

Cataract & Refractive Surgery TODAY

Premium Cataract Surgery (Not Just for Premium IOLs)

A continuing medical education activity based
on a symposium held in November 2008 in Atlanta, Georgia.

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This continuing medical education activity is jointly sponsored by



PREMIUM CATARACT SURGERY (NOT JUST FOR PREMIUM IOLs)

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STATEMENT OF NEED

The new modality of premium refractive IOLs, including presbyopia-correcting lenses, differs from traditional monofocal IOLs and requires a different set of implantation procedures. This CME course will provide cataract and refractive surgeons with unbiased and broad-based views on the best practices for premium refractive cataract surgery.

TARGET AUDIENCE

This activity is designed for anterior segment ophthalmic surgeons and general ophthalmologists.

LEARNING OBJECTIVES

Upon successfully completing this learning program, participants should be able to:

- learn techniques and implement successful outcomes in cataract surgery
- identify strategies for the avoidance of capsulorhexis complications
- utilize strategies to prevent cystoid macular edema
- understand the prophylaxis of endophthalmitis

METHOD OF INSTRUCTION

Participants should read the learning objectives and continuing medical education (CME) activity in their entirety. After reviewing the material, please complete the self-assessment test, which consists of a series of multiple-choice questions. To answer these questions online and receive real-time results, please visit www.dulaneyfoundation.org and click "Online Courses."

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This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of The Dulaney Foundation and Bryn Mawr Communications LLC, publisher of *Cataract & Refractive Surgery Today*. The Dulaney Foundation is accredited by the ACCME to provide continuing education for physicians. The Dulaney Foundation designates this medical education activity for a

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All those involved in the planning and editing of this educational activity have indicated that they have no financial relationships to disclose. ■

Avoiding Capsulorhexis Complications

Understanding the problem is the key to avoiding complications.

BY DAVID F. CHANG, MD



There are four general conditions that increase the risk of a radial capsulorhexis tear: poor visibility, eye movement, chamber shallowing, and increased capsular elasticity.

These situations may arise either because of the ocular anatomy or due to poor surgical technique.

POOR VISIBILITY

A good red reflex and visibility are important in order to manipulate the flap and monitor the direction of the tear as it develops. A surgeon's delayed recognition of a peripherally escaping tear may preclude any chance to redirect it in time.

Ocular causes of a poor red reflex include tear film debris, decreased corneal clarity, small pupils, anterior cortical opacity (anterior spokes or white cataract), nuclear opacity (brunescence), and vitreous opacities such as asteroid hyalosis or hemorrhage. Errors in surgical technique may also compromise visibility. Excessive drying can cloud the corneal epithelium. Poor irrigation fluid runoff may submerge the cornea. Clumsy instrument maneuvers might create corneal striae or displace the globe out of optimal microscope alignment. Finally, excessive downward pressure from the capsulotomy needle's tip will penetrate and stir up the epinucleus. This can cause focal loss of the red reflex right at the area where the flap inserts.

With challenging cases, surgeons must pay greater attention than usual to sharp focus, a clear corneal tear film, and positioning the eye so as to optimize the red reflex. The surgeon should increase the microscope zoom if necessary. Furthermore, a surgeon should consider trypan blue dye whenever he anticipates difficulty with visualizing the anterior capsule. He can apply dye even after he initiates the capsulotomy, because trypan blue preferentially stains the capsule but not the cortex.

EYE MOVEMENT

The potential for eye movement is characteristic of topical anesthesia or an unintentional consequence of a poor regional block. A sudden unanticipated head or eye movement may cause a peripheral radial tear. Patients

must be cooperative enough to have surgery under topical anesthesia, and using appropriate levels of sedation and communication should enhance their cooperation. Fixation is improved by avoiding excessive microscope light intensity, which can induce squeezing. During the capsulotomy, the cornea should be moistened in a way so as to avoid startling the patient or surgeon. One way to eliminate the need for an assistant to manually wet the cornea during surgery is to lubricate it in the following manner. The surgeon first smears a few streaks of a dispersive ophthalmic viscosurgical device (OVD) such as Viscoat (Alcon Laboratories, Inc., Fort Worth, TX), Amvisc Plus (Bausch & Lomb, Rochester, NY), or Occucoat (Bausch & Lomb) onto the corneal surface.



Figure 1. Soft-shell technique. After first injecting the dispersive OVD, the cohesive OVD is injected over the convex anterior capsule. This step pushes the dispersive OVD into the cornea and against the inner incision wall.

