

New-Generation Multifocal IOLs Worth Another Look

Surgeons who were disappointed with earlier bifocal and multifocal IOLs will find predictable outcomes and high patient satisfaction with recent options.

BY DETLEV R.H. BREYER, MD

Until fairly recently, my focus in phacorefractive surgery was on toric IOLs and monovision. I had tried several multifocal IOLs over the years in the hopes of providing my patients with a better range of vision; however, I was dissatisfied with the outcomes after the first 10 to 20 cases, and I quit using these lenses.

Approximately 3 years ago, I attended a symposium on new-technology IOLs. Shortly after that, I began implanting the foldable acrylic Acri.LISA multifocal IOL (Carl Zeiss Meditec AG, Jena, Germany). I prefer the model designed for microincision surgery (366D), but one- and three-piece versions are also available for traditional microincision cataract surgery (MICS). The Acri.LISA provides patients with a predictability of vision that I did not experience with other multifocal IOLs. It has become my lens of choice for most patients who desire a multifocal IOL.

SHIFTING INTEREST

A 2003 survey of US surgeons found low interest in toric and multifocal IOLs.¹ In 1989, 15% of respondents said they had no interest in multifocal IOLs. By 2002, the number increased to 36% of respondents.

Several factors may contribute to the low interest in first-generation multifocal IOLs. They were dependent on pupil size and vulnerable to decentration. Additionally, light scatter occurred between the near and distance foci, and patients did not always gain spectacle independence. Disturbing visual phenomena were also reported.

The successes and failures of earlier multifocal IOLs have led to new technologies and designs, including the concept of refractive-diffractive optics used in the Acri.LISA family of multifocal IOLs.

The refractive-diffractive hybrid design features asymmetric light distribution—65% for distance and 35% for

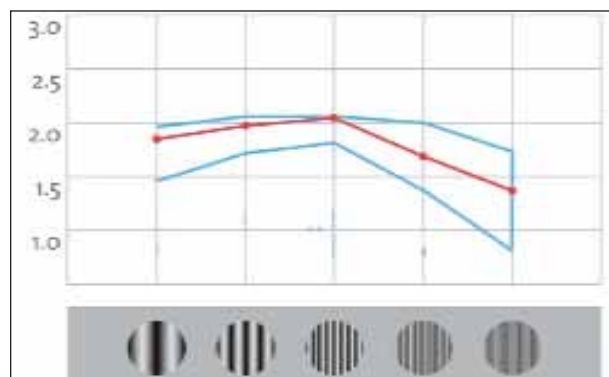


Figure courtesy of Ulrich Meister

Figure 1. Distance-corrected binocular contrast sensitivity. The Acri.LISA multifocal IOL (red) is within the normal range for monofocal IOLs (blue).

near in both eyes, which is helpful to decrease halos and glare, improve intermediate vision, and provide good distance and near vision under different lighting conditions. The Acri.LISA is in the normal range of contrast sensitivity for monofocal IOLs (Figure 1).

Compared with its predecessor the Acri.Twin, the Acri.LISA has a smoother transition between refractive zones, producing less light scatter (Figure 2).² The refractive-diffractive design covers the complete 6-mm optical zone and is therefore independent of pupil size. The Acri.LISA also compensates for spherical aberration.

I target a refraction of 0.25 D for the dominant eye and -0.15 to -0.50 D for the nondominant eye, with a maximum difference between eyes of approximately 0.50 D. This small amount of monovision provides better intermediate depth of focus for computer use.

I never mix multifocal IOL types in the same patient because I am concerned about the ramifications of mixing two optical systems. We do not yet have good guidelines

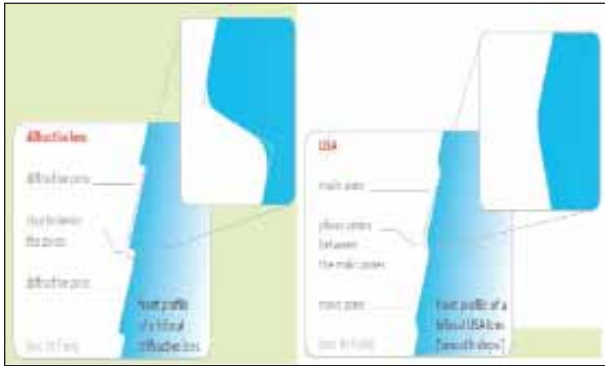


Figure 2. The smooth steps between the zones of the Acri.LISA reduce light scatter.

for how and when it is appropriate to do this.

I prefer coaxial microincision cataract surgery (CO-MICS) because of its excellent predictability of refractive outcome and astigmatic neutrality. Also, the fluidics and phacodynamics are smooth, the operative view is good, and the techniques are familiar to me. There is no stretching of collagen fibers, and less energy is released into the anterior chamber, which remains stable during the procedure. However, it does take more experience to inject the IOL through the ultras small incision. I create a 5.5-mm capsulorhexis that completely covers the optic edge. The Acri.LISA lens is then injected through a 1.6- to 1.8-mm incision.

OUTCOMES AND PATIENT SATISFACTION

Although the multifocal Acri.LISA acts like a bifocal IOL, intermediate visual acuity is better than with the Acri.Twin, especially with the refractive targeting discussed above. My patients can see sufficiently up to approximately 70 cm (ie, computer distance).

