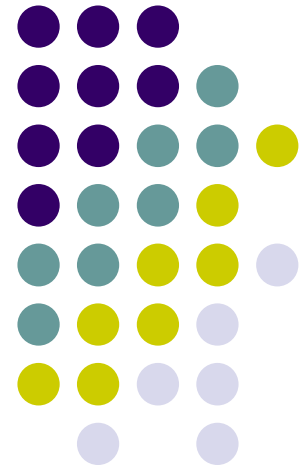


PRELIMINARY RESULTS IN TRANS EPITHELIAL CORNEAL CROSSLINKING

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Introduction



- Keratoconus is a progressive disorder in which the cornea assumes a conical shape secondary to stromal thinning.
- The onset is around puberty with slow progression until the third/ fourth decade of life when it usually arrests.
- The disorder is bilateral in 85% of cases, asymmetric and more frequent in men.
- Treatment objectives: *stopping progression and restoring visual acuity.*

I	Eccentric steepening Induced myopia and/or astigmatism of ≤ 5.00 D K-reading ≤ 48.00 D Vogt's lines, typical topography
II	Induced myopia and/or astigmatism > 5.00 to ≤ 8.00 D K-reading ≤ 53.00 D Pachymetry ≥ 400 μm
III	Induced myopia and/or astigmatism > 8.00 to ≤ 10.00 D K-reading > 53.00 D Pachymetry 200 to 400 μm
IV	Refraction not measurable K-reading > 55.00 D Central scars Pachymetry ≤ 200 μm

Introduction



- TE-CXL is an innovative approach to the treatment of keratoconus and cornea ectasia.
- Alternative to the standard treatment protocol, involving the removal of the corneal epithelium before the Riboflavin application.
- The goal of the treatment is to halt progressive and irregular changes in corneal shape.



- TE-CXL uses a harmless substance (riboflavin contained in Ricrolin TE) to create a chemical reaction within the corneal stroma.
- This reaction is triggered by low intensity UVA irradiation and results in the formation of high strength covalent bonds between the collagen fibres.
- As a consequence the collagen in the corneal stroma is reorganised in a more compacted way resulting in an increase in corneal biomechanical strength.

Aim of study



- To evaluate the early clinical effects of this technique in patients with progressive keratoconus.
- To evaluate the eventual side-effects of this technique.

Material and method



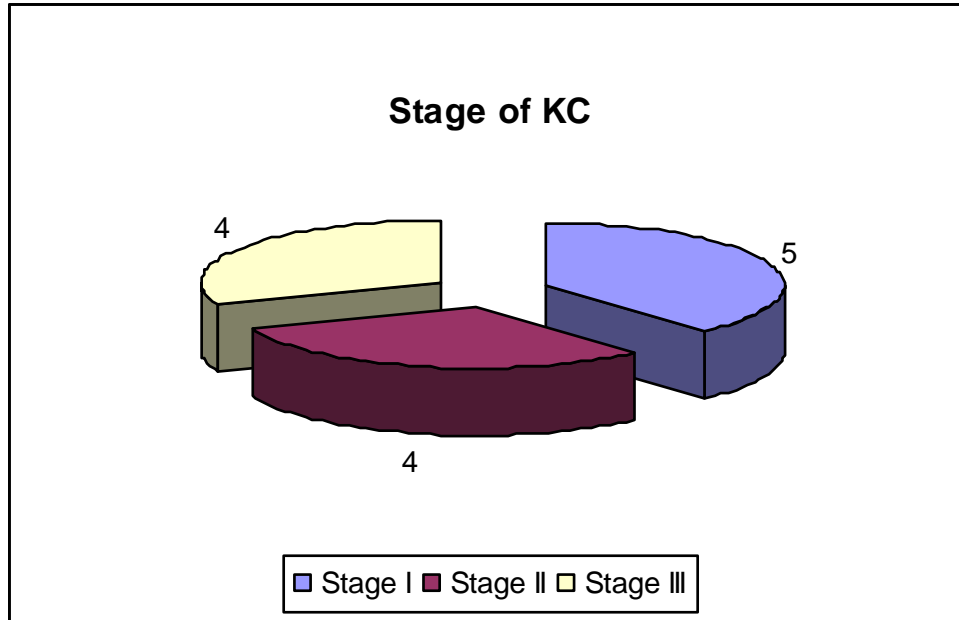
- We studied 13 eyes of 9 patients with a history of progressive keratoconus.
- The patients were followed by corneal topography pre and post intervention in the Ophthalmology Clinic Sibiu.

