

Microinvasive Glaucoma Surgery and Premium IOLs

Refractive errors and glaucoma can be approached as comorbidities that can be treated together.

BY JOEL M. SOLANO, MD, AND JOHN P. BERDAHL, MD

Historically, glaucoma surgery has been highly invasive and frequently associated with postoperative complications.¹ The idea of making a complex situation worse by introducing refractive goals was de trop. The predictability of microinvasive glaucoma surgery (MIGS), however, has allowed the alignment of IOP goals with physicians' expectations and patients' desired refractive goals. The iStent Trabecular Micro-Bypass Stent (Glaukos) has a high safety profile and poses minimal risks when combined with cataract surgery.² The device is refractively neutral and allows glaucoma specialists to surgically address IOP without introducing optical aberrations.

DETERMINING PATIENTS' EXPECTATIONS AND GOALS

Paramount to establishing a surgical plan that combines MIGS and refractive cataract surgery is determining the patient's objectives. After identifying a patient with glaucoma and cataracts who requires surgical intervention, the next step is to determine if he or she desires to be less dependent on spectacles. At this point, options for combining cataract surgery with IOP-lowering surgery can be presented. Patients undergoing combined phacoemulsification-MIGS have three refractive options: (1) continue to use spectacles postoperatively, (2) opt for spectacle independence for distance vision, (3) or aim for spectacle independence at distance and near.

Continue With Spectacles

For the patients who do not mind wearing glasses after surgery, the surgeon can offer a standard monofocal lens with a targeted refractive error that matches the patient's refractive desires. Typically, this goal is a

"The ideal preoperative evaluation includes assessing keratometry, topography, refraction, and biometry."

spherical equivalent of plano, but on occasion, patients will desire postoperative myopia for reading. These individuals should be counseled not to expect spectacle independence. The key here is that the surgeon can allow any cylindrical error of the prescription to be addressed with glasses. Biometry is required to determine the IOL power best suited to meet these patients' refractive goals.

Spectacle Independence at Distance

A combination of methods allows patients with or without glaucoma to be free of spectacles for distance vision. Achieving emmetropia for spectacle-free distance vision requires accurate targeting of both spherical and cylindrical components of the refractive error. The ideal preoperative evaluation includes assessing keratometry, topography, refraction, and biometry. These tests help to closely predict postoperative residual cylinder. To target the postoperative refractive error even better, ophthalmologists can perform intraoperative wavefront aberrometry with ORA (Alcon) to confirm IOL calculations and residual astigmatism. ORA can be valuable when targeting cylinder and can guide on-axis surgery, manual or femtosecond laser-assisted astigmatic keratotomy, toric IOL implantation, or a combination of these options,

depending on the amount of preoperative astigmatism. Carefully addressing astigmatism can help patients achieve their goals.

Spectacle Independence at Distance and Near

For patients with glaucoma, the options for spectacle independence at both distance and near include monovision, accommodating IOLs, and multifocal IOLs. Visual field evaluations assist IOL selection in these patients. The presence of visual field defects is a contraindication for multifocal IOLs, because both these lenses and glaucoma reduce contrast sensitivity.^{3,4} The benefit of spectacle independence does not outweigh the reduced image quality and visual field changes. For patients with visual field defects, the physician can consider monovision and accommodating IOLs for improved spectacle independence. With monovision, however, it is important to understand the results of the visual field test and ensure that the defects are mild and do not interfere with tracking.

The Crystalens (Bausch + Lomb) is not thought to reduce contrast sensitivity,⁵ which is a reasonable option for patients with glaucoma who desire some near vision from a lens that corrects for distance. A thorough preoperative examination is important. The Crystalens may be a poor choice for patients with pseudoexfoliation due to the risk of an unstable zonular bag complex and capsular contraction.

Monovision for glaucoma patients is similar to monovision in the unaffected population. The ideal candidate either has tried the method through contact lenses or happens to have natural monovision and enjoys it. For patients who have not experienced monovision but are interested in this option, the clinician should require a contact lens trial. Typically, the dominant eye is reserved for distance correction and the nondominant eye for near. A thorough discussion with the patient regarding the risks of disease progression and subsequent difficulty with monovision is important.

ACCESS TO AN EXCIMER LASER

Glaucoma specialists often do not have an excimer laser at their disposal, which makes offering options for spectacle independence difficult but not impossible. Just as the comprehensive ophthalmologist who offers premium IOL services may team with a local refractive surgeon, the glaucoma specialist can also try for such a relationship. Premium lenses can be offered without excimer laser support, but there will frequently be patients who would benefit from an enhancement to enjoy their full visual potential. Patients should be educated on the relationship between thin corneas and IOP so that future eye care providers adjust their IOP measurements appropriately.

“It is important for glaucoma specialists to remember that, when treating the disease, there is also an opportunity to address refractive errors.”

CONCLUSION

The growing population of people leaving the workforce often has multiple coexisting diseases. It is important for glaucoma specialists to remember that, when treating the disease, there is also an opportunity to address refractive errors. Many surgeons hesitate to offer options for spectacle independence in the setting of glaucoma with vision loss, but the decision belongs to the patient, not the treating physician. Given the opportunity, many patients will choose an option that offers some visual advantage over a standard monofocal lens. It lies with the physician to ensure that patients choose from options that will improve their quality of vision and quality of life. ■

Section Editor Richard A. Lewis, MD, is in private practice in Sacramento, California. Dr. Lewis may be reached at (916) 649-1515: rlewiseyemd@icloud.com.

Joel M. Solano, MD, is an anterior segment fellow at Vance Thompson Vision in Sioux Falls, South Dakota. He acknowledged no financial interest in the products or companies mentioned herein. Dr. Solano may be reached at joelmsolano@gmail.com.



John P. Berdahl, MD, is a clinician and researcher with Vance Thompson Vision in Sioux Falls, South Dakota. Consultant/Advisor for Alcon, Bausch + Lomb, and Glaukos. He has received honoraria from Alcon and Glaukos. Dr. Berdahl may be reached at johnberdahl@gmail.com.



1. Gedde SJ, Herndon LW, Brandt JD, et al; on behalf of the Tube Versus Trabeculectomy Study Group. Postoperative complications in the Tube Versus Trabeculectomy (TVT) study during five years of follow-up. *Am J Ophthalmol*. 2012;153:804-814.
2. Samuelson TW, Katz LJ, Wells JM, et al; for the US iStent Study Group. Randomized evaluation of the trabecular micro-bypass stent with phacoemulsification in patients with glaucoma and cataract. *Ophthalmology*. 2011;118:459-467.
3. McKendrick AM, Sampson GP, Walland MJ, Badcock DR. Contrast sensitivity changes due to glaucoma and normal aging: low-spatial-frequency losses in both magnocellular and parvocellular pathways. *Invest Ophthalmol Vis Sci*. 2007;48(5):2115-2122.
4. Souza CE, Muccioli C, Soriano ES, et al. Visual performance of AcrySof apodized diffractive IOL: a prospective comparative trial. *Am J Ophthalmol*. 2006;141:827-832.
5. Pepose JS, Qazi MA, Chu R, Stahl J. A prospective randomized clinical evaluation of 3 presbyopia-correcting intraocular lenses after cataract extraction. *Am J Ophthalmol*. 2014;158(3):436-446.