

TORIC IOLS: WHEN AND WHEN NOT TO USE IN GLAUCOMATOUS EYES

Implanting these lenses during combined phacoemulsification and glaucoma surgery is nuanced.



BY GIO CAMPAGNA, MD

Monofocal IOLs are an excellent choice for patients with glaucoma. For those who also have visually significant regular corneal astigmatism, toric monofocal IOLs can provide sharper and clearer distance or near UCVA without splitting light or worsening their contrast sensitivity.¹ Many glaucoma surgeons consider a toric monofocal IOL to be an appropriate option for patients with good central visual potential.

The subtype of glaucoma is relevant. Pseudoexfoliation, trauma, and chronic angle closure can result in zonulopathy, which may put the IOL at greater risk of tilt, decentration, rotation, or dislocation. Implanting a toric IOL during combined phacoemulsification and glaucoma surgery requires special consideration. The importance of preoperative counseling cannot be overstated.

PHACOEMULSIFICATION COMBINED WITH TORIC IOL IMPLANTATION AND ANGLE SURGERY

MIGS is commonly performed at the time of cataract surgery and toric IOL

implantation and generally achieves good, predictable refractive outcomes. The refractive outcomes of cataract surgery alone, cataract surgery with goniotomy, and cataract surgery with a trabecular meshwork bypass stent are clinically similar.² Patients and physicians alike can have confidence that the placement of a toric IOL at the time of cataract surgery combined with an angle procedure (eg, stenting, goniotomy, canaloplasty, and procedural pharmaceutical placement) will have a favorable refractive outcome. It is important to counsel patients that, should the need arise for filtration surgery in the future, their refraction may change.

PHACOEMULSIFICATION COMBINED WITH TORIC IOL IMPLANTATION AND FILTRATION SURGERY

Filtration surgery—trabeculectomy, tube shunt placement, Xen Gel Stent (AbbVie) or Preserflo MicroShunt (Santen/Glaukos) implantation—can influence the refractive state of the eye. On the topic of refractive changes after glaucoma surgery, trabeculectomy is the most studied.

This procedure has frequently been linked to a decrease in axial length and an increase in with-the-rule astigmatism.³ Erring on the myopic side of the intended refractive target during combination cases can help avoid a hyperopic surprise secondary to axial length shortening. Although the trabeculectomy flap may be largely responsible for an astigmatic shift, the bleb itself may also contribute variability in the amount of astigmatism for several months postoperatively until the final refraction is determined, especially if there are tight limbal sutures for a limbus-based bleb.

When phacoemulsification is combined with Xen implantation, the amount of surgically induced astigmatism (SIA) may be significantly lower than after phacoemulsification combined with trabeculectomy.⁴ In combination cases, the astigmatic outcome can be harder to predict and may take many months to stabilize, so caution is warranted with toric IOLs. The Light Adjustable Lens (RxSight) may be a better choice in this situation.

An additional consideration is that some filtration surgeries require the

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anterior chamber to be filled partially or completely with an OVD at the conclusion of the case. Residual OVD in the eye can increase the likelihood of early postoperative toric IOL rotation. The anterior chamber can also shallow after filtration surgery, which may result in a change in IOL position, such as an anteriorization of the optic in front of the capsulorhexis, or IOL tilt.

PHACOEMULSIFICATION WITH TORIC IOL IMPLANTATION AFTER FILTRATION SURGERY

Filtration surgery performed in the superior quadrant can have an astigmatic effect. It has been reported that patients can expect a 0.50 D increase in with-the-rule astigmatism 6 months after a trabeculectomy⁵ caused by the bleb or the flap. Shiratori and colleagues investigated 66 glaucomatous eyes of Japanese patients who underwent superotemporal trabeculectomy and reported a shift in oblique astigmatism corresponding to the flap's location.⁶ Their findings suggests that scleral flap suturing plays a pivotal role in inducing corneal steepening in the direction of the flap, whereas the choice of surgical technique—limbus-versus fornix-based—had a minimal effect on the extent of SIA. The effect of tube shunts on astigmatism is less well studied, but it stands to reason that the amount of astigmatism could increase along the axis of the tube shunt if the bleb closure is tight. In general, it takes about 3 months for the patient's refraction to stabilize after filtration surgery.⁷

Xen and Preserflo implantation may have less of an effect on postoperative astigmatism than trabeculectomy and tube shunt surgery. It has been suggested that the block excision of corneal tissue during a trabeculectomy also has an effect on astigmatism because the Ex-Press glaucoma filtration device (Alcon) has been shown to induce less SIA than a trabeculectomy.⁸ Similarly, Ishiyama and colleagues observed a significantly lower astigmatic effect 3 months after Preserflo implantation compared to trabeculectomy in pseudophakic patients.⁹ To achieve the most predictable and desirable refractive outcome, it may therefore be most prudent to delay cataract surgery for months or years after filtration surgery when possible.

REFRACTIVE OUTCOMES WITH SUPRACILIARY PROCEDURES

The supraciliary space is a natural pathway that is suitable for glaucoma surgery. One of the earliest efforts to leverage this space for the surgical management of glaucoma was the CyPass Micro-Stent (Alcon; no longer available). Although the CyPass was recalled owing to concerns about endothelial cell function, myopic shifts were also occasionally observed with the device.¹⁰ The best explanation for this sequela is that suprachoroidal effusions caused anteriorization of the IOL–capsular bag complex.

Currently, the mainstream supraciliary procedure for glaucoma is the AlloFlo (Iantrek), a biointerventional tissue for endoscleral reinforcement and cleft formation. No

concerns about a myopic shift have been documented to date. This may relate to a broader and more diffuse choroidal effusion seen with AlloFlo relative to CyPass, with less impact on the position of the IOL. Further research is required to investigate these conjectures.

CONCLUSION

Toric IOLs can be safely implanted during angle surgery, in combination with filtration surgery, or after any type of glaucoma surgery, and many patients will achieve a good refractive outcome. When toric IOL implantation is combined with filtration surgery, especially trabeculectomy or aqueous shunt placement, the refractive outcome may be unstable for several months postoperatively, so thorough preoperative counseling is required. ■

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GIO CAMPAGNA, MD

- Fredericksburg Eye Associates, Fredericksburg, Texas
- gcampagna@fbgeye.com
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