

Claoué: In my own studies, patients prefer to be spectacle independent by a ratio of at least 2:1. However, presbyopia-correcting IOLs have a cost, and I am horrified that whereas my state-funded cataract patients have been able to have multifocal IOLs for the past 10 years, they are no longer available simply for cost considerations. I think that some of the reluctance on behalf of surgeons has been the halos story. This can eat into chair times and particularly if managed poorly. If a patient tells me they can see halos in the early postoperative period, they just want to be reassured that nothing is wrong. They are not really complaining. My management is to say, "You can see halos; that is great—it proves that the lens is working properly!" The patient heaves a sigh of relief and does not worry about this again. Now, this does not mean that I am not listening to my patients; I am, and very closely! But, to think that everything that a patient mentions is a criticism is simplistic. Doctors are there to make patients happy. The patient's psychological environment includes a sympathetic and reassuring surgeon.

Hardten: I believe that surgeons hesitate because there is no easy cookbook approach to making them work in an individual practice. Moreover, it is a lot of work to educate patients, manage their expectations, and perform enhancements.

Pepose: A big mistake that some surgeons make early on is to present patients with a menu of IOL options rather than be the doctor and make a recommendation. The patient just goes away confused.

Knorz: In addition, you need to offer laser refractive surgery or partner with someone who performs it. I would estimate that, even for the best surgeons, approximately 5% to 10% of patients will not have an emmetropic result after IOL implantation. These patients need additive laser vision correction. If you cannot achieve spectacle independence, then they will not be happy.

Patient Selection and Counseling

Chang: What tips do you have regarding selecting and counseling patients?

Hardten: One issue is the mismatch between patients who are ideal physical candidates and those who are ideal emotional candidates, meaning the ones who really desire presbyopic correction. For example, an 85-year-old lady who sees 20/100 with cataracts and

"Women are mostly satisfied with bilaterally implanted diffractive lenses, and mixing and matching is a better solution for men."

—Magda Rau, MD

whose husband does all the driving would do well physically with presbyopia-correcting IOLs, but she is not motivated to pay for them. In contrast, a 48-year-old race car driver who has had LASIK and sees 20/20 but is frustrated with early presbyopia may be highly motivated but would be tough to please with these lenses.

Knorz: If I want to give patients an idea of what their vision will be like postoperatively, I have them wear multifocal contact lenses. In my experience, low myopes are the most likely to be dissatisfied. Individuals who like the multifocal contact lenses are almost always happy with multifocal IOLs.

Hardten: Patients who present with minimal cataracts but complain bitterly about halos and glare are really tough to please with multifocal IOLs. Those who tolerate their cataracts reasonably well will probably be satisfied by these lenses.

Claoué: Implanting refractive multifocal IOLs only requires three things: normal eyes, normal patients, and normal surgery. If you avoid excessively perfectionist patients, then it is difficult to have a problem.

As to what to say to patients: under-promise and over-perform. This means superlative biometry and personalizing your A-constant, telling patients that they will need to wear glasses occasionally (even though you know many or most will not), and having no hesitation in rejecting patients whose aspirations are unreasonable.

Donnenfeld: Ophthalmologists should hold an open preoperative discussion with patients, in which they explain the procedure's risks and benefits, but they should emphasize that problems can be resolved.

Patient selection is certainly key, but it is more important to do all you can preoperatively to guarantee a successful outcome. I seek to optimize the ocular surface by ensuring that the patient has a healthy tear film. In addition, I prescribe an NSAID 3 days preoperatively and 1 month postoperatively to avoid CME.

Rau: Men and women accept multifocal lenses differently. For the most part, men find the distance vision more important, whereas the women are more interested in details. Therefore, women are mostly satisfied with bilaterally implanted diffractive lenses, and mixing and matching is a better solution for men.

Mixing or Matching Lenses

Chang: This is a good transition to the next topic. One of the hottest topics this past year has been whether to mix different refractive IOLs. What are you all currently doing?