Procedure

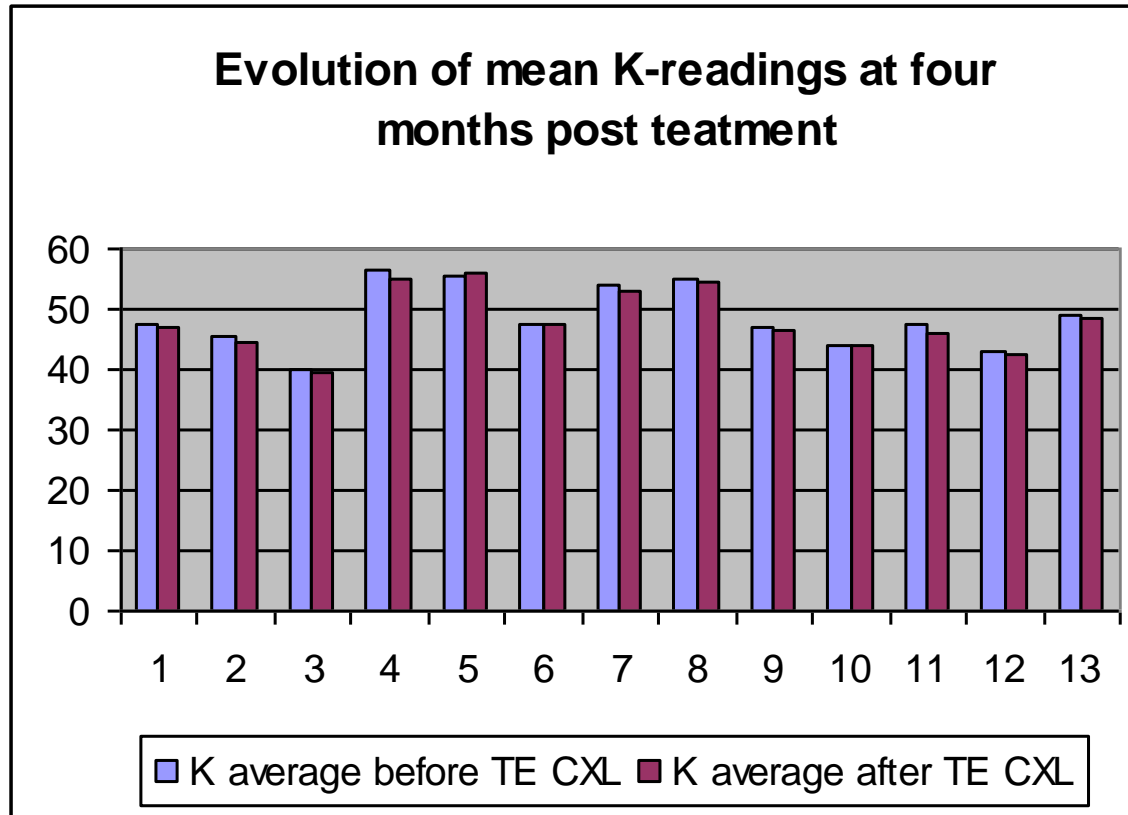


- Pilocarpine 30 minutes prior to irradiation.
- Ricrolin TE – 1 drop every 2 minutes for 30 minutes prior to irradiation.
- Topical anesthetic – 1 drop every 4 minutes at the beginning and again just before irradiation.
- UVA irradiation for 30 minutes – 6 steps of 5 minutes, Ricrolin TE at the beginning of each step.
- Therapeutical contact lens for 3-4 days, artificial tears.

Results



- 9 out of 13 eyes presented KC stage I or II with a cornea >400 microns
- 4 eyes presented KC stage III



- Topography performed at four months post-treatment showed a slight decrease of mean K-readings in the majority of eyes, with a mean of $0.48 D$.
- One eye showed KC progression, with an increase of *about 1 D* in the mean K-readings.