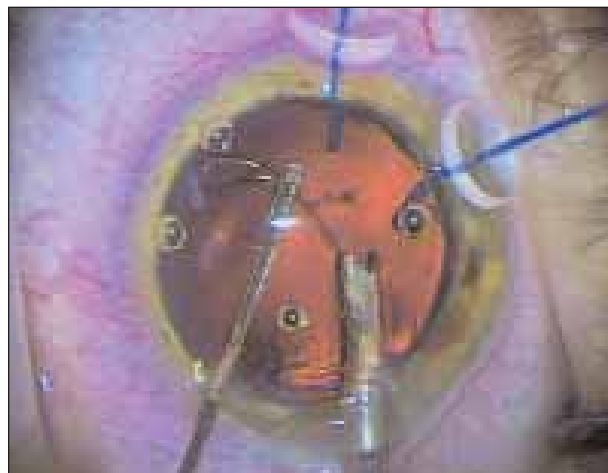


Figure 2. Mackool capsular retractors (Impex Surgical, Staten Island, NY) are long enough to be able to hook the capsulorhexis edge and yet support the equatorial capsule.

Adding several drops of balanced salt solution will create an even, but viscous wetting layer that will resist evaporation and provide superb clarity.

ANTERIOR CHAMBER SHALLOWING

The natural anterior convexity of the equatorial lens tends to steer any capsular tear toward the periphery. The shallower the chamber is, the more convex the anterior capsule becomes, and the more the tear tends to run radially “downhill.” The direction of the tear is most easily controlled if the anterior capsular surface is flattened.

A shallow anterior chamber may be the natural result of a small globe, narrow angles, or an intumescent lens. Severe zonular laxity may result in an unexpectedly shallow chamber despite a normal axial length. A common cause of anterior capsular convexity is intraoperative shallowing of the anterior chamber due to escape of fluid or OVD through the wound. Excessive instrument pressure on the posterior incision lip will “burp” the chamber through a momentary wound gape, and the surgeon should interrupt the capsulotomy step to inject more OVD.

Because it creates more of a mass effect, a maximally cohesive OVD is better able to flatten the anterior capsular convexity when compared with a dispersive OVD. The latter better resists being burped out through the incision, however. The soft-shell technique originated by Steve A. Arshinoff, MD, FRCSC, from the University of Toronto combines the complementary advantages of each OVD by placing the cohesive agent directly over the anterior capsule and blocking the incision with the dispersive OVD¹ (Figure 1). Sodium hyaluronate 2.3% (Advanced Medical Optics, Inc., Santa Ana, CA) is a maximally cohesive and viscoadaptive OVD that combines both of these desirable characteristics in a single agent.²

CAPSULAR ELASTICITY AND PSEUDOELASTICITY

The more elastic a material is, the more difficult it is to control how it tears. As an example, latex is more difficult to tear accurately than paper. As one attempts to tear an elastic material, it first stretches before abruptly splitting. Because of the rebound energy, the resulting tear is overly rapid and tends to slingshot away from, rather than toward, the grasping instrument. Because pediatric anterior capsules are very thin and elastic, the flap tends to spiral outward and is very difficult to control.³ Similarly, the adult posterior capsule has less tensile strength, and it is thinner and more elastic than the

anterior capsule. It behaves more like the pediatric anterior capsule, and accomplishing a posterior capsulorhexis is more challenging for this reason.

Lacking sufficient circumferential tension, a capsule that is not taut will also exhibit elastic behavior. As the surgeon pulls on the anterior capsular flap, the peripheral capsule should be immobile if he is to control the precise direction of the tear. This situation occurs if the zonules are intact, but weak zonules give rise to a condition that I call *capsular pseudoelasticity*,^{4,5} where the anterior capsule is of normal adult thickness but behaves as though it is more lax and pliant due to insufficient zonular traction. Because the peripheral capsule will move along with, and in the same direction as the flap is being pulled, the tear is difficult to control and will tend to slingshot radially. Poor surgical technique whereby the capsular flap is allowed to become too long can also create pseudoelasticity. The farther the grasping point of the capsular forceps is from the tearing point, the more pliant the flap becomes, and the more difficult it is to direct the tear. If the tear tends to spiral radially outward, the surgeon must regrasp the flap closer to the leading edge of the tear.