Claoué: I have always held that putting different IOLs into the eyes of a single visual system was a way to create unhappy patients. Nevertheless, surgeons that I respect are describing good results with mix and match. My concern is the chair time. The mix and match brigade say, "The patient is not so happy with the first IOL, so I will put a different one in the second eye." But, surely the patient will want a detailed explanation as to why the latter IOL wasn't used in the first eye.

Pepose: I participated in a study that compared 49 patients' vision with (1) bilateral Crystalens implants, (2) bilateral ReZoom lenses, (3) bilateral AcrySof Restor IOLs, (4) a Crystalens in their dominant eye and a ReZoom lens in their nondominant eye, and (5) a Crystalens in their dominant eye and the AcrySof Restor IOL in their nondominant eye.³ My colleagues and I found that the bilateral Crystalens was superior in terms of distance BCVA, intermediate UCVA and BCVA, and near BCVA. The bilateral AcrySof Restor lens provided the best near UCVA. For the patients who received a combination of IOLs, those with a Crystalens and an AcrySof Restor IOL had the best overall vision in terms of uncorrected Snellen visual acuity at distance, intermediate distance, and near. Based on patients' responses to quality-of-life and quality-of-vision questionnaires, the multifocal lenses did not perform quite as well as the accommodating lens. If you mixed the two, photic phenomena (such as complaints of nighttime glare) were in the middle—not as severe as in patients with bilateral multifocal IOLs but worse than in patients with bilateral Crystalens implants.

Knorz: I originally thought that patients should receive the same bifocal lens in both eyes in order to achieve visual summation. When I looked at my clinical data, however, I found that many of these patients were dissatisfied with their intermediate vision and a few were unhappy with their distance vision. I therefore started to

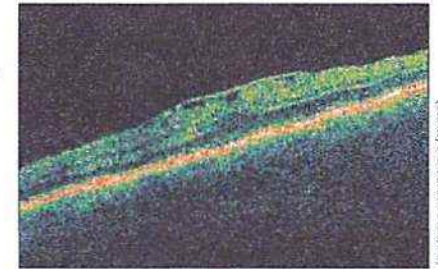


Figure 4. Ocular coherence tomography shows a patient with an epiretinal membrane and CME.

mix presbyopia-correcting IOLs with the distance-dominant lens (ReZoom IOL) in their dominant eye and a near-dominant lens (Tecnis Multifocal IOL) in their contralateral eye. This strategy eliminated my patients' complaints about their distance and intermediate vision.

Pepose: Why would you risk sacrificing some contrast sensitivity rather than implant an accommodating lens in the patient's dominant eye?

Knorz: I am not sure if my answer is the right one. For me, however, there would be too great of a difference in vision between the two eyes. It is like a monofocal and a multifocal lens. If there is too much difference, it will impede neural adaptation. That is why I prefer to use differently balanced multifocal lenses rather than combine a so-called accommodating lens with a near-dominant multifocal lens, as you did with the Crystalens and the AcrySof Restor IOL. This is, however, just a theoretical concern. I have not used the Crystalens IOL yet.

Rau: In the past, I mixed two refractive IOLs, the MF 4 (Carl Zeiss Meditec AG) (central zone for the near) and the Array (central zone for distance) to satisfy the individual needs of patients. I achieved very good results. Later, I combined the refractive and diffractive IOLs in one patient. In my opinion, it is the best method to treat presbyopia.

Now, I implant the ReZoom in the dominant eye and the Tecnis in the other eye to provide the patient with spectacle independence. The ReZoom does not provide near vision that is good enough for presbyopia correction, so bilateral implantation of the ReZoom is mostly not satisfying. Mixing and matching a diffractive and refractive IOL also offers the maximum strength of

(Courtesy of Eric D. Donnenfeld, MD)

refractive and diffractive technologies, providing greater spectacle independence. In my opinion, it is the right answer to meet patients' needs and expectations. The option of mixing and matching gives each surgeon the possibility of satisfying a larger share of patients.

