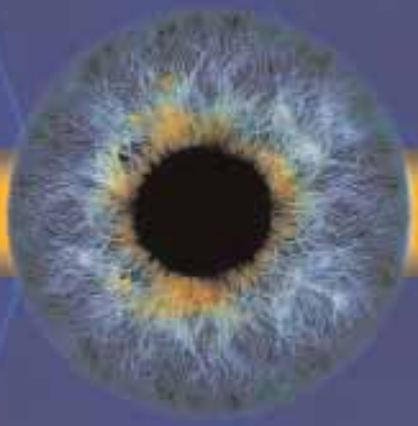
Supplement to

Supported by an unrestricted educational grant from Alcon Laboratories, Inc.

Cataract & Refractive Surgery TODAY

September 2007



Conquering the Challenges of Refractive IOLs

Based on highlights from the summer 2007 CME symposia series.

This continuing medical education activity is jointly sponsored by

Conquering the Challenges of Refractive IOLs

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Jointly sponsored by The Dulaney Foundation and *Cataract & Refractive Surgery Today.*

Release date: September 2007. Expiration date: September 30, 2008.

This continuing medical education (CME) activity is supported by an unrestricted educational grant from Alcon Laboratories, Inc.

STATEMENT OF NEED

This CME-accredited course will provide cataract and refractive surgeons with an unbiased and broad-based view on achieving success with the different refractive IOL technologies available. Leading ophthalmologists will discuss the necessary surgical steps in conquering refractive IOL challenges. Data on proper antibiotic prophylaxis and nonsteroidal anti-inflammatory drug use to prevent cystoid macular edema complications related to these procedures will be presented.

TARGET AUDIENCE

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

LEARNING OBJECTIVES

Upon successful completion of this activity, participants should be able to:

- review and understand technology-dependent parameters to optimize patient outcomes with refractive IOLs;
- outline appropriate presurgical prophylaxis to maximize outcomes and prevent CME;
- list key criteria of patient selection for successful refractive IOL results and patient satisfaction; and
- develop a surgical technique to reduce the possibility of infection.

METHOD OF INSTRUCTION

Participants should read the learning objectives and CME program in their entirety. After reviewing the material, they must complete the self-assessment test, which consists of a series of multiple-choice questions. This test is available exclusively online at www.CMEToday.net. Once you register and log in, you can take the test, receive real-time results, and print out your certificate.

Please e-mail afagan@bmctoday.com or call (484) 581-1824 if you have any questions or technical problems with the Web site.

Upon completing the activity and achieving a passing score of over 70% on the self-assessment test, you can print out a CME credit letter awarding *AMA/PRA Category 1 Credit™*. The estimated time to complete this activity is 1 hour.

ACCREDITATION

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, Bryn Mawr Communications Group LLC, and Bryn Mawr Communications LLC, publisher of *Cataract & Refractive Surgery Today*. The Dulaney Foundation is accredited by the Accreditation Council for Continuing Medical Education to sponsor continuing education for physicians. The Dulaney Foundation designates this educational activity for a maximum of 1 *AMA/PRA Category 1 Credit™*. Physicians should only claim credit commensurate with the extent of their participation in the activity.

DISCLOSURE

In accordance with the disclosure policies of The Dulaney Foundation and to conform with ACCME and FDA guidelines, all program faculty are required to disclose to the activity participants: (1) the existence of any financial interest or other relationships with the manufacturers of any commercial products/devices, or providers of commercial services that relate to the content of their presentation/material or the commercial contributors of this activity; and (2) identification of a commercial product/device that is unlabeled for use or an investigational use of a product/device not yet approved.

FACULTY CREDENTIALS

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FACULTY DISCLOSURE DECLARATIONS

Paul J. Dougherty, MD, receives grant/research support from Allergan, Inc., and Nidek, Inc.; he is a consultant for Allergan, Inc., Alcon Laboratories, Inc., Nidek Inc., and Lenstec, Inc.; he is on the speakers list for Allergan, Inc., Alcon Laboratories, Inc., Nidek Inc., and Lenstec, Inc.; and he is a stock/shareholder in STAAR Surgical Company and Lenstec, Inc.

Rex Hamilton, MD, has received honoraria and travel support from Alcon Laboratories, Inc., Allergan, Inc., and Reichert Instruments for educational lectures.

Terrence P. O'Brien, MD, is an ad hoc nonsalaried consultant for Alcon Laboratories, Inc., Allergan, Inc., Bausch & Lomb, Advanced Medical Optics, Inc., and Inspire Pharmaceuticals, Inc.

Pharmacologic Tools for Refractive Cataract Surgery

A review of the latest standards of care in perioperative therapeutics.

