

# Trends in the Surgical Management of Presbyopia

What we have learned in practice.

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Presbyopia management presents a challenge and an opportunity. An estimated 128 to 139 million people are presbyopic in the United States alone.<sup>1,2</sup> A wealth of surgical and nonsurgical treatment options are available. Appropriate candidate selection depends on the patient's visual goals and ocular anatomy. This article shares our experience-based strategies.

## PHARMACOLOGIC TREATMENT

We view topical miotic drops such as aceclidine ophthalmic solution 1.44% (Vizz, Lenz Therapeutics), pilocarpine ophthalmic solution 0.4% (Qlosi, Orasis Pharmaceuticals), and pilocarpine HCl ophthalmic solution 1.25% (Vuity, AbbVie) as a low-cost, low-risk strategy for patients who

are frustrated with their presbyopic symptoms and those who are not candidates for surgery.

We have found, moreover, that these pharmacologics can serve as a bridge to surgical intervention for presbyopia by increasing public awareness of the condition. A growing number of patients who present to our practice have tried topical drops and are seeking more permanent correction.

## REFRACTIVE LENS EXCHANGE COUNSELING

A fair percentage of our practice volume consists of myopic laser vision correction (LVC) procedures for patients in their 40s. For the treatment of presbyopia in hyperopic patients older than 40 years of age and myopic patients older than 50 years of age, however, we usually recommend refractive lens exchange (RLE).

Most critical to success with RLE is setting realistic patient expectations before surgery. No IOL is perfect, and we clearly communicate the trade-offs presented by each technology. One

of our favorite sayings is *there is no free light*. In other words, nothing we do can give these patients back their 30-year-old eyes. We explain that our goal is instead to maximize their spectacle independence while minimizing bothersome trade-offs. We also show patients the level of uncorrected near visual acuity (UNVA) they can expect and an appropriate working distance following surgery.

Despite the similarities between RLE and refractive cataract surgery, patients' expectations for the procedures differ significantly. Those undergoing refractive cataract surgery have experienced a decrease in their visual acuity, and likely no focal point is clear. This is not the case for patients undergoing RLE; these individuals typically can achieve functional, clear vision at most distances with spectacles. We therefore devote more time to discussing neural adaptation with our RLE patients than our cataract surgery patients.

Our LVC enhancement and IOL exchange rates are also higher for RLE

versus cataract surgery patients. We counsel the former that fine-tuning is not a complication but a normal part of the process due to changes in the effective lens position as the eye heals. Fortunately, improvements in biometry and IOL technology as well as our use of augmented reality for aligning toric lenses have reduced our enhancement rate.

Counseling patients with emmetropic presbyopia is particularly challenging because these individuals already see well at distance. We discuss at length that the trade-off for spectacle independence is decreased contrast sensitivity, especially at distance. We are also careful to use terms our patients can understand. Typically, we ask them to rate their vision on a scale of one to 100 and make sure they are willing to accept a 10% to 15% reduction in their quality of vision to improve their UNVA. We discuss dysphotopsias frankly and emphasize that neural adaptation to new optics takes time. It is not unusual for us to ask patients to go home and think things over before making a decision.

### **IOL SELECTION**

Choosing the most appropriate IOL for an RLE patient requires understanding their visual needs and their surgical and refractive history.

#### **An Extended Depth of Focus or Monofocal IOL Paired With a Trifocal Lens**

This is the approach to presbyopia correction employed most often in our practice for suitable candidates. An extended depth of focus (EDOF) or monofocal IOL is implanted in the dominant eye. Compared with the trifocal IOL, the EDOF or monofocal lens provides greater contrast sensitivity at distance and typically better nighttime and driving vision. The trifocal IOL provides patients with the UNVA they desire while enhancing their uncorrected distance visual acuity (UDVA) and uncorrected

intermediate visual acuity (UIVA). Because their UDVA is similar in both eyes, patients' brains need not adapt to monovision.

The downside of pairing an EDOF or monofocal lens with a trifocal IOL is that patients' UNVA will not be as good as it would be with bilateral trifocal IOLs.