- We found no significant change in visual acuity after treatment.
- At four months post TE-CXL 7 eyes were fitted with RGP contact lenses, RK2 design and RK2 PG, thus increasing considerably the visual acuity.



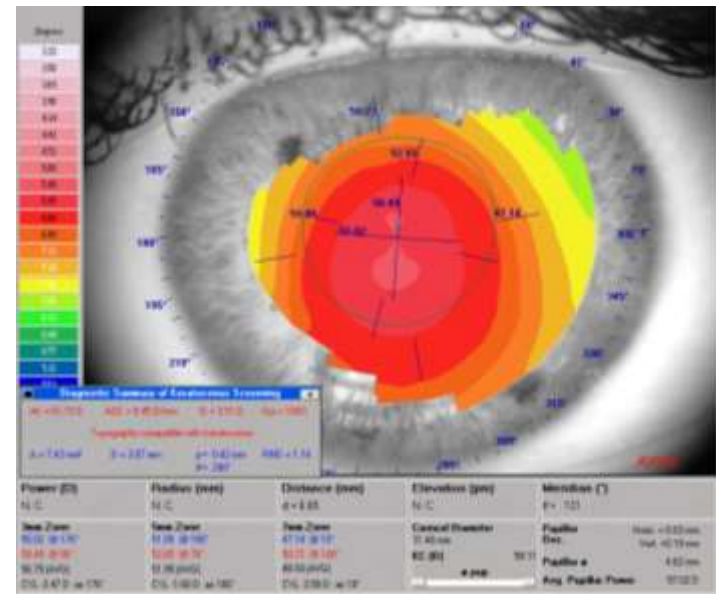
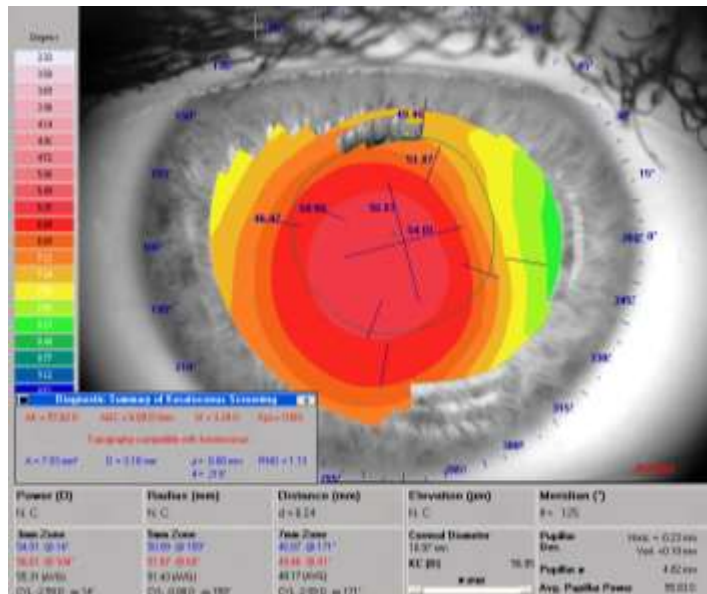
- None of the patients presented with any complication related to the procedure.
- A slight hyperemia of the conjunctiva was present the day of the procedure.
- The TCL was removed 3-4 four days after the procedure.

