

IMPROVING VISION AND LIVES WITH CATARACT SURGERY



A look at visual function, vision quality, and quality of life.

BY LISA M. NIJM, MD, JD

IMPACT OF FIRST EYE VERSUS SECOND EYE CATARACT SURGERY ON VISUAL FUNCTION AND QUALITY OF LIFE

Shekhawat NS, Stock MV, Baze EF, et al¹

ABSTRACT SUMMARY

This multicenter, longitudinal, 328-patient cohort study compared the impact on visual function and quality of life (QOL) of cataract surgery on the first versus the second eye. Primarily, Shekhawat and colleagues sought to identify postoperative National Eye Institute Visual Functioning Questionnaire (NEI-VFQ) scores and to compare the improvement in those scores between eyes. The researchers calculated scores using the traditional NEI-VFQ algorithm and a psychometrically validated Rasch-refined version to allow the conversion of numeric values into continuous logit scores for a more valid comparison of latent variables such as vision-related quality of life (VRQOL). The authors' Rasch-refined scoring approach sorted questions on the NEI-VFQ into two subscales: visual function and socioemotional QOL.

To be included in the study, patients had to complete pre- and postoperative ophthalmic examinations, including BCVA, for cataract surgeries on both their first and second eyes, and they had to complete the NEI-VFQ pre- and

postoperatively (30- to 90-day period). The mean age of the patients was 70.4 years (± 9.6 years standard deviation). First eyes had a worse preoperative BCVA compared with second eyes (0.55 vs 0.36 logMAR; $P < .001$) and a slightly worse postoperative BCVA (0.06 vs 0.03 logMAR; $P = .039$), but first eyes experienced a greater improvement in BCVA postoperatively (-0.50 vs -0.32 logMAR; $P < .001$). Compared with cataract surgery on first eyes, the procedure on second eyes resulted in higher NEI-VFQ scores for nearly all traditional subscales ($P < .001$) as well as for the visual function (-3.85 vs -2.91 logits;

$P < .001$) and socioemotional subscales (-2.63 vs -2.10 logits; $P < .001$) using the Rasch-refined scoring approach. Compared with the procedure on the second eye, cataract surgery on the first eye was associated with a greater improvement in the visual function subscale but a similar improvement in socioemotional QOL.

DISCUSSION

In the current US health care system, patient-reported outcomes and gains drive the value placed on medical procedures. Because cataract surgery is the most commonly performed surgical intervention,²

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- Cataract surgery in a patient's second eye can provide improvements in objective measures such as visual acuity and contrast sensitivity. This multicenter, longitudinal, 328-patient cohort study also quantitatively showed the procedure to confer significant benefits in terms of quality of life beyond those achieved with cataract surgery in the first eye alone.

WHY IT MATTERS

Contrary to popular belief, little quantitative evidence exists that supports the subjective gains achieved in patients who undergo cataract surgery in their second eye, especially in comparison with their first eye. With scientifically validated methods, this study convincingly demonstrated what most ophthalmologists and their patients experience: second-eye cataract surgery improves visual function and quality of life to a greater extent than does cataract surgery in one eye.

an evidence-based demonstration of an improvement in the patient-reported QOL benefits of cataract surgery on the second eye cannot be overstated. Objective measures of the benefits of second-eye cataract surgery in terms of visual acuity,³ contrast sensitivity,⁴ and mobility⁵ have been widely reported. Contrary to popular belief, however, little quantitative evidence exists that supports the subjective gains achieved in patients who undergo cataract surgery on their second eye, especially in comparison with their first eye. A review of the literature revealed mixed conclusions.⁶⁻⁸ One reason for this lack of evidence may be the difficulty in measuring VRQOL outcomes, because typical QOL questionnaires do not account for the substantial VRQOL gained after cataract surgery. With their study, Shekhawat and colleagues strive to fill this gap.

