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Correlations Between Central and Peripheral Changes in Anterior Corneal Topography After Myopic LASIK and Their Implications in Postsurgical Contact Lens Fitting.

Articles

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Abstract:

Purpose. To investigate the changes in central and peripheral anterior corneal curvatures after myopic laser in situ keratomileusis (LASIK) and to correlate them with the manifest refractive change to discuss how such results could affect post-LASIK corneal topography profiles and midterm stability and their implications in postsurgical contact lens fitting.

Methods. Topographic and refractive data from 18 eyes of 11 patients that had undergone myopic LASIK were collected for 6 months after surgery. Short-term and midterm topographic responses were investigated and correlated with spherical equivalent manifest refractive changes.

Results. There was a strong correlation between eccentricity changes and manifest refractive change 15 days after surgery ($r^2 = 0.753$, $P < 0.001$), with no significant changes thereafter for the following 6 months ($r^2 = 0.148$, $P = 0.114$). A strong linear relationship was found between baseline manifest refraction and changes in corneal curvature at the center ($r^2 = 0.810$, $P < 0.001$), 4-mm chord ($r^2 = 0.895$, $P < 0.001$), and 6-mm chord ($r^2 = 0.696$, $P < 0.001$). Statistically significant changes were also found after the first 15 days ($P < 0.005$) and showed a regression effect that affects the three zones. In this case, a weaker relationship was found between curvature regression and the final refractive change for the central location ($r^2 = 0.412$, $P = 0.004$), 4-mm chord area ($r^2 = 0.430$, $P = 0.003$), and 6-mm chord area ($r^2 = 0.283$, $P = 0.023$).

Conclusions. After myopic LASIK, the anterior corneal dioptric power is expected to change, on average, approximately 77% of the attempted spherical equivalent correction at the center; 60% at the 4-mm chord region, where the stronger

correlation between topographic and refractive change is found; and 30% at the 6-mm chord area. The paracentral area 4 mm from the center seems to be more likely to predict baseline corneal curvature from manifest refractive change. Some degree of regression in the midterm period is expected to occur after myopic LASIK, which shows a significant correlation with the manifest refractive change. Again, this effect is more evident and more accurately predicted at the 4-mm chord area. The results of the current study are of interest for those fitting contact lenses after myopic LASIK.

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