Beware the Low Myope

J. DAVID STEPHENS, MD;
DANIEL TERVEEN, MD;
ARTHUR VAN DEN BERG, MD;
GEORGE O. WARING IV, MD, FACS;
NANDINI VENKATESWARAN, MD;
JÉRÔME C. VRYGHEM, MD, PHD;
AND HEATHER M. WEISSMAN, MD

Panelists determine how they would counsel a patient who is unhappy with his near vision after cataract surgery.

CASE PRESENTATION

You perform flawless cataract surgery on a patient who used to have moderate myopia (-4.00 D of sphere OU). Preoperatively, he expressed a desire to have good uncorrected distance vision. You remind him after surgery that you explained that his near vision would be blurry without reading glasses, and he bitterly exclaims, "I didn't know it was going to be that bad. You stole my near vision."

QUESTIONS FOR THE PANEL

1. How would you manage the patient's refractive problem?
2. How would you have counseled the patient preoperatively to reduce the risk of miscommunication?
3. Would you charge the patient for the extra work?
4. When do you entertain monovision as a refractive option instead of a presbyopia-correcting IOL?

J. DAVID STEPHENS, MD

Patients with low to moderate myopia have had excellent uncorrected near vision for their entire lives. As they reach the typical cataract age, they become accustomed to performing near tasks such as reading, shaving, putting on makeup, texting, and eating without needing glasses. They are often excited about seeing well at distance for the first time after cataract surgery. The preoperative discussion is crucial to assessing their lifestyle and setting reasonable expectations.

During the preoperative discussion, I start by asking patients if they read without glasses, if they have used bifocals or progressives, and if they have ever worn contact lenses. Those who have worn contact lenses for distance vision and used readers are generally better able to understand what their postoperative vision will be like. If they could not tolerate bifocals, if they enjoy reading in bed, or if they perform fine near tasks, they likely will be happier with a postoperative refraction that targets near vision.

MANAGEMENT

Possible strategies. I would ask the patient to complete a monovision contact lens trial for myopia in the nondominant eye and a bilateral contact lens trial that allows him to revisit life with myopia. If he likes monovision, he can continue to wear a contact lens for monovision or undergo an IOL exchange for a near target. Another option is an IOL exchange for a Light Adjustable Lens (RxSight) with the near focal point fine-tuned to achieve a satisfactory refractive outcome.

I would also discuss the option of a presbyopia-correcting IOL with the patient now that he has experienced good distance vision and poor near vision. The important caveat is that his near vision will not be quite as sharp as with his previous natural myopia but will be far better than with the current monofocal IOL.

LASIK or PRK is yet another option, but there is a risk of regression after hyperopic treatment. A piggyback IOL could be considered as well, but my preference would be an IOL exchange with the new IOL placed in the bag to avoid the risks of uveitis-glaucoma-hyphema syndrome and intralenticular opacification.

Financial considerations. A question is who pays for a procedure to shift the patient's refractive error. If he decides to undergo an IOL exchange, the patient's insurance provider would be billed for the surgical exchange using Current Procedural Terminology code 66986. If the patient decides to upgrade to a presbyopia-correcting IOL, he would pay for the refractive portion of the procedure.

Recommendation. In this situation, I would place a presbyopia-correcting IOL such as the AcrySof IQ PanOptix IOL (Alcon). I believe that monovision works best in phakic patients with emerging presbyopia. In early presbyopia, the crystalline lens remains capable of modest accommodation, and patients can achieve good vision at all distances with low levels of anisometropia. Pseudophakia pushes patients into absolute presbyopia, so there is a smaller landing zone than during the early years of presbyopia. The postoperative refraction must be spot on, and even then, either intermediate (66 cm) or near (40 cm) vision is typically sacrificed.

As patients age, their depth perception and balance become increasingly important. By design, monovision sacrifices some stereopsis. Moreover, if a patient develops a visually significant pathology such as macular degeneration in one eye, they will quickly become fully dependent of spectacles. I therefore usually prefer patients seeking spectacle independence to have balanced refractions with presbyopia-correcting IOLs or a similar refractive target in both eyes. I consider monovision for those who have experience with the strategy but with the caveats noted earlier.