BY TERRENCE P. O'BRIEN, MD

Ophthalmic surgeons are now in a brave new world of advanced customized cataract surgery. Although transitioning to this new category is exciting, it also presents unique challenges. Today's refractive cataract patients expect more from their surgeries than their predecessors. Fortunately, we have new technologies, devices, and surgical strategies to help us optimize patients' outcomes, provide high levels of satisfaction, and improve their quality of life. Following are a number of pharmacologic tools, surgical devices, and practices that have proven beneficial in meeting high patient expectations.

LIDOCAINE GEL

Certain pharmaceutical tools allow us to improve the odds for success with premium refractive lenses. Several years ago, my team and I began applying lidocaine jelly to the corneal surface after instilling prophylactic antiseptic and antibiotic and just before creating the incision. A comparison of the corneal anesthetic effects of a single application of lidocaine gel and multiple tetracaine eyedrops assessed with the Cochet-Bonnet aesthesiometer (Luneau Ophthalmologia, Chartes, France) showed that applying both agents equally reduced corneal sensation at 5 minutes after the procedure's start and at its conclusion. The lidocaine gel, however, induced less toxicity. We also found no difference between the gel and the tetracaine drops for controlling postoperative pain.[1]

NSAIDs

Ophthalmic nonsteroidal anti-inflammatory drugs (NSAIDs) can augment topical anesthesia by providing supplemental analgesia, and certain formulations even deliver a slight anesthetic effect. NSAIDs should not replace topical corticosteroids, because the latter work further upstream, inhibiting the formation of arachidonic acid and other metabolites to feed into the cyclooxygenase pathway and also potently inhibit the immune system and induction of matrix metalloprotease levels. Corticosteroids also prevent metabolites from feeding into the lipooxygenase pathways to form reactive leukotrienes.

NSAIDs, in contrast, work mainly on the cyclooxygenase pathway to inhibit proinflammatory prostaglandin markers (Figure 1).[2] Concerns about the safety of certain

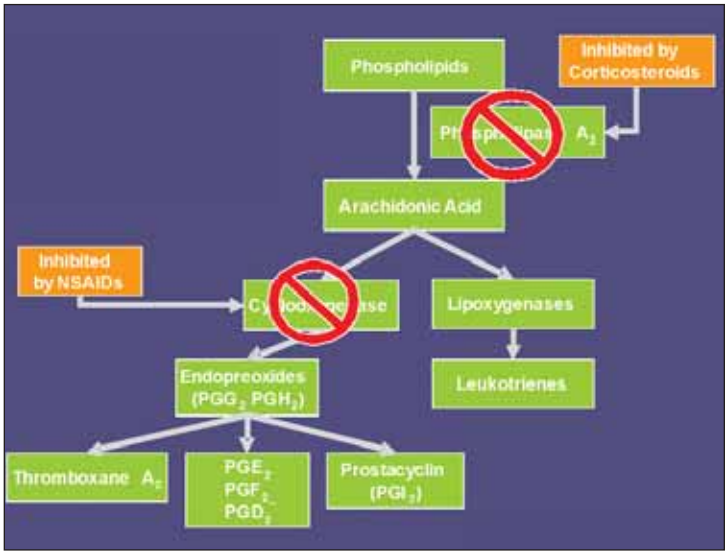

Figure 1. NSAIDs' mechanism of action. (Jampol LM. Pharmacologic therapy of aphakic cystoid macular edema. A review. *Ophthalmology*. 1982;89:8:891-897.[2])

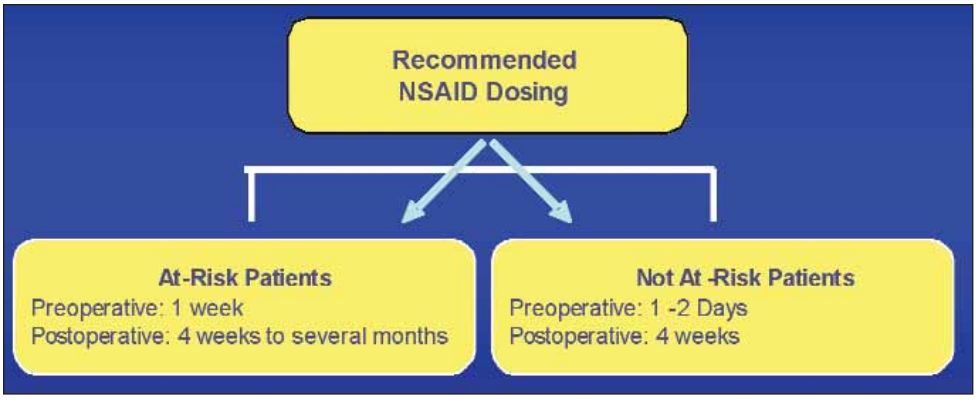

Figure 2. This image illustrates what the author considers to be the appropriate use of NSAIDs in the prevention of CME. (O'Brien TP. Emerging guidelines for use of NSAID therapy to optimize cataract surgery patient care. *Curr Med Res Opin*. 2005;21:7:1131-1137.[4])

earlier-generation NSAIDs have been overridden by the new-generation products that possess high potency and excellent biocompatibility.