Rajesh Aggarwal, BM, MRCP, FRCS, FRCOphth, of the United Kingdom, reported excellent distance and near visual acuity with the Acri.LISA multifocal IOL.³ Ninety percent of patients had 0.63 distance visual acuity, approximately 83% had J2 near acuity, more than 90% of patients did not require reading glasses, and 90% did not require intermediate or distance glasses (Figure 3). Dr. Aggarwal also evaluated the AcrySof Restor (Alcon Laboratories, Inc., Fort Worth,

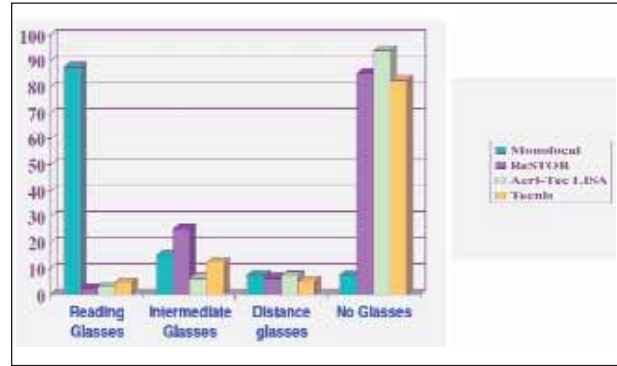


Figure 3. Spectacle dependence with the Acri.LISA multifocal IOL.

Texas) and the Tecnis Multifocal (Advanced Medical Optics, Inc., Santa Ana, California). He concluded the Acri.LISA had a lower incidence of night halos compared with the other IOLs (Figure 4).

In the past 2 years, I have implanted more than 150 Acri.LISA 366D MICS lenses without a single explantation. In my experience, the IOL does not tilt or decenter; however, photic phenomena sometimes occur. I tell patients before surgery not to expect 20/20 acuity on the first postoperative day. When they report photic phenomena or lower-than-expected acuity after 1 week or 1 month, I tell them to wait for another month. These phenomena typically resolve by 3 months.

Most of my Acri.LISA patients are happy: Approximately 5% say they thought they would see a little bit better; however, they do not want the lens explanted. Preoperative counseling is essential. I emphasize that the Acri.LISA is a bifocal, not a progressive lens. I believe the 5% who are not perfectly satisfied forget that advice.

PEARLS

I was very surprised by how well amlyopic patients tolerate and accept this bifocal IOL, even if they do not reach 20/20 visual acuity. One should not be afraid to implant the Acri.LISA toric (466TD) in patients with high ametropia and high astigmatism: These are my happiest patients.

Accurate biometry is key to successful multifocal IOL surgery, as is keratography to rule out conditions such as forme fruste keratoconus. We do not want to implant a multifocal IOL in any eye that does not have full visual potential.

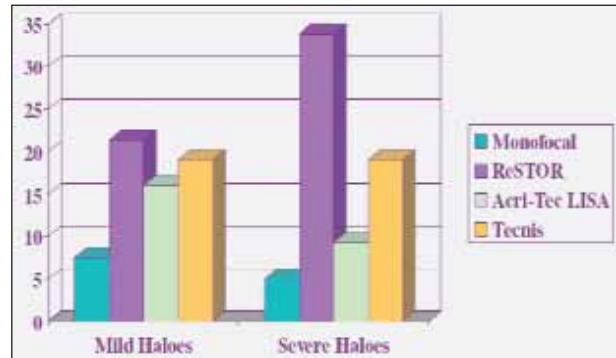
Surgeons who want to implant multifocal IOLs should use precise techniques to prevent induced astigmatism and reduce existing astigmatism. The Acri.LISA toric lens can be used in eyes with corneal astigmatism greater than 0.75 D cylinder. CO-MICS is a perfect match for this lens because it allows implantation through a 1.6-mm incision that does not induce astigmatism. I believe it is important to have access to an excimer laser to fine-tune

(Continued on page 80)

Courtesy of Rajesh Aggarwal

TAKE-HOME MESSAGE

- The Acri.LISA provides predictability of vision and compensates for spherical aberration.
- Intermediate visual acuity is better with the Acri.LISA than the older Acri.Twin.
- The incidence of night halos was lower with the Acri.LISA than with the Restor or Tecnis Multifocal.
- Photic phenomena may take up to 3 months to resolve.



Courtesy of Rajesh Aggarwal

Figure 4. Incidence of mild and severe night halos.

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the postoperative refraction, if needed.

Multifocal IOLs are best suited for patients with hyperopia or greater than 3.00 D of myopia. Low myopes fare the worst with multifocal IOLs, but patients with high astigmatism tend to appreciate multifocal IOLs. In any case, the IOL and refractive target must be carefully selected based on the patient's lifestyle.

I cannot overemphasize the importance of providing good, detailed written information and proper counseling to patients. When patients are paying out-of-pocket for multifocal IOLs, their expectations are understandably high, and it is the surgeon's responsibility to ensure that these expectations are realistic. Patients should be told that neural adaptation may take between 1 and 3 months. They should also know there is a possibility of moderate halos and/or reduction in color brightness and luminosity.

The Acri.LISA and the Acri.LISA toric IOL provides improved intermediate vision and contrast sensitivity, enhanced light distribution, and good simultaneous near and distance vision. Photoc phenomena are less frequent than with other multifocal IOLs, and there is a high rate of spectacle independence. Patient satisfaction is excellent.

The Acri.LISA family of IOLs can be used with MICS technology. I believe the combination of new-technology multifocal IOLs and CO-MICS is crucial for excellent results and predictability in modern phaco refractive surgery. ■

Detlev R.H. Breyer, MD, is head of Breyer Eye Surgery, a private practice in Düsseldorf, Germany. Dr. Breyer did not provide financial disclosure information. He may be reached at tel: +49 211 5867 5726; e-mail: d.breyer@breyer-augenchirurgie.de.



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