

COMPARATIVE ANALYSIS OF HIGHER ORDER ABERRATIONS AFTER CONVENTIONAL AND Q-VALUE GUIDED FEMTOLASIK WITH THE MICROSKAN VISUM

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The aim: To compare the results of the Q-value guided FemtoLASIK with the conventional FemtoLASIK for the myopia correction with the MicroScan Visum.

Materials and methods: 64 myopic patients who underwent FemtoLASIK were divided in 2 equal groups: group of investigation after Q-value guided FemtoLASIK and the control group after conventional FemtoLASIK. All patients were examined pre-op. and post-op. up to 12 months with quality of vision and contrast sensitivity evaluation (Optec 6500 (Stereo Optical Company, USA)); aberrometry (OPD-Scan ARK-10000 (Nidek, Japan)) with the total root mean square (RMS), RMS of higher-order aberrations (RMS HO), spherical aberration (SA), coma (C) and corneal Q-value (Q) analysis. Femto LDV (Ziemmer, Switzerland) was used for flap creation. Ablation was performed using MicroScan Visum excimer laser (OptoSystems, Troitsk, Russia)

Results: Pre-op. data: Group of investigation: SE -4.29 ± 0.27 D, RMS HO 6 mm 0.44 ± 0.21 mm, SA $0,03 \pm 0,06$ mm, C $-0,05 \pm 0,02$ mm, Q -0.37 ± 0.11 . Control group: SE -4.11 ± 0.32 D RMS HO 6 mm 0.43 ± 0.11 mm, SA $0,03 \pm 0,12$ mm, C $-0,03 \pm 0,12$ mm, Q -0.35 ± 0.06 .

Post-op. data: group of investigation - SE was close to "0 D": 0.12 ± 0.04 D, comparing to control group 0.26 ± 0.11 D ($p < 0.05$). In the group of investigation RMS HO 6 mm, (0.48 ± 0.18 mm) and Q value (-0.33 ± 0.09) were preserved at preoperative ranges, while in control group these values increased in 2 times: RMS HO 6 mm was 0.74 ± 0.24 mm, Q: 0.023 ± 0.10 ($p < 0.05$). Group of investigation SA $0,06 \pm 0,08$ mm, C $0,03 \pm 0,07$ mm. Control group SA $0,09 \pm 0,10$ mm, C $0,06 \pm 0,14$ mm. Quality of vision in mesopic conditions was higher in the investigation group.

Conclusion: Retaining the corneal shape and pre-operating level of High Order Aberrations, such as SA and C after Q-value guided FemtoLASIK increases the quality of vision for myopic patients as compared with conventional FemtoLASIK.