The reason that combining an EDOF or monofocal IOL and a trifocal lens is our preferred approach is that most of our patients expect to achieve distance vision and pay for near vision. They are more likely to achieve their distance vision goals with this strategy than with bilateral trifocal IOLs. Their UIVA (ability to view a computer screen) also tends to be better with this approach than it would be with a trifocal IOL in each eye.

#### **Trifocal IOLs for a Full Range of Vision in Both Eyes**

The benefit of bilateral trifocal IOL implantation is its simplicity. The same lens is typically implanted in both eyes, and the distance and near vision correction is equal between the eyes. Preoperatively, patients are counseled on possible postoperative dysphotopsias and their potential need for an LVC enhancement or IOL exchange.

The downsides of bilateral trifocal IOL implantation are that some patients' brains may be unable to adapt to multifocal optics and others may be dissatisfied with their UDVA, UIVA, and/or UNVA. Advanced technology IOLs such as the Clareon PanOptix Pro (Alcon), Tecnis Odyssey (Johnson & Johnson Vision), and enVista Envy (Bausch + Lomb) have lessened these concerns.

#### **Blended Vision With Postoperatively Adjustable or Monofocal IOLs**

Not every patient is a candidate for a trifocal lens. Ocular surface disease, vitreous opacities, retinal disease, and glaucoma can be contraindications

for this technology. We also avoid trifocal IOLs in many patients who have a history of refractive surgery because they are at increased risk of a poor quality of vision postoperatively.

Additionally, some patients who are candidates for trifocal IOLs may be better served by blended vision. For example, we favor this approach for individuals who have a successful history with blended vision contact lenses. In this situation, a monofocal IOL is typically implanted in the dominant eye, and an enhanced monofocal lens is placed in the nondominant eye.

IOL selection is more nuanced for patients who have a history of refractive surgery. The goal is to match the IOL to the spherical aberration of the cornea. We tend to choose a Light Adjustable Lens (RxSight) for patients with a history of myopic LVC or radial keratotomy because refractive surprises are common in this population and enhancements can be challenging. For individuals who have a history of hyperopic LVC, we prefer an aberration-free enVista lens (Bausch + Lomb) to optimize their quality of vision.

### **ENHANCEMENT STRATEGIES**

Every patient is scheduled for a fine-tuning examination 3 to 4 months after RLE. During the visit, we discuss their level of satisfaction, a potential LVC enhancement, and, in rare instances, an IOL exchange. Patients who qualify for an enhancement are shown how the procedure would affect their vision and asked whether the effect is noticeable.

For many of our patients who elect to undergo an enhancement, LASIK or limbal relaxing incisions provide a second "wow" effect. Patients who have a history of refractive surgery and did not receive a Light Adjustable Lens generally require a different approach. In this situation, our

preference is either to perform a PRK enhancement or to make a sidecut of a smaller diameter to create a flap within a flap.

In our experience, enhancements for residual myopia are generally straightforward. For hyperopic errors, we sometimes opt for an IOL exchange or piggyback lens implantation.

### **BLENDED VISION ALTERNATIVES**

RLE is not always the best form of surgical presbyopia treatment. Blended vision with LASIK or the EVO ICL (STAAR Surgical) plays an important role in our practice, particularly for myopic patients in their 40s. Many of these individuals present for a consultation after hearing about their friends' success with RLE, so we discuss why the procedure might not be a

suitable choice for them (no posterior vitreous detachment, high axial length, etc). We then explain that blended vision with LASIK or an EVO ICL could meet their refractive goals for the next 10 to 15 years, at which time they are likely to need cataract surgery.

### **CONCLUSION**

The options for presbyopia management continue to grow. Whichever procedure is selected, we explain to patients that their journey may include other surgeries as their eyes age. It is important they understand that excellent long-term results require a partnership that continues after their refractive goal is achieved. ■

1. Chang DH, Waring GO IV, Hom MM, Barnett M. Presbyopia treatments by mechanism of action: a new classification system based on a review of the literature. *Clin Ophthalmol*. 2021;15:3733-3745.

2. American Optometric Association. Unblurring the lines. *ADA Focus*. January 3, 2024. Accessed February 14, 2026. <https://www.aoa.org/news/clinical-eye-care/diseases-and-conditions/unblurring-the-lines>

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