

Quality of vision after cataract surgery after Tecnis Z9000 intraocular lens implantation: Effect of contrast sensitivity and wavefront aberration improvements on the quality of daily vision

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Purpose

To compare ocular performance and quality of vision in pseudophakic eyes with an aspherical intraocular lens (IOL) or a conventional spherical IOL

Methods

Twenty patients (40 eyes) were randomly divided in 2 equal groups to bilaterally receive the aspherical Tecnis Z9000 IOL (AMO) or the spherical CeeOn Edge 911 IOL (AMO). Contrast sensitivity was measured and ocular wavefront analysis performed before surgery and 6 months after. Patients completed the Activities of Daily Vision Scale (ADVS) to evaluate patient-centered visual outcomes. Other examinations included refraction before and after mydriasis and pupil diameter.

Results

The mean postoperative best corrected visual acuity (logMAR) was 0.03 ± 0.05 (SD) in the Tecnis group and 0.01 ± 0.05 in the CeeOn Edge group ($P = .41$). Refractive evaluation with mydriasis showed a mean myopic shift as low as -0.02 ± 0.36 diopter (D) in the Tecnis group and -0.51 ± 0.37 D in the CeeOn Edge group ($P = .001$). Mesopic contrast sensitivity at high spatial frequencies was significantly better in the Tecnis group ($P < .001$), while contrast sensitivity under photopic and glare conditions was not different between the 2 groups. Spherical aberration was significantly lower in the Tecnis group, which had a mean Z40 of $0.01 \pm 0.06 \mu\text{m}$, than in the CeeOn Edge group, which had a mean Z40 of $0.16 \pm 0.12 \mu\text{m}$ ($P < .001$). The global score on the ADVS was not statistically different between groups; however, quality of distance vision was better in the Tecnis group than in the CeeOn Edge group (mean 99.0 ± 2.0 versus 89.2 ± 3.4) ($P < .001$).

Conclusion

Implantation of an aspherical IOL with a negative spherical aberration resulted in reduced ocular spherical aberration and improved mesopic contrast sensitivity and led to better subjective quality of vision. -