

BLURRY POSTOPERATIVE VISION

Options for addressing patient dissatisfaction after refractive lens exchange with a trifocal IOL.

BY NEDA NIKPOOR, MD; I. PAUL SINGH, MD; GARY WÖRTZ, MD; AND DAGNY C. ZHU, MD

CASE PRESENTATION

A 54-year-old man underwent immediately sequential bilateral refractive lens exchange (RLE) to correct his low hyperopia and presbyopia. The patient elected same-day surgery for its convenience and chose a trifocal IOL for both eyes to reduce his dependence on glasses. Preoperatively, he had mild blepharitis and reported experiencing recurrent corneal erosions several years earlier. The ocular surface was optimized, and appropriate expectations were discussed before surgery.

The patient reported fluctuating, blurry vision during the first 3 months after RLE. Objectively, his monocular UCVA ranged from 20/20- to 20/50 at distance and J1 to J1+ at near depending on the day. His refraction ranged from -0.25 to -1.25 D of myopia with -0.25 to -1.00 D of astigmatism. The patient described “strobing” vision, halos, a restricted field of vision, and foreign body sensation. He was happy with his near vision but miserable with his distance vision, which he described as blurry.

Aggressive therapy for dry eye disease was initiated, and the patient reported good adherence. An examination revealed minimal ocular surface abnormalities and corneal staining and a healthy tear film, findings that were confirmed with the

HD Analyzer (Keeler USA). A fundus examination and macular OCT imaging were within normal limits. Imaging with the DPD-Scan III (Nidek) and iTrace (Tracey Technologies) was normal and did not detect significant higher-order aberrations. By postoperative week 10, the refraction was reasonably stable. His UCVA was 20/30-2 and J1 OD and 20/20-1 and J1+ OS. His BCVA was 20/20- with a refraction of -0.75 -0.25 x 100° OD and 20/20 with a refraction of +0.25 -0.75 x 002° OS.

Given the relative stability of his refraction from 2 to 3 months postoperatively, the patient’s blurry distance vision was attributed to a residual refractive error. Because of the thinness of the corneas, a mild posterior float, and his history of recurrent corneal erosions, he was scheduled for a PRK enhancement in each eye. During an examination 1 week before the procedure, his UCVA was J1+ OU, 20/25- OD, and 20/20 OS. His BCVA was 20/15 OU with a refraction of -0.50 -0.25 x 122° OD and plano -0.50 x 178° OS. The patient confirmed that refraction improved his vision. A PRK enhancement was performed on both eyes as planned although the correction was very low.

The postoperative course was uneventful. Two months after the enhancement, the patient’s

UCVA ranged from 20/20- to 20/25 OU, yet he stated that his vision remained blurry. He was counseled that epithelial remodeling should lead to an improvement over time.

Five months after PRK and 8 months after RLE, the patient’s UCVA is 20/20- and J1 to J1+ OU. His residual refractive error is less than -0.25 D. He states that he is satisfied with his near vision but unhappy with his distance and intermediate vision. The patient reports constant fluctuations in vision that sometimes make him feel like he is “looking through water,” so he rinses his eyes routinely. He instills preservative-free artificial tears three times a day as instructed but reports that his eyes are comfortable. There are minimal to no signs of ocular surface disease (OSD) on slit-lamp examination or diagnostic testing. A rigid contact lens trial does not improve his vision. The patient enjoys being free of reading glasses and does not want to lose his excellent near vision. He says he notices but is no longer bothered by halos.

How would you proceed? Would you consider performing an IOL exchange? If so, what type of IOL would you implant? Is there other diagnostic information you would obtain?

— Case prepared by Neda Nikpoor, MD



I. PAUL SINGH, MD

There is no significant residual refractive error or retinal pathology, the ocular surface is healthy, and a rigid

gas permeable contact lens does not improve the patient’s vision. The IOL is therefore the likely cause of his visual concerns. I would reexamine the eye for early posterior capsular opacification and repeat measurements with the iTrace to look for internal aberrations and vitreous opacities. I have found an improvement in higher-order aberrations and near vision after

Nd:YAG vitreolysis in patients with amorphous clouds in the middle of the visual axis.¹ I would also review the values for angle alpha and chord mu. If mild or moderate posterior capsular opacification is evident, a decision must be made on whether to perform an Nd:YAG laser capsulotomy, which would make an IOL exchange more challenging.

