Comparative Analysis of Keratoconic Scleral Lens Wearers With & Without Corneal Cross Linking

Andrew Fischer, OD; Sarah Henderson, OD; David Kading, OD, FAAO, FCLSA
Specialty Dry Eye and Contact Lens Center, Seattle, WA

Purpose

The purpose of this study was to analyze the average K-values in keratoconic patients that have had a corneal crosslinking (CXL) procedure prior to scleral lens fitting, compared to those who have not undergone corneal crosslinking.

Figure 1: Medmont E300 Topographer

Methods & Materials

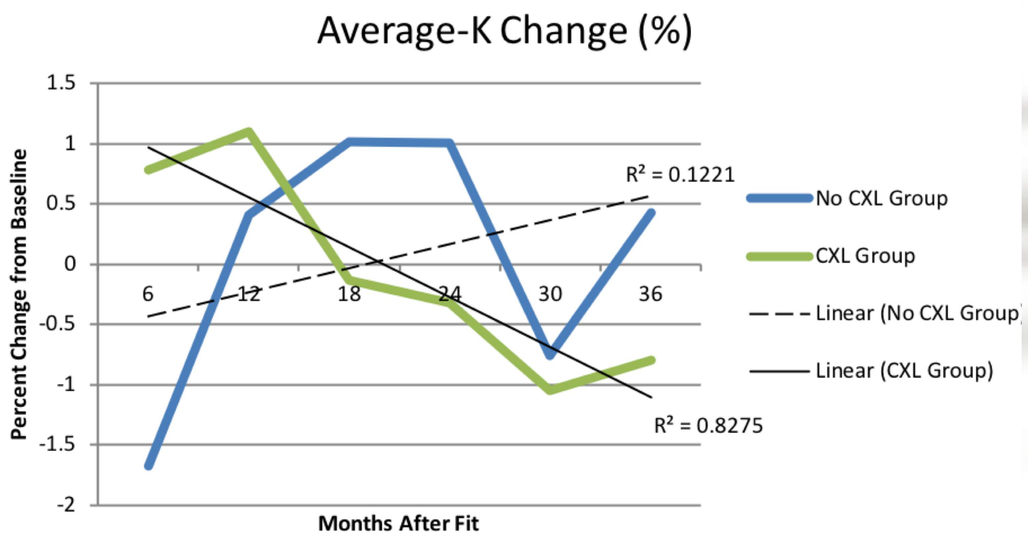
This study evaluated the average keratometry values of keratoconic patients over a period of 36 months after being fit into scleral contact lenses. Subjects were separated into two groups: Non-Treatment Group (N=30) and CXL Treatment Group (n=15). Data was collected on 45 eyes of 25 patients, with an average age of 33.1 years. Inclusion criteria required a diagnosis of keratoconus and a new scleral lens fitting. Exclusion criteria included previous scleral contact lens wear and previous corneal surgeries other than CXL, including intacs and corneal transplants. Corneal topography was performed using a Medmont E300 Corneal Topographer. All patients received a baseline topography prior to fitting and at each subsequent visit. Based on the return visit date, average keratometry readings were organized into groups of 6-month intervals. The annual rate of change was calculated for each interval period between initial fitting and 36 months.

Results

CXL Group:
Over the 36-month period, the average annual rate of change was -0.071%.

Non-Treatment Group:
Over the 36-month period, the average annual rate of change per year was 0.068%.

Over the 36 month follow-up period, the CXL group showed a decrease in Average-K, while the non-treatment group showed an progression in Average-K.



Discussion

This study determined that after keratoconic patients had CXL, then were fit in sclerals, they experienced a gradual flattening of their average keratometry values over the next 36 months. The Non-Treatment Group experienced a gradual steepening of their average keratometry values.

Because the average-K values at the baseline exam ranged widely (39.8D to 62.82D), initial analysis of dioptric changes artificially skewed data to one of the two extremes. By comparing percent changes from baseline at each 6-month follow-up interval, this was minimized.

Both groups showed changes in average-K values over the 36 months. Corneas without CXL showed continued progression in average-Ks in this study, where the CXL treatment group did not. It is vitally important to closely monitor keratoconic corneas for progression, and to consider CXL early if progression is detected.

Limitations

In this study, a reflection-based topographer was utilized, which has been shown to be variable depending on quality of the Placido ring reflection.
Some patients in this study did not return on regular 6-month intervals, while others were lost to follow up. This resulted in inconsistent number of subjects for each 6-month interval.

In further studies, a strict follow-up protocol should be utilized to ensure consistent intervals. Scheimpflug tomography would likely give more reliable K values than reflection based topography. Additionally, a pre-fit average-K inclusion criteria with a smaller range may provide better analysis of K changes, as opposed to percent changes.

Acknowledgements

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Contact Information

For more information, please contact Dr. Fischer at drfischer@specialtyeye.com

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