

# Handling Postoperative Issues With Refractive IOLs

Baby boomers and refractive IOLs are on a collision course.  
Let's maximize their outcomes and our successes.

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**T**he 80 million baby boomers in the United States began turning 60 in 2006. By 2011, when this demographic starts becoming eligible for Medicare, there will be an estimated 40 million people over the age of 65 in this country. By 2020, that number will be close to 55 million. This group of individuals differs greatly from previous senior populations. As a whole, the boomers have significant disposable income, they are well educated and computer savvy, and they engage in active lifestyles. With more than 50% of patients over the age of 65 suffering from visually significant cataracts, it is clear that anterior segment surgeons will not only be busy in the coming decade, but they will also have more demanding patients than in years past.

Refractive IOLs are here to stay despite the currently challenging economic times. While keratorefractive surgery was down 11% in the first quarter of 2008 compared with the first quarter of 2007, IOL procedures were up 3.4%, and refractive lens exchange was up 11.0% from the first quarter of 2007.<sup>1</sup> In 10 years, we may not be using the same IOLs we are today, but we will most definitely be dealing with patients' postoperative expectations that are at least equivalent to those of today's refractive cataract surgery patients (see *Preoperative Screening and Setting Expectations*).

This article reviews the main postoperative issues that we anterior segment surgeons can expect to deal with today, as we incorporate refractive IOLs into our practices.

## WHY ARE PATIENTS UNHAPPY AFTER RECEIVING REFRACTIVE IOLs?

### Spherical Ametropia

Spherical ametropia is the number-one cause of postoperative unhappiness among patients who have received

refractive IOLs. Personalized A-constants along with consistent keratometry and biometry (using either immersion A-scan or the IOLMaster [Carl Zeiss Meditec, Inc., Dublin, CA]) are essential to achieving emmetropia with refractive IOLs. When myopia occurs early on in the first eye of a patient receiving the Crystalens (Bausch & Lomb, Rochester, NY), first ensure that your technician or optometrist is not "over-minussing" the patient during the manifest refraction. Verify that the patient's unaided distance and near vision are consistent with the refraction. If the eye is truly myopic, ensure that the lens is well centered with both haptics positioned in the peripheral capsular bag and that there is no significant capsular contraction. Highlight for the patient the exceptional unaided near vision that he has achieved, a result that has far exceeded your expectations. Proceed with the implantation of a Crystalens in the patient's second eye after adjusting the refractive target to account for the unexpected effective lens position that you observed in the first eye. For example, if the first eye ends up with -0.75 D sphere for a goal of plano, target +0.50 to +0.75 D in the second eye. Do not correct the myopia in the patient's first eye with keratorefractive surgical techniques or a lens exchange prior to placing a lens implant in the second eye.

It is less likely that multifocal lens patients will end up with spherical myopia due to a more consistent effective lens position. It is more likely, however, that a keratorefractive or IOL exchange procedure will be required in patients who end up myopic after receiving a multifocal lens, but you should still wait to perform an adjustment until after operating on the second eye, if possible. Hyperopic ametropia can be easily addressed with conductive keratoplasty. This minimally invasive procedure has an advantage

over PRK and LASIK: it has essentially no effect on dysfunctional tear syndrome, a disorder that is prevalent in the cataract population, particularly among postmenopausal women. In my experience, the main downside to conductive keratoplasty, regression of refractive effect, occurs to a much lower degree in older patients.

