

COMBINING VITREORETINAL SURGERY WITH EDOF IOL IMPLANTATION



The lens technology's potential to reduce patients' trips to the OR and loss of accommodation.

BY PETER STALMANS, MD, PHD

Cataract surgery is often thought of as an age-related procedure. In numerous European countries, however, including Belgium, where I practice, many patients receiving a vitrectomy undergo concurrent cataract surgery if they are older than 50 years of age to minimize the number of surgical procedures they will require and maximize their UCVA. IOL selection in this situation is challenging because these individuals are typically active members of the workforce who require crisp intermediate and near visual acuity. My colleagues and I therefore conducted a study to evaluate patient satisfaction when vitrectomy was combined with the implantation of an extended depth of focus (EDOF) IOL (AT LARA, Carl Zeiss Meditec).¹

WHY AN EDOF IOL?

Traditional multifocal IOLs are designed to provide better near visual acuity and greater spectacle independence than monofocal IOLs.² Patients who receive multifocal IOLs, however, are more likely to experience glare, halos,^{2,3} and reduced contrast sensitivity.³ An EDOF lens was selected for our study because it can provide good intermediate visual acuity with fewer unwanted visual effects.⁴ Participants with more than mild

corneal astigmatism received a toric model.

Earlier research demonstrated high patient satisfaction with EDOF lenses.^{5,6} Our study is the first to gauge patient satisfaction with an EDOF IOL implanted following a vitrectomy. The study also explored whether unilateral or bilateral IOL status had an impact on quality of life.

METHODOLOGY

Patients who underwent a vitrectomy at the University Hospitals Leuven in Belgium from January 2019 to January 2022 were invited to participate in our study. In addition to patients with vision-threatening conditions such as retinal detachment (RD) and epiretinal membrane, the study enrolled a small number of individuals who elected to undergo a vitrectomy to remove floaters. Among patients with an RD, only those with macula-on detachments at the time of the procedure or those with macula-off detachment of less than 24 hours' duration were included. The enrollment of individuals with epiretinal membranes was limited to stages 1 and 2 because we felt more advanced stages made patients unsuitable candidates for an EDOF lens. Patients with macular holes were excluded.

A total of 89 individuals participated in the study. They were 56.7 years old

on average (vs a mean age of 73 years for traditional cataract extraction⁷). Three widely used questionnaires were administered—CatQuest (to measure quality of life after cataract surgery), Near Acuity Visual Questionnaire (NAVQ; to assess near visual quality), and Assessment of Photoc Phenomena and Lens Effects (to assess visual disturbances). Patients also responded to a few follow-up questions regarding their spectacle lens habits and general contentment. Notably, nearly 50% of the participants transitioned from unilateral to bilateral EDOF IOLs, which made us feel more confident when gauging patient satisfaction between the two statuses.

RESULTS

Most of the participants were satisfied overall with their outcomes (about a 3.44/4.0 score on the CatQuest). Although most patients were happy with their intermediate visual acuity postoperatively (3.55/4.0 NAVQ score), many rated their near visual acuity as average (2.75/4.0 NAVQ score). That said, 73% reported no difficulty in performing daily tasks such as reading price tags. Almost 60% stated that no extra effort was required to write notes and sign documents—daily tasks that demand near focus and

REFRACTIVE VITREORETINAL SURGERY?

By Tal Raviv, MD



Dr. Stalmans' article presents an interesting and novel approach to visual rehabilitation following pars plana vitrectomy for retinal pathology. In brief, patients older than 50 years of age who presented for vitrectomy due to a macula-on retinal detachment (RD) or grades 1 to 2 epiretinal membranes were offered simultaneous refractive lens exchange (RLE). Furthermore, they all received a diffractive extended depth of focus (EDOF) IOL—toric model if indicated—specifically the AT-LARA (Carl Zeiss Meditec), which is not currently available in the United States. Good uncorrected distance and intermediate visual acuity was targeted. About half of the patients then underwent RLE with an EDOF IOL on their fellow, noncataractous eye to reduce anisometropia and improve their spectacle independence. Wow!

In the United States, where I practice, IOL surgery typically would be performed only months to years following vitrectomy—when the patient developed a visually significant cataract. During a postvitrectomy cataract evaluation, I assess a patient's candidacy for various IOL designs based on the health of their macula and the presence/absence of other comorbidities. The decision takes the fellow, noncataractous eye into account. In my experience, most 50-year-old myopic patients who are status post RD repair in one eye hesitate to undergo an RLE on the contralateral, unaffected eye, which is presumably also at increased risk of an RD. This limits the options for the refractive correction of the

first eye. When one of these individuals is a candidate for an EDOF IOL, I discuss their potential need for a refractive enhancement with laser vision correction and the rare possibility that they may require an IOL exchange for a monofocal lens.

Cataract surgery practice patterns in Europe and the United States differ in many ways. In Europe, many retina surgeons are also cataract surgeons, and immediately sequential bilateral cataract surgery is more commonplace. Economic and accessibility constraints may also create long waiting periods for cataract surgery.

It is certainly more cost-effective and convenient for patients if RLE is performed at the time of vitrectomy. I have concerns, however, about choosing an EDOF IOL (vs a monofocal or even a multifocal IOL) for everyone without knowing their postoperative visual prognosis.

The results of Dr. Stalmans' study are intriguing.

