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THE EFFICIENCY OF CORNEAL CROSS-LINKING AGAINST THE PROGRESSION OF KERATOCONUS

Ophthalmology

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KEYWORDS

Corneal collagen cross-linking (CXL), riboflavin, endothelium, Keratoconus (KC), Keratectasia, stromal thickness

INTRODUCTION:

Corneal collagen cross-linking (CXL) with riboflavin and ultraviolet-A light is a method used to stop the progression of keratectasia. The currently accepted treatment parameters induce collagen cross-linking in the anterior 250 to 350 µm of corneal stroma. To protect the endothelium, CXL inclusion criteria require a minimum corneal thickness of 400 µm after removal of the epithelium. In some keratoconus eyes, however, progressive corneal thinning often leads to a remaining stromal thickness of less than 400 µm after epithelial removal.

PURPOSE:

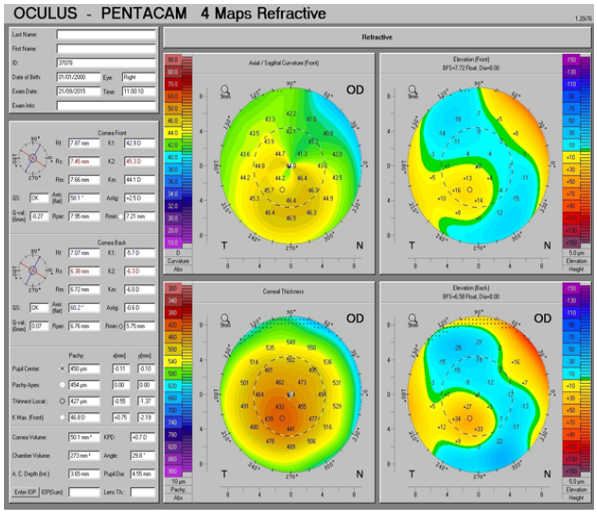
To compare the efficiency of 2 methods, we apply on each eye of the same patient presenting the same grade of Keratectasia in both eyes, one of the 2 methods differently:

OD: isotonic riboflavin with contact lens (without UV lock).
OS: Farhad Hafezi protocol.

METHOD:

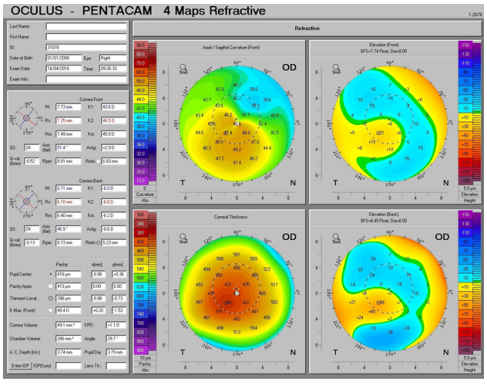
CXL was performed on both eyes of the same patient 16 y/o male presenting with same grade of keratoconus in both eyes: OD: Corneal thickness was 427 microns before epithelial removal, after epithelial removal we used isotonic riboflavin for 30 minutes, then we apply a soaked contact lens to enhance corneal thickness above 400 microns before initiating the UV treatment (30 minutes illumination with 365 nm, 3 mW/cm2; 5 cm distance). OS: Corneal thickness was 427 microns before epithelial removal, after epithelial removal we apply isotonic riboflavin for 30 minutes, as the thickness remained below 400 microns we apply hypotonic riboflavin till the thickness becomes above 400 Microns (Farhad ProtocoL) before initiating the UV treatment (30 minutes illumination with 365 nm, 3 mW/cm2; 5 cm distance). Pentacam have done 5 days prior and 6 months after CXL.

OD before CXL



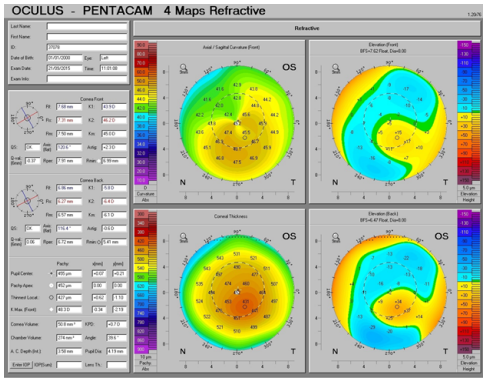
- K max = 46.8
- Thickness at the thinnest location =427 microns.

OD 6 months after CXL

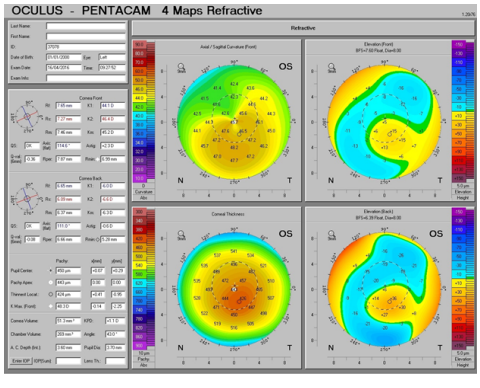


- K max =49.4
- Thickness at the thinnest location = 398 microns.
- Thickness is decreased 29 microns (sign of progression)
- K max increased by 2.6 (sign of progression)

OS before CXL



OS 6 months after CXL



- K max (before and after CXL) = 48.3
- Thickness at the thinnest location (before CXL) = 427
- Thickness at the thinnest location (6 months after CXL) =424
- No signs of progression

CONCLUSION:

Patient presenting the same grade of KC OU, CXL did not show the same efficacy between the 2 methods used after 6 months follow-up. CXL succeeded to prevent progression in the eye treated using Farhad protocol, while the using a contact lens in other eye did not stop the progression of the disease.