

Wavefront-Guided LASEK With the Zyoptix System for the Correction of Moderate to High Myopia and Compound Myopic Astigmatism With Six-Month Follow-Up

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Purpose: To assess the safety, efficacy, predictability, stability, and change in aberrations after wavefront-guided laser-assisted subepithelial keratectomy (LASEK) for myopia and myopic astigmatism.

Setting: Ophthalmology Department of Fajr Hospital and Negah Eye Center, Tehran, Iran.

Design: Prospective, nonrandomized, self-controlled trial.

Methods: Wavefront-guided LASEK was performed in 70 eyes in a six-month trial. Treated eyes had a mean subjective manifest spherical equivalent (SE) of -5.71 ± 2.18 D, with a range of -2.0 to -12.0 D of myopia and 0 to -4.0 D of astigmatism. The preoperative Zernike root mean square (RMS) 6mm and higher-order aberrations (HOAs) 6mm were 7.76 ± 2.82 and 0.37 ± 0.12 , respectively. After an epithelial flap creation, a wavefront-based excimer ablation (Zyoptix) was performed. Safety, efficacy, predictability, and stability were evaluated at one week and two and six months postoperatively. Wavefront changes of HOAs and contrast sensitivity at six months determined for pupil sizes of 6 mm.

Results: At six months postoperatively, UCVA was 20/20 or better in 87.1 % of the eyes, and 20/30 or better in 100%. The mean subjective manifest SE at six months was -0.14 ± 0.22 D; it was within 0.50 D in 97.8% and within 0.75 D in 100%. No eye lost lines of BSCVA at six months postoperatively, 5 eyes gained one line of BSCVA, and 3 eyes gained two lines. The mean Zernike RMS 6mm and HOA root mean square (RMS) 6mm was 1.63 ± 0.62 and 0.81 ± 0.27 , respectively. The total HOA (RMS) increased on average by a factor of 2.18 with a 6mm pupil. No change or reduction in the total HOA RMS was observed in 6.0% of the eyes for a 6mm pupil. There was a significant increase of primary spherical aberration (Z 4, 0) by a factor of 4.90 for 6mm pupils. The mesopic and photopic contrast sensitivity was within normal range.

Conclusions: Wavefront-guided LASEK using Zyoptix is an effective and safe procedure for the treatment of myopia and myopic astigmatism. Although

in all of the eyes total RMS could be reduced, there was still undercorrection and induction of HOAs with the algorithm employed.