

# Outstanding Outcome: Scleral Lenses in Severe Keratoconus Status-Post Novel CXL

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**Abstract:** The advent of corneal collagen crosslinking (CXL) has created a unique potential to slow the progression of keratoconus (KCN). Despite promising outcomes from CXL, contact lenses are frequently necessary to achieve maximum vision. Herein we report on a 43 year-old male with severe KCN who achieved maximum vision and comfort with scleral lenses post epithelium-on (epi-on) accelerated CXL with a new riboflavin formulation and pulsed light.

## Case Presentation:

Following successful epi-on CXL with 2.5D flattening OD and 4D of flattening OS in one year, a 43 year-old male presented to our clinic for scleral lens fitting to maximize his vision. Entering best corrected visual acuities (BCVA) with spectacle correction were 20/40 OD and 20/80 OS. Slit lamp examination and corneal topographies revealed moderate KCN OD and severe KCN OS. After fitting with Valley Contax Custom Stable Elite scleral lenses (Figure C), the patient reported significant improvement in BCVA to 20/20 OD and 20/25 OS and in quality of vision.

## Discussion:

CXL was performed in a tertiary care facility which uses a novel technology. A superior riboflavin was soaked (sponge is used to aid max contact) on the cornea which does not require epithelial removal. Approximately 10% of patients require additional riboflavin loading hence UVA irradiation is not started until cornea is fully soaked with riboflavin (confirmed using a slit lamp). UVA light is pulsed on and then off during the 30 minutes procedure hence delivering less total energy at 3.6 J/cm<sup>2</sup> (compared to the standard Epi-off method which delivers 5.4 J/cm<sup>2</sup>). The need for retreatment with the standard method is 3-7% versus 1% for this one. Our patient had an outstanding outcome with flattening of the steeper meridians and steepening of the flatter meridians in each eye one year status-post Epi-on CXL (figures A and B).

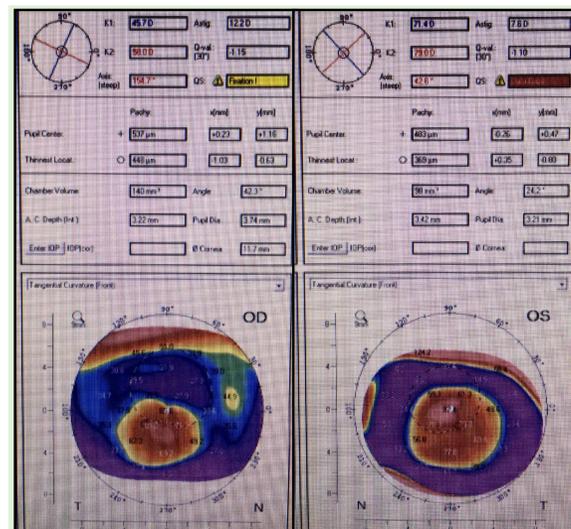


Figure A. Oculus Pentacam Pre- CXL

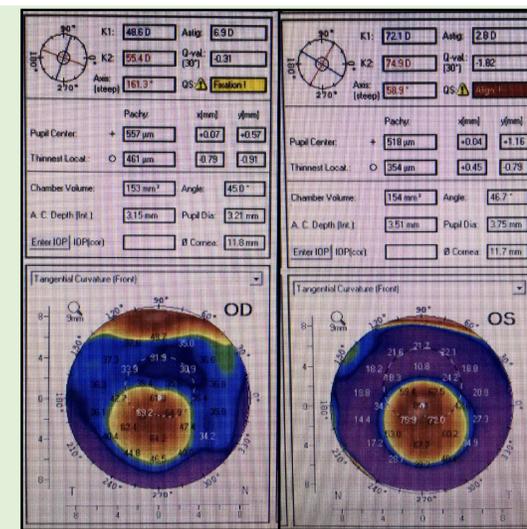


Figure B. Oculus Pentacam Post-CXL

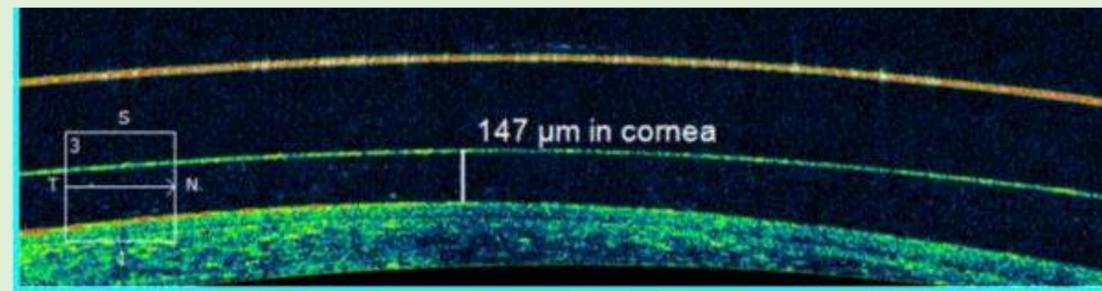


Figure C. Anterior Segment OCT of Valley Custom Stable Elite on OD after 2 hours of wear

## CL Parameters: Valley Contax, Custom Stable Elite OU

Eye	Power	Base Curve	Diameter (mm)	Thickness (µm)	Color	Material	Limbal Zone	Scleral Zone	Other
OD	-1.50	7.85	15.80	250	Clear	Opt Ext	-1LCZ	+1F SLZ	Dot
OS	-2.75	7.50	15.80	250	Blue	Opt Ext	6.40/6.43	+4F SLZ	

## Conclusion:

Epi-on accelerated CXL with pulsed light along with a unique riboflavin formulation is a promising technique to improve outcomes for KCN patients. Scleral lenses are a viable visual rehabilitative corrective option for optimal success following this novel procedure. One year status post CXL, corneal topographies reveal significant flattening of cornea in our patient and there were no complications with new scleral lenses fit.

## References:

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2. Stulting RD, Trattler WB, Woolfson JM, Rubinfeld RS. [Corneal crosslinking without epithelial removal](#). J Cataract Refract Surg. 2018 Nov;44(11):1363-1370. doi: 10.1016/j.jcrs.2018.07.029. Epub 2018 Sep 15. PubMed PMID: 30228014.

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