Using NSAIDs pre- and postoperatively increases the surgical success of premium refractive IOLs in several ways. First, they decrease the likelihood of intraoperative miosis and maintain papillary mydriasis. They prime the anti-inflammatory cascade by the potent inhibition of the key enzymes that contribute to surgically triggered tissue inflammation. Perhaps most importantly, however, NSAIDs prevent the occurrence of cystoid macular edema (CME). Colgin, Raizman, and colleagues showed that CME occurs more often than previously thought. Even in routine, low-risk cases, the incidence is as high as 12%.[3]

In my practice, an optical coherence tomographic examination not infrequently discloses subclinical or clinical CME in cataract patients, even after perfect surgery. Even gifted, experienced surgeons who complete their surgeries quickly without excessive tissue injury will cause a release of prostaglandins, thus necessitating the use of NSAIDs, in my opinion.

How can we prevent CME, which is more prevalent than endophthalmitis? First, we must identify at-risk patients. Even eyes with background diabetic retinopathy or an epiretinal membrane are now considered at risk. Because I think it is better to prevent than to treat a condition like CME, I recommend that all cataract patients receive a topical NSAID together with a topical steroid pre- and postoperatively, because these agents work synergistically. The periocular and intravitreal use of steroids are also options, but they have risks. I recommend dosing at-risk patients t.i.d. for 2 to 3 days before surgery and continuing this regimen for at least 4 weeks after (Figure 2). I start even earlier with patients who are at high risk for CME and continue even longer, beginning at t.i.d. to q.i.d. for 1 to 2 weeks preoperatively and continuing for 6 to 8 weeks postoperatively.[4]

The ideal ocular NSAID would have excellent penetration and potency but would also be nontoxic and comfortable. Some new-generation NSAIDs have improved on these properties over the older formulations. For example, bromfenac ophthalmic solution 0.09% (Xibrom; Ista Pharmaceuticals, Irvine, CA) and nepafenac ophthalmic suspension (Nevanac, Alcon Laboratories, Fort Worth, TX) each have a higher affinity for the cyclooxygenase 1 and 2 enzymes, resulting in greater inhibition. Nepafenac ophthalmic suspension 0.1% (Nevanac; Alcon Laboratories, Inc., Fort Worth, TX) has a unique prodrug formulation that converts to amfenac (Figure 3), a potent inhibitor of inflammation, upon dosing and distributes throughout the eye, including the cornea.

A retrospective study of cataract surgeries conducted by Richard Braunstein, MD, from Columbia University in New York, found that patients dosed with both

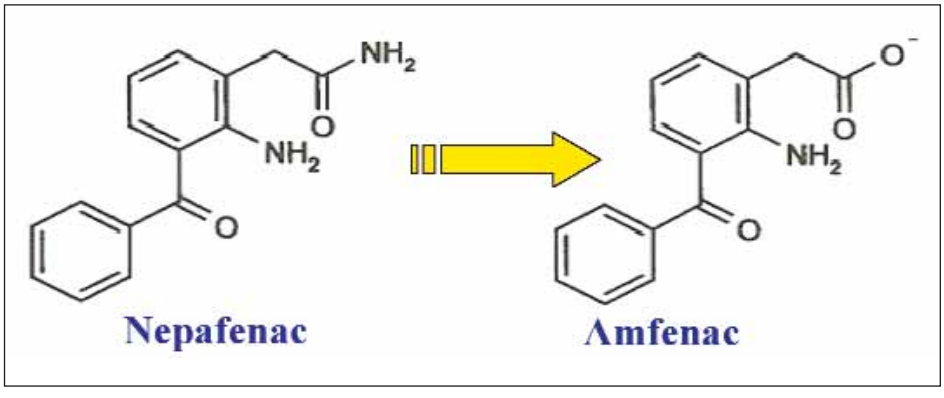

Figure 3. The chemical representation of nepafenac's conversion to amfenac.