DANIEL TERVEEN, MD

When dealing with unhappy patients, I start by acknowledging their feelings and apologizing for the position they are in. Even though I explain the consequences of a patient's decision to them preoperatively, I take responsibility for the feeling they have that everything wasn't explained. Informed consent is a complicated process. Patients do not have a surgeon's level of understanding and expertise, so it is not surprising that wires sometimes cross. It is important to remember that even individuals in their 60s and 70s with cataracts can have more than 1.00 D of accommodative amplitude and that distance-corrected pseudophakia renders them absolutely presbyopic.[1] This can compound a patient's perceived loss of near vision after cataract surgery.

OPTIONS

I would ask the patient about his hobbies to get an understanding of how he wants to use his eyes. Next, we would discuss the benefits of near vision with a monofocal IOL, monovision, and a presbyopia-correcting IOL. The patient would then complete a contact lens trial of either a bilateral near refractive target or monovision. Assuming that he is unhappy with bifocals or readers, I think there are three main surgical options:

- **No. 1**. Laser vision correction with a targeted refraction of -2.50 D OU.
- **No. 2**. Laser vision correction with a monovision strategy.
- **No. 3**. An IOL exchange for a presbyopia-correcting or monofocal IOL.

PERSONAL PREFERENCE

My first choice for this patient would be an IOL exchange in each eye for a

presbyopia-correcting IOL because of the binocularity, distance vision, and near vision that can be achieved with the technology. The patient would be charged my practice's standard price for the package but no additional fees.

If he does not want or cannot afford presbyopia-correcting IOLs, less than 6 months has elapsed since the original procedure, and an Nd:YAG laser capsulotomy has not been performed, my recommendation would be an IOL exchange for a monofocal IOL, and the patient would not be charged. Surgery on the two eyes would be staged 2 to 4 weeks apart, and the nondominant eye would be treated first.

If more than 6 months has passed since the original procedure or an Nd:YAG laser capsulotomy has been performed, I would recommend refractive surgery, and the patient would be charged.

If an Nd:YAG laser capsulotomy has been performed and the patient cannot afford or is a poor candidate for refractive surgery, we would have an extensive discussion of the risks of an IOL exchange in an eye with an open posterior capsule. Surgery would be performed only after the patient has sufficient time to think about and understand the risks.

1. Duane A. Studies in monocular and binocular accommodation, with their clinical application. *Trans Am Ophthalmol Soc*. 1922;20:12-157.

ARTHUR VAN DEN BERG, MD, AND GEORGE O. WARING IV, MD, FACS

In our opinion, the best option for the patient is an IOL exchange. We would first perform the procedure on the nondominant eye and, assuming he is an appropriate candidate, select a full range of vision IOL such as the Tecnis Synergy (Johnson & Johnson Vision). We would counsel the patient on the risks and benefits of an IOL exchange and would emphasize the risks of dysphotopsias and possible changes in his quality of vision.

After surgery on the first eye, if the patient desires more near vision, we would recommend he undergo the same procedure in the dominant eye and select an extended depth of focus lens such as the Tecnis Symfony OptiBlue IOL (Johnson & Johnson Vision). The patient would be counseled again on the risks and benefits of an IOL exchange. He would be charged an additional fee for the IOL exchange procedures.

In our preoperative evaluations, we explain to patients that we recommend fixing their focus in addition to their cloudy lens and, if they are a candidate, preserving their reading vision. We carefully explain that we want to provide them with something they do not have (uncorrected distance vision) rather than remove something they do have (uncorrected reading vision), which will be permanent.

We recommend a presbyopia-correcting IOL over monovision to all patients with myopia who are appropriate candidates. We attempt to preserve or restore stereopsis whenever possible.

Patients with myopia are often the most challenging to treat. Many take their near vision for granted until it is gone.

OBSERVATION

I think the key to avoiding the situation described in the case presentation is to identify which patients with myopia wear readers already and which do not. I carefully observe patients with myopia as they sit in the exam chair waiting for me. Many of them have glasses on their head as they read a book or their phone screen. This behavior indicates that they enjoy using their natural near vision for up-close tasks. I also ask patients how they eat, put on makeup, or work on computers. If they take off their glasses to do these activities, it indicates a preference for spectacle-free near vision.

Other patients wear contact lenses for distance vision and progressive or bifocal glasses or readers over top to improve their near vision. These individuals are likely to tolerate distance-targeted IOLs because they do not mind and are used to wearing reading glasses.

A third group of patients with myopia wears monovision, multifocal, or bifocal contact lenses. If they have a history of successful monovision, they will likely enjoy pseudophakic monovision.