Knorz: Mixing IOLs is just one option in a dynamic process. For example, I implant the ReZoom lens in the patient's dominant eye first and then ask him to read and evaluate his vision. In my experience, patients like their near vision 60% to 80% of the time. If they are satisfied with their near vision, they receive a ReZoom lens in their second eye. Otherwise, I implant a Tecnis Multifocal IOL in their nondominant eye. Other surgeons use this general approach but with their preferred lenses.

Donnenfeld: David Hardten and I have been working together on an international multicenter clinical trial using this approach, and we plan on presenting data at the upcoming annual meeting of the American Society of Cataract and Refractive Surgery. Our goal is to provide patients with the best quality of vision by basing our selection of the second IOL on the patients' evaluation of their quality of vision after their first eye has a lens implant. You can never predict how patients are going to respond to a multifocal IOL until they have one. At that point, why not listen to what they have to tell you?

I have completely changed my way of managing refractive IOL patients. In the past, no matter what happened with their first eye, I implanted the second IOL 2 weeks after the first. Now, I place my preferred IOL in the patient's first eye and follow up with him 1 week later. I resolve any complaints he has before implanting the second IOL. I will treat a residual refractive error with LASIK or limbal relaxing incisions (LRIs). Optimizing the first eye's result enables the patient to tell me if he needs more distance, intermediate, or reading vision. If he is satisfied with the first operation, then I implant the same lens in his second eye. If not, I choose a different IOL for his second eye to provide the vision that the patient desires.

Hardten: I take a similar approach. I place a distance-dominant refractive IOL in patients' dominant eye and assess their result before proceeding with the second implant. Most of the time, my patients have a reasonable range of focus in their first eye with a distance-dominant refractive IOL and can receive the same implant in their second eye.

Pietrini: Most of my patients do not like the idea of receiving two different IOLs, especially when they feel

comfortable with the first one. Except in specific cases, my patients are asking for the same optical system. I have used mix and match with the Acri.Tec TwinSet IOLs (Carl Zeiss Meditec AG). The far dominant IOL had a distribution of light of 70% for far and 30% for near. The near dominant IOL has the opposite distribution (30%/70%). If we had excellent results in binocular vision, we had some patients dissatisfied with the near dominant IOL because of the loss of quality in far vision. Moreover, it is sometimes difficult to choose the right eye for far and near, especially in patients with cataracts or when the same eye is dominant for far and near. Later on, we realized that the far dominant eye gave enough light for good near vision. We then performed implantation of the far dominant IOL in both eyes, leading to better comfort and easier selection for the surgeon. I now always implant the same lens for both eyes.

"The real question is, what data do we need to gather upfront to maximize the patient's satisfaction with his first eye?"

—Jay S. Pepose, MD, PhD

Knorz: You need to listen to the patient. If he is happy with his first eye, then you continue. If there are deficiencies and you think you can fix them, you cure the deficiencies. If you think you cannot fix them, you explain the lens.

Hardten: It is hard to determine whether patients are happy. They are never superbly happy, so you have to help them understand that they are probably going to be happy when both of their eyes have implants and they are finished with any enhancements.

Chang: A staged approach is extremely logical. We have three different presbyopia-correcting lenses in the United States that are complementary in terms of their advantages and disadvantages. You do not want to make the process of selecting an IOL unnecessarily complicated, so you recommend what should work best for each individual. You would likely match the second IOL if they are happy with their first surgical outcome. If, however, they are unhappy about halos or with their vision at one particular distance, you have an opportunity to improve or address this problem with a different IOL in their second eye. Knowing that they have this option helps a lot of patients who oth-

erwise would worry about being trapped with having a lens they did not like (eg, because of halos) in both eyes.

Donnenfeld: When patients come in for surgery, they have concerns, they are scared, and they have done research. You exponentially increase their worries when you start talking about operating on both eyes. I tell them that I am only concerned about their first eye and that they are going to tell me what to do with their second eye. This approach creates a partnership with the patient.

