ORIGINAL ARTICLE

Change in Stromal Thickness and Anterior Curvature After Refractive Corneal Lenticule Extraction With the CLEAR Application

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Abstract

PURPOSE: To measure the changes in stromal thickness and anterior corneal curvature after corneal lenticule extraction for the correction of myopia and myopic astigmatism with the Corneal Lenticule Extraction for Advanced Refractive correction (CLEAR) application (Ziemer Group).

METHODS: The correlations between achieved correction on maximum myopic meridian and stromal thinning and spherical equivalent of achieved correction and anterior corneal flattening were evaluated by optical coherence tomography 6 months after CLEAR in 78 eyes of 78 patients in a retrospective, consecutive, non-comparative case series study.

RESULTS: With an optical zone of 6.5 mm (52 eyes), the mean correction achieved was −5.80 ± 1.52 diopters (D) (range: −2.25 to −9.25 D), the mean stromal thinning was 104 ± 15 µm (range: 76 to 138 µm), and the regression line was: µm of thinning = 8.46 • D of correction + 55.25. With an optical zone of 6 mm (26 eyes), the mean correction achieved was −8.33 ± 1.61 D (range: −5.50 to −11.00 D), the mean stromal thinning was 114 ± 12 µm (range: 93 to 144 µm), and the regression line was: µm of thinning = 6.35 • D of correction + 60.92. With 6.5 mm, the mean corneal flattening was 4.27 ± 0.88 D, and the regression line was: D of flattening = 0.50 • D of correction + 1.60. With 6 mm, the mean corneal flattening was 6.40 ± 0.70 D, and the regression line was: D of flattening = 0.37 • D of correction + 2.36.

CONCLUSIONS: Stromal thinning and anterior corneal flattening were correlated with the amount of myopic correction in a linear fashion. The thinning was significantly less than predicted by the laser software.

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