In higher-risk cases, I consider the capsulorhexis to be a “zonular stress test,” because the first indication of how weak the zonules are becomes evident during this step. If the anterior capsule is very lax, the capsulotomy needle’s tip will tend to dimple and indent it, rather than immediately puncture it. Next, as the surgeon tugs the capsular flap, the peripheral lens capsule is likely to stretch and move along with the flap toward the forceps. With extreme zonular weakness, the entire lens may start to move with the capsular forceps. The surgeon needs to take great care to avoid outward spiraling of the tear. In addition to using capsular forceps to regrasp the flap more frequently, employing the tear recovery technique originated by Brian Little, MD, from the Royal Free Hospital NHS Trust, in London, United Kingdom, is invaluable in these situations.⁶

If pseudoelasticity is severe, the surgeon can use iris hooks or specially designed capsular retractors to help anchor the bag during the capsulorhexis step.⁷ Richard Mackool, MD, Director of The Mackool Eye Institute and Laser Center in Astoria, New York, has designed self-retaining retractors that are elongated enough to hook a small-diameter capsulorhexis from the limbus⁸ (Figure 2). After completing several clock hours of the capsulorhexis, one or more capsular retractors can be placed. These retractors stabilize the bag and provide helpful countertraction against the tugging flap. Care must be taken to avoid placing too much tension on

the capsular edge with the retractors, as this force alone can extend the tear uncontrollably. A surgeon can use the capsular tension segments created by Ike Ahmed MD, FRCSC, from the University of Toronto and the University of Utah in Salt Lake City, in a similar manner. A surgeon should never insert a capsular tension ring before completing the capsulorhexis, however, because the expansive force of the ring will extend the tear. If the pupil is of borderline size, enlarge its diameter with iris retractors. Optimal visualization of the peripheral capsular region is of far greater importance here than with a routine case.

Opinions differ regarding the target diameter of the capsulorhexis in eyes with loose zonules. A larger-diameter capsulorhexis will make nuclear and cortical removal much easier, but it is much harder to complete in eyes with capsular pseudoelasticity. With weakened zonules, the more peripherally the tear advances, the more it wants to veer radially outward, and the more difficult it is to rescue the flap. In comparison, a smaller-diameter capsulorhexis is easier to control. It increases the margin for error by allowing more time to recognize and rescue a peripherally escaping tear. Although a small-diameter capsulotomy may somewhat hinder the subsequent surgical steps, it is far preferable to having a torn capsular edge, particularly when other risk factors are present.

For this reason, I believe that one should always aim for a smaller-diameter capsulorhexis in the presence of significant zonular laxity. Successful completion of a continuous circumlinear edge is more important than attaining the optimal size. The surgeon must mentally visualize its diameter during nuclear emulsification, however, so as not to tear it with the chopper shaft or phaco tip. Bimanual instrumentation is superior for cortical cleanup in loose capsular bags and greatly improves subincisional access through a small capsulorhexis. Modern injectors facilitate implantation of foldable IOLs through a small capsular opening. Finally, the surgeon should secondarily enlarge the capsulorhexis after the IOL and capsular tension ring are safely implanted.

CONCLUSION

In summary, achieving an intact capsulorhexis is crucial to the safety of the cataract procedure. To maximize the odds of success, the surgeon needs to make the diameter smaller when he encounters difficulty. Given the long-term importance of having a properly sized capsular opening, the surgeon should secondarily enlarge a small capsulorhexis following IOL insertion when the surgical conditions are more favorable. ■

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CME and Endophthalmitis Prophylaxis

The proper use of therapeutic agents to prevent and manage complications.

BY MICHAEL B. RAIZMAN, MD



I believe more surgeons are beginning to recognize the important benefits of using NSAIDs. When used correctly, these drugs have the potential to enhance the surgical outcomes of all cataract patients, including premium refractive IOL recipients. Following is a review of some of the more challenging pathologies that hinder optimal results and how the right drugs can prevent or minimize them.

RETINAL SWELLING

Patients judge the quality of their outcome during the initial postoperative period on two primary experiences: their comfort level and the speed at which they achieve good vision. Good vision means more than just Snellen acuity; it also includes high contrast sensitivity. The chief enemy to achieving this kind of quality vision is retinal swelling, which occurs more often than we would like if not treated appropriately. I think any swelling of the retina is a problem for patients, even if it is mild and transient.

