

Selective transepithelial topography-guided photorefractive keratectomy with the LaserSoft solid-state 210 nm photorefractive laser platform combined with accelerated corneal collagen cross-linking

PURPOSE

NO FINANCIAL INTEREST

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METHODS

12 eyes underwent selective topography-guided transepithelial PRK followed by accelerated CXL using riboflavin A and enhanced-intensity (9 mW/cm², 7.2 J) ultraviolet light. Outcome parameters included uncorrected distance visual acuity (UCVA) and best spectacle corrected visual acuity (BSCVA). Corneal tomography and corneal wavefront aberrations were assessed before and 6 months after the procedure.

Selective Topo Guided Transepithelial PRK with accelerated Crosslinking was performed with the small spot size, high-repetition rate, all-solid-state LaserSoft (Katana Technologies, Berlin, Germany), which is a stabilized, tunable short-pulse, Q-switched, frequency-shifted, and diode-pumped laser.

Wavelength : 200 and 210 nm.

Repetition rate : 2 kHz.



SELECTIVE TOPOGRAPHY GUIDED TRANSEPITHELIAL PRK : The Topography guided map generated from the Sirius (CSO, Italy) was modified based on the Surgeons algorithm to ablate the epithelium central stroma upto 50 microns , hence called Selective.



METHODS

- Informed consent was obtained from all patients.
- One surgeon (APN) performed Selective Topo Graphy Guided Transepithelial PRK with LaserSoft (Katana Technologies, Berlin, Germany)
- Spot diameter was 0.2 mm
- Laser ablation zone varied up to 6mm. Ablation depth was less than 50 microns for all patients.
- Riboflavin(0.2 with HPMC) was applied for 30 minutes
- Accelerated Crosslinking with PESHKE PXL Platinum was done for 10 minutes (9 mW/cm², 7.2 J)
- Bandage Contact Lens was placed for 3 days till the epithelium healed.
- All patients received drops of antibiotics, steroids, and artificial tears 4 times daily till the bandage Contact lens was removed. Corticosteroid drops were continued till 2 months and Artificial Tears till 3 months.
- The examinations were performed at 1, 3, 6, and 9 months postoperatively





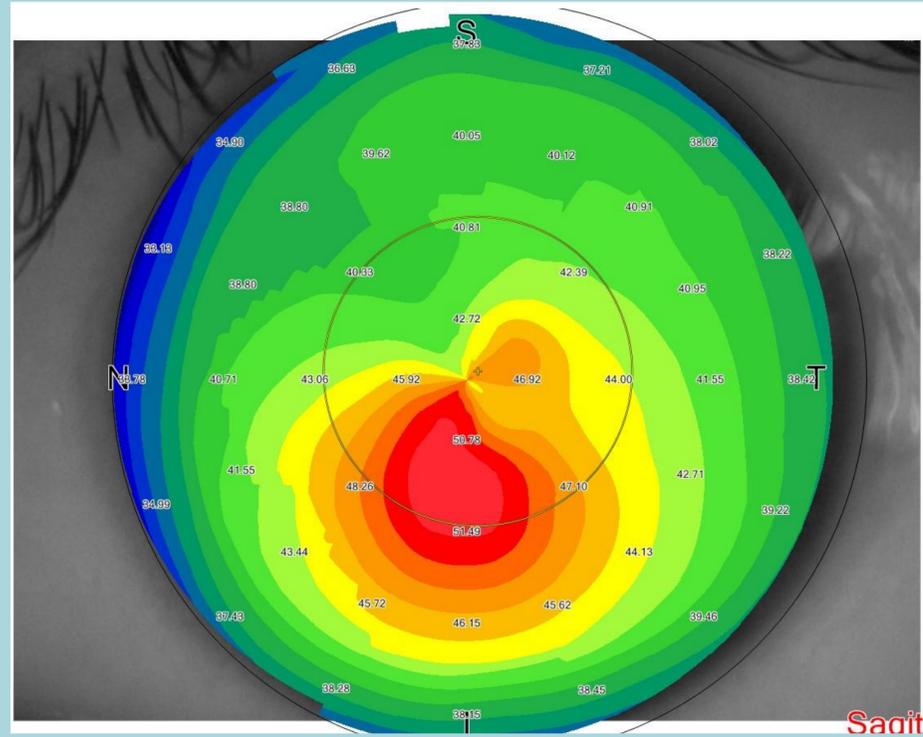
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OBSERVATIONS

