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Follow Up of Ocular Aberrations After Zyoptix and Planoscan LASIK Retreatment

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Purpose: To evaluate the magnitude of ocular aberrations after wavefront-guided LASIK retreatment (Zyoptix, Bausch & Lomb) and standard LASIK retreatment (Planoscan, Bausch & Lomb) for myopia and myopic astigmatism, during follow up of one, three and six months. **Methods:** It was a prospective, randomized trial with paired-eye control of 74 eyes from 37 patients who underwent LASIK retreatment. Each patient had retreatment using Zyoptix LASIK in 1 eye and PlanoScan LASIK in the contralateral eye. The mean patient age was 32.24 ± 07.03 (SD) years and the mean preoperative LASIK retreatment spherical equivalent (E) was -1.34 ± 0.81 for the Zyoptix group and -1.07 ± 0.73 for the PlanoScan group. A complete ophthalmologic examination was performed. Wavefront analysis was achieved with a Hartmann-Shack aberrometer (Zywave) and surgeries were performed with the Technolas 217 Z excimer laser system (Bausch & Lomb) by a single surgeon (WN). Zyoptix and Planoscan groups were compared in terms of variability of ocular aberrations after 1, 3 and 6 months after surgery. **Results:** In Zyoptix group, all Zernike coefficients and groups of ocular aberrations were stable since one month after LASIK retreatment, with no statistical difference between mean values of ocular aberrations at 1, 3 and 6 months. In the 6 month follow up, there was a reduction of 68.24% of second order, 19.44% of third order and 11.19% of higher order aberrations with an increase of 2.67% of fourth order aberrations. In Planoscan group, mean values of spherical aberration and secondary astigmatism were statistically higher in the third month when compared to the six month period ($p < .05$). At 6 months, there was a reduction of 41.24% of second order aberrations and an increase of 22.94% of third order, 4.87% of fourth order and 12.78% of higher order aberrations. **Conclusion:** Wavefront-guided LASIK with Zyoptix produces better correction and more stability of ocular aberrations than standard LASIK with PlanoScan in retreatment of refractive errors after primary LASIK.