

Transepithelial corneal collagen crosslinking for progressive keratoconus: 24-month clinical results

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PURPOSE: To assess the clinical results of transepithelial collagen crosslinking (CXL) in patients 26 years and younger with progressive keratoconus suitable for epithelium-off (epi-off) CXL.

SETTING: Department of Ophthalmology, Siena University Hospital, Siena, Italy.

DESIGN: Case series.

METHODS: The study included 26 eyes (26 patients) treated by transepithelial (epithelium-on) CXL. The mean age was 22 years (range 11 to 26 years) (10 younger than 18 years; 16 between 19 years and 26 years). Preoperative and postoperative examinations included uncorrected (UDVA) and corrected (CDVA) distance visual acuities, simulated maximum keratometry (K), coma and spherical aberration, and corneal optical coherence tomography optical pachymetry. The solution for transepithelial CXL (Ricola TE) comprised riboflavin 0.1%, dextran 15.0%, trometamol (Tris), and ethylenediaminetetraacetic acid. Ultraviolet-A treatment was performed with the Caporossi Baiocchi Mazzotta X Linker Vega at 3 mW/cm².

RESULTS: After relative improvement in the first 3 to 6 months, the UDVA and CDVA gradually returned to baseline preoperative values. After 12 months of stability, the simulated maximum K value worsened at 24 months. Coma aberration showed no statistically significant change. Spherical aberration increased at 24 months. Pachymetry showed a progressive, statistically significant decrease at 24 months. Fifty percent of pediatric patients were retreated with epi-off CXL due to significant deterioration of all parameters after 12 months of follow-up.

CONCLUSIONS: Functional results after transepithelial CXL showed keratoconus instability, in particular in pediatric patients 18 years old and younger; there was also functional regression in patients between 19 years and 26 years old after 24 months of follow-up.

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Transepithelial corneal collagen crosslinking for progressive keratoconus in a pediatric age group

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PURPOSE: To evaluate the effectiveness and safety of transepithelial corneal collagen crosslinking (CXL) in children with keratoconus and the refractive changes induced by this treatment.

SETTING: Ophthalmology Department, Ain-Shams University Hospitals, Cairo, Egypt.

DESIGN: Comparative case series.

METHODS: Patients younger than 18 years with bilateral keratoconus had transepithelial CXL with the use of transepithelial riboflavin. The other eye was used as a control and was treated conservatively. The uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), and corneal tomography at 12 months were the main outcome measures.

RESULTS: The mean patient age was 15.7 years \pm 2.1 (SD). After transepithelial CXL, the improvement in the mean UDVA was statistically significant (from 0.95 \pm 0.34 logMAR to 0.68 \pm 0.45 logMAR) ($P < .05$). No eye lost lines of preoperative UDVA; 1 eye lost 1 line of preoperative CDVA. There was no improvement in the control group in UDVA or CDVA ($P > .05$). The mean simulated keratometry (K) decreased by a mean of 2.03 diopters (D), with mean flattening of the apical K by 2.20 D; both results were statistically significant ($P < .05$). In the control group, the simulated K increased by a mean of 0.59 D ($P > .05$), with mean steepening of the apical K by 2.9 D ($P < .05$). No significant changes occurred in the endothelial cell count in either group.

CONCLUSION: Preliminary results of transepithelial CXL in children with keratoconus were encouraging, with no evidence of progression of keratoconus over 12 months.

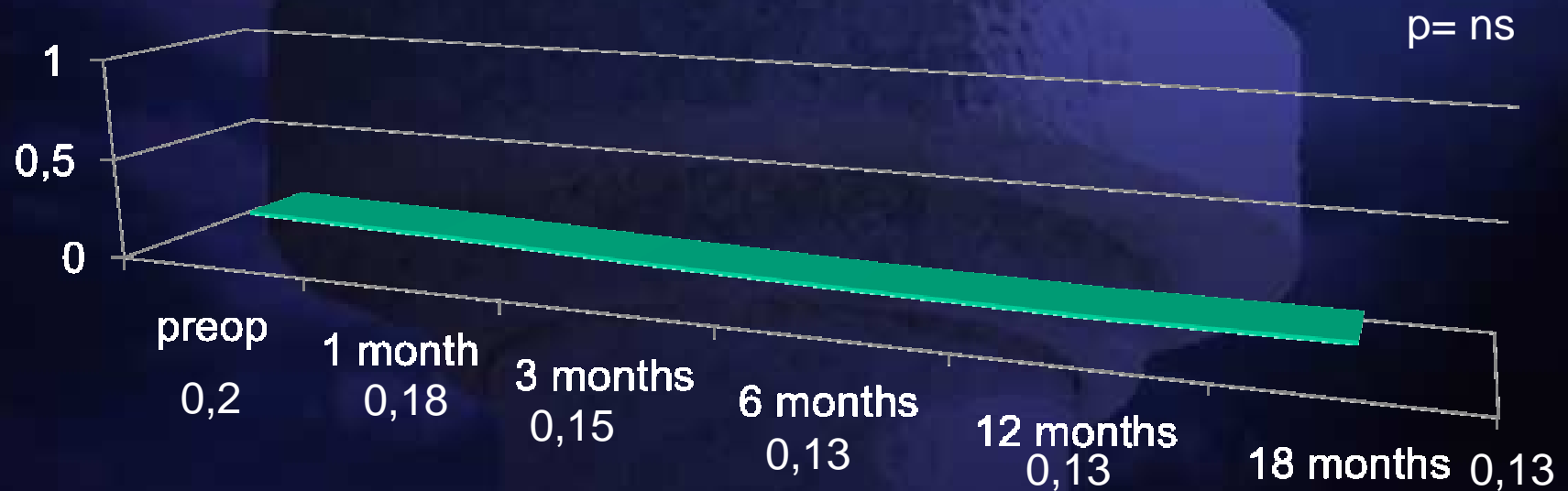
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LogMar UCVA



LogMar BCVA



Kmax (D)

$p = 0,01$



Thinnest point (micron)

$p = ns$