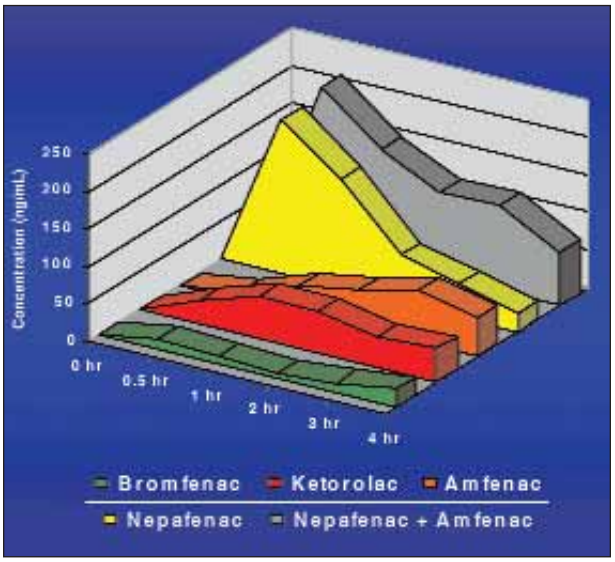

Figure 4. Human aqueous humor concentrations of NSAIDs. (Walters TR, Raizman M, Ernest P, et al. A double-masked, randomized, single-dose, pharmokinetic study of nepafenac, amfenac, ketorolac, and bromfenac in human aqueous humor following topical administration of NEVANAC, ACULAR LS, or XIBROM. Paper presented at: The 2007 ARVO Annual Meeting; May 6, 2007; Fort Lauderdale, FL.)

nepafenac and a steroid had a lower incidence of CME.[5] Figure 4 shows the concentrations of the currently available NSAIDs. Given the unique prodrug formulation of nepafenac, this compound is converted to a potent metabolite, amfenac, which steadily increases in tissue concentration as conversion ensues with time. The combination of nepafenac and amfenac has a much higher area under the curve, meaning that much more drug is potentially bioavailable to prevent inflammation and CME. Topically administered Nevanac has the capability of penetrating to the posterior segment of the eye, potentially reducing levels of prostaglandin intermediates in the vitreous humor and posterior segment (Figure 5).

ANTIBIOTICS

Any ophthalmic procedure that penetrates the eye carries a high potential risk of postoperative infection. Our best defense against this type of complication is to prevent the microorganisms that are normally found on the ocular surface from entering the eye. We do this either mechanically (by sequestering the ciliary body and the meibomian glands from the surgical field) or pharmacologically (by applying topical antiseptics and antibiotics). The ESCRS recently completed a multicenter study that explored the efficacy of intracameral cefuroxime for preventing infections after cataract surgery.[6] Although the study appeared to show that intracameral cefuroxime reduced the incidence of endophthalmitis, it included many variables, some of which were not completely controlled between surgeons from across the European Union. If you choose to use cefuroxime intracamerally, understand that this use is not FDA-approved. In the ocular microbiology laboratory, my colleagues and I did not find intracameral cefuroxime very effective against methicillin-resistant

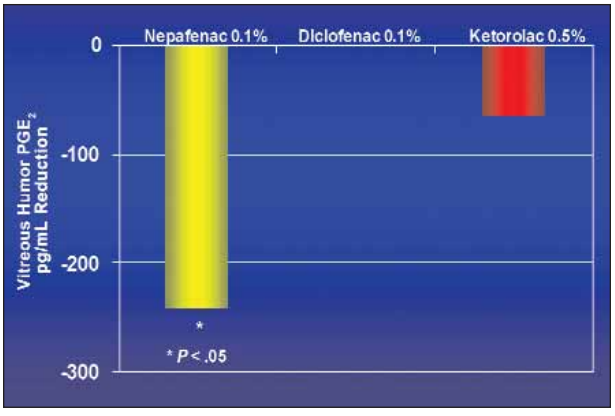

Figure 5. Decline in vitreous PGE_2 with prophylactic NSAID treatment in preclinical model. (Lindstrom R, Kim T. Nepafenac ocular penetration and inhibition of retinal inflammation: an examination of data and opinion of clinical utility. *Curr Med Res & Opin*. 2006;22:2:397-404, and Kapin MA, Yanni JM, Brady MT, et al. Inflammation-mediated retinal edema in the rabbit is inhibited by topical nepafenac. *Inflammation*. 2003;27:5:281-291.)

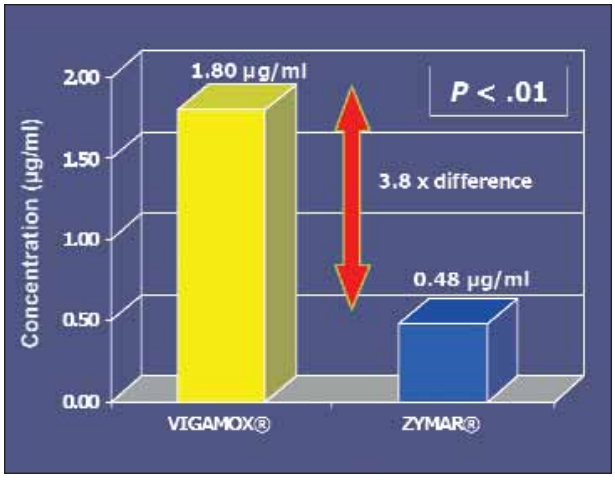

Figure 6. The mean C_{max} of moxifloxacin and gatifloxacin in the aqueous humor. (Kim DH, Stark WJ, O'Brien TP, Dick JD. Aqueous penetration and biological activity of moxifloxacin 0.5% ophthalmic solution and gatifloxacin 0.3% solution in cataract surgery patients. *Ophthalmology*. 2005;112:11:1992-1996. Epub 2005 Sep 23.[7])

