CXL and PRK
Melissa Barnett, O.D.

Since corneal collagen cross-linking (CXL) was introduced, it has been used in the treatment of ectatic disorders by increasing the biomechanical stability of the cornea. More recent studies of CXL in combination with refractive procedures have shown varying degrees of success.

CXL with PRK has been demonstrated to be effective in slowing or halting the progression of keratoconus, pellucid marginal degeneration, and post-LASIK ectasia. Additionally, CXL with PRK may potentially decrease or delay the need for penetrating keratoplasty or lamellar keratoplasty. In many cases, the combined procedure can improve visual acuity, stabilize corneal ectasia, and delay or even prevent the need for more invasive procedures.

Several small case series have shown improved stability and efficacy of PRK and LASIK when combined with CXL, as well as a potentially decreased risk of postoperative ectasia.

Documented findings include:
- Improvement of uncorrected distance visual acuity
- Improvement of corrected distance visual acuity
- Lower refractive error
- Improvement of corneal astigmatism
- Better patient satisfaction
- The combined procedure can save time and money
- Stability without progression for more than two years

Potential challenges include:
- Some patients may become hyperopic from the crosslinking alone. The combination of CXL and PRK may produce too much hyperopia.
- Some difficulty predicting refractive error after surgery.
- Depth of treatment.
- Minimum corneal thickness of 430um.

Future studies are needed to determine the efficacy and long-term stability of CXL in combination with keratorefractive procedures, as well as to address possible complications.

Below are corneal topography maps along with difference maps of a young patient with keratoconus who was cross-linked OU by Dr. Ray Stein of Toronto in January 2010. He returned for topo-guided-PRK OU in the fall of 2012. Appreciate the improvement of results and much added refractive benefits to CXL alone. He now wears Biofinity Toric lenses, can see well with glasses and is very happy!
The AOA’s CLCS Newsletter, November 2013

COMPREHENSIVE TOPOGRAPHY REPORT

DOB: 06/29/1986

Visante OCT Exam: 07/02/2013 08:07:27 PM
ATLAS Exam: 07/02/2013 05:22:15 PM

Simulated Keratometry:
- Steep K: 46.87 D @ 27
- Flat K: 45.52 D @ 117
- Mean K: 46.35 D

4.5 mm Zone:
- Asphericity: Q: -0.79
- Pachy Min: 374 µm

Anterior Axial Curvature

Pachymetry

Anterior Mean Curvature

Relative Pachymetry

Anterior Elevation (Sphere)
- 5.09 mm (44.65 D), Zone=10.23mm

Posterior Elevation (Sphere)
- 6.12 mm (-6.53 D), Zone=5.02mm

Visante OCT 3.0.1.8 Caution: Excessive motion suspected. Maps may be unreliable.

Report Date: 07/02/2013 08:08:10 PM

DUPAGE MEDICAL GROUP 2-Difference

Axial Curvature

Axial Curvature

(c) 2009 CARL ZEISS MEDITEC ATLAS Revision 3.0.0.39
References:

Dr. Barnett is a principal optometrist at the UC Davis Medical Center in Sacramento, where she performs primary and medical eye examinations and fits contact lenses, including specialty lenses, in addition to teaching optics and contact lenses to ophthalmology residents. She lectures and has been published on topics including dry eye, anterior segment disease, contact lenses, corneal collagen cross-linking and creating a healthy balance between work and home life for women in optometry. She is also a spokesperson for the California Optometric Association and has appeared on several television shows. In her spare time she enjoys cooking, yoga and spending time with her husband, Todd Erickson, O.D., and two sons, Alex, 6, and Drew, 4.

Please close this browser window to return to the CLCS Newsletter