Another concern is the patient's fluctuating vision. Therapy to optimize the health of the ocular surface would be continued and perhaps augmented with intense pulsed light and/or thermal pulsation or debridement. Does the patient's vision clear temporarily after the instillation of preservative-free artificial tears? His BCVA was 20/15 before PRK. He therefore has the potential for improved vision with his current IOLs, so OSD could also be the issue. I would consider obtaining epithelial mapping.

If an exchange is required, a monofocal IOL is probably the patient's best option given that OSD will likely remain an issue over time and quality distance vision is his priority. The Light Adjustable Lens (LAL; RxSight) would be my preference because it will allow his vision to be dialed in postoperatively and will not induce additional aberrations. I would explain to the patient that a monovision strategy should give him the broadest range of vision. Another advantage of the LAL is that it may be placed in the sulcus if an Nd:YAG laser capsulotomy is performed before the IOL exchange.

The patient would be advised that he may need glasses for some activities after surgery.



GARY WÖRTZ, MD

There are four issues I address in a stepwise fashion whenever a multifocal IOL patient is unhappy after surgery.

► **No. 1: The ocular surface.** OSD—whether from aqueous deficiency, blepharitis, or both—must be managed. OSD is a major cause of postoperative issues because of unreliable biometry and a frank loss of contrast. Aqueous deficiency and an unstable tear film

must be addressed before and after surgery, as they were for the patient.

► **No. 2: Residual refractive error.**

Optimizing the ocular surface helps determine if uncorrected sphere or astigmatism or epithelial changes from epithelial basement membrane dystrophy are causing the blurry vision. The issues can usually be resolved with LASIK or PRK, as was done in the current situation.

► **No. 3: Vitreous opacities.** Even small vitreous veils can amplify the loss of contrast sensitivity associated with the implantation of a multifocal IOL. The effects can mimic the visual fluctuations of OSD. A simple core vitrectomy has provided amazing results to more than a few of my unhappy multifocal IOL patients.

► **No. 4: Neural adaptation.** Most patients are satisfied with their multifocal IOL by 6 months postoperatively if the first three issues are managed appropriately. If, however, a patient is unhappy after 6 months and has been unhappy since day 1, then I offer an IOL exchange. The key is to avoid an early Nd:YAG laser capsulotomy if a patient is unhappy because it makes performing an IOL exchange much more difficult.

I would refer the patient to a retina colleague for a vitrectomy evaluation. If the procedure is performed and does not resolve the symptoms, then an IOL exchange for a monofocal distance-targeted IOL would be performed in the dominant eye. I would assess whether the patient can tolerate a mix-and-match strategy before considering an IOL exchange for the second eye.



DAGNY C. ZHU, MD

Presbyopia-correcting IOLs have improved the lives of many of my

patients, but counseling those who are unhappy after receiving a premium IOL is an inevitable part of a refractive cataract surgeon's job. In my experience, the most common reasons for their dissatisfaction are OSD and residual refractive error. Both issues were addressed early with the current patient: Dry eye therapy was aggressive, and small amounts of residual myopia in the right eye and astigmatism in the left were treated with PRK. The latter also addressed underlying epithelial basement membrane dystrophy.

Unfortunately, the patient continues to experience blurred vision. The hard contact lens trial definitively ruled out the cornea as the cause. Before proceeding with an IOL exchange, I would closely examine the vitreous. Many patients with dense anterior vitreous opacities describe having blurry, fluctuating vision that makes them feel like they are looking through water, a cloud, or a film. I have found that many experience a substantial improvement in their vision after undergoing an Nd:YAG vitreolysis or pars plana vitrectomy.

Only after ruling out the vitreous as a cause of blurry vision would I exchange the IOL in the dominant eye for a Clareon Vivity lens (Alcon). Most of my patients who receive the Vivity in one eye and a Clareon PanOptix IOL (Alcon) in the other experience fewer dysphotopsias postoperatively than the individual here and achieve crisp uncorrected near visual acuity.²



WHAT I DID: NEDA NIKPOOR, MD

As my colleagues astutely point out, after OSD and refractive error are systematically eliminated as causes of a patient's poor vision following the implantation of a multifocal IOL,

only two etiologies remain—the IOL (ie, failed neural adaptation) and the vitreous. Presbyopia-correcting IOLs can improve patients' quality of life, but surgeons must be ready to assist the small percentage of them who are dissatisfied postoperatively.