NANDINI VENKATESWARAN, MD

If they like the flexibility of bifocal or multifocal contact lenses, they may enjoy presbyopia-correcting IOLs. That said, a thorough discussion of the expected postoperative quality of vision and the risk of glare and halos with diffractive IOL platforms is required.

PREOPERATIVE COUNSELING

When counseling patients with myopia about their IOL options, I state repeatedly that they will not be able to read a smartphone screen, see the food on their plate, or view objects close to their face if the IOLs are targeted for distance vision. I also emphasize that, although excellent, presbyopia-correcting IOL technologies cannot provide the same quality of near vision that they are likely used to.

I explain that every option entails a compromise and that they must decide which visual goal–uncorrected distance vision, uncorrected near vision, or a greater range of vision with less dependence on spectacles–is most important to them.

TREATMENT

▶ **Option No. 1: Spectacle wear.** The most conservative option is to counsel the patient to continue wearing readers and adapt to their use, which may take time.

▶ **Option No. 2: Low myopia.** The patient can perform a trial of a lower amount of myopia (likely -2.00 D) using glasses or contact lenses. This should afford him greater near vision and a better quality of distance vision compared to his preoperative refraction. If the patient enjoys the simulated vision, I would offer him an IOL exchange in both eyes with a target of myopia, but I would emphasize that he will lose the excellent uncorrected distance vision provided by his current distance-targeted monofocal IOLs.

▶ **Option No. 3: Monovision.** Varying levels of myopic correction can be simulated with glasses or a contact lens on the nondominant eye. This would allow the patient to determine if he can tolerate monovision and, if so, to what degree (-0.75 to -2.50 D). If he likes monovision, the dominant eye can be left as is, and the desired degree of monovision correction can be achieved in the nondominant eye with either a contact lens or an IOL exchange. Monovision would allow the patient to perform most distance and near tasks without glasses. A refractive enhancement (either LASIK or PRK) could also be considered in the nondominant eye for monovision correction. A hyperopic ablation profile, however, would be required, which may be associated with an extended recovery time and an increased risk of regression of effect. For these reasons, a contact lens or an IOL exchange would be my preference.

▶ **Option No. 4: Presbyopia correction.** I would discuss with the patient the possibility of a presbyopia-correcting IOL in lieu of a monofocal distance-focused IOL to achieve a greater range of vision. If he is motivated to pursue this strategy, an IOL exchange would be performed on the nondominant eye first, perhaps with a target of mild myopia (-0.25 to -0.50 D) to enhance reading vision. Before surgery, the patient would be counseled that the vision between the two eyes may seem different immediately after surgery but that, after neural adaptation, the eyes should work well together. With this strategy, the dominant eye has excellent uncorrected distance vision with a monofocal IOL, and the nondominant eye can assist with reading.

If the patient prefers to have the same IOL technology in both eyes, the IOL in the dominant eye can also be exchanged provided he is happy with the vision in the nondominant eye. A diffractive or nondiffractive IOL design would be selected based on his tolerance of glare and halos, if present, after surgery on the first eye.

After thorough informed consent, the most feasible option for the patient would be pursued.

"When counseling patients with myopia about their IOL options, I state repeatedly that they will not be able to read a smartphone screen, see the food on their plate, or view objects close to their face if the IOLs are targeted for distance vision. I also emphasize that, although excellent, presbyopia-correcting IOL technologies cannot provide the same quality of near vision that they are likely used to."

– NANDINI VENKATESWARAN, MD

JÉRÔME C. VRYGHEM, MD

As one of the first surgeons to implant trifocal IOLs,[1,2] I have considerable experience with these lenses. Of the more than 10,000 trifocal IOLs I have implanted, I have exchanged only two for a monofocal IOL in a single patient because I misjudged his visual needs. A major factor in the high rate of patient satisfaction I have attained is an extensive preoperative discussion about risks and side effects. Issues covered include temporary halos, fixed reading distances, loss of contrast sensitivity and a requirement for brighter illumination, and the possible need for a laser enhancement if the targeted postoperative refraction is not achieved.

I have used several extended depth of focus IOLs, but I continue to favor trifocal IOLs for the superior reading vision they provide. Approximately one-third of my patients perceive halos around lights at night after receiving trifocal IOLs but are not bothered by the phenomenon after a period of neural adaptation. Trifocal IOLs account for 97% of the IOLs I implant; in 65% of these cases, a toric model is used.

I would not have implanted monofocal IOLs and targeted distance vision in a patient with -4.00 D of myopia preoperatively. Only in the rare instance when one of my patients does not elect

a trifocal IOL after the preoperative consultation do I consider pursuing a monovision strategy with monofocal IOLs and a refractive target of -1.50 D in the dominant eye.

