JUST TRY IT: THIS IOL IS TICKING ALL THE BOXES

The RayOne Aspheric fully preloaded monofocal IOL is ideal for a high-volume surgeon.

BY THOMAS M. REYNOLDS, MD, FACS

As a general ophthalmologist with a robust cataract surgery schedule, I know the challenges of meeting patients' increasing expectations while striving for peak efficiency to counter decreasing reimbursements. To that end, every machine, instrument, and device I use for cataract surgery must deliver consistently good results.

During my 32 years in practice, I've used at least 10 different intraocular lenses, always searching for advancements that would translate to better outcomes with greater efficiency. I was originally drawn to Rayner IOLs 6 years ago because of the lens material and, in particular, the haptic construction, which was devised by the late David J. Apple, MD, a renowned ophthalmic pathologist who devoted much of his career to IOL design and posterior capsule opacification prevention.

About 1 year ago, I was introduced to the latest iteration of the Rayner C-flex lens, the RayOne Aspheric IOL, which I now use for all my monofocal cases. Here are some of the reasons why it is my go-to lens.

Comparison of Preloaded IOLs

Company	Rayner	Alcon	Johnson & Johnson
Lens platform	600C	Acrysof IQ	Tecnis1
Injector	RayOne	UltraSert	iTec
Nd:YAG rate	1.7%[1]	7.47%[7]	3.75%[7]
Miyata grade (glistenings)	0[3] (None)	3[8] (High)	0[12] (None)
Abbe value	56[2]	37[9]	55[9]
Refractive index	1.46[3]	1.55[10]	1.47[12]
Mean decentration	0.08 mm[4]	0.78 mm[11]	0.27 mm[13]
Nozzle diameter	1.65 mm[5]	2.08 mm[5]	1.86 mm[5]
Injector preparation steps	2[6]	3[10]	4[12]

1. Mathew RG, Coombes AGA. *Ophthalmic Surg Lasers Imaging*. 2010;41(6):651-655.
2. Rayner. Data on File. White paper.
3. Ferreira T, et al. *J Refract Surg*. 2019;35(7):418-425.
4. Bhogal-Bhamra GK, Sheppard AL, Kolli S, et al. Rotational stability and centration of a new toric lens design platform using objective image analysis over 6 months *J Refract Surg*. 2019;35(1):48-53.
5. Nanavaty MA, Spalton DJ, Boyce J, et al. Wavefront aberrations, depth of focus, and contrast sensitivity with aspheric and spherical intraocular lenses: fellow-eye study. *J Cataract Refract Surg*. 2009;35:663-671.
6. *www.rayner.com*
7. Cullin F, Busch T, Lundstrom M. Economic considerations related to choice of intraocular lens (IOL) and posterior capsule opacification frequency - a comparison of three different IOLs. *Acta Ophthalmol*. 2014;92(2):179-183.
8. Werner L. Glistenings and surface light scattering in intraocular lenses. *J Cataract Refract Surg*. 2010;36(8):1398-1420.
9. Zhao H, Mainster MA. The effect of chromatic dispersion on pseudophakic optical performance. *Br J Ophthalmol*. 2007;91(9):1225-1229.
10. *www.myalcon.com*
11. Humbert G, Colin J, Touboul D. [AcrySof® Toric (SN60T) Intraocular Lens Implantation: Refractive Predictibility and Aberrometric Impact of Decentration]. *J Fr Ophthalmol*. 2013;36(4):352-361.
12. *jnjvisionpro.com*
13. Baumeister M, Buhren J, Kohnen T. Tilt and decentration of spherical and aspheric intraocular lenses: effect on higher-order aberrations. J Cataract Refract Surg. 2009;35(6):1006-1012.

Figure 1. With the smallest nozzle available, the RayOne IOL delivery system can deliver the lens through a sub 2.2-mm corneal incision.

Figure 2. The RayOne Aspheric lens is designed to maintain its position within the capsular bag.

LENS AND INJECTOR MADE FOR EACH OTHER

What's interesting about the Rayner system is that the RayOne lens and the injector were designed specifically to work together. The patented Lock & Roll mechanism rolls the lens to less than half its size for smooth entry into the eye. The cartridge is fully enclosed, which reduces the risk of lens contamination and damage. The 1.65-mm nozzle, the smallest available (Figure 1), delivers the lens through a sub 2.2-mm corneal incision with minimal force via a one-handed plunger. The single-use injector is ergonomically designed for ease of handling.

The entire maneuver is intuitive, and the system is easier to use than any other IOL delivery system I've used before. I just insert OVD into the cartridge via the port, lock the cartridge, and I'm ready to implant the lens. The lens travels down the nozzle smoothly and unfolds naturally, allowing it to be easily rotated clockwise, if necessary.

NOTEWORTHY LENS CHARACTERISTICS

The RayOne Aspheric IOL has a 6-mm optic and is available in a broad range of powers (+8.0 D to +34.0 D). I've found that it's stable in the eye, centers well, and stays centered. It's so flexible that I can keep the haptics at 3 o'clock and 9 o'clock without needing to rotate the lens. The anti-vaulting haptic technology provides excellent fixation in the capsular bag (Figure 2).[1]

I also appreciate that I don't have to place the I/A tip under the implant after it's in position. I just turn the I/A port toward the implant, turn on aspiration, and remove any OVD residue. The maneuver is fast and easy.

The RayOne lens has a large 6-mm optic, so I can make a somewhat larger capsulorhexis on a thicker cataract, which is an advantage in terms of safety.