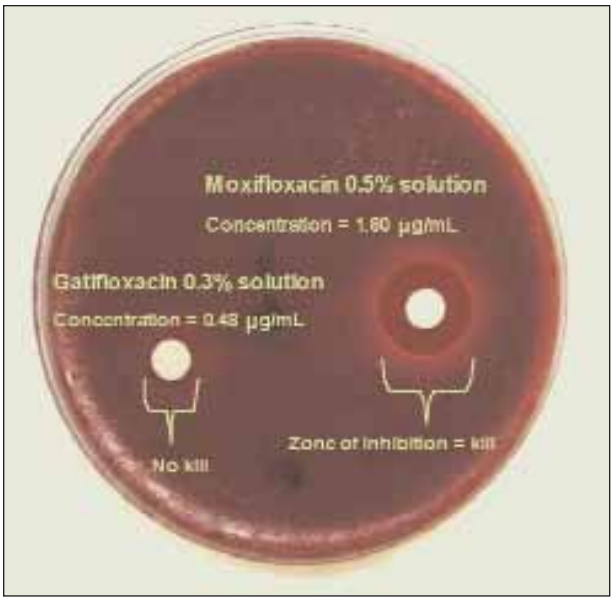

Figure 7. The author and colleagues used disc-diffusion analysis to test the zone of inhibition of moxifloxacin 0.5% and gatifloxacin 0.3% versus *S. aureus*. They found a zone of inhibition for moxifloxacin 0.5% solution (24 mm) and no zone of inhibition for gatifloxacin 0.3% solution. Also, moxifloxacin 0.5% solution demonstrated a greater antimicrobial activity than gatifloxacin 0.3% solution. (O'Brien TP, Stroman DW. A comparison of ocular penetration and microbiological efficacy of fourth generation fluoroquinolones in cataract surgery patients. Paper presented at: The Ocular Microbiology and Immunology Group meeting; October 15, 2005; Chicago, IL.)

Staphylococcus aureus, *S. epidermidis*, *S. Enterococcus*, or *Pseudomonas* with in vitro testing. Furthermore, because cefuroxime is not distributed in commercially available premixed doses and must be diluted, using an incorrect concentration of the drug can cause ocular toxicity or even death in patients who have beta-lactam hypersensitivity.

An ongoing debate among ophthalmologists is whether antibiotics should be used routinely in cataract surgery. Medical and medicolegal reasons argue both for and against such a policy. One strategy would be to identify high-risk patients who need antibiotics more than their healthier counterparts, adjust our surgical plans accordingly, and, for our protection, consider asking these patients to sign an additional informed consent form. We should also use the best therapeutic agents available, such as gatifloxacin and moxifloxacin (the "smart bombs" of antimicrobial warfare). Compared with drugs from previous generations, these new antibiotics' formulations and pharmacodynamics give them greater potency against microorganisms and allow them to reach the compromised sites better. Colleagues and I found an almost fourfold difference in the achieved concentration in aqueous humor with topical dosing for moxifloxacin 0.5% versus gatifloxacin 0.3% that could not be explained by the difference in their concentrations alone (Figure 6).

Moxifloxacin induced a higher zone of inhibition (indicating a greater kill) in a disc of *S. aureus* than gatifloxacin, which demonstrated no antibiotic effect (no kill zone) against the bacteria (Figure 7).

TAKE-HOME MESSAGES

Combine a preoperative topical antiseptic and a potent, bactericidal antibiotic application to enhance the efficacy of each drug. I think the jury is still out on whether or not to use intracameral antibiotics for all routine cases not perceived at higher risk. Postoperatively, use topical antibiotics with a short-term, high-dose pulse approach to protect the eye during its window of vulnerability. If you have any doubt that stromal hydration is sufficient, place a 10–0 nylon or 10–0 Vicryl suture (Ethicon Inc., Somerville, NJ). This step adds about $16 to the surgery, but you will sleep better at night.

My friend, patient, and noted author Tom Clancy reminded me of an old saying in the US Navy: "Never trade luck for skill." I have a corollary that I try to impart to our young resident and fellow physicians in training: "Chance favors the prepared ocular surgeon." The better prepared we are, the better we are going to perform surgery and meet our cataract patients' increasingly high expectations. ▲

1. Barequet IS, Soriano ES, Green WR, O'Brien TP. Provision of anesthesia with single application of lidocaine 2% gel. *J Cataract Refract Surg.* 1999;25:5:626-631.

2. Jampol LM. Pharmacologic therapy of aphakic cystoid macular edema. A review. *Ophthalmology.* 1982;89:8:891-897.

3. McColgin AZ, Raizman MB. Efficacy of topical diclofenac in reducing the incidence of postoperative cystoid macular edema. *Invest Ophthalmol Vis Sci.* 1999;40:S289.