CYSTOID MACULAR EDEMA

CME is a significant problem if we do not use non-steroidal therapy. It is the leading cause of unexpected poor vision after routine cataract surgery.¹ Although we surgeons fear endophthalmitis more, statistically, it pales in comparison to the incidence of CME, which can be as

high as 30%, depending upon the patient's risk factors and the type of surgery performed. For instance, the rate of CME is over 32% in diabetics, and the rate climbs to 81% if they already have background diabetic retinopathy with any macular edema prior to cataract surgery.²

There is some debate about whether we should define CME as angiographic or clinically significant (based on optical coherence tomography [OCT] or Snellen acuity). I do not think such a distinction matters, because today's drugs can prevent CME.

About 10 years ago, I showed that NSAIDs could prevent CME after routine, uncomplicated phacoemulsification. In that study, 12% of low-risk eyes developed CME without postoperative NSAIDs, whereas no treated eyes developed macular edema.³ Since that study, these data have been corroborated by additional research. One of the best studies, conducted by Donnenfeld et al, was a very large, prospective study that compared the use of ketorolac tromethamine ophthalmic solution and prednisolone acetate to using prednisolone acetate alone.⁴ In this study, 12% of patients developed macular edema if they received prednisolone acetate alone. There was only a 1% incidence, however, with the prednisolone acetate and ketorolac together. Another study presented by Roberts et al study showed that contrast sensitivity also improved by using ketorolac tromethamine with prednisolone acetate.⁵

Although many forms of macular edema are treatable, some forms will not respond to even the most aggressive therapy. Certain types of CME can cause permanent changes in the retina. I find this unacceptable given the available diagnostic technology for early detection and pharmaceutical therapies for treatment. A fluorescein angiogram is one option for detection, but many surgeons, myself included, are now using OCT exclusively. It is fast, noninvasive, and it provides more information than an angiogram does. I now perform OCT preoperatively on all my premium IOL patients to check for any risk factors for CME. If I see any epiretinal membrane formation, I will discuss the increased risk with the patient prior to surgery. Then, in the event of an adverse outcome, he understands the situation.

INFLAMMATION AND INFECTION

Antibiotics

We have excellent pharmaceuticals for preventing postoperative infection. I consider the fourth-generation antibiotics the standard of care for all cataract surgery, because their coverage and penetration is superior to the older agents.⁶ I do not use subconjunctival antibiotics or intracameral antibiotics at this time.

Steroids and NSAIDs

I think it is essential for all cataract patients, and especially premium IOL patients, to receive both a steroid and an NSAID after surgery, because these two agents work more effectively together. Although it is true that approximately 90% of patients will have well-controlled inflammation with an NSAID alone, the other 10% do not, and it is not possible to predict which patient will fall into this latter group. In addition, steroids alone may not prevent macular edema. Again, I feel it is better to prevent inflammation and CME most effectively by combining the two agents.

Topical steroids are critical for preventing surgical inflammation. Today's topical steroid formulas are excellent, and all ophthalmic surgeons should use them. I prefer prednisolone acetate 1%, although there are other options. I do not think there is any reason to begin administering a steroid prior to surgery, but they should be started immediately postoperatively and used aggressively for 4 weeks. I begin topical steroids several hours after surgery and use one drop every 3 hours for the first 24 hours while the patient is awake.

Although steroids alone are excellent for inhibiting prostaglandins, they cannot block the entire arachidonic cascade and therefore are inadequate for controlling and preventing CME. NSAIDs can reduce the majority of postoperative cell and flare and they also help to prevent and treat CME. These agents also help keep the pupil maximally dilated during the procedure, and I think they greatly enhance patients' comfort during and after surgery. I use NSAIDs for 3 days before surgery and 4 weeks after surgery in routine cases. I use nonsteroidal drops longer in patients who are at higher risk, but I will not use them in patients with dry eyes and never more than 4 times per day.

COMFORT

Premium IOL patients, in particular, expect to be comfortable during their surgery. I use topical anesthesia for all of my cases. Because I do not use a block (due to the small but significant risks associated with inserting a needle into the eyelid, I especially like the added degree of comfort that NSAIDs provide. I also use a fair amount of intravenous sedation to keep my patients comfortable.

Aesthetically, patients appreciate when their eyes look good after surgery, so I am very careful not to touch the conjunctiva to avoid conjunctival hemorrhage. At their next-day follow-up, many of my patients are excited to tell me that their eye looked so good, their family could not believe they had surgery. It may be a minor issue, but I think it adds value to patients' experience.

