

Glaucoma and Toric IOLs: No Pressure

Determining whom these lenses can benefit.

BY ROBERT J. CIONNI, MD

The patient sitting before you hopes for increased freedom from spectacles after cataract surgery but has glaucoma and 1.00 D or more of astigmatism. Should you recommend a toric IOL? Will glaucoma limit the patient's chance for a successful visual outcome? If the disease progresses, will the toric IOL provide a lower level of visual function than a conventional IOL would? Will the patient then regret spending the extra money for a toric lens?

The decision whether or not to implant a toric IOL in a glaucomatous eye depends on two separate issues. First, will a conventional or a toric lens provide the best quality of vision to this individual irrespective of spectacle freedom? Second, will the level of vision attained be sufficient for the patient to appreciate the additional cost of a toric IOL?

QUALITY OF VISION

Patients with significant glaucoma are more likely to have diminished vision in low-contrast settings.¹ Such

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individuals may not see well with a multifocal IOL, which splits light into two focal points and thus may result in worse vision in low-contrast settings than a conventional IOL. Unlike multifocal lenses, toric IOLs do not split light and therefore do not decrease contrast sensitivity. Actually, aspheric toric IOLs should provide better visual quality, irrespective of spectacle wear, than IOLs that are neither aspheric nor toric. Spherical IOLs add positive spherical aberration to a visual system that already has positive spherical aberration, thereby worsening contrast sensitivity and potentially decreasing the quality of vision.

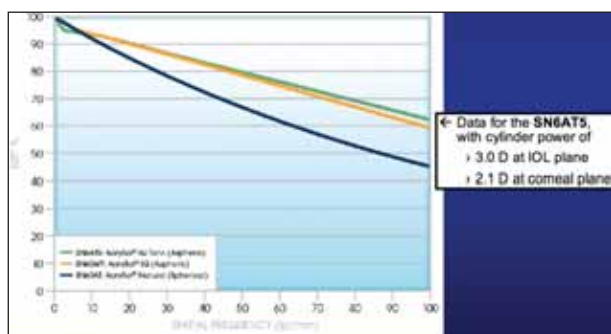


Figure 1. The MTF of the AcrySof IQ (SN60WF), the AcrySof IQ Toric (SN6AT5), and the conventional AcrySof (SN60AT) IOLs in a model eye representing a 3-mm pupil (all lenses manufactured by Alcon Laboratories, Inc.).

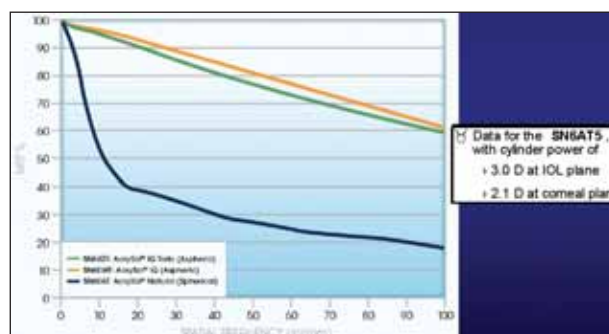


Figure 2. The MTF of the AcrySof IQ (SN60WF), the AcrySof IQ Toric (SN6AT5), and the conventional AcrySof (SN60AT) IOLs in a model eye representing a 5-mm pupil.

LENS RECEIVES NTIOL STATUS

Alcon Laboratories, Inc. (Fort Worth, TX), announced on August 18, 2009, that the Centers for Medicare & Medicaid Services have designated the AcrySof IQ Toric IOL a New Technology Intraocular Lens (NTIOL). Effective July 31, 2009, Medicare will pay \$50 more than its customary reimbursement per lens to ambulatory surgical centers that implant an AcrySof Toric IOL during cataract surgery.

The AcrySof IQ Toric IOL (models SN6AT3, SN6AT4, and SN6AT5; Alcon Laboratories, Inc; Fort Worth, TX) incorporates aspheric optics that decrease positive spherical aberration and thereby improve the modulation transfer function (MTF). A better MTF typically means better contrast sensitivity. Simply put, the MTF represents how similar an image is to the original object as it is viewed through a lens. Figures 1 and 2 demonstrate how the AcrySof Toric IQ IOL compares to a conventional aspheric IOL and a conventional spherical IOL. These MTF data show that the AcrySof IQ Toric IOL maintains the same high-quality image that the conventional aspheric IOL provides and therefore should give patients with compromised retinal function the same high potential for good vision as an aspheric “nontoric” IOL. Both aspheric-style IOLs have better MTF values than the spherical lens. Notice that the importance of aspheric optics increases as the pupil’s size becomes larger.

Based on the aforementioned data, an aspheric toric IOL should provide the same high quality of vision in a patient with glaucoma as an aspheric IOL without toricity would. Will glaucoma patients be glad, however, that they spent additional money to decrease their dependence on spectacles? The answer hinges on the severity of their glaucomatous damage as well as whether and how much it worsens in the near future. If the glaucomatous damage is sufficiently severe to limit their ability to appreciate a reduction in astigmatism (or is likely to become so in a few years), then it is difficult to justify the additional cost of a toric IOL’s implantation.

CASE EXAMPLES

No. 1

A 60-year-old male has a history of chronic bilateral open-angle glaucoma that is well controlled with just one medication used daily. Visual field testing shows a minimal arcuate scotoma in each eye. This patient has 1.50 D of keratometric astigmatism at 40° in his right eye and 1.75 D of keratometric astigmatism at 130° in his left eye. He expresses a desire for the best uncorrected distance vision possible. What do you recommend?

This patient should do extremely well with an aspheric

toric IOL. He has a high likelihood of spectacle freedom at distance after bilateral implantation. It is therefore reasonable to recommend aspheric toric IOLs to him.

No. 2

A 70-year-old male presents with a 12-year history of chronic bilateral open-angle glaucoma. Despite his use of three medications to control his glaucoma, his IOPs tend to be high, and visual field testing reveals slowly worsening defects that are encroaching upon the central visual axis. You have discussed with the patient the importance of his using his prescribed medications and his likely need for filtering surgery. He has 2+ to 3+ cortical cataracts that could explain a visual acuity of 20/40, but his BCVA is 20/100. He also has 2.00 D of corneal astigmatism in both eyes.

Compared with the patient in the first case, this individual is much less likely to appreciate the benefits of a toric IOL, because his visual potential is poor. Additionally, future filtering surgery could alter his corneal astigmatism, and the spherical refractive result may be less certain as well. This patient will likely be disappointed if he spends additional money for a premium lens of any kind. A conventional aspheric IOL is therefore a better choice.

These case examples represent opposite ends of the spectrum. In between are myriad less extreme cases in which the patient will need your help to make a well-informed choice as to which lens will likely provide the greatest level of satisfaction. You therefore must have a clear understanding of patients’ visual potential before making a recommendation, which should be based on the IOL’s expected value to them.

CONCLUSION

Today, you can offer patients with corneal astigmatism and good visual potential the possibility of decreased spectacle wear for distant or near tasks. The presence of controlled glaucoma should not affect your decision to make this offer. Patients with significant and/or poorly controlled glaucoma, however, may not fully appreciate the visual result of any style of IOL. Although a toric IOL should not diminish their quality of vision compared with a conventional IOL, offering the former lens to these individuals may not be the wisest decision. □

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1. Stamper R. The effect of glaucoma on central visual function. *Trans Am Ophthalmol Soc.* 1984;82:792-826.