HOW TO PROCEED

If this dissatisfied patient presented to my office for a consultation, I would recommend the implantation of supplementary trifocal IOLs, either a trifocal AddOn (1stQ) or a Sulcoflex Trifocal (Rayner). If cost is an issue, I would offer LASIK monovision with a target refraction of -1.50 D in the dominant eye as an alternative.

I would not charge the patient for either procedure. Dissatisfied patients can discourage other candidates from pursuing surgery not just by the original ophthalmologist but by eye surgeons in general.

1. Vryghem JC, Heireman S. Visual performance after the implantation of a new trifocal intraocular lens. *Clin Ophthalmol*. 2013;7:1957-1965.
2. Cochener B, Vryghem J, Rozot P, et al. Visual and refractive outcomes after implantation of a fully diffractive trifocal lens. *Clin Ophthalmol*. 2012;6:1421-1417.

HEATHER M. WEISSMAN, MD

I would begin by reassuring the patient that cataract surgery went well and the desired outcome of excellent distance vision was achieved. I would then counsel the patient that nothing is permanent and options are available to improve his reading vision.

HOW TO PROCEED

Reading glasses are the first and least invasive choice. If the patient desires spectacle independence, however, he would be offered a contact lens trial of monovision. If he tolerates it well, he can undergo refractive surgery or an IOL exchange to achieve monovision. The cost of the contact lens trial and additional surgery is the patient's responsibility if he signed the consent forms for the original surgery and it was documented in the chart that he would require reading glasses postoperatively.

I am most comfortable offering monovision to patients who have a successful history with monovision contact lenses. I also find monovision and mini-monovision to be useful options for patients with an ocular condition that makes them a poor candidate for multifocal IOLs, such as those with an epiretinal membrane, early macular degeneration, and dry eye disease.

When offering a multifocal IOL, I adhere to the mantra *underpromise and overdeliver*. Results with this technology can be excellent if patients are aware that they may experience nighttime halos after surgery. I also explain to patients with myopia that their near vision will never be as crisp with a multifocal IOL as it would be with a monofocal IOL.

STRATEGIES FOR AVOIDING MISCOMMUNICATION

The presented case illustrates the importance of the preoperative discussion for cataract surgery. Even when the loss of near vision is touched on many times and clearly described in the consent form, some patients with myopia struggle to comprehend the change. I spend a long time during the preoperative visit describing the changes that patients will experience. If they wear contact lenses, I raise the option of monovision during the cataract consultation. A monovision contact lens trial is a must when considering a monovision strategy for cataract surgery to help make sure the patient will adapt well. If a patient requires good stereopsis after cataract surgery and they are a candidate for a multifocal IOL, I tend to steer them away from monovision. ■

J. DAVID STEPHENS, MD
- Tyson Eye, Fort Myers, Florida
- david.stephens@tysoneye.com
- Financial disclosure: Consultant (Allergan, RxSight)

DANIEL TERVEEN, MD
- Vance Thompson Vision, Sioux Falls, South Dakota
- daniel.terveen@vancethompsonvision.com
- Financial disclosure: None acknowledged

NANDINI VENKATESWARAN, MD
- Instructor of Ophthalmology, Harvard Medical School, Boston
- Cataract, refractive, and cornea surgeon, Massachusetts Eye and Ear Infirmary, Waltham, Massachusetts
- nandini.venkat89@gmail.com; Twitter @nandinivenkatmd
- Financial disclosure: None

ARTHUR VAN DEN BERG, MD
- Assistant Professor, Department of Ophthalmology, Universidade Federal de São Paulo, Brazil
- arthur-vdb@hotmail.com
- Financial disclosure: None acknowledged

JÉRÔME C. VRYGHEM, MD
- Medical Director, Brussels Eye Doctors, Belgium
- Member, *CRST Europe* Editorial Board
- jerome.vryghem@vryghem.be
- Financial disclosure: None acknowledged

GEORGE O. WARING IV, MD, FACS
- Founder and Medical Director, Waring Vision Institute, Mount Pleasant, South Carolina
- Member, *CRST* Executive Advisory Board
- gwaring@waringvision.com
- Financial disclosure: None acknowledged

HEATHER M. WEISSMAN, MD
- Atlanta Ophthalmology Associates, Georgia
- heather.weissman@northside.com
- Financial disclosure: None acknowledged