CONCLUSIONS

The strategic use of therapeutic drug agents helps to produce a clear, smooth ocular surface that contributes to positive outcomes for our cataract patients. Eventually, drops will not be needed; innovative drug delivery systems will be able to get these aids directly onto the corneal surface. I look forward to exciting advancements in this area. ■

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Pearls for Managing the Unhappy Refractive IOL Patient

Tips and tricks on how to handle these individuals.

BY ERIC D. DONNENFELD, MD



Most patients who receive presbyopia-correcting IOLs are extremely happy. You can take several steps, however, to increase post-operative success dramatically. The first is to set realistic expectations preoperatively.

Before surgery, I discuss patients' common concerns, such as glare, halo, their quality of vision, residual refractive error, and the possible need for enhancements. I cannot overemphasize how important it is to have these discussions. When you tell a patient he may have glare and halo after he receives a multifocal IOL, he expects that to happen. I tell him it is going to get better or we can treat it. When you do not tell patients about glare and halos, these visual disturbances become complications. The patient grows defensive, as do you, and they believe you did something wrong. My advice is to tell your patients before surgery about things that they can commonly expect postoperatively.

ADDRESSING THE CAUSES OF UNHAPPINESS

We can effectively correct six different reasons why patients are unhappy with their presbyopia-correcting IOL. Number one is the implantation of a monocular IOL. I do not expect patients to be fully functional until the second IOL is placed in their fellow eye. I warn them about this lack of utility preoperatively. Bilateral implantation is critical to the success of the procedure, as is providing an adequate neuroadaptive period.

Other causes of suboptimal results are minimal refractive error, posterior capsular opacities, ocular surface disease, cystoid macular edema (CME), and an off-center IOL. When I see a patient with a multifocal IOL, I go through the list of possible complications he may be experiencing. When I have exhausted that list, then I know I am out of options. By that point, however, approximately 99% of patients are happy (I have only explanted one of 400 presbyopia-correcting IOLs). In fact, most patients are ecstatic about their results.

REFRACTIVE MYTHS

Small Refractive Errors

A refractive legend regarding presbyopia-correcting IOL patients is that they will tolerate small refractive errors. This could not be more wrong. Presbyopia-correcting IOL patients are incredibly sensitive to small refractive errors, and you have to be willing and able to handle them. My rule for astigmatism is as follows: if a patient has greater than or equal to 0.50 D but less than 1.50 D of cylinder, I perform limbal relaxing incisions (LRIs). Surgeons who choose to implant presbyopia-correcting IOLs need to know how to perform LRIs. For patients who have more than 1.50 D of cylinder, I will also debulk the astigmatism with an LRI and then treat the residual cylinder with PRK or LASIK or refer them for laser refractive surgery. If a cataract surgeon does not perform excimer laser photoablation, then the patient can be referred for laser refractive surgery.

LASIK

Another refractive legend is that surgeons who implant presbyopia-correcting IOLs need to learn to perform LASIK. I disagree. You should learn to perform PRK, which is not too difficult; you can learn the procedure in an afternoon. If you want to learn LASIK later, you can, but start with PRK. Surface ablation is less stressful for you and the patient and often produces better outcomes. The epithelium is less adherent in older, presbyopic patients, so there are fewer problems of epithelial sloughing and basement membrane disease.

Neither must you learn to perform customized laser ablations. Conventional ablations are probably better for 90% of patients receiving presbyopia-correcting IOLs. I almost always perform conventional correction on patients who received presbyopia-correcting IOLs because the aberrometer will not recognize the multifocal IOL accurately. I mark the cornea, scrape off a 9-mm-diameter area of epithelium, wipe the bed very gently with a cellulose sponge, and then perform the ablation. I place a bandage contact lens on the eye and follow the patient until his epithelium heals. His vision should improve in approximately 4 days. In about 2 months, his vision is optimized. PRK requires the post-operative management of patients to ensure the epithelium heals well.

Nomograms

You do not have to learn nomograms for PRK after implanting multifocal IOLs, because you are dealing with treatments of 1.00 D or less most of the time. If you are off by 0.10 D, it does not make a difference. I aim for +0.10 D. If I end up with +0.20 D, that is fine. If I get a plano result, that is also acceptable. Do not attempt any nomogram adjustments for humidity or the patient's age.