TAL RAVIV, MD

- Founder and Medical Director, Eye Center of New York, New York
- Clinical Associate Professor of Ophthalmology, New York Eye and Ear Infirmary of Mount Sinai, New York
- Member, CRST Executive Advisory Board
- talraviv@eyecenterofny.com; X (formerly Twitter) @TalRavivMD
- Financial disclosure: Consultant (Johnson & Johnson Vision)

can be challenging for the elderly. In contrast, individuals who receive monofocal IOLs typically wear spectacles to perform these tasks. Some study participants experienced visual disturbances, such as mild glare and halos, but most reported no unusual or debilitating visual disturbances.

No notable distinction in visual performance, satisfaction, or visual disturbances was observed between unilateral implantation (phakic group) and bilateral implantation (pseudophakic group). The only discernible difference between the two groups related to spectacle dependence. Patients who underwent bilateral IOL implantation reported wearing glasses less frequently than those who underwent unilateral implantation. Sixty percent of the

unilateral group and almost 90% of the bilateral group were either completely free of spectacles or used only reading glasses. Only about 9% of the participants were unsure about requesting an EDOF lens again if given the opportunity. Factors that could have influenced their decision included a residual refractive error that was larger than expected, visual disturbances, and vision impairment due to the retinal condition that prompted the vitrectomy.

Participants who underwent an elective vitrectomy, such as for floaters, were among the least satisfied. This trend may be attributable to these patients' higher expectations due to the elective nature of surgery and greater attention to visual disturbances compared to the patients undergoing

vitrectomy for other vitreoretinal diseases.

LIMITATIONS

Our analysis was prospective, but patient reporting is subjective. The focus of our study was the EDOF lens and its impact on quality of vision. The use of medical terminology in our surveys could have skewed results. We attempted to eliminate the potential language barrier by encouraging patients to ask questions whenever they needed clarification, but there was no way to ensure complete comprehension.

The retrospective nature of surveys, moreover, with months sometimes elapsing between surgery and patients' responses to questionnaires, could have lowered

satisfaction scores. Many individuals feel most satisfied with lens surgery immediately after its conclusion, when they can most directly compare their pre- and postoperative vision.

STRENGTHS

By design, our study included individuals who experienced surgical complications, including macular edema, metamorphopsia, recurrent RD, and IOL-related complications. The range of preoperative refractive errors, moreover, was large (+5.00 to -16.00 D). We were thus able to determine that the EDOF IOL was effective regardless of the amount of preoperative refractive error and that patients undergoing both unilateral and bilateral surgery could achieve satisfactory results. Bilateral implantation seemed to be particularly well suited to patients who indicated preoperatively that comfortable reading vision was a priority.

As a side note, I consider unilateral EDOF IOL implantation only when the refraction of the contralateral eye is close to emmetropia (ie, between +1.00 and -1.00 D). Otherwise, either a spherical monofocal IOL is implanted to match the refraction of the contralateral eye, or both eyes receive an EDOF IOL.

CONCLUSION

The results of our study suggest that performing lens extraction and EDOF IOL implantation at the time of vitrectomy in patients of working age can maximize their visual improvement. A welcome finding was that the lens procedure was effective regardless of the patient's preoperative refraction, which seemed to have no impact on their level of postoperative satisfaction. Instead, patient satisfaction seemed to be influenced more significantly by their preoperative retinal condition. ■

PETER STALMANS, MD, PHD

- Head of Clinic and a vitreoretinal specialist, Ophthalmology Department, University Hospitals Leuven, Belgium
- Assistant Professor, KU Leuven, Leuven, Belgium
- peter.stalmans@uzleuven.be
- Financial disclosure: Consultant (Carl Zeiss Meditec)

1. Van Hoe W, Van Calster J, Jansen J, et al. Patient satisfaction after EDOF intraocular lens implantation in vitrectomized eyes. *Graefes Arch Clin Exp Ophthalmol*. 2023;261(12):3465-3474.
2. Nijkamp MD, Dolders MGT, de Brabander J, van den Borne B, Hendrikse F, Nuijts RMA. Effectiveness of multifocal intraocular lenses to correct presbyopia after cataract surgery: a randomized controlled trial. *Ophthalmology*. 2004;111(10):1832-1839.
3. Martínez Palmer A, Gómez Faiña P, España Albelda A, Comas Serrano M, Nahra Saad D, Castilla Céspedes M. Visual function with bilateral implantation of monofocal and multifocal intraocular lenses: a prospective, randomized, controlled clinical trial. *J Refract Surg*. 2008;24(3):257-264.
4. Kancierz P, Toto F, Grzybowski A, Alio JL. Extended depth-of-field intraocular lenses: an update. *Asia Pac J Ophthalmol (Phila)*. 2020;9(3):194-202.
5. Ganesh S, Brar S, Rp N, Rathod D. Clinical outcomes, contrast sensitivity, reading performance and patient satisfaction following bilateral implantation of AT LARA 829MP EDOF IOLs. *Clin Ophthalmol*. 2021;15:4247-4257.
6. Tarib I, Kaiser I, Herbers C, et al. Postoperative results in patients implanted with a novel enhanced depth of focus intraocular lens. *EC Ophthalmol*. 2018;9(4):192-202. Accessed January 16, 2024. <https://www.researchgate.net/publication/327668442>
7. Golligly HE, Hodge DO, St Sauver JL, Erie JC. Increasing incidence of cataract surgery: population-based study. *J Cataract Refract Surg*. 2013;39(9):1383-1389.