Pepose: The real question is, what data do we need to gather upfront to maximize the patient's satisfaction with his first eye? For example, if we are implanting a zonal progressive lens, should we measure pupillary dynamics? If we know the patient has a small dynamic range, what is the probability that he will be happy with his near vision?

"When patients come in for surgery they have concerns, they are scared, and they have done research."

—Eric D. Donnenfeld, MD

Knorz: The biggest challenge is determining what these patients want and what they are willing to sacrifice. I think the clinical measurements are secondary. Of course, patients must have the potential for 20/20 vision and no macular degeneration or amblyopia. Beside this, it is basically what do you want, and what are you willing to pay for? I tell them that patients usually lose a little distance and near vision, but they see without glasses. I use the analogy of all-weather tires. They will never perform as well as tires designed for summer or winter, but they allow people to drive year

REASONS FOR CHOOSING MONOFOCAL IOLs

By Anders Behndig, MD, PhD

In modern cataract and clear lens extraction surgery, we have a couple of options for aphakia correction, of which multifocal IOL implantation has attracted much attention. In the ideal case, multifocal IOLs can offer total spectacle independence, and thus they are certainly an excellent option.

Noticeably, however, with the best efforts, only one-fourth of patients achieve total spectacle independence,¹ and the overall perceived quality of vision with multifocal IOLs may indeed not match that of traditional monofocal IOLs.² At present, most surgeons and authors agree that multifocal IOL implantation is not suited for all patients, which makes patient selection an important matter when considering multifocal IOLs. Additionally, certain multifocal IOLs may be better suited for certain types of visual requirements.³ This makes the selection even more sensitive, especially since the patient's visual requirements may change over time, a common example being the shift from extensive computer work to other activities (eg, reading books, distance work) after retirement. In this context, I feel we must not forget the possibilities offered by monofocal IOL implantation.

Experience with monofocal IOLs dates back many decades, and we know that these IOLs will continue to perform well—even in an aging retina with macular degeneration or diabetic retinopathy, which may not always hold true for a multifocal IOL. A multifocal optic always means a compromise, because what is gained in near vision is lost in other aspects of visual quality (eg, reduced contrast sensitivity,⁴ increased higher-

order aberrations,^{5,6} glare and halos,^{7,8} phenomena that may affect the overall quality of vision seriously in patients developing retinal diseases).

Another concern is the risk for reoperation, especially in younger myopes who are at risk for retinal detachment and other serious complications after any intraocular procedure.⁹

When we look at IOLs that do not perform well and have to be explanted, dislocation/decentration and incorrect IOL power are the main reasons for explantation in all types of monofocal IOLs.⁸ The former can be partially prevented by improved techniques in the primary surgery and less extensive reposition/fixation methods, the latter by improved devices and biometry formulas. Glare and optical aberrations, on the other hand, which remain the main causes for explantation of a multifocal IOL,⁸ may not be as predictable or preventable.

Naturally, economy also has to be taken into account when implanting multifocal IOLs. Not only is a multifocal IOL more expensive, but considering multifocal IOL implantation also means considering bilateral surgery, at least in presbyopes. Although a unilateral multifocal IOL implantation may be an option in a nonpresbyopic, emmetropic patient,⁹ presbyopes make up a major part of the cataract population^{10,11} and are less likely to be satisfied with such a solution. A large-scale increase in bilateral surgery with more expensive IOLs is likely to have significant effects on health care economics in many countries.^{7,11}

In my experience, the ordinary elderly cataract patient rarely asks for total spectacle independence, at least not actively. In case

round. If patients are not willing to make any sacrifices, then presbyopia-correcting lenses are not for them.

Managing Unhappy Patients

Change: What advice can you offer about people who are unhappy with having a different IOL in each eye?