Posterior Capsulotomy

I perform many more YAG laser procedures on patients who receive presbyopia-correcting IOLs than I have ever done in the past, because their eyes are incredibly sensitive. The loss of contrast sensitivity and the glare created by a multifocal IOL is made worse by any capsular opacity. I perform a large capsulotomy on these eyes. Once I open the posterior capsule, I perform an IOL exchange. For patients who are very unhappy with a presbyopia-correcting IOL, I explain, "If I open the posterior capsule, I will probably make your vision better, but, if I break it, you buy it." Once the posterior capsule

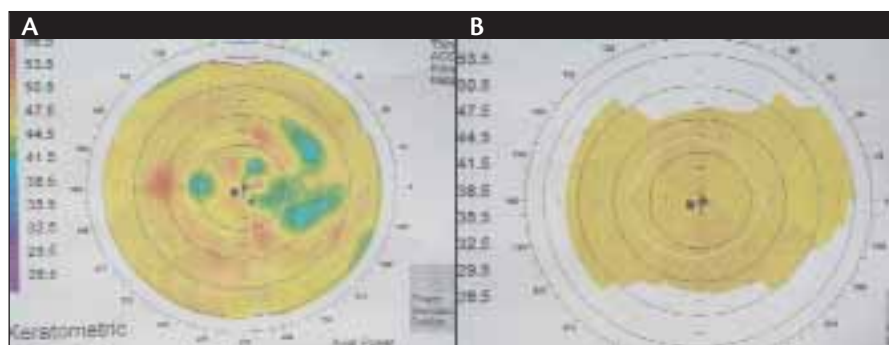


Figure 1. Topography before (A) and after (B) the use of topical cyclosporine 0.05%.

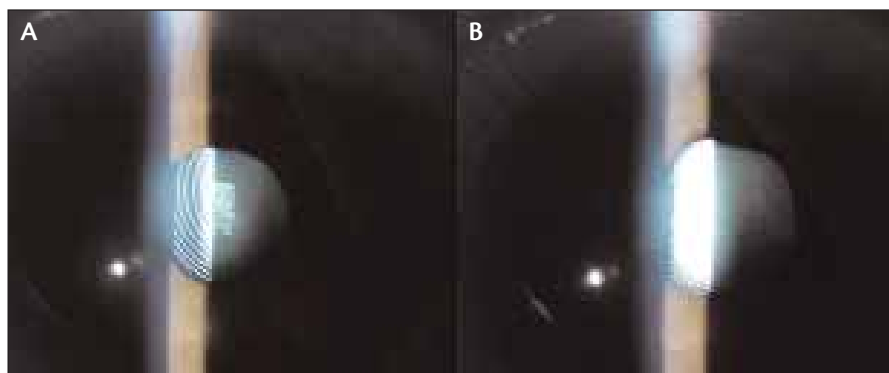


Figure 2. The IOL is not centered under the pupil (A), so the author performed an argon laser iridoplasty. The eye had this appearance after the procedure (B).

is open, you have exposed the patient to a whole other level of complications, so I will not remove a presbyopia-correcting IOL after a YAG capsulotomy. I inform patients of this policy prior to their capsulotomy.

Cystoid Macular Edema

CME is incredibly important and common. Patients who have conventional cataract surgery with no risk factors and no capsular breakage have up to a 70% chance of developing macular thickening visible on ocular coherence tomography (OCT)¹ and a 12% chance of having visually significant CME if topical NSAIDs are not used perioperatively.² I prescribe ketorolac tromethamine ophthalmic solution q.i.d. for 3 days preoperatively, and the therapy is continued for 3 to 4 weeks postoperatively. This treatment regimen is becoming the standard of care. Many studies in the literature state that you must use an NSAID.^{2,3}

The loss of contrast sensitivity associated with a multifocal IOL is worsened by CME.³ Once the normal architecture of the retina is lost, visual quality is degraded for life. Snellen visual acuity will improve, but contrast sensitivity will be permanently reduced.

The best way to look for CME after cataract surgery is with OCT. In addition, OCT is a very effective preoperative screening tool for foveal membranes, which will reduce quality of vision after cataract surgery.

Dry Eye

Dry eye disease is common in older patients. Even a mild breakdown of the corneal epithelium reduces the tear film's ability to smooth out the ocular surface (Figure 1). A study my colleagues and I performed shows that eyes treated with cyclosporine had significantly improved mesopic and scotopic contrast sensitivity compared with eyes that received only an artificial tear.⁴ A more regular tear film and ocular surface improve quality of vision.

