

Choosing the Right Implant in Presbyopia-Correcting Cataract Surgery

The choice hinges on a comprehensive discussion of the patient's visual goals.

BY ROBERT J. WEINSTOCK, MD

One of the most important and challenging decisions that surgeons face is choosing the right implant technology for each patient when correcting presbyopia and attempting to deliver a spectacle-free refractive solution at the time of cataract surgery. There is no silver bullet, and there is no substitute for the surgeon's sitting down one on one with each patient and coming to the most practical and intelligent decision possible based on the patient's past ocular history, examination, and lifestyle preferences.

SOLUTIONS FOR PRESBYOPIA

Three of the most common ways to address presbyopia at the time of cataract surgery are monovision, multifocal implants, and accommodating IOLs. None of these technologies or modalities is foolproof, and regardless of which option the surgeon and the patient choose, there will always be compromises, either to the patient's visual quality and/or spectacle independence.

It is imperative to perform a thorough examination and conduct a preoperative consultation with the patient to discuss his or her lifestyle and activities so that an educated recommendation can be made. This is the time for the surgeon to say which technology he or she feels would be the best option and then allow the patient time to digest the benefits and the potential shortcomings of the presbyopia-correcting options. Many surgeons use something like the Dell questionnaire, which is intended to elucidate the patient's preferences and help the surgeon recommend the technology best suited to that individual's lifestyle and

activities. It is also very helpful to have surgical counselors meet with the patient before and/or after to follow up with additional information, to continue to set expectations, and to ensure that the patient understands how his or her vision will be after the procedure.

IMPORTANCE OF ASTIGMATIC CORRECTION

The importance of correcting corneal astigmatism correction in patients who are to receive multifocal implants as well as monovision or accommodating implants cannot be overstated. Whichever presbyopia-correcting technologies the surgeon uses, if the corneal astigmatism is not addressed, the patient will not have satisfactory uncorrected vision and spectacle independence after cataract surgery. Low amounts of astigmatism can be corrected with laser or manual arcuate incisions. If the patient has corneal cylinder of more than 1.50 D, it would probably be best to employ a toric IOL. Fortunately, one presbyopia-correcting implant available in the United States also has toric platforms available. For example, the toric version of the Crystalens accommodating implant (Bausch + Lomb), the Trulign, is available in three cylindrical powers. Three manufacturers offer toric monofocal lenses, and if the patient is a successful candidate for monovision, these are a great solution for treating astigmatism and presbyopia. Outside the United States, there are more choices in this arena, and multifocal torics are available.

MONOVISION

One of the easiest and most successful ways of achieving spectacle freedom after the cataract procedure is in

patients who are lucky enough to have adapted to monovision in contact lenses. Even patients who have not used monovision with contact lenses prior to cataract surgery can be successful if an adequate monovision trial is done before the procedure. This is not always possible because some patients have dense cataracts and cannot see well enough for a suitable trial. In other situations, for example, in a patient with bilateral low myopia, the first eye can be targeted for distance correction, and several weeks can be scheduled between surgeries on the two eyes to see how the patient tolerates natural monovision. If he or she is successful, then the second eye can be targeted for near with little risk to the patient's adaptation process. These patients wind up being some of the most satisfied and spectacle free. Traditional techniques target the dominant eye for distance and the nondominant eye for a near-target myopic result best suited for the patient's primary activities. Oftentimes distance glasses are needed by patients to reduce glare and improve vision in the near eye for night-time driving.

MULTIFOCALS

IOLs such as the Tecnis (Abbott Medical Optics) and the AcrySof Restor (Alcon) are valued for addressing presbyopia at the time of cataract surgery. Probably the largest drawback to this option is the nonphysiologic optical properties of these implants. It is well known that a neuro-adaptative process is frequently required and will often last up to 1 year. In addition, although we call them *multifocal lenses*, they are really bifocal lenses: they do not cover all ranges of vision. Therefore, there are often zones that the patients still have difficulty seeing and for which they may require glasses. When light travels through a multifocal optic, not all rays reach the retina in focus, resulting in decreased contrast sensitivity and other visual disturbances. In patients who have healthy eyes, minimal corneal astigmatism, and reasonable expectations, there can be wonderful success with multifocal implants and extremely satisfied patients who need glasses rarely, if at all.

If, however, a patient has significant corneal astigmatism that cannot be corrected with laser or arcuate incisions or has corneal diseases, map-dot-fingerprint dystrophy, or Fuchs endothelial dystrophy, there can be significant challenges to seeing well with multifocal optics. In addition, if the patient suffers from moderate to severe glaucoma or any type of macular disease, his or her visual potential is limited due to the diffractive and refractive properties of the multifocals. Nonetheless, multifocal implants have had great success internationally as a good solution. Many more multifocals are available outside the United States and are on the horizon, which may prove to be better than the current versions.

ACCOMMODATING IMPLANTS

The Crystalens and Trulign represent the bulk of accommodating IOL technology in the United States. With a hinged haptic platform, these lenses have been shown in numerous studies to provide a greater level of spectacle independence than can be achieved with a standard monofocal IOL.^{1,2}

Patients with a Crystalens can consistently achieve good uncorrected distance visual acuity as well excellent intermediate vision without the need for glasses. The Achilles' heel of this technology is that, usually, the patients are not completely spectacle independent and require a pair of reading glasses with a slight prescription for smaller print if both eyes achieve a refraction near plano. Properly discussing with patients what their visual outcome should be and what kind of glasses will be needed is critical to patients' achieving high satisfaction with all IOLs. In my experience with accommodating technology, hyperopic patients are usually happy with the quality of spectacle freedom achieved. In addition, the patients who require great distance vision and do not want to see any halos or glare at night are also great candidates for this particular implant, as multifocal optics are not employed. Some of the more challenging patients for whom to use this technology are those with long or short eyes and those who have unusual biometric readings. Because of the way the optics sit inside the eye due to its hinged design and posterior vault, I find there can sometimes be variability in the effective lens position and an occasional refractive miss.

CONCLUSION

Choosing the right technology for correcting presbyopia at the time of cataract surgery is certainly no easy task. There are also many implant properties such as asphericity, induced spherical aberration, index of refraction, and optic size that can be considered part of the decision-making process. With a surgeon's thorough understanding of the technologies, a meaningful consultation with the patient, a careful examination, and proper biometric analysis, an optimal choice for the patient and an outstanding refractive outcome can be achieved. ■

Robert J. Weinstock, MD, is a cataract and refractive surgeon in practice at The Eye Institute of West Florida in Largo, Florida. He is a consultant to Alcon and Bausch + Lomb. Dr. Weinstock may be reached at (727) 585-6644; rjweinstock@yahoo.com.



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