



TECHNICAL TALK

MANAGEMENT OF RECURRENT HYPHEMA AFTER TRABECULAR MESHWORK BYPASS



Although rare, this complication can be challenging for both the patient and the surgeon.

BY MONICA K. ERTEL, MD; CARA E. CAPITENA YOUNG, MD; AND SARAH H. VAN TASSEL, MD

Trabecular meshwork (TM) bypass surgery is a type of MIGS that lowers IOP by reducing outflow resistance through the TM. This effect can be achieved via stenting or with incisions into or excision of the TM. Because of the procedure's favorable risk profile, its utility for the treatment of several stages of glaucoma, and its ability to be combined with phacoemulsification, TM bypass has become the most commonly performed form of glaucoma surgery.¹ Its use has been reported to be higher among nonspecialists than glaucoma subspecialists.²

This article describes the management of recurrent hyphema—a rare but challenging postoperative complication of TM bypass surgery—and shares insights from two angle surgery experts: Sarah H. Van Tassel, MD, director of the Glaucoma Service and Glaucoma Fellowship at Weill Cornell Medicine, and Cara E. Capitena Young, MD, an assistant professor of ophthalmology at the Sue Anschutz-Rodgers Eye Center at the University of Colorado.

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Early-onset hyphema is a frequently reported side effect of angle-based surgery. This complication can occur intraoperatively or in the early postoperative period, it is usually self-limited, and it rarely requires intervention.^{3,4} A less common side effect is delayed-onset, recurrent hyphema, which can occur months after both implant-based and non-implant-based TM procedures.

Late-presenting hyphemas can result in symptoms of blurry vision and even discomfort from IOP elevation.⁵ In a study of 12 patients with delayed-onset hyphema after Trabectome (MicroSurgical Technology) surgery, Ahuja et al⁵ found that the median time to onset was 5 months after surgery and that 50% of patients reported four or

more episodes. Mean IOP at the time of symptom onset was 25 mm Hg, which was noted to be significantly higher than at the visits both before hyphema onset and after resolution.⁵ Similar cases have been reported with implant-based TM bypass procedures.^{6,7}

PREOPERATIVE CONSIDERATIONS

One of the most effective ways to avoid delayed-onset, recurrent hyphema is careful preoperative planning. Dr. Van Tassel suggests avoiding angle surgery in patients with known elevations in episcleral venous pressure (EVP) because these individuals are likely to develop blood reflux into the anterior chamber. It is important to note that trabecular outflow resistance is not the etiology of elevated IOP in these

patients. Dr. Van Tassel also advises against angle surgery in patients with low preoperative IOPs because of their increased overall risk profile.

Dr. Capitena Young emphasizes the importance of careful preoperative gonioscopy to identify subtle angle findings, such as neovascularization of the iris or angle and specific iris anatomy that might indicate a patient is not a good candidate for an angle-based surgical approach or implant.

THOROUGH HISTORY AND EXAMINATION

When a patient presents with recurrent hyphema after angle surgery, it is important to obtain a thorough history focused on precipitating or inciting factors. In the study by Ahuja et al,⁵ 10 of the 12 patients awoke with

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symptoms, and the majority reported sleeping on the operative side or face-down. Other patients reported symptom onset after strenuous activity, which likely increased EVP.

Dr. Capitena Young recommends paying close attention to IOP, with particular attention to low IOP that causes blood reflux into the anterior or an IOP spike from the hyphema. Dr. Van Tassel emphasizes the importance of gonioscopy to look for “a misplaced canal-based device or contact between the device and the iris, neovascularization of the angle, or a surprise finding such as a mass.” Dr. Capitena Young adds, “Misplaced implants can be subtle, and a thorough gonioscopic examination is warranted for all of these patients.”

The angle should also be assessed in patients who present with elevated IOP because clotted blood can occlude the trabeculotomy. It is important to remember that complaints from these patients may be subtle. They may mention mild occasional blurring of vision that can be attributed to other causes such as dry eye, and, on examination, almost no anterior chamber cell may be appreciated; however, gonioscopic examination may reveal the true cause through identification of a clot or layered blood.

Dr. Capitena Young suggests going one step further in patients in whom a cause is not readily identified. A dilated examination may rule out posterior pathology, and obtaining additional imaging such as ultrasound biomicroscopy, anterior segment OCT, or potentially fluorescein angiography of the iris and/or retina may be helpful. Uveitis-glaucoma-hyphema syndrome is also on the differential for these patients and can be excluded with a careful slit-lamp examination and ultrasound biomicroscopy, if needed.

MANAGEMENT

A number of approaches can be used to manage these difficult cases depending on the suspected or confirmed cause. Dr. Van Tassel says that, if gonioscopy findings and IOP readings are normal, she assumes these episodes are happening when the EVP is higher than the IOP, which occurs most commonly when patients are sleeping. In this situation, she suggests that surgeons consider counseling patients on head-of-bed elevation or recommending the use of a wedge pillow to elevate the neck and head above heart level. Altering sleep position, however, can be extremely difficult for patients, she cautions.

Dr. Capitena Young recommends considering an IOP-based approach. If a patient with multiple episodes of hyphema consistently presents with IOPs lower than 12 mm Hg and has a less strict pressure goal, a quick solution may be to stop a medication to raise the IOP slightly. This can be a win-win for the patient, who has a reduced drop burden and may experience a resolution of symptoms. On the other hand, as noted by Ahuja et al,⁵ these patients may present with an acute elevation in IOP at the time of the hyphema. Depending on the level of IOP elevation and the patient's target IOP, an anterior chamber washout may be indicated.

Both Dr. Van Tassel and Dr. Capitena Young express hesitancy about removing an angle-based device, but they point out that removal may be indicated if all other management approaches are unsuccessful. If a malpositioned device in the angle is in contact with the iris or the ciliary body, surgical removal may be the only option. Farazdaghi et al recently reported a case of recurrent hyphema that was successfully managed by removal of the MIGS device, offering evidence that sometimes device explantation is necessary.⁶

CONCLUSION

Although recurrent hyphema can be frustrating for the patient and surgeon, Dr. Van Tassel notes that “angle surgery continues to be exceedingly safe.” According to Dr. Capitena Young, “Time can be the surgeon's best friend,” because most cases of recurrent hyphema resolve with watchful waiting. It is hoped that these tips make this rare complication easier to manage, should it occur. ■

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