Centration of the Lens

If all other options have been exhausted, I look for the centration of the IOL beneath the pupil. The pupil and the center of the capsular bag often do not coincide, so the lens will appear to be decentered (Figure 2). In such cases, I perform an argon laser iridoplasty. I place four spots in the iris' midperiphery in the direction I want to pull the pupil. I use a power of 500 mW and a spot size of 500 μ m in diameter for a duration of 0.5 seconds. I perform the argon laser iridoplasty when a patient complains of glare and halos and when I am going to perform an excimer laser enhancement. I want to center the IOL on the pupil so my ablation is not off the visual axis or off the center of the lens.

CONCLUSION

There are many ways to improve the vision of patients with multifocal IOLs. Look at organic problems before stating that neuroadaptation is going to resolve all of your patient's visual complications. By paying attention to residual refractive error, the ocular surface, CME, the posterior capsule, and pupillary centration over the IOL, you can satisfy most patients who are unhappy after receiving presbyopia-correcting IOLs. ■

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Screening, Selecting, and Counseling Premium IOL Patients

How to succeed with these lenses despite consumers' reluctance to spend.

BY STEVEN J. DELL, MD



Everyone knows that the United States is experiencing difficult economic times, and ophthalmology is suffering along with everyone else. Nevertheless, I think a bear economy is an

important time in which to examine our clinical business models. Let's use this opportunity to trim fat and position ourselves for the inevitable economic turnaround. Following are several strategies for making the most of the market right now.

DIVERSIFY

Glaucoma and retinal patients generally represent a higher value than refractive and cataract patients. For example, a glaucoma patient requires two to four examinations per year, often entailing visual field testing, optic disc photographs, optical coherence tomography, gonioscopy and pachymetric measurements. Retinal screenings also add value: our ability to perform diagnostic testing and therapeutic treatment for age-related macular degeneration is now an important component of our practices.

ADOPT PREMIUM IOLs

But Commit Fully

Although a lot of patients may want premium IOLs, the market is going to be shrinking for a while in response to the economic uncertainty. The occasional LASIK surgeon has already largely dropped out of the refractive game, and I think IOL surgeons who implant multifocal IOLs infrequently will similarly abandon these premium lenses until the market picks up. Those who embrace premium IOL technology will prosper, but quality outcomes will become even more critical, because patients' expectations rise when dollars become more precious.

Manage Expectations

Keep in mind that the slick brochures that the IOL manufacturers produce on how to market premium IOLs to your patients may not necessarily jibe with your experience about managing their expectations. I begin by showing

prospective patients a video that introduces the concept and vocabulary of presbyopia-correcting IOLs. This video also helps patients realize that they may need glasses for some tasks postoperatively. Then, my technicians give prospective patients a handout that describes these lenses in further detail as well as my experience implanting them. Next, they ask patients to complete a questionnaire that helps us to determine the type of vision they most desire and also sets their expectations. The questions include (1) Where do you want to be able to see without glasses? And (2) If you had to wear glasses for one activity, for which one would you do so most willingly? The last question asks them to rate their personality from easygoing to perfectionist (visit www.crstoday.com/Pages/Dellindex.doc for the complete form).

Make a Recommendation, Then Reinforce Expectations

I give the patient my definitive recommendation for an IOL at the conclusion of the consultation. If the patient has corneal cylinder but says she wants to see well at distance, I tell her she will need either a toric IOL or a limbal relaxing incision (LRI) after surgery. If he wants to see well at near and distance, then he will need a premium IOL, and I recommend a particular lens. Our recommendations need to be unequivocal, and we must tell patients that there will be a pair of glasses that will improve some component of their vision after surgery, and our goal is to reduce their need for those glasses to a bare minimum. Many practitioners think this admission will significantly reduce their surgical volumes, but that assumption is wrong. We should also tell our patients that a laser vision touch-up is a possibility. Here are five concepts that I feel refractive cataract patients must understand before proceeding with surgery:

1. With any IOL implantation, a power miss is possible and is not the result of a deviation from the standard of care.
2. Remedies exist for a power miss; the likely timeframe for the treatment is X and the cost will be X (if anything).
3. (a) If you seek to avoid glasses with a multifocal implant, you must be willing to accept unwanted visual images; they are normal and unavoidable.
(b) If you are interested in an accommodating IOL, you must be willing to put up with slight minimonovision. Still, the surgery may not quite achieve the level of near vision you desire.
4. You will own a pair of glasses after the surgery.
5. Removing these implants is only done as a last resort and may result in a significant complication.