Rau: I am lucky, because I do not have problems with my patients who have been mixed. It is very important to provide preoperative education. We do not promise glare and halos so that they are prepared to deal with them, if necessary. The other reason is staged implantation, where the operation of the other eye follows 4 to 6 weeks after the first IOL is implanted.

Hardten: Educating patients does not prevent them from comparing the vision of their two eyes. Eventually, they get used to the differences.

REASONS FOR CHOOSING MONOFOCAL IOLs (Continued)

of such a request, however, monovision may be an alternative with a high reported level of patient satisfaction.¹¹ Often, myopia of approximately -1.50 D in the nondominant eye, together with some pseudocommodation,¹² will suffice for reading price tags and shorter texts.¹³ Also, this low level of myopia will have little negative effect on binocular function.¹⁴ Thus, for longer reading or near work, reading glasses are likely to give acceptable binocularly. The monovision approach means no compromise in optical quality in the individual eye and if the patient is not satisfied a pterygialk impairment in the myopic eye is undoubtedly less extensive than a bilateral IOL exchange.

The ultimate goal we all dream of is an aphakia correction offering the visual quality of a young, healthy, emmetropic eye. Asured we are still far from that goal. Although multifocal IOLs are certainly a good option with the right patient selection, a multifocal IOL will always mean a compromise—and a larger degradation of the eye's optical quality than seen with a monofocal IOL. Therefore, even when making the complex decisions of mixing and matching to aim for spectacle independence, I feel that unilateral surgery with implantation of a conventional monofocal IOL and bilateral surgery with monovision must still be kept in mind as viable options.

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Knorz: You need to have an exit strategy. During the initial consultation, I explain to patients that they may not be happy postoperatively, in which case the procedure can be reversed. In such instances, I will implant a monofocal lens. They will need glasses but will have perfect vision. Fortunately, I have had no complaints from patients about the mixture of different lens designs, but some have not been happy with their overall postoperative vision. In three such cases I have had, I replaced the multifocal lens in their dominant eye with a monofocal lens. All of the patients were satisfied.

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best quality of vision. Patients will accept a refractive multifocal IOL if they have good driving vision and can see far away but have to wear glasses some of the time. They are particularly unhappy when they cannot see far away or cannot drive at night. Ophthalmologists need to optimize patients' distance vision and then give them as much reading vision as they can achieve.

Change: I have seen two people in consultation who have preferred their refractive to their diffractive multifocal IOL. You must counsel people up front that each eye will see differently but that their brain will successfully blend the strengths of each eye as long as they do not constantly compare or overanalyze the vision of their two eyes.

"I am increasingly using multifocal contact lenses to show patients what their postoperative vision will be like."
—Michael Knorz, MD

Knorz: For a refractive IOL patient, operate on his dominant eye first and only place the second implant after resolving any problems with the first procedure. If the patient really does not like the multifocal implant, you exchange the lens. If a cataract surgery patient does not like the multifocal lens, select a monofocal IOL for his second eye. If the patient is still not happy, explain the lens from his first eye.

Donnenfeld: When a patient returns to my office unhappy with his surgical outcome, my technicians see him first and perform an evaluation that includes ocular coherence tomography. I can then tell the patient as I enter the room that he should be unhappy, because we found the problem. Next, I describe how I am going to address it. I act before he has a chance to become angry with me.

Hardten: One of the worst things to do is to tell patients they should be happy, because they see 20/20 minor problem and blame their symptoms on it. I then address the problem with some active therapy. If they are still unhappy after the first problem is resolved, I find and fix another problem. One of the most frequent issues when patients see well objectively but are

not happy is dry eye. Managing with artificial tears, cyclosporine, and lid hygiene can be extremely helpful.

Knorz: Patients are frequently more likely to accept a problem if they understand it. For example, I explain why they are seeing halos or experiencing double vision after the implantation of a multifocal IOL. I ask for their patience to allow neural adaptation to occur and say that we can explain the lens in a few months if they are still unhappy. I rarely have to remove a multifocal IOL.