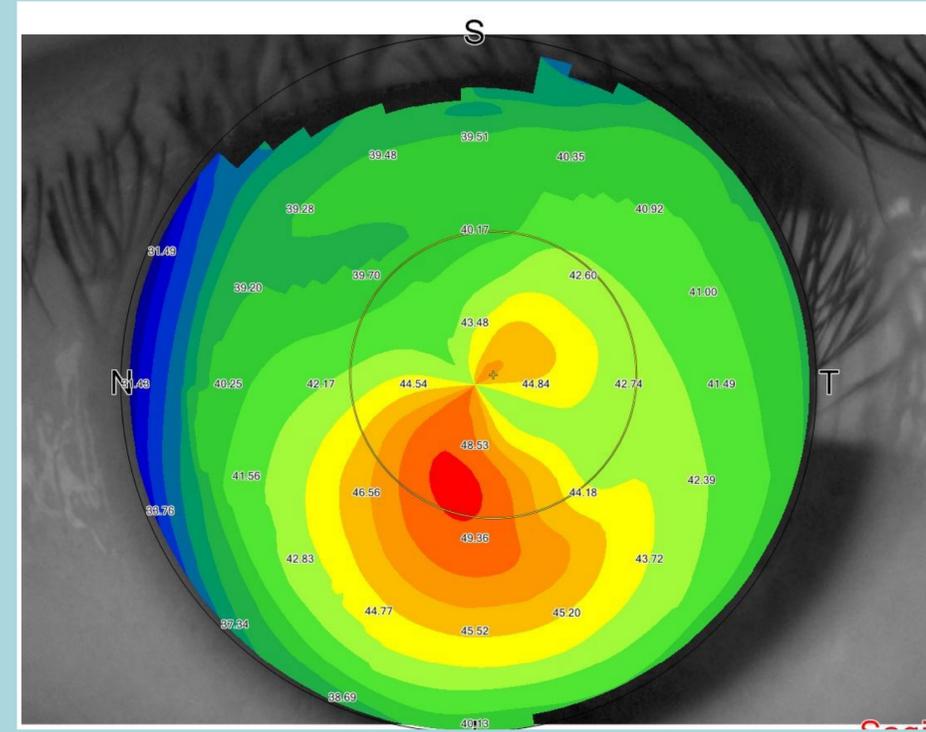
UCVA, BSCVA, sphere, cylinder, and simulated keratometry improved after treatment. However, BDVA improved more in eyes with cone located within central 3mm. There was significant improvement in coma and corneal asymmetry aberration in eyes with cone located outside the central 3mm zone. Corneal wavefront Zernike aberrations changed but were not affected by cone location. No adverse effects were observed.



Pre op

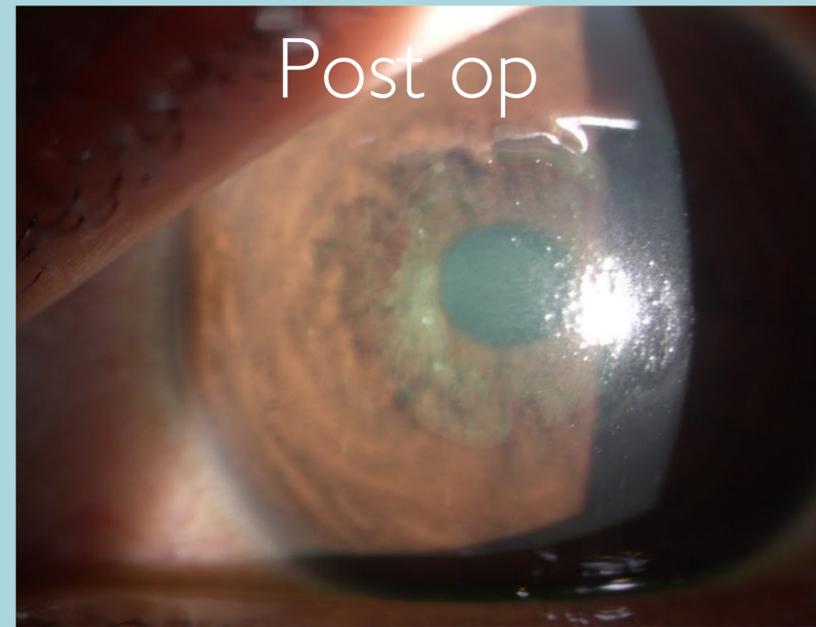
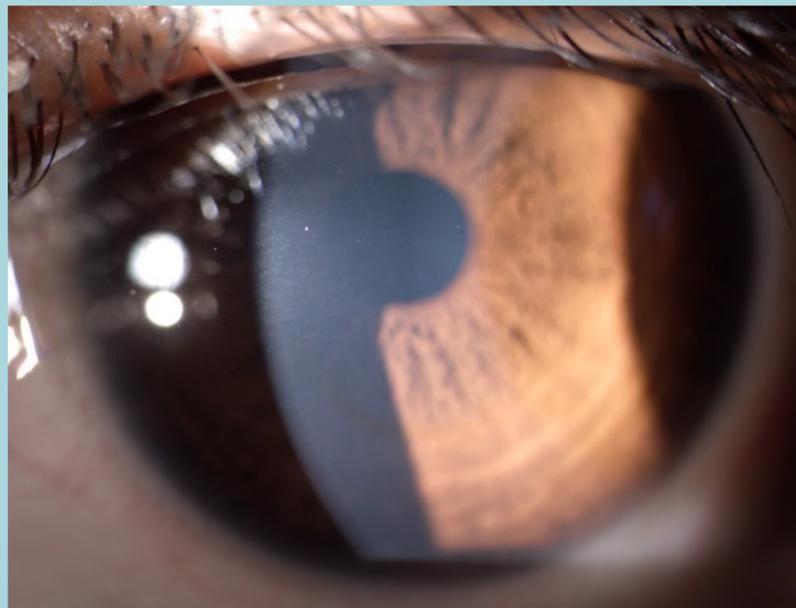


Post op 6 months



OBSERVATIONS

CORNEAL TRANSPARENCY





210 nm selective topography-guided transepithelial PRK was easy to perform and well tolerated by patients.

The combined LaserSoft and PXL protocol demonstrated effective results in halting keratoconus progression improving corneal regularity with a safe and effective profile.

It improved both visual acuity and corneal aberration in the mid-term period.

Longer follow-up is need to confirm these results and observe long-term cxi flattening effect on the cone.

SUMMARY

