

Visual Performance at Different Distances After Implantation of an Isofocal Optic Design Intraocular Lens

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ABSTRACT

PURPOSE: To evaluate refractive and visual outcomes at different distances after implantation of an isofocal optic design intraocular lens (IOL) following cataract surgery.

METHODS: This multicentric, retrospective/prospective, open-label, observational study considered 183 eyes of 109 patients who were implanted with the ISOPURE 123 (PhysIOL) IOL. The main outcome measures were refractive error and monocular and binocular uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), uncorrected intermediate visual acuity (UIVA), and distance-corrected intermediate visual acuity (DCIVA) at 66 and 80 cm, uncorrected near visual acuity (UNVA), and distance-corrected near visual acuity (DCNVA) at 40 cm. Binocular visual acuity at different vergences (defocus curve) was also measured. Patients were evaluated at least 120 days postoperatively.

RESULTS: A total of 95.7% of the eyes were within ± 1.00 diopter (D) and 73.2% of the eyes were within ± 0.50 D; the mean postoperative spherical equivalent was -0.12 ± 0.42 D. There were 90.54% and 98.57% of patients presenting a cumulative binocular UDVA and CDVA value of 20/25 or better, respectively; 80.65% and 50.0% of patients presented a binocular DCIVA value of 20/25 or better at 80 and 66 cm, respectively; and 41.94% of patients presented a binocular DCNVA value of 20/40 or better. The through-focus curve showed good visual acuity at far and intermediate distances with a depth of focus value of 1.50 D. No adverse events were reported.

CONCLUSIONS: The current study shows that this isofocal optic design IOL provides excellent visual performance for far vision and functional intermediate vision with an extended range of vision. This lens is an effective option for providing functional intermediate vision and correcting aphakia.

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Monofocal intraocular lenses (IOLs) are usually considered for implantation after cataract surgery, allowing patients with both myopia and hyperopia to achieve excellent distance visual acuity through selecting the appropriate IOL power. However, patients implanted with monofocal IOLs need to wear glasses for near and intermediate distance activities such as reading. Multifocal IOLs, based on different optical technology, have been launched onto the market and used worldwide; patients undergoing multifocal IOL implantation are more likely to be spectacle free but have a

higher risk of unwanted visual phenomena, such as glare or halos, and lower contrast sensitivity.¹⁻³ Specifically, a recent review and meta-analysis concluded that trifocal IOLs demonstrated better performance at near distances than hybrid multifocal extended depth of focus (EDOF) IOLs, but apparently resulted in more photic disturbances. A report by the American Academy of Ophthalmology⁴ indicated that most multifocal and EDOF IOLs that were compared with a control monofocal IOL demonstrated that patient-reported spectacle independence was superior to that with monofocal IOLs; all patients

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