Repose: Some patients are hypercritical after surgery on their first eye. When they say they see some halos at night, I ask for their patience to allow neural adaptation to occur and say that we can explain the lens in a few months if they are still unhappy. I rarely have to remove a multifocal IOL.

Change: A common problem is that we normally do not schedule a lot of time for a postoperative cataract examination, because we are so accustomed to happy patients. If a patient is dissatisfied for any reason after receiving a presbyopia-correcting IOL, however, the worst thing to do is quickly dismiss his concerns and rush off to the next patient. In such a situation, I try to have the patient return when I have more time to spend with him. To buy more time, I may increase the frequency of his NSAD or prescribe artificial tears. I schedule a return visit for the end of my day in 1 to 2 weeks so that we can have plenty of time to discuss his concerns without my appearing rushed or uninterested.

Knorz: Patients have to adapt to their new vision. If you ask them to return in 1 year, however, they will feel deserted. Instead, I schedule follow-up visits for 8 weeks and 3 months. They are much more patient when I see them regularly.

"A sub-2-mm incision for both phaco and implantation is optimal in terms of induced astigmatism and corneal aberrations."
—Dominique Pietrini, MD

Hardten: I have to be reasonably certain that I can make a patient happy with his first operation before I implant an IOL in his second. Most often, the problem lies with the ocular surface. I compare the pre- and postoperative topographies. I manage problems with

the ocular surface aggressively. Next, I perform ocular coherence tomography to look for CME or an epiretinal membrane. If neither is the problem, it may be that the patient is extremely sensitive to capsular opacity.

If I have a reasonable suspicion that the capsule is causing the patient's waxy vision or symptoms of glare, I will open it. Most of the time, this procedure will

resolve the problem. If it does not, however, you are stuck with an open capsule and trying to exchange the lens, which is a little more difficult.

Donnenfeld: We have spent a lot of time talking about unhappy patients, but most of the individuals who receive presbyopia-correcting IOLs are the happi-

est patients in my practice. They have sharp vision, usually for the rest of their lives, and that gives them an extraordinary sense of independence and safety.

EVOLUTION

Chang: Tell me what you have changed during the past year that has really made a difference for you in terms of

success with refractive IOLs. For example, 1 year ago, I had not done much mixing of different lenses. I am now impressed by how well tolerated this approach is, as long as I explain to patients why I am implanting different IOLs and what they should expect. It has often given both the patient and me more confidence to try a presbyopia-correcting IOL while knowing that we have a contingency plan in the event

RESTOR IOL CENTRATION AND OPTICAL WAVEFRONT

By Paolo Vinciguerra, MD, and Fabrizio I. Camesasca, MD

Multifocal IOLs provide a new horizon of possibilities in presbyopia correction. The Restor IOL (Alcon Laboratories, Inc., Fort Worth, Texas), an apodized diffractive multifocal IOL with optic concentric steps that diffract light in smaller waves, is an extremely interesting option.^{1,4} Emmetropia to minimal hyperopia is the best optical strategy for final refraction with the Restor.⁵ Surgeons must be aware that patients will perceive halos around point sources of light at night, and neural adaptation, mostly if the implant is binocular, will diminish perception of this problem with time.

In our experience, the Restor is an outstanding IOL, however, a cautious and organized approach is recommended to obtain the best results. Most importantly, precise IOL centration is mandatory.^{6,7} A decentered Restor lens provides a worse performance than a well-centered one, in which all steps work on the visual axis. Residual refractive defects may be induced by imperfect centration, and patients with diffractive multifocal IOLs poorly tolerate these defects.

It is important to remember that the center of the pupil and the line connecting it with the fixating object (ie, line of sight [LOS]) are not always coincident with the visual or optical axis. As a matter of fact, mean distance between the cen-

ter of the pupil (LOS) and the visual axis (angle kappa) is 2.6° horizontally and 0.6° vertically. Furthermore, the center of the pupil shifts during miosis or mydriasis. Thus, centering a multifocal IOL in the bag in a fully dilated eye does not mean centering it on the pupil, and the pupil center may not be coincident with the visual axis.