Their findings convincingly demonstrate what most ophthalmologists and their patients experience anecdotally in the office: patients who undergo cataract surgery on their second eye report better visual function in everyday activities such as reading ordinary print in newspapers; noticing objects off to the side while walking; and going out to see movies, plays, or sporting events.¹ Although the gain in visual function was not as dramatic as after cataract surgery on their first eye, most patients in the study began with a preoperative BCVA that was much worse in the first versus the second eye (0.55 vs 0.36 logMAR; $P < .001$). It is thus even more impressive that, on a socioemotional level, patients reported experiencing a reduction in frustration, an increased sense of control, and a decreased need for help from others to the same degree as after surgery on their first

eye (-1.51 logits for second eyes vs -1.62 logits for first eyes; $P = .255$). Importantly, the investigators concluded that “second eye cataract surgery may confer significant quality of life benefits that are not achieved by first eye surgery alone.”¹

The study is limited in terms of the diversity of patients examined because the research was conducted in five Veterans Administration centers with predominantly white, male populations, and because the exact timing of the surveys was not standardized (30–90 days before or after surgery), leading to the possibility of survey response bias. Nevertheless, the large sample size and the use of a Rasch-validated and vision-specific instrument to measure patient-reported QOL outcomes provide strong evidence that second-eye cataract surgery improves QOL metrics to a much greater degree than does surgery on the first eye alone.

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CLINICAL EFFICACY OF IMPLANTATION OF TORIC INTRAOCULAR LENSES WITH DIFFERENT INCISION POSITIONS: A COMPARATIVE STUDY OF STEEP-AXIS INCISION AND NON-STEEP AXIS INCISION

He W, Zhu X, Du Y, et al⁹

ABSTRACT SUMMARY

This 60-patient prospective study compared the clinical outcomes of cataract surgery using two different clear corneal incisions (CCIs)—along the steep axis and along the nonsteep axis—followed by implantation of the AcrySof IQ Toric IOL (Alcon). The main purpose of the research was to determine if the location of the CCI produced any statistically significant difference with regard to visual acuity, residual astigmatism, accuracy of preoperative calculations for toric IOLs, or quality of vision.

One experienced surgeon performed all of the procedures using topical anesthesia in a standardized manner. The 30 eyes of the 30 patients in the steep group received a 2.6-mm CCI along the steep axis; the 30 eyes of the 30 patients in the nonsteep group received a similar incision made 15° to 75° away from the steep axis. Routine pre- and postoperative examinations were conducted.

The primary outcome measures included visual acuity, residual astigmatism, and change in corneal astigmatism 3 months postoperatively. The investigators recalculated the toric IOL axis according to actual surgically induced astigmatism (SIA) and deviation from the implanted axis assessed. They found no statistical difference in the demographics of the two groups except for the position of the incision. The study's results showed no difference in residual astigmatism ($P = .412$), toric IOL rotation ($P = .980$), SIA ($P = .461$), or visual acuity ($P > .05$). Corneal astigmatism was significantly reduced 3 months postoperatively compared

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► In this 60-patient prospective study, creating a clear corneal incision along the steep axis helped reduce the cylinder power of a toric IOL, but it also decreased the incidence of postoperative irregular astigmatism and higher-order aberrations, resulting in an overall improvement in postoperative quality of vision.

WHY IT MATTERS

Refractive cataract surgeons should be aware of the potential impact of incision placement on vision quality and corneal irregularity, and they should adjust their surgical technique accordingly whenever possible.

to preoperatively in the steep group (2.09 ± 0.55 vs 1.59 ± 0.58 D; $P < .001$), however, whereas there was no significant change in the nonsteep group (2.05 ± 0.57 vs 2.02 ± 0.77 D; $P = .784$). Moreover, a greater number of patients in the nonsteep versus steep group had irregular corneal astigmatism after surgery (43.33% vs 10%; $P = .004$), and the deviation of the IOL axis using the actual SIA was significantly larger in the nonsteep group ($P < .001$). Most important, overall postoperative visual function was improved in the steep group across various measurements, including point spread function, modulation transfer function, and higher-order aberrations.

DISCUSSION

As the number of patients seeking astigmatic correction during cataract surgery grows, so does surgeon focus on high-quality visual outcomes. Earlier research has established the hypothesis that operating on the steep axis may flatten that meridian and steepen the flat meridian, thus partially correcting astigmatism.¹⁰ In their study, He and colleagues found that, by 3 months after surgery, operating on the steep meridian had decreased corneal astigmatism by as much as 0.40 ± 0.52 D.⁹ Because the size of the cataract incision is shrinking—even to microporportions—the effect of SIA alone may not be large enough to negatively

affect visual acuity. Nonetheless, this study showed that placing the CCI along a nonsteep access can negatively affect vision quality, corneal irregularity, and corneal aberrations. Refractive cataract surgeons must be aware of these potential effects and adjust their surgical technique accordingly whenever possible. ■

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