Case presentation

- Female, 22 years old

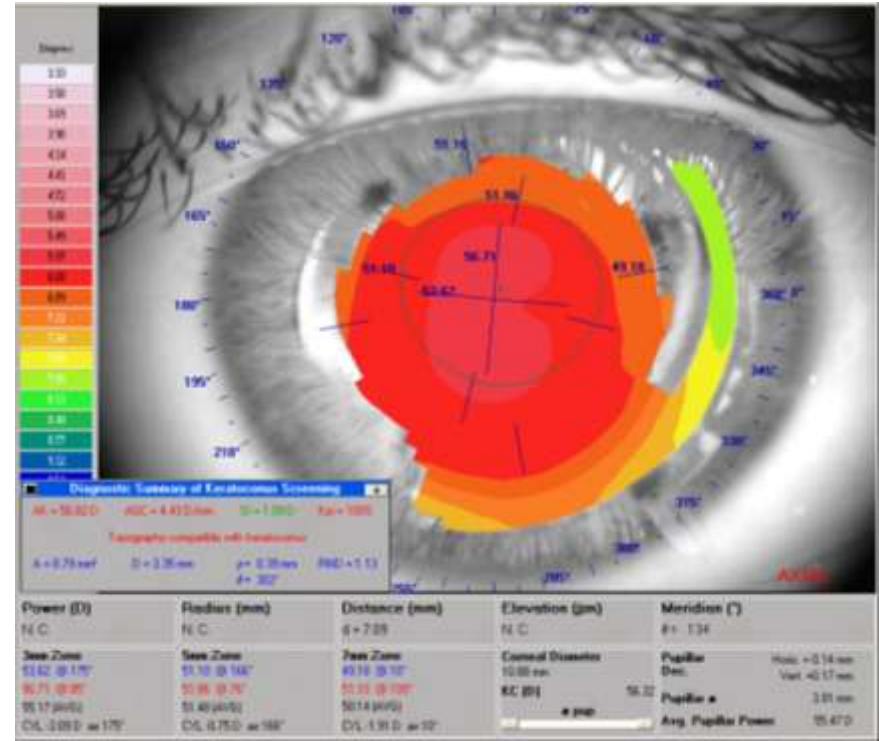
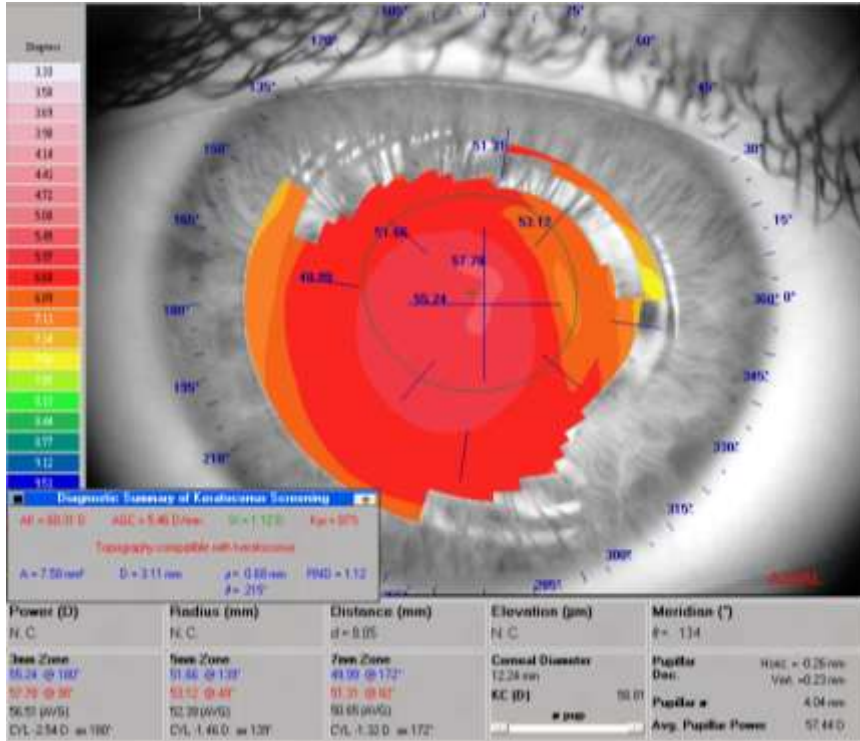
BCVA: OD= 0.4