THE PROCESS

Preoperative evaluation. Ideally, the visual axis, pupil center, and IOL center must coincide. We presently exclude patients with a very distant visual axis and pupil center, as well as those patients with very distant pupillary centers in miosis versus mydriasis. The whole situation can be verified preoperatively with a combined topographer-aberrometer based on patient fixation (OPD-Scan; Nidek, Inc., Gamagori, Japan), also providing the total, internal, and corneal ocular aberrations. Evaluating the topography and excluding the map visualization, it is easy to visualize if the pupil is centered with the topography rings, and thus with the visual axis. Furthermore, the OPD-Scan provides information pertaining to pupil centration on the cornea (optical axis). The pupil diameter and center in miosis and mydriasis will also be measured.

Another suggested exam is biometry with the IOLMaster

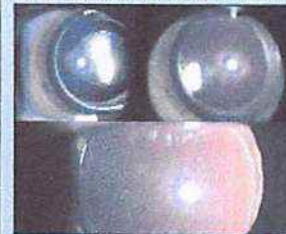


Figure 1. A well-centered Restor IOL.

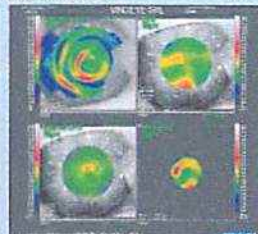


Figure 2. OPD-Scan evaluation of an eye with a decentered Restor. Total aberrations (top right) are remarkable. Internal higher-order aberrations (bottom, right) are elevated, and coma is the main component (bottom, left).

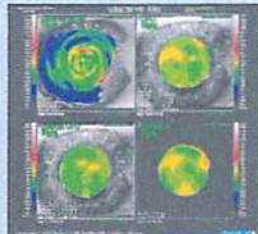


Figure 3. The same eye from Figure 2, after Restor repeated centration. Total, internal, and higher-order aberrations are markedly reduced.

(Carl Zeiss Meditec AG, Jena, Germany). This device provides precise determination of the visual axis length, reducing operator or indenting probe bias, with patient fixation constantly present in all measurements. In our personal experience, however, we integrate IOLMaster information with topography-derived keratometry readings (ie, the mean pupillary power derived from 4,000 topography measurements points).

Intraoperative centration. Ideally, the IOL must be centered on the visual axis, and since this can not be determined intraoperatively, once the preoperative examination has defined that it is almost coincident with the center of the pupil and thus with the LOS, the referral structure is the myotic pupil. The ideal rhexis is a well-centered, 5-mm anterior capsule opening, and obviously capsule rupture must be avoided. The surgeon must accurately center the IOL in the bag, remove the viscoelastic, check the centration again, and finally inject a miotic.

When the pupil is 3 to 4 mm, the surgeon must align the IOL rings with the miotic pupil. In cases of even minimal decentration on day 1, the IOL must be immediately recentered with the pupil in miosis. If recenteration is necessary, this must be pursued by IOL rotation instead of simple shift or tilt. Usually, despite physiological postoperative fibrosis, the haptics will keep the IOL in this final position (Figure 1).

Clinical case. Figure 2 presents OPD evaluation of an eye with a decentered Restor. The patient complained of poor vision and ghost images. OPD maps with total aberrations showed a considerable amount of aberrations. Internal higher-order aberrations were elevated, and coma was the main component. Figure 3 presents the same eye after recenteration. Total, internal, and higher-order aberrations were

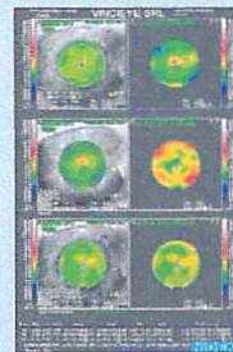


Figure 4. The difference between internal aberrations preoperatively (top, left), immediately postoperative with IOL decentration (center, left), and after recenteration (bottom, left). A differential map (top, right) between pre- and immediately postoperative situations clearly shows induction of coma by imperfectly centered IOL. Note how the preoperative and final internal aberration maps are similar.