> **"The RayOne Aspheric IOL is a precise lens in terms of refractive postoperative results. I've never had to exchange a lens, place a piggyback lens, or recommend PRK or LASIK for any patients who have received this lens."**

THOUGHTFUL DESIGN AVOIDS COMPLICATIONS

Every aspect of the RayOne Aspheric IOL is designed to minimize complications and ensure positive outcomes. The lens is made from hydrophilic acrylic material and has an aspheric anterior surface that creates no spherical aberration.

Studies have demonstrated that, compared with spherical IOLs, aberration-neutral technology offers improved contrast sensitivity and provides better low-light visual acuity.[2-4] In addition, aberration-neutral IOLs are less susceptible to the effects of decentration than aberration-negative IOLs, and they can offer more depth of field by retaining the patient's natural level of corneal spherical aberration.[5,6] Researchers have also found three times fewer reports of visual disturbances with an aberration-neutral IOL than an aberration-negative IOL.[5]

A 2015 study found the Rayner lens design reduces dysphotopsias,[7] and, in my experience, with the haptics at 3 o'clock and 9 o'clock, I rarely see a postoperative dysphotopsia that doesn't resolve within a week or 2.

Rayner's 360° Amon-Apple Enhanced Square Edge creates an optimum barrier to reduce epithelial cell migration, including at the haptic-optic junction, and studies have demonstrated extremely low Nd:YAG capsulotomy rates.[8,9]

Although an infrequent occurrence with the RayOne Aspheric lens, in my experience, the capsule may have striae in the direction of the haptics. The striae usually resolve as the capsule shrink-wraps around the implant, but if they do not, they are easily addressed with the Nd:YAG laser a month or two later. I see only a couple of these cases a year, and I suspect the patient's anatomy may be a contributing factor. Keeping the haptics at 3 o'clock and 9 o'clock helps to limit this phenomenon in my experience.

In all of the years I've used Rayner IOLs, I'm still surprised at the low rate of retinal tears and retinal detachments that have occurred compared to other lenses I've used—anecdotally, about 1 in 2,000 cases. I believe the design of the RayOne Aspheric haptics and the stability of the lens help reduce the risk of these complications.

Rayner reports the microvacuole-free material used in the RayOne Aspheric lens ensures a glistenings-free IOL,[10] and I can confirm I've never seen a glistening with a RayOne Aspheric lens—not even a hint of it, ever.

HIGH SUCCESS RATE

The RayOne Aspheric IOL is a precise lens in terms of refractive postoperative results. I've never had to exchange a lens, place a piggyback lens, or recommend PRK or LASIK for any patients who have received this lens.

Perhaps most indicative of the successes I've seen with the RayOne Aspheric monofocal IOL is that more than 95% of the patients in whom I've implanted this lens—with limbal relaxing incisions to correct residual astigmatism when necessary—have reached their goal of not needing eyeglasses except for reading. These are very happy patients.

TEST THE WATERS

The RayOne Aspheric IOL has numerous features that make it worth recommending: ease of use, predictability, excellent outcomes, low risk for postoperative complications, and so on. As a surgeon, however, I know it's best to experience a new instrument or device, particularly an IOL, so my recommendation is, don't take my word for it. Try it! ■

1. Claoué CMP. IOLs and the aging eye. *Clin Surg Ophthalmol*. 2008;26(6):198–200.
2. Nanavaty MA, Spalton DJ, Boyce J, et al. Wavefront aberrations, depth of focus, and contrast sensitivity with aspheric and spherical intraocular lenses: fellow-eye study. *J Cataract Refract Surg*. 2009;35:663–671.
3. Yagci R, Uzun F, Acer S, et al. Comparison of visual quality between aspheric and spherical IOLs. *Eur J Ophthalmol*. 2014;24(5):688–692.
4. Pepose JS, Qazi MA, Edwards KH, et al. Comparison of contrast sensitivity, depth of field and ocular wavefront aberrations in eyes with an IOL with zero versus positive spherical aberration. *Graefes Arch Clin Exp Ophthalmol*. 2009;247(7):965–973.
5. Johansson B, Sundelin S, Wikberg-Matsson A, et al. Visual and optical performance of the Akreos Adapt Advanced Optics and Tecnis Z9000 intraocular lenses: Swedish multicenter study. *J Cataract Refract Surg*. 2007;33(9):1565–1572.
6. Altmann GE, Nichamin LD, Lane SS, et al. Optical performance of 3 intraocular lens designs in the presence of decentration. *J Cataract Refract Surg*. 2005;31(3):574–585.
7. Vyas A. Incidence of dysphotopsia in patients implanted with the C-flex intraocular lens with 360° enhanced edge: a questionnaire-based study. *J Clin Exp Ophthalmol*. 2015;6(1):107.
8. Vyas AV, Narendran R, Bacon PJ, et al. Three-hundred-sixty degree barrier effect of a square-edged and an enhanced-edge intraocular lens on centripetal lens epithelial cell migration two-year results. *J Cataract Refract Surg*. 2007;33(1):81–87.
9. Mathew RG, Coombes AGA. Reduction of Nd:YAG capsulotomy rates after implantation of a single-piece acrylic hydrophilic intraocular lens with 360° squared optic edge: 24-month results. *Ophthalmic Surg Lasers Imaging*. 2010;41(6):651–655.
10. Rayner. Data on File. White paper.

THOMAS M. REYNOLDS, MD, FACS
- Novamed Surgery Center, Chattanooga, Tennessee
- cabbott@chattvision.com
- Financial disclosure: None