

ABiC ... EASY AS 1, 2, 3

A question-and-answer session with two surgeons experienced with this new minimally invasive glaucoma surgery procedure.

BY MARK J. GALLARDO, MD, AND MAHMOUD A. KHAIMI, MD

Performed via a self-sealing, clear corneal incision, ab interno canaloplasty (ABiC) conserves the clinically proven benefits of 360° viscodilation provided by traditional canaloplasty, but with the speed and ease of implementation of a microinvasive glaucoma surgery (MIGS) procedure. The procedure's safety profile and simplified surgical approach make it a viable option for the treatment of most glaucoma types. It can be used in conjunction with existing drug-based glaucoma treatments, with or without cataract surgery, after laser or other types of incisional surgery, and it does not preclude or affect the outcome of future surgery.

How do you perform ABiC?



Dr. Khaimi: ABiC can be performed in three easy steps. First, I create a temporal clear corneal incision, approximately 1.8 mm wide. Next, I inject an ophthalmic viscosurgical device into the anterior chamber in order to maintain stability. I then introduce the iTrack micro-catheter (Ellex) into the anterior chamber via a sideport incision in preparation for inserting it in Schlemm canal. Using a 27-gauge needle, I perform a small goniotomy before placing the iTrack into Schlemm canal and advancing it 360°. The last step is to extract the iTrack and perform viscodilation (15 to 20 clicks).



Dr. Gallardo: Like other MIGS procedures, ABiC is performed through clear corneal incisions. During combined ABiC/cataract extraction, I introduce the catheter through the sideport incision, and I use the clear corneal wound as my primary means to manipulate the catheter with microforceps in the anterior chamber and Schlemm canal. Unlike traditional canaloplasty, there is no need to ever touch the conjunctiva or sclera. However, ABiC follows the same dilation principles as traditional canaloplasty, where viscodilation allows for the separation of lamellae within the trabecular meshwork, creates microperforations within the inner wall of Schlemm canal, and lyses herniations of the inner wall of Schlemm canal/trabecular meshwork complex from the collector channels.

How long does ABiC take to perform?

Dr. Khaimi: ABiC is performed with the speed and efficiency of a MIGS device insertion. Because it eschews the tensioning

suture, deep sclerectomy, and Descemet window used in traditional canaloplasty, ABiC is much faster to perform and is well tolerated by the majority of patients in my experience.

Dr. Gallardo: ABiC is similar to other MIGS procedures in that it only takes a few minutes to perform. When done in conjunction with cataract surgery, the combined procedure routinely takes 10 to 15 minutes.

What are your treatment pearls for ABiC?

Dr. Khaimi: To create the ostomy, I use a 27-gauge, 0.5-inch needle with bevel facing up toward the ceiling. I insert the tip of the needle through my previously fashioned clear corneal wound and engage nasal trabecular meshwork. I start high in the anterior of the trabecular meshwork and pull downward to approximately the middle of the trabecular meshwork. A heme reflux can occur when creating the ostomy, so it may be necessary to add more of an ophthalmic viscosurgical device into the anterior chamber to improve visualization. A whitish scleral color should help to identify Schlemm canal. It is important that the ostomy be situated central to the anterior of the trabecular meshwork. If the ostomy is too posterior in the trabecular meshwork, it will be impossible to stent because of the close proximity to the sclera.

Dr. Gallardo: To become a successful ABiC surgeon, one must ensure good visualization of the nasal drainage angle. The temporal clear corneal wound should be made directly across from the nasal angle, and sideport incisions should be 90° from this angle. Corneal incisions should avoid the limbal vessels as much as possible, because surface bleeding can stain the viscoelastic used as a coupling agent for the gonioscopy lens and hinder the view to the drainage angle.

I also recommend using a viscodispersive ophthalmic viscosurgical device to inflate and pressurize the anterior chamber; it helps maintain IOP and chamber depth and will not easily burp out of the wounds when the surgeon manipulates the catheter. I have found that the more the anterior chamber is pressurized, the less bleeding one encounters from the ostomy site during surgery, which provides a clearer view. As the surgeon becomes more comfortable with the procedure, the small regurgitation of blood that may come through the ostomy site will interfere less with the successful intubation and passage of the catheter into and through the canal.

Which patients are best suited for ABiC?

Dr. Khaimi: ABiC is recommended early in the disease process; the primary indication is for patients with mild-to-moderate glaucoma on medical therapy. However, it may also be considered as a first-line treatment option, or in patients who have undergone laser trabeculoplasty and those who are noncompliant with glaucoma medical therapy. Patients with exfoliative glaucoma and those in whom glaucoma surgery in the fellow eye has failed may also be considered for ABiC. The exclusion criteria are similar to those for traditional canaloplasty, and ABiC should not be performed on patients with neovascular or chronic angle-closure glaucoma.

Dr. Gallardo: Because ABiC is minimally invasive and relatively atraumatic, it can be used in a broad spectrum of patients. It can be a first-line, standalone procedure for the treatment of uncontrolled glaucoma that requires surgical intervention in both phakic and pseudophakic patients. In those whose glaucoma is well controlled via topical therapy, ABiC can be used adjunctively with cataract surgery to reduce the medication burden. In eyes with uncontrolled glaucoma, ABiC may reduce IOP and avoid filtration surgery during cataract surgery.

I also like to use ABiC in monocular patients, because it has such a great risk-benefit profile, can be performed under topical anesthesia, and provides almost immediate recovery along with an excellent reduction in IOP.

ABiC has also proven to be highly effective in cases of controlled glaucoma. In a recent case series of 122 eyes followed over 12 months, my colleagues and I used ABiC to effectively reduce the medication burden of controlled glaucoma patients (< 15 mm Hg IOP) by an average of 50%, while maintaining mean IOP at 12.8 mm Hg (data on file with Ellex Medical Pty Ltd.).

What is the postoperative regimen?

Dr. Khaimi: The postoperative regimen for ABiC is similar to that for cataract surgery. I prescribe topical antibiotics and a low-dose topical steroid for 3 to 4 weeks, and instruct patients not to engage in extreme lifting or bending. That is it. With trabeculectomy and glaucoma drainage implants, patients are

PATIENT SELECTION

ABiC is indicated for the reduction of elevated IOP in open-angle glaucoma (OAG), including OAG with ocular surface disease and patients intolerant of antiglaucoma medications.

ABiC is also suitable for the following:

- pigmentary glaucoma (PG)
- pseudoexfoliation glaucoma (PXF)
- ocular hypertension
- normal tension glaucoma (NTG)
- juvenile glaucoma
- steroid-induced glaucoma
- patients post selective laser trabeculoplasty
- patients post single session low-power argon laser trabeculoplasty (ALT)
- patients with previous failed trabeculectomy or tube surgery
- OAG with narrow but not occludable angles after laser iridotomy

Canaloplasty is contraindicated for the following:

- neovascular glaucoma
- chronic angle closure glaucoma
- traumatic/angle recession glaucoma

usually prescribed drops for at least 2 months, and no physical exertion for up to 8 weeks. From a quality-of-life perspective, those are big differences.

Dr. Gallardo: I have found that a significant number of patients respond adversely to steroids by developing pressure spikes. When I perform ABiC alone, I only prescribe a topical NSAID drop and an antibiotic. In combined procedures, I may add a mild steroid four times a day for 1 week, then either discontinue or quickly taper the steroid, if possible, over a 1-week period. ■

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