OS= 0.2



TE-CXL →

4 months check-up



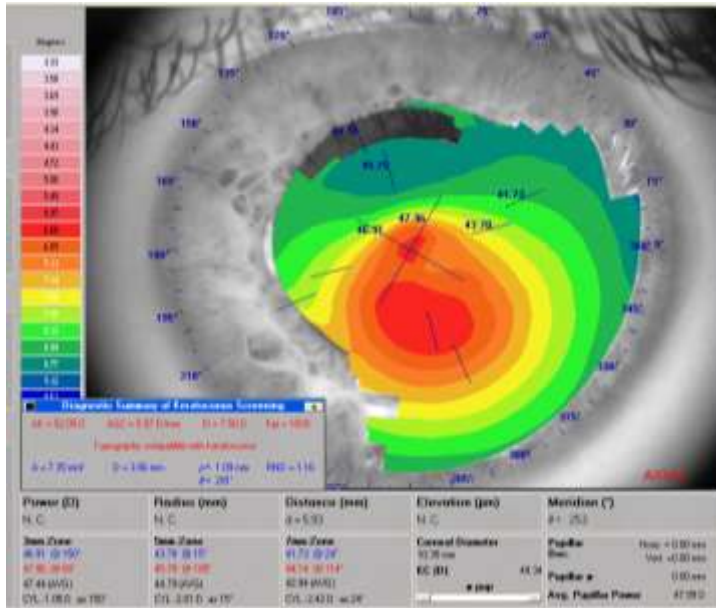
RK2 6,3; diam. 8,7; -8,50 Dsf; EL-0
VOD= 0.8

RK2 6,4; diam. 8,7; -7,50 Dsf; EL-0
VOS= 1

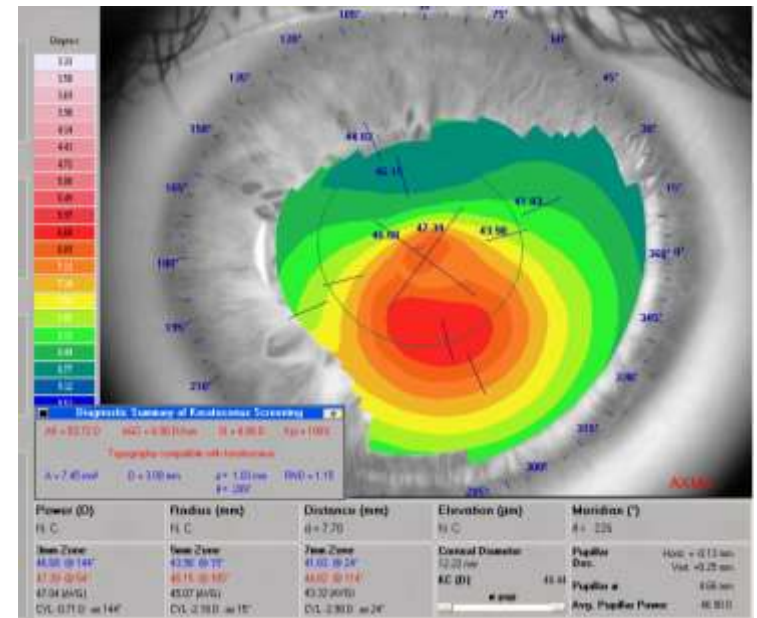
Case presentation



- Male, 24 years old, unilateral KC
- BCVA: OS= 0.5



TE-CXL
→



RK2 7,5; diam 9,2; -2,75 Dsf; EL +0.5
VOS= 1

Conclusions



- TE-CXL is an *effective* method to treat progressive KC, 12 eyes showed a slight decrease of mean K readings at 4 months.
- One eye (stage III) showed progression at four months, suggesting that the procedure might be more effective when used in early stages of KC.
- TE-CXL can be used safely also in special cases such as those with pachimetry < 400 microns, though its efficacy remains to be evaluated.



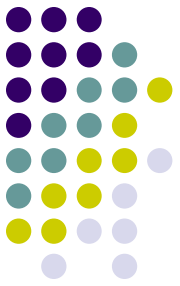
- TE-CXL is a *safe* method to treat KC, repeatable, avoiding the complications due to de-epithelisation.
- The patients experienced no post-treatment pain and no deterioration of VA following the procedure.

Future prospects



- A shorter permeation phase obtained thanks to iontophoresis technique, which allows for the rapid passage of the riboflavin into the cornea. The goal is to reduce the absorption phase from the current 30 minutes.
- Epithelial disruption technique which involves first making numerous small perforations in the epithellium that allows the riboflavin to penetrate into the cornea at a very high dosage.
- A shorter irradiation phase by using higher power irradiation sources.
- Integrated technique: combination of TE-CXL with ICR, which will bring major improvements in VA .

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Thank you for your attention!!!

