

ADVANCED TECHNOLOGY IOLS IN GLAUCOMA PATIENTS

How two surgeons from different parts of the world approach lens selection in this population.

BY JOSHUA FRENKEL, MD, MPH, AND NATHAN KERR, MBCHB, MD

MILD GLAUCOMA DOES NOT PRECLUDE PATIENTS FROM RECEIVING A PREMIUM IOL

As with any patient, I try to customize IOL selection for glaucoma patients to their needs. These individuals suffer enough from this progressive, lifelong disease, and not everyone with glaucoma should be limited to a standard monofocal lens. I consider a multifocal IOL such as a Clareon PanOptix (Alcon) or Tecnis Synergy (Johnson & Johnson Vision) for glaucoma suspects and individuals with mild glaucoma and a low likelihood of disease progression. For example, I am more cautious about recommending a multifocal IOL to a young patient with mild glaucoma because they are at greater risk of future vision loss than an older patient with a similar stage of disease. That said, I generally prefer an extended depth of focus (EDOF) lens such as a Tecnis Symphony OptiBlue (Johnson & Johnson Vision) or Clareon Vivity (Alcon) for patients with mild glaucoma who desire an increased range of vision.

A monofocal IOL is my preference for patients with moderate to advanced glaucoma. Someone with reduced contrast sensitivity is more likely to notice a further reduction caused by multifocal optics. In addition to a standard monofocal IOL, I would consider implantation of an enhanced monofocal lens such as the Tecnis Eyhance (Johnson & Johnson Vision). I would also strongly consider a blended vision strategy with a Light Adjustable Lens (RxSight). Both approaches can

extend range of vision but without the risks associated with multifocal optics.

YOU GET A TORIC! AND YOU GET A TORIC!

I have no issue placing a monofocal toric IOL in any eye that qualifies as having glaucoma. A toric lens will only help their UCVA and should not result in any reduction of contrast sensitivity.

In the United States, the lowest cylinder correction available for toric lenses is a T3 (1.25 D for an enVista IOL [Bausch + Lomb] and 1.50 D for other major manufacturers). Many patients therefore do not qualify for a toric IOL. Thus, for lower levels of astigmatism (roughly <1.00 D), I recommend femtosecond laser arcuate incisions.

OCULAR SURFACE DISEASE

Most patients have ocular surface disease (OSD), and glaucoma patients are no exception. They often have advanced OSD due to their use of glaucoma drops, which can be harsh on the cornea. I therefore am aggressive at preparing the ocular surface for cataract surgery. I often do a pulse of a low-strength steroid such as lotoprednol or fluorometholone because it carries a low risk of steroid response IOP rise. I also am aggressive about placing punctal plugs and starting prescription dry eye medications. I like my patients to do a meibomian gland-expressing procedure such as iLux (Alcon) before biometry because it helps ensure consistent measurements.



For astigmatism management, I refer to keratometry readings from two different biometry machines. If they deviate significantly, I bring the patient in for a repeat measurement. My preferred IOL formula is the Barrett Universal II, although there are many excellent newer formulas such as Kane and a slew of new AI formulas.

MIGS AND CATARACT SURGERY

I would consider a combined MIGS/cataract surgery procedure in almost any patient who has glaucoma with an angle that can be treated and a cataract that's significant. Aside from lowering IOP, the combination of these procedures has an added potential benefit of improving the ocular surface by reducing topical medication burden, which most patients are grateful for.

When counseling patients who are expecting a premium result, I educate them that, because they are getting two surgeries instead of one, they can expect a slightly slower recovery. Often, recovery is not delayed, but it is helpful for patients to expect it in the event they experience more inflammation postoperatively.

THREE CONSIDERATIONS ARE WARRANTED IN THESE PATIENTS

Advanced technology IOLs, including multifocal, EDOF, and toric lenses, have transformed cataract surgery because they offer patients the possibilities of spectacle independence and a better quality of vision. The technologies' use in patients with glaucoma, however, traditionally has been limited owing to concerns about worsening their preexisting contrast sensitivity impairment.

In my opinion, advanced technology IOLs may be appropriate and beneficial for select individuals with glaucoma. There are three key considerations to patient selection:

- The type and stage of disease;
- The presence of ocular comorbidities; and
- The individual's lifestyle and expectations.

MY APPROACH TO IOL SELECTION

Multifocal IOLs. For patients with ocular hypertension, primary angle closure without glaucomatous optic neuropathy, and stable preperimetric glaucoma who desire spectacle independence, I am inclined to recommend a multifocal IOL. This type of lens can offer the spectacle independence they desire, especially in good lighting conditions.

EDOF lenses. For patients with early-stage glaucoma, I often opt for an EDOF lens. This type of lens can provide a continuous range of high-quality vision from distance to intermediate without the glare and halos that can be experienced with a multifocal IOL. EDOF IOLs also have less impact on contrast sensitivity. These lenses can be particularly beneficial for patients who use digital devices frequently.

My colleagues and I studied the use of the AcrySof IQ Vivity IOL (Alcon) in patients with early glaucoma.¹ Our study examined 58 eyes of 29 patients with early glaucoma undergoing cataract surgery who received bilateral implantation of either an AcrySof IQ

Vivity or monofocal IOL. Better uncorrected intermediate visual acuity was achieved by those who received the Vivity IOL compared to a standard monofocal IOL with no difference in uncorrected distance visual acuity. The Vivity group also reported greater spectacle independence and higher overall satisfaction with their postoperative vision.¹ Our results suggest that EDOF lenses may improve the quality of life of patients with early glaucoma.

Monofocal IOLs. I tend to recommend monofocal lenses to patients with moderate to advanced glaucoma. Monofocals do not offer the same level of spectacle independence as a multifocal or EDOF design, but they provide a more predictable and stable visual outcome, which is paramount for individuals with impaired contrast sensitivity and advanced visual field loss.

Toric IOLs. Nearly all my glaucoma patients who have regular corneal astigmatism receive a toric lens. The goal is to enhance their UCVA by minimizing residual astigmatism.

Under certain circumstances, a toric IOL is less desirable in the presence of glaucoma. An eye with marked zonular weakness, for example, such as in pseudoexfoliation syndrome, may be unable to provide the stability required for success with a toric IOL. Additionally, the amount of astigmatism induced by a combined procedure such as phacoemulsification and trabeculectomy can be unpredictable. In these situations, I typically select a nontoric IOL to deliver the most stable and predictable postoperative visual outcomes possible.

OCULAR SURFACE DISEASE

The preoperative management of OSD, including dry eye, is an integral part of my approach to glaucoma patients undergoing



cataract surgery. A healthy ocular surface increases the accuracy of biometry measurements, which is crucial for IOL power calculations and astigmatism management. Addressing OSD can also improve patients' postoperative visual acuity and comfort.

The long-term use of topical glaucoma drops can exacerbate dry eye symptoms and OSD. For this reason, I often combine MIGS with cataract surgery. Reducing patients' reliance on topical glaucoma medications can improve the overall health of the ocular surface, promote better surgical outcomes, and enhance patients' postoperative satisfaction and quality of life. ■

1. Kerr NM, Moshegov S, Lim S, Simos M. Visual outcomes, spectacle independence, and patient-reported satisfaction of the Vivity extended range of vision intraocular lens in patients with early glaucoma: an observational comparative study. *Clin Ophthalmol*. 2023;17:1515-1523.

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