

ENVISION SUCCESS

Tips for optimizing the placement of a trabecular microbypass stent.

BY ELIZABETH A. DALE, MD, AND MARLENE R. MOSTER, MD



Microinvasive glaucoma surgery (MIGS) bridges the wide gap between medical therapy and traditional glaucoma surgery. This article focuses on one MIGS device, the iStent Trabecular Micro-Bypass Stent (Glaukos),

which is FDA approved for use in conjunction with cataract surgery. The iStent G1, the first ab interno microbypass stent, is designed to improve aqueous outflow by creating a bypass through poorly functioning trabecular meshwork into Schlemm canal. Access to the inferior nasal quadrant is enabled through the use of a clear corneal temporal incision. Strategic placement of the iStent in this location optimizes outflow in an area with the highest concentration of collector channels and aqueous veins. In our experience, successful placement of the implant depends on patient selection, intraoperative gonioscopy skills, head and microscope positioning, and angle visualization.

PATIENT SELECTION

By carefully selecting appropriate patients for this procedure, surgeons can improve the likelihood of success. We find that it is easier to visualize and target the anatomical landmarks in eyes with wide-open angles and pigmented trabecular meshwork. In addition, it is important to select cooperative patients who do not require heavy sedation or a block and who can easily comply with instructions for positioning their head and eye.

GONIOSCOPY: PRACTICE MAKES PERFECT

For new adopters of the iStent, proper positioning of the patient's head and eye and angle visualization are typically the greatest challenges. The successful surgeon has an excellent understanding of angle anatomy and superior gonioscopy skills, which are critical for identifying and targeting anatomical landmarks. Before using the iStent, we recommend practicing intraoperative gonioscopy (using the nondominant hand) at the completion of routine cataract cases. It is also worthwhile to make use of the resources provided by Glaukos: representatives will arrange wet labs and attend cases to foster surgeons' comfort and success. (For more on gonioscopy for MIGS, see Dr. Shareef's article on p. 42.)

POSITIONING AND VISUALIZATION

Various strategies can improve visualization of the trabecular meshwork and access to the angle, thereby facilitating the stent's placement. We prefer to implant the device after removing the cataract, because the deeper anterior chamber often improves our visualization of angle structures. Instilling trypan blue dye at the outset of phacoemulsification stains not only the lens capsule but also the trabecular meshwork, thus facilitating identification of the surgical target. Areas of increased pigmentation indicate underlying aqueous collector channels, which helps us to place the iStent in an ideal location.

After removing the cataract, the patient's head is tilted away from the surgeon, and the microscope is tilted 30° toward the surgeon. We place viscoelastic on the corneal surface to interface with the gonioscopic prism and inject additional viscoelastic to deepen and stabilize the anterior chamber. We prefer a cohesive agent such as Healon GV (Abbott). It is important not to apply excessive pressure on the cornea; doing so may eject viscoelastic, create corneal folds, and obstruct the surgeon's view. By maintaining moderate pressure within the anterior chamber, we can permit a



WATCH IT NOW

Marlene Moster, MD, demonstrates the use of a 25-gauge microvitrectomy blade to optimize placement of the iStent.



<http://bit.ly/moster916>

Moster Wills

Right-handed surgeons who prefer a forehand approach may use the “left” iStent, and those who like the backhand approach may use the “right” iStent (in either right or left eyes). The opposite is true for left-handed surgeons.

reflux of blood into Schlemm canal, a technique that helps us to identify landmarks in eyes with lightly pigmented irides. Injecting too much viscoelastic may cause Schlemm canal to collapse and make the iStent’s implantation more challenging.

If initial attempts to place the device result in bleeding within the anterior chamber, the view may be compromised. Displacing this blood with viscoelastic can improve the view.

LANDING STRIP TECHNIQUE

Surgeons in our group developed a technique to prepare the trabecular meshwork for iStent placement. We use a 25-gauge microvitrectomy blade to bisect the trabecular meshwork for half a clock hour in the area where the device is to be placed.

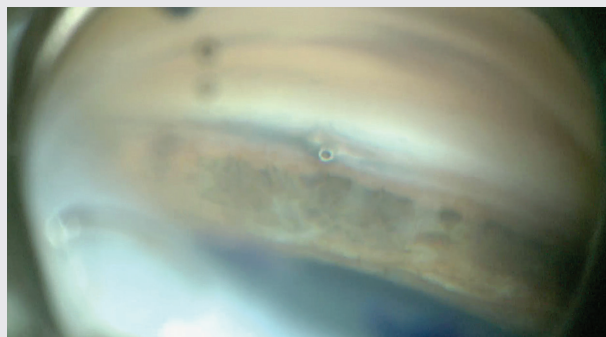


Figure. Gonioscopic view of the iStent after its successful insertion into Schlemm canal.

This small goniotomy essentially creates a “white landing strip” for the stent’s placement. We can widen this space with a cohesive viscoelastic and then advance the iStent into place using the landing strip as a guide. Starting with the implant on the white landing strip, we gently advance the device behind the trabecular meshwork and into the canal (see *Watch It Now*).

Blood reflux indicates patency and effective placement of the iStent within the canal (patency within the episcleral venous system). We find it useful to tap the device with the viscoelastic cannula to ensure that the implant is well seated in the canal. Occasionally, we use the cannula to tap the elbow of the stent and advance it farther into the canal (Figure). ■

Elizabeth A. Dale, MD

- clinical instructor in ophthalmology, Thomas Jefferson University School of Medicine, Philadelphia
- assistant surgeon, Glaucoma Service, Wills Eye Hospital, Philadelphia
- (484) 434-2700; edale@oppdoctors.com
- financial interest: none acknowledged

Marlene R. Moster, MD

- professor of ophthalmology, Thomas Jefferson University School of Medicine, Philadelphia
- attending surgeon on the Glaucoma Service, Wills Eye Hospital, Philadelphia
- (484) 434-2700; marlenemoster@aol.com
- financial interest: none acknowledged