4. O'Brien TP. Emerging guidelines for use of NSAID therapy to optimize cataract surgery patient care. *Curr Med Res Opin.* 2005;21:7:1131-1137.

5. Wolf EJ, Braunstein A, Shih C, Braunstein RE. Incidence of visually significant pseudophakic macular edema after uneventful phacoemulsification in patients treated with nepafenac. *J Cataract Refract Surg.* 2007;33:9:1546-1549.

6. Endophthalmitis Study Group, European Society of Cataract & Refractive Surgeons. Prophylaxis of postoperative endophthalmitis following cataract surgery: results of the ESCRS multicenter study and identification of risk factors. *J Cataract Refract Surg.* 2007;336:978-988.

7. Kim DH, Stark WJ, O'Brien TP, Dick JD. Aqueous penetration and biological activity of moxifloxacin 0.5% ophthalmic solution and gatifloxacin 0.3% solution in cataract surgery patients. *Ophthalmology.* 2005;112:11:1992-1996. Epub 2005 Sep 23.

Advantages and Challenges of New IOLs

A primer to aid in the selection of premium refractive IOLs.

BY REX HAMILTON, MD

Because ophthalmologists do not yet have the perfect lens implant for the baby boomer population, it is helpful to understand the subtleties of the three currently available FDA-approved premium IOLs in order to select the best one for our patients' needs.

THE ACRYSOF RESTOR IOL

The AcrySof Restor lens (Alcon Laboratories, Inc., Fort Worth, TX) is based on the company's familiar SN platform and features optics that operate independently of pupil size. As with any multifocal platform, the AcrySof Restor IOL reduces contrast sensitivity, although I expect this to be less of an issue with the just-released aspheric version of the lens. The lens' satisfactory intermediate vision may also be better with its aspheric version. Furthermore, patients need time to neuroadapt to the Restor's optics, which can delay any postoperative "wow factor."

THE CRYSTALENS ACCOMMODATING IOL

The Crystalens accommodating IOL (Eyeonics, Inc., Aliso Viejo, CA) does not introduce the same quality-of-vision issues as multifocal lenses and therefore is better tolerated by a larger range of patients (and personalities). Its latest version is the AT-50 SE, which was released in late 2006.

A primary challenge with the Crystalens is its relatively unpredictable refractive endpoint, which can be more pronounced in hyperopes. Refractive predictability is greatly improved, however, in my early experience with the AT-50 SE. Also, when targeting emmetropia in both eyes, the lens' unaided near vision is not as good as that with the AcrySof Restor lens. I believe that most surgeons find that the Crystalens performs best with "mini-monovision," in which the surgeon targets -0.50 to -0.75 D in the nondominant eye. Mini-monovision avoids the decrease in depth perception associated with full monovision, yet provides excellent near vision, routinely in the J3 range, in my experience.

The Crystalens' implantation differs somewhat from routine 5- to 10-minute cataract surgery. Surgeons experience a learning curve for creating a consistent, correctly sized capsulorhexis (5.5 mm). Also, meticulous cortical clean-up is essential to avoid asymmetric fibrosis, which can lead to anterior and/or asymmetric vaulting of the lens.

THE REZOOM MULTIFOCAL IOL

Advantages of the ReZoom multifocal IOL (Advanced Medical Optics, Inc., Santa Ana, CA) include its high level of spectacle independence and better near vision than the Crystalens (although perhaps not with mini-monovision). Also, most patients prefer the ReZoom's reading position to the AcrySof Restor's, which is closer in range. Many surgeons feel that this lens also provides better intermediate vision than the Restor, although this difference may become less significant with the Restor aspheric lens. Like the Restor, the ReZoom reduces contrast sensitivity and requires neuroadaptation. Its glare and halos may be more significant than the AcrySof Restor's and persist longer, in my experience.

The ReZoom's largest drawback, in my opinion, is that its central optical zone is distance-dominant, which will give an eye with a small pupil very poor near vision in bright light. Thus, surgeons need to carefully evaluate pupil size in prospective patients.

CHALLENGES TO OPTIMAL VISION

Most importantly, postoperative astigmatism and posterior capsular opacification impair the visual function of a multifocal lens and must be minimized. Thus, I frequently perform a YAG laser capsulotomy with these lenses. Other comorbidities include epiretinal membranes, diabetic retinopathy, and macular degeneration. A dense cataract can obscure subtle epiretinal membranes, so I often evaluate patients preoperatively with optical coherence tomography. Epiretinal membranes can affect vision and also predispose an eye to cystoid macular edema (CME). CME can greatly decrease the performance of all of these lenses, particularly the multifocal IOLs. I recommend CME prophylaxis in all premium-IOL recipients. Finally, an eye with diabetic retinopathy needs to be very well controlled and have good macular function. Macular degeneration is often a contraindication to using a multifocal IOL, depending on the type. ▲

Managing the Multifocal Patient

Strategies for selecting patients and setting expectations.

