the success of the next. Mastering familiarity with intraoperative gonioscopy and maintaining the best view are the most crucial steps to succeeding with MIGS surgery. It is extremely beneficial to insert the iStent before cataract surgery in order to have a clearer view of the angle and allow easier insertion. I recommend trying this approach and seeing the difference. ■

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2. Kaplowitz K, Schuman JS, Loewen NA. Techniques and outcomes of minimally-invasive trabecular ablation and bypass surgery. *Br J Ophthalmol.* 2014; 98(5):579-585.
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- financial disclosure: financial support from Glaukos for research