EARLY REGIONAL CHANGES IN CORNEAL STROMAL THICKNESS AFTER COLLAGEN CROSSLINKING

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PURPOSE: To evaluate changes in corneal stromal thickness after collagen crosslinking (CXL) measured with Scheimpflug imaging for Keratoconus (KC) and post-LASIK-Ectasia (Ectasia).

METHODS: Retrospective analysis of corneal stromal thickness measurements taken centrally (CST) and at 6 peripheral points [superior (S), nasal (N), inferior (I), temporal (T), superonasal (SN), superotemporal (ST), inferonasal (IN) and inferotemporal (IT)] at 1 and 2 mm radii before CXL and at postoperative month 1 (POM 1) and 3 (POM 3). Total corneal thickness measurements were obtained with both Scheimpflug imaging (Pentacam) and Optical Coherence Tomography (OCT), while epithelial thickness was measured by anterior segment OCT (Optuvue) in order to calculate stromal thicknesses by subtracting epithelial thickness from total thickness.

RESULTS: There were 14 KC eyes and 11 Ectasia eyes evaluated. In the KC group, when measured with Pentacam, there was significant stromal thinning in the 2mm SN point at POM 1 and in the 1mm temporal point at POM 3. There were no significant changes between POM 1 and POM 3. When measured with OCT there were no significant changes on POM 1 or POM 3. No significant changes in CCT were detected with either technology. In the Ectasia group, when measured with Pentacam, there was significant stromal thinning at POM 1 at 2 and 3 mm superior points and 1 and 2 mm nasal points, and at POM 3 there was no significant changes compared with preoperative measurements. The 2 and 3 mm superior points were significantly thinner on POM 1 compared to POM 3. When measured with OCT there were no significant changes detected neither on POM 1 nor on POM 3. No significant changes in CCT were detected with either technology.

CONCLUSION: There were minimal average changes in central or regional stromal thickness in Keratoconus or Ectasia at 1 and 3 months after CXL measured with Pentacam and OCT; however, great variability exists between eyes both centrally and peripherally.