BY PAUL J. DOUGHERTY, MD

Today's lenticular surgery is not the same cataract surgery we performed 10 years ago, where we placed a monofocal lens into every eye. Refractive cataract surgery strives to improve patients' quality of life by minimizing their need for glasses or contact lenses.

Two keys to success with premium refractive IOLs are selecting the appropriate patients and managing their expectations. Following are the strategies that have helped me succeed with these lenses.

PATIENT SELECTION

Premium refractive IOLs are not for everybody. You must take into account a patient's lifestyle, occupation, medical history, and expectations. I automatically exclude anyone who requires perfect distance vision, drives extensively at night, has unrealistic expectations for their vision, or may not be able to adapt to the technology. Also, I proceed cautiously with patients who have preexisting corneal or retinal pathology.

I use a personally modified version of the questionnaire by Steven Dell, MD, of Austin, Texas (available at http://www.crstoday.com/Pages/Dellindex.doc) to screen patients for cataract surgery or refractive lens exchange with premium refractive IOLs and determine which option I should offer them. The form asks patients about their occupation, hobbies, and expectations, as well as what zones of vision are most important to them, whether they need a particular range of vision, and if they will tolerate spectacles for reading or distance vision. Perhaps most importantly, I ask them to rate their expectation for visual perfection. Then, depending on how patients answer these questions, I explain that certain IOLs can provide both distance and near vision, if the patient is willing to accept their out-of-pocket costs and the possible limitations of presbyopic technology.

SETTING EXPECTATIONS

Managing patients' expectations about multifocal IOLs requires a lot of chair time for the surgeon. First, I explain to patients that the procedure is bilateral and that they will not be satisfied with their vision until I implant the lens in both eyes. I think this is one of the most important expectations we need to set with these individuals (and a good one to reiterate after the initial implantation). Also, patients need to know that multifocal IOLs, particularly the AcrySof Restor (Alcon Laboratories, Inc., Fort Worth, TX), provide fairly close-range reading vision. The AcrySof Restor has a 4.00 D add and a set point of 31 cm, or about 12 to 13 inches. With time, patients adapt to the IOL and can expand their range of reading vision, but it is important that we be specific about the range they will likely have immediately preoperatively.

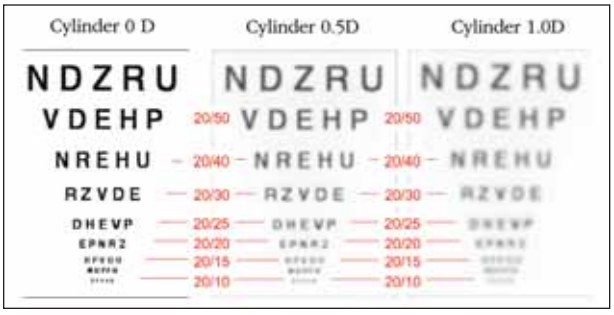

Figure 1. This chart illustrates how even a small amount of cylinder can distort vision for refractive IOL patients.

Patients must also be aware of the possibility that they may see glare and halos at night. Approximately 5% of patients who receive the AcrySof Restor and ReZoom multifocal (Advanced Medical Optics, Inc., Santa Ana, CA) IOLs experience these symptoms, 20% of which are described as mild to moderate.[1] Although these problems tend to improve with time, patients must be made aware of their possibility preoperatively. If driving at night is significantly important to a patient, I might steer him toward an accommodative IOL such as the Crystalens (Eyeonics, Inc., Aliso Viejo, CA) or the investigational Tetraflex accommodating IOL (Lenstec, Inc., St. Petersburg, FL).

DISSATISFACTION AFTER INITIAL IMPLANTATION

When patients complain about their vision after a multifocal IOL's implantation in their first eye, we must always consider whether they will be happier or more discontented after they receive the second lens. Full neuroadaptation can take up to 6 months, during which time patients continue to improve bilaterally.

In a planned bilateral AcrySof Restor procedure, I always implant the nondominant eye first, whether or not it has the worse cataract. This approach tests the patient's reaction to the lens' optics. For example, if the patient says that his reading vision is good but a little close and that he is not particularly happy with his intermediate vision, I will then make the dominant eye +0.50 D to extend both the reading and the intermediate visions outward.

DISSATISFACTION AFTER BILATERAL IMPLANTATION

Refractive Error

If the patient is still unhappy with his vision a few months after bilateral implantation, I first look at his refractive error, because in my experience, this is most likely the cause of his dissatisfaction. Because patients who receive multifocal IOLs are very sensitive to low degrees of refractive error, you should not consider implanting these lenses unless you are willing to fine-tune the patient's vision postoperatively with laser vision correction.