The patient's psychological posture during this discussion will tell you whether to proceed with the surgery and

should also strongly influence how well these patients do postoperatively.

Maximize Outcomes

Premium IOLs are not a one-shot deal. In fact, the acceptable landing zone for a presbyopia-correcting IOL is tighter than for LASIK. You can leave a 23-year-old +0.75 D after LASIK and he will be ecstatic, but that refraction is generally not acceptable after implanting a premium IOL. Laser interferometry has made our IOL calculations much more accurate, and now the weakest link in IOL calculations is keratometry. Many factors cause dry eye, which Eric Donnenfeld, MD, refers to as the *double trouble cornea*. The double trouble cornea interferes with preoperative keratometry readings and also causes postoperative visual fluctuations. A healthy cornea is critical with an accommodating lens and hypercritical with a multifocal implant, because these lenses magnify surface irregularities. An accommodating IOL does not rely on a perfect ocular surface and macula quite as heavily as its multifocal cousins, but its slight minimonovision does require nailing the refraction twice.

Premium IOL recipients need to have a healthy ocular surface and macula, because this surgery taxes the cornea in unprecedented ways. First, the cornea must be in good shape for the preoperative keratometry readings. Then, it is subjected to the cataract operation, an LRI (which renders a part of the cornea significantly neurotrophic), a month of postoperative medications, and perhaps customized wavefront LASIK after that. Many borderline corneal surfaces deteriorate under the combination of these insults. As an aside, we need to keep these patients comfortable and free of cystoid macular edema (in my opinion, we should all be using NSAIDs after each cataract surgery).

Perhaps the best way to deal with dry eye in premium IOL patients is to manage it well before they are measured for surgery by using artificial tears, oral doses of omega-3 fatty acids, and punctal occlusion (make sure there is no inflammatory blepharitis component). My staff and I also routinely use topical cyclosporine, and sometimes we apply a steroid in the initial cyclosporine ramp-up to enhance patient comfort.

CONCLUSION

Times are tough, and they may get worse before they get better. Particularly when patients are paying out of pocket, it is important to quickly identify what they want and set their expectations appropriately. We also have to ensure that our patients are receiving perfect surgery, which includes optimizing their ocular surface and their macular function. ■

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CME QUESTIONS

1. When making the capsulorhexis, what type of ophthalmic viscosurgical device is better able to flatten the anterior capsular convexity?

- a. a combination OVD
- b. a maximally dispersive OVD
- c. a maximally cohesive OVD
- d. none of the above

2. Capsular pseudoelasticity is a condition stemming from

- a. the elasticity of pediatric anterior capsules
- b. weak zonules
- c. a capsular flap that is too long

3. A capsular ring should never be implanted when?

- a. before completing the capsulorhexis
- b. after completing the capsulorhexis
- c. before beginning the capsulorhexis

4. In the presence of significant zonular laxity, what size capsulorhexis does Dr. Chang advocate?

- a. large
- b. small

5. After cataract surgery, what is the chief enemy to achieving high contrast sensitivity?

- a. corneal dryness
- b. induced astigmatism
- c. macular edema
- d. retinal swelling

6. The rate of postsurgical cystoid macular edema can be as high as

- a. 15%
- b. 20%
- c. 30%
- d. 35%

7. Which agent is effective at preventing infections and inhibiting prostaglandins but ineffective at blocking the arachidonic cascade?

- a. topical steroids
- b. NSAIDs

8. Why are conventional LASIK enhancements a better option than customized enhancements for most recipients of presbyopia-correcting IOLs?

- a. conventional enhancements allow for better outcomes
- b. customized enhancements are not necessary with multifocal lenses
- c. aberrometers do not recognize multifocal IOLs accurately
- d. none of the above

9. If topical NSAIDs are not used perioperatively, patients who undergo conventional cataract surgery with no risk factors and no capsular breakage have what chance of experiencing visually significant CME?

- a. up to 12%
- b. up to 10%
- c. up to 14%
- d. up to 8%

10. Identify a preoperative therapy for treating dry eye.

- a. punctal occlusion
- b. oral omega-3 fatty acids
- c. artificial tears
- d. all of the above

