

# The Literature

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## FOUR-YEAR VISUAL, REFRACTIVE, AND CONTRAST SENSITIVITY OUTCOMES AFTER WAVEFRONT-GUIDED MYOPIC LASIK USING AN ADVANCED EXCIMER LASER PLATFORM

Shaheen MS, Massoud TH, Ezzeldin H, Khalifa MA<sup>1</sup>

### ABSTRACT SUMMARY

Shaheen et al prospectively evaluated the 4-year outcomes of wavefront-guided LASIK with a mechanical microkeratome for the correction of low to moderate myopia (mean spherical equivalent,  $3.36 \pm 1.71$  D) in 255 consecutive eyes using the Visx CustomVue platform (Abbott Medical Optics). Postoperative logMAR uncorrected distance visual acuity was 20/25 or better in 98% and 100% of eyes at 1 and 4 years, respectively. Four years postoperatively, the mean spherical equivalent was  $-0.22 \pm 0.28$  D, with 97.3% of eyes achieving a spherical equivalent within  $\pm 0.50$  D. An improvement in contrast sensitivity was observed at some spatial frequencies between 1 and 4 years postoperatively. Only three retreatments were required during the follow-up period, and only one eye (0.39%) lost 1 line of BCVA.

### DISCUSSION

Wavefront-guided ablations have been demonstrated to effectively minimize aberrations, yielding generally excellent postoperative visual acuity, provided the centration and photoablation for the procedure is accurate. Iris registration technology, used by the CustomVue platform, provides further precision to wavefront-guided laser treatments by considering the iris periphery, a static reference point for centration, instead of the pupillary center that may change with variable illumination conditions.<sup>2</sup> Studies report excellent visual and refractive results following wavefront-guided ablation using this laser platform in the short term (up to 1 year after surgery). Nevertheless, corneal biomechanical changes and ocular changes associated with patients' age may limit the potential of the correction achieved with wavefront-guided ablation profiles.

Shaheen and coauthors found that wavefront-guided LASIK using iris registration technology provides an effective and predictable correction of low to moderate myopia over 4 years, preserving patients' visual acuity and quality. It would be interesting to analyze in future

studies with longer follow-up periods if the aberrometric profile achieved with wavefront-guided LASIK treatments minimizes or slows down the impact of aberrometric modifications associated with aging.

## RESOLVING REFRACTIVE ERROR AFTER CATARACT SURGERY: IOL EXCHANGE, PIGGYBACK LENS, OR LASIK

Fernández-Buenaga R, Alió JL, Pérez Ardoy AL, et al<sup>3</sup>

### ABSTRACT SUMMARY

Fernández-Buenaga et al compared three different procedures to correct residual refractive error after cataract surgery. The retrospective multicenter study comprised 65 eyes of 54 patients that underwent phacoemulsification, resulting in residual ametropia with an unacceptable final refractive error. These eyes underwent one of three surgical procedures: IOL exchange (17 eyes), piggyback lens implantation (20 eyes), or LASIK (28 eyes). The investigators observed no difference between the IOL exchange and piggyback lens groups in spherical equivalent, sphere, or cylinder ( $P = .072, .436, \text{ and } .081$ , respectively). The LASIK group had a statistically significant reduction in spherical equivalent and refractive cylinder when compared with the IOL exchange group ( $P < .001$  and  $P = .001$ , respectively). When compared with the piggyback lens group, the LASIK group showed reduced refractive cylinder ( $P = .002$ ). All three groups had a similar safety index. The predictability (defined as  $\pm 1.00$  D of final spherical equivalent) was 62.5% of eyes in the IOL exchange group, 85% of eyes in the piggyback lens group, and 100% of eyes in the LASIK group.

### DISCUSSION

The most common postoperative cataract surgical problems result from refractive inaccuracies. Lack of precision in biometric analysis, inadequate selection of the IOL power, limitations of the calculation formulas, or IOL positional errors intraoperatively may contribute to unexpected refractive errors and visual outcomes after uneventful cataract surgery. IOL exchange, piggyback lens implantation, and laser vision correction (LASIK) are all reasonable alternatives to reduce postoperative ametropia and improve patients' satisfaction.

Few studies, however, have been conducted to demonstrate acceptable results for these procedures.

According to the authors, only one prior study conducted a comparative analysis of LASIK versus lens-based correction (IOL exchange or piggyback IOL implantation).<sup>4</sup> Both approaches showed similar results for correcting residual refractive error after cataract surgery.<sup>4</sup> In the current study, piggyback lens implantation and IOL exchange were analyzed separately, as IOL exchange may induce higher astigmatism due to the larger incision required. In conclusion, LASIK, IOL exchange, and piggyback lenses are effective postoperative treatment options for correcting residual ametropia after cataract surgery. The LASIK group showed the best outcomes in efficacy and predictability. Longer-term studies analyzing the safety of the various treatments are needed. ■

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