Sphere

I find that the biggest culprit in missed spherical outcomes is that the surgeon did not have a personalized A-constant. I believe the best way to personalize an A-constant is with immersion A-scan or the IOLMaster (Carl Zeiss Meditec, Inc., Dublin, CA). I use the IOLMaster, because I find the applanation method less accurate and more technician-dependent.

Cylinder

As little as 0.50 D of cylinder will make multifocal lens patients unhappy, and 1.00 D of cylinder can be a serious issue (Figure 1). I disregard the refractive cylinder, because it may include lenticular cylinder. I treat anyone with 1.00 D or more of corneal cylinder aggressively with a limbal relaxing incision during the implantation surgery. If, however, the patient continues to have visually significant sphere or cylinder at 3 months, I have no issues with performing LASIK surgery after clear corneal, sutureless lens surgery.

Posterior Capsular Opacification

It is often difficult to determine whether patients' postoperative visual complaints are due to mild postoperative posterior capsular opacification. If I believe a patient's main visual complaint is capsular, I will perform a capsulotomy, although this procedure makes it much more difficult to perform a refractive lens exchange. Also, treating posterior capsular opacification maximizes patients' intermediate vision.

Dry Eye

Even a subtle disturbance in the tear film can make multifocal patients unhappy, particularly if they are older. I like to normalize multifocal patients' tear film with Restasis ophthalmic emulsion (Allergan, Inc., Irvine, CA) before I insert punctal plugs.

Cystoid Macular Edema

Even subtle swelling from cystoid macular edema can create significant visual dissatisfaction in a multifocal patient. I use optical coherence tomography (Carl Zeiss Meditec, Inc., Dublin, CA) to evaluate macular thickness. I will aggressively start a topical steroid (I prefer Econopred Plus [Alcon Laboratories, Inc.]) and a topical NSAID (my preference is Nevanac ophthalmic prodrug [Alcon Laboratories, Inc.] because of its posterior penetration) in the event of even minor increases in macular thickness.

VISUAL FLUCTUATIONS

Sometimes, multifocal patients who are initially happy with their vision later complain of decreased near or distance visual acuity or experience more halos and glare. You must determine what has changed in their eyes. Perhaps the lens has moved as the capsule has contracted. It is also possible for postoperative refraction to change as the corneal wound or an LRI heals and cylinder returns. Of course, you should always examine the posterior capsule. Fortunately, mild-to-moderate cases of glare and halos tend to improve with time. Thus, I ask patients who are complaining of these symptoms at 3 months to wait another 3 to 6 months before I begin considering a lens exchange.

DIFFERENT SURGERY, DIFFERENT PATIENTS

Above all, remember that premium refractive IOL patients are paying a lot more money than patients undergoing standard lens-replacement surgery and therefore have higher expectations about their visual outcomes. These individuals are also much more likely to be litigious than traditional cataract patients, so you should document all aspects of your preoperative discussion in their clinical charts. Most importantly, do not guarantee that refractive IOLs will free patients from eyeglasses. Many of my patients who receive AcrySof Restor IOLs use spectacles for computer work. Instead, stress that you are trying to minimize, not eliminate, their need for glasses. ▲

1. AcrySof ReSTOR IOL [package insert]. Fort Worth, TX: Alcon Laboratories, Inc.; 2006.

CME QUESTIONS

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1. Which of the following is a comorbidity to implanting multifocal IOLs?
a. Induced astigmatism
b. Posterior capsular opacification
c. Epiretinal membranes
d. Diabetic retinopathy
e. Macular degeneration
f. All of the above
g. None of the above

2. Which multifocal IOL's central optical zone is distance dominant?
a. The AcrySof Restor IOL's.
b. The ReZoom IOL's
c. The Crystalens accommodating IOL's

3. Neuroadaptation is a primary cause of a delayed "wow factor" with multifocal lens implantation.
a. True
b. False

4. Approximately what percentage of patients who receive multifocal implants experience postoperative glare and halos at night?
a. 2%
b. 3%
c. 4%
d. 5%

5. Approximately what percentage of visual symptoms with multifocal IOLs is described as mild to moderate?
a. 10%
b. 15%
c. 20%
d. 25%

6. A capsulotomy excludes the possibility of subsequently performing a refractive lens exchange.
a. True
b. False

7. What do some researchers now believe is the risk of postoperative cystoid macular edema in intraocular surgeries?
a. As high as 6%
b. As high as 10%
c. As high as 12%
d. As high as 14%

8. Which antibiotic achieved a greater kill zone against *Staphylococcus aureus* in a laboratory study?
a. Gatifloxacin
b. Moxifloxacin
c. Cefuroxime

9. NSAIDs inhibit the formation of arachidonic acid and other metabolites.
a. True
b. False

10. The intracameral use of cefuroxime is not approved by the FDA.
a. True
b. False