## Astigmatic Ametropia

Residual astigmatism will often have a negative impact on patients' acceptance of their unaided near and distance vision. Treat refractive IOL patients like keratorefractive surgery patients; topographic analysis is an essential component of the preoperative evaluation. Patients with less than 1.50 D of regular corneal astigmatism can usually be successfully treated with limbal relaxing incisions or astigmatic keratotomy at the time of the IOL surgery. Those with more than 1.50 D of corneal cylinder are most effectively treated with keratorefractive surgery following IOL implantation. PRK may be performed as soon as 1 month after IOL surgery, whereas LASIK should be delayed for at least 6 weeks following IOL surgery to allow the clear corneal incision time to heal. With the Crystalens, patients usually have good visual function with postoperative astigmatism of 0.75 D or less. Multifocal lenses generally require that there be 0.50 D of astigmatism or less for optimal performance. Ideally, when beginning to implant refractive IOLs, choose patients with less than 0.50 D of preexisting corneal astigmatism. Individuals with topographic keratoconus are not the best candidates for refractive IOLs.

If you are lucky enough to have a patient seeking independence from spectacles who has successfully worn monovision contact lenses for many years, a toric IOL such as the AcrySof Toric (Alcon Laboratories, Inc., Fort Worth, TX) should be your first choice in terms of lenses. With one surgery, you can treat this patient's cataract and astigmatism and provide a high level of spectacle independence.

## Suboptimal Scotopic Visual Function

Unwanted nighttime visual disturbances are inherent to multifocal lens designs and should not come as a surprise to patients receiving these IOLs. The halos and glare become less problematic with neuroadaptation. The decreased contrast sensitivity does not improve with neuroadaptation, however, because the loss of contrast relates directly to the amount of light used to form the retinal image. Newer lens designs such as the AcrySof Restor Aspheric (SN6AD3; Alcon Laboratories, Inc.) offer improved contrast sensitivity compared with older designs.

A patient who primarily complains of the halos and glare from lights in the early postoperative period but does not complain about difficulty seeing street signs at night will likely accept the multifocal design as neuroadaptation

occurs. Do not be dissuaded from implanting another multifocal lens in this person's second eye. Patients whose primary complaint is of waxy vision at night and difficulty seeing street signs may have a bigger problem. Remind them of their wonderful unaided near vision by having them read through -3.00 D spectacles. After ruling out ametropia as a cause of waxy nighttime vision, consider placing an aspheric monofocal IOL or the Crystalens in his fellow eye, depending on his need for the best possible unaided distance vision versus unaided intermediate vision. A patient who was doing well after the implantation of a multifocal IOL but developed suboptimal scotopic visual function in the late postoperative period merits an evaluation for other ocular comorbidities, with posterior capsular opacification at the top of the list of differential diagnoses.

## Suboptimal Unaided Intermediate Vision

There is no question that the Crystalens is the refractive IOL of choice for patients requiring excellent unaided intermediate vision. The latest design, the Crystalens HD, still provides excellent intermediate visual acuity but augments patients' unaided near vision. This lens allows surgeons to reduce the postoperative anisometropia necessary to achieve clear unaided near vision with the current Five-O model.

Phase 4 trials have begun on the AcrySof Restor Aspheric SN6AD1 lens. This model features a lower add (+3.00 D) at the IOL plane, which should improve patients' unaided intermediate vision with this lens. Individuals receiving the current AcrySof Restor Aspheric SN6AD3 should be warned that they may need glasses if they spend many hours at the computer each day. Patients complaining of inadequate unaided intermediate vision with an AcrySof Restor lens in their first eye may benefit from a Crystalens HD in their second eye to improve their computer-range vision.

## PREOPERATIVE SCREENING AND SETTING EXPECTATIONS

The importance of the screening and counseling process cannot be overstated. Surgeons who have experience dealing with keratorefractive surgical patients have an advantage here, because they understand the mindset of patients seeking spectacle independence. An excellent source of multiple opinions and pearls on the screening/counseling process is section VII of *Mastering Refractive IOLs: The Art and Science*, a comprehensive textbook edited by David F. Chang, MD.<sup>1</sup>

1. Chang, DF, ed. *Mastering Refractive IOLs: The Art and Science*. Thorofare, NJ: Slack, Inc.; 2008:332-431.

## FACTORS IN THE CHOICE OF IOL DESIGN

As in other forms of refractive surgery, the preoperative evaluation of patients is key to success with refractive IOLs. Certain preexisting conditions and prior surgeries have a bearing on visual outcomes and should influence your selection of lenses.