In my practice, OSD and residual refractive error are the first and second most common causes, respectively, of patient dissatisfaction after receiving a multifocal IOL. Both, fortunately, are easily remedied and were addressed in this case, leaving the vitreous and neural adaptation as potential causes. I love the order in which Dr. Wörtz presents the potential problems because I believe that the vitreous must be ruled out before the IOL is blamed and explanted. The last thing I want to do is exchange an IOL only to discover the patient is still unhappy because the problem was the vitreous.

The panelists and many other colleagues have helped raise awareness that the vitreous is an underdiagnosed and underappreciated cause of postoperative dissatisfaction among patients who receive diffractive multifocal IOLs. I learned from them the importance of looking at and not through the vitreous. Like OSD, vitreous opacities often cause fluctuating, blurry vision. A careful examination of the patient's eyes found vitreous veils and cloudiness.

I referred him to a trusted retina colleague, who performed an uncomplicated, 15-minute vitrectomy. The patient was delighted to have clear vision the next day—and he was the happiest patient in the busy retina clinic.

Removing the vitreous improved the patient's optical clarity and saved him from undergoing an IOL exchange. He achieved an excellent quality and range of vision with minimal dependence on spectacles.

The lesson of this case? Cataract surgeons must pay close attention to the vitreous and consider a vitrectomy before exchanging an IOL. ■

1. Singh IP. An objective analysis of quality of vision in patients undergoing YAG vitreolysis for the treatment of symptomatic floaters. Paper presented at: ASCRS Annual Meeting; May 5-9, 2017; Los Angeles.
2. Zhu D, Strawn A, Zhou I. Visual outcomes and patient satisfaction after mix-and-match implantation of a trifocal IOL and non-diffractive extended depth of focus IOL. Paper presented at: ASCRS Annual Meeting; April 22-26, 2022; Washington, DC.

SECTION EDITOR NEDA NIKPOOR, MD

- Cataract, cornea, and refractive surgeon, Aloha Laser Vision, Honolulu, Hawaii
- Member, CRST Editorial Advisory Board
- drneda@alohalaser.com
- Financial disclosure: Consultant (Alcon, Allergan, Bausch + Lomb, Dompé, Johnson & Johnson Vision, Oyster Point Pharma); Research support (Alcon, Avellino, Glaukos, RxSight); Speakers bureau (Alcon, Allergan, RxSight, Sun Ophthalmics, STAAR Surgical)

I. PAUL SINGH, MD

- The Eye Centers of Racine & Kenosha, Wisconsin
- Member, *Glaucoma Today** Editorial Advisory Board
- ipsingh@amazingeye.com
- Financial disclosure: Consultant (Alcon, Allergan, Bausch + Lomb, Carl Zeiss Meditec, Quantel); Research support (Alcon, Allergan); Speakers bureau (Alcon, Allergan, Bausch + Lomb, Carl Zeiss Meditec, Quantel, Rayner)

GARY WÖRTZ, MD

- Private practice, Commonwealth Eye Surgery, Lexington, Kentucky
- Founder and Chief Medical Officer, Omega Ophthalmics
- Member, CRST Executive Advisory Board
- Member, *MillennialEYE** Editorial Advisory Board
- garywortzmd@gmail.com
- Financial disclosure: Consultant (Alcon, Bausch + Lomb, Carl Zeiss Meditec, Johnson & Johnson Vision, Lensar, Ocuphire); Speakers bureau (Avellino); Stock/shareholder (Arcuate Innovations, Omega Ophthalmics)

DAGNY C. ZHU, MD

- Cornea, cataract, and refractive surgeon; Medical Director; and Partner, NVISION Eye Centers, Rowland Heights, California
- Member, CRST Editorial Advisory Board
- dagny.zhu@nvisioncenters.com; www.dzeyemd.com; Instagram and Twitter @DZEyemd
- Financial disclosure: Consultant (Alcon, Johnson & Johnson Vision); Speakers bureau (Alcon)

**Glaucoma Today* and *MillennialEYE* are sister publications to *CRST*