markedly reduced. Figure 4 presents the difference between internal aberrations preoperatively, immediately postoperative with IOL decentration, and after recenteration. A differential internal aberrations map clearly shows induction of coma by the imperfectly centered IOL. Note how preoperative and final internal aberration maps are similar. Following recenteration, the patient's vision improved, and he did not refer to ghosting of images anymore. We have recentered two out of 56 implanted IOLs (4.0%).

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that they are somewhat disappointed with the performance of the first IOL.

Hardten: I have simplified my educational process. I used to have a complex questionnaire. Now I ask three questions: (1) Are you interested in seeing well at distance without glasses after cataract surgery? (2) Are you interested in seeing well at near without glasses? (3) Are you willing to tolerate some glare and halos to achieve this lesser dependence on glasses and contact lenses? My use of refractive IOLs has increased, partly because it is easier to understand the patients' answers to these less complicated questions.

Clauqué: Until recently, I treated PRELEX patients with corneal astigmatism with a mixture of multifocal IOL and astigmatic keratotomies; as a trained corneal surgeon, this does not bother me. However, because of the introduction of foldable toric aspheric multifocal IOLs, management of these patients is much easier and within the reach of routine cataract surgeons. The fact that you can order lenses that correct up to 12.00 D of corneal astigmatism and the almost complete lack of halos has made an enormous difference.

Pietrini: The association of microincision with multifocal microincision IOLs has changed my results in terms of predictability and patient satisfaction. A sub-2-mm incision for both phacoemulsification and implantation is optimal in terms of induced astigmatism and corneal aberrations, but it is also ideal for the predictability of eventually associated limbal relaxing incisions or toric implantation.

Donnenfeld: I became a better doctor in 2007, because now I make certain that I have a relationship with every patient before I implant a refractive IOL. I spend more time with patients, I create reasonable expectations, and I ensure that I feel comfortable that they understand those expectations before surgery. I make certain that patients understand that I am their partner throughout the procedure. This approach has greatly reduced my stress level.

Additionally, I now use video systems to help teach patients about the lenses and IOL surgery. Seeing what they can expect has really improved patients' level of comprehension. I use a system from Eyemaginations, Inc. (Towson, Maryland). The video is customized to each of my patient's needs.

Pepose: I simplified my approach. I ask patients if they would be interested in what I call *walk-around vision*. That means they could drive to the supermarket, see what is on

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—David F. Chang, MD

the shelf and read the labels on cans. I tell them up front that they may still require low-powered reading glasses to see the small print listing the ingredients on the back of a can. I explain that they might need their glasses in dimly lit rooms but that they will depend on their spectacles a lot less than they would with monofocal lenses.

Additionally, I now perform staged surgery and operate on the patient's dominant eye first. This approach is simpler and more effective than beginning with the nondominant eye.

Knorz: I changed to operating on the patient's dominant eye first and implanting a distance-dominant multifocal IOL. Then, I base my selection of the second IOL on the patient's feedback. Additionally, I am increasingly using multifocal contact lenses to show patients what their postoperative vision will be like. If they like it, I proceed with surgery.

Rau: For multifocal IOL implantation in cataract patients, I always determine which eye is dominant. It helps us to choose the right lens. Even if the patient is satisfied with the first implantation and we implant the same IOL in the other eye, we can fine-tune the process by calculating the lens of the nondominant eye slightly myopic, for instance, if better near vision is requested.

Chang: I want to thank the participants for their comments. Ours is an incredibly dynamic field, because every year we are each clearly doing things differently than the preceding year. The one thing we probably all can agree on is that there is no single best IOL or approach for every patient. I am always impressed by how much we can all learn from sharing our experiences—both our successes and our failures. ■

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