### EPIRETINAL MEMBRANE

Carefully evaluate patients who have a preexisting epiretinal membrane with optical coherence tomography prior to refractive IOL surgery. Even subtle epiretinal membranes may adversely affect the performance of a multifocal IOL. In addition, multifocal optics may make membrane peeling surgery more challenging for the vitreoretinal surgeon. The Crystalens HD (Bausch & Lomb, Rochester, NY) may be a better choice for these patients.

### AGE-RELATED MACULAR DEGENERATION AND DIABETIC RETINOPATHY

Macular dysfunction can significantly affect the performance of multifocal IOLs. Patients with preexisting dry macular degeneration or moderate diabetic retinopathy

may not be the best candidates for multifocal technology. Even if their macular function is currently adequate, these patients are at somewhat higher risk of decreased macular function in the future, a problem that may be compounded by the multifocal IOL optic. The Crystalens HD may be more forgiving of subtle macular dysfunction and is therefore a somewhat better choice for these patients.

### POSTREFRACTIVE SURGERY PATIENTS

Multifocal lenses are likely to produce suboptimal results in eyes that have undergone LASIK or PRK, and they are very likely to perform poorly in post-RK eyes. These corneas have reduced contrast sensitivity due to their oblate shape, which then amplifies the decrease in contrast sensitivity associated with multifocal optics. The top choice for post-refractive surgery patients is aspheric monofocal IOLs, possibly in a monovision configuration if the corneal irregularity is not too severe. Future aspheric versions of refractive IOLs should have better results in these patients than current models of these lenses.

## OTHER OCULAR COMORBIDITIES

### Dysfunctional Tear Syndrome

All refractive surgery patients must be evaluated for dysfunctional tear syndrome as a possible contraindication for surgery. Refractive IOL patients are no exception and are more likely to be affected, due to their overall older age demographic. Treat dysfunctional tear syndrome aggressively and early in patients with preexisting symptoms. The mainstay of therapy includes cyclosporine A 0.05% (Restasis ophthalmic emulsion; Allergan, Inc., Irvine, CA), oral omega-3 fatty acid supplements such as BioTears (Biosyntrx, Inc., Lexington, SC), punctal occlusion, and lid hygiene. The role of dysfunctional tear syndrome in suboptimal results with refractive IOLs cannot be overstated and should be foremost in your mind when evaluating these patients.

### Posterior Capsular Opacity

Even subtle posterior capsular opacities can be clinically relevant in eyes with refractive IOLs. Particularly with multifocal lenses, even a single capsular fold across the diffractive portion of the IOL can decrease performance. Have a very low threshold for performing an Nd:YAG capsulotomy in these eyes.

### Cystoid Macular Edema

Prophylaxis against cystoid macular edema (CME) is essential for all refractive IOL patients. Prior to the introduction of these lenses, ophthalmologists may not have

treated angiographic CME, because they considered it to be subclinical. Today, angiographic CME is now optical coherence tomography-positive CME and should be treated in all cases due to patients' high expectations and the sensitive performance characteristics of refractive IOLs, multifocal designs in particular. Patients should begin taking NSAID drops at least 2 days prior to surgery and continue them for at least 4 weeks postoperatively along with topical steroids. Evaluate patients who present with decreased BCVA after refractive IOL surgery with optical coherence tomography and promptly start them on NSAID/prednisolone acetate 1% combination therapy for macular thickening. Patients with persistent CME that is refractory to topical therapy should be referred for a retinal evaluation. ■

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1. Harmon D, Freeman W. The Surgeon's Quarterly Survey Report: Q1 2008. St. Louis, MO: Marketscope, LLC; June 30, 2008.