



Multifocal IOLs Are Unsuitable for Patients With a History of Refractive Surgery

Technological advances and thorough diagnostic testing have made successful outcomes possible in this population.



BY LUKE REBENITSCH, MD

A common misconception is that a history of refractive surgery is a contraindication for a multifocal IOL. The term *refractive surgery*, however, covers a range of procedures—LASIK, PRK, radial keratotomy, and automated lamellar keratoplasty—each with distinct implications for multifocal IOL candidacy. Other

factors influencing patient selection include corneal health, IOL design, and the patient's potential need for an enhancement.

With the right approach and modern technology, many patients who have undergone refractive surgery can achieve excellent outcomes with a multifocal IOL.

UNDERSTANDING MULTIFOCAL IOL CANDIDACY

Higher-Order Aberrations and Corneal Health

Increased corneal higher-order aberrations (HOAs) can have a significant influence on outcomes with multifocal IOLs in eyes that have undergone refractive surgery. Patients whose surgery was performed with early laser systems that used a small optical zone and less optimized ablation



MYTH: Multifocal IOLs are unsuitable for patients who have undergone refractive surgery.



REALITY: These patients are a diverse group, and some of them can achieve excellent outcomes with modern multifocal IOLs.

patterns can have significant residual HOAs. Modern wavefront-guided, wavefront-optimized, or topography-guided procedures can leave corneas less aberrated postoperatively than in the past. These patients may benefit from a multifocal IOL. Candidacy must be determined on a case-by-case basis.

THRESHOLDS FOR MULTIFOCAL IOL SUCCESS

My clinic has established guidance based on our data.

- ▶ **Higher-order aberration threshold:** Higher-order aberrations should generally be less than 0.5 at a 6-mm optical zone.
- ▶ **Spherical aberration:** Spherical aberration below 0.6 is the target.
- ▶ **Patient satisfaction:** A 3-year retrospective chart review revealed that exceeding the values listed above was associated with greater patient dissatisfaction.
- ▶ **Outcome:** Adhering to these cutoffs has improved candidate selection and reduced patient dissatisfaction.

IOL Technology

Current multifocal IOLs are far more advanced than those on the market a decade ago. Diffractive multifocal IOLs such as the Clareon PanOptix (Alcon) and Tecnis Odyssey (Johnson & Johnson Vision) and extended depth of focus lenses such as the Tecnis Symfony OptiBlue (Johnson & Johnson Vision) and Clareon Vivity (Alcon) can provide patients with a better quality of vision and greater contrast sensitivity than earlier premium lenses. As with any form of surgery, proper patient counseling is essential.

The recent introduction of the Clearview 3 (Lenstec) gives patients with a history of refractive surgery another option. The relatively simple design of this refractive, aspheric lens avoids some of the problems patients experienced with early multifocal IOLs. In our experience, although some patients who receive the Clearview 3 may experience minor dysphotopias, results have been favorable overall.

KEY DIAGNOSTIC TESTS FOR SUCCESS

Thorough diagnostic testing with high-quality topographers, tomography systems, and OCT devices is essential to success with multifocal IOLs. Unless each eye is assessed from the front to the back, candidate selection is unreliable.

Patients who have a history of refractive surgery are known to have extremely high expectations. Missing the mark because of incomplete diagnostic testing or poor candidate selection leads to patient dissatisfaction.

Biometry

Accurate biometry is the foundation

of successful IOL placement. Even with advanced formulas such as the Kane and Barrett and newer AI-driven algorithms, the old adage “garbage in, garbage out” applies. If the biometric data are flawed, the results will be poor. Modern biometers such as the IOLMaster 700 (Carl Zeiss Meditec) and Argos (Alcon) improve precision through the use of more data points and can reduce the need for postoperative enhancements. These devices can be particularly helpful with post-refractive surgery eyes for which hitting the target is more challenging.

Corneal Tomography

I appreciate the detailed tomographic data provided by the Pentacam (Oculus Optikgeräte). Alternatives include the Galilei (Ziemer Ophthalmic Systems) and OCT systems. At my practice, we also use the OPD-Scan III (Nidek) for comprehensive analyses of the cornea and internal optics. Another option is the iTrace (Tracey Technologies), which is also highly effective for assessing HOAs and determining multifocal IOL candidacy (see *Thresholds for Multifocal IOL Success*).

Macular OCT

OCT imaging of the macula is an essential part of candidate selection for a multifocal IOL. Even experienced ophthalmologists can miss subtle epiretinal membranes without OCT. Additionally, devices such as the Optos (Optos) and Clarus (Carl Zeiss Meditec) can be used to examine the peripheral retina for pathology that might affect visual outcomes.

SHATTERING MYTHS ◀

PATIENT EDUCATION AND COUNSELING FOR SUCCESS

Educating patients with a history of refractive surgery is key to success with multifocal IOLs. Explaining the technological advances that make successful outcomes possible reassures patients and sets appropriate expectations for visual recovery. It is crucial to inform patients that their prior surgery may influence IOL selection but explain that, with modern diagnostic tools and IOL technologies, excellent results can still be achieved.

It is also essential to prepare patients for the possibility of early postoperative visual disturbances, such as halos or glare. Counseling on neural adaptation helps set realistic expectations. Most patients begin to adapt within 2 to 3 months, although in our experience, it can take up to a year in some cases. For those who experience residual refractive errors, discussing the potential for enhancements early on provides reassurance that achieving optimal outcomes is a gradual process.

DEBUNKING THE MULTIFOCAL IOL MYTH

Multifocal IOLs can be a highly effective option for patients who have undergone refractive surgery. Success requires a tailored approach that factors in the specific type of refractive surgery, the current state of the cornea, HOAs, and the potential need for an enhancement. Modern diagnostic tools, advanced IOL technologies, and careful postoperative management are critical to achieving optimal outcomes. ■

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