

# IONTOPHORESIS, PHOTOTHERAPEUTIC KERATECTOMY AND EPITHELIUM-OFF: A RETROSPECTIVE COMPARISON OF THREE METHODS OF CROSSLINKING

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## INTRODUCTION

- Keratoconus is a degenerative condition
- Crosslinking aims at stabilizing the disease
- Various techniques with their pros and cons are available:
  - Epithelium-off: most efficient / pain, discomfort, transient corneal edema
  - Transepithelial: minimal side effects / less effective
- Alternative techniques to alter the epithelium and promote stromal penetration:
  - Iontophoresis
  - Phototherapeutic keratectomy

## PURPOSE

To compare the efficiency of iontophoresis crosslinking, crosslinking combined with phototherapeutic keratectomy (PTK) and epithelium-off crosslinking

## METHODS

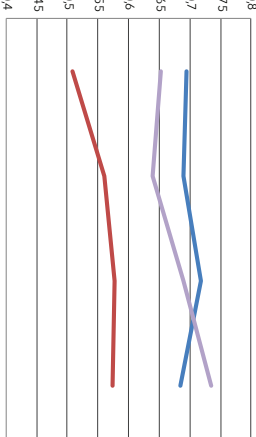
- Retrospective study comparing three surgical techniques: iontophoresis crosslinking (T1), crosslinking with PTK (T2) and epithelium-off crosslinking (T3).
- Clinical evaluation made at baseline and at 1, 7 and 15 months post-treatment:
  - Best-corrected visual acuity (BCVA)
  - Flat (Kflat), steep (Ksteep), mean (Kmean) and maximum (Kmax) keratometry values (Pentacam)
  - Central (Pcent) and minimum (Pmin) pachymetry values (Pentacam)
  - Higher-order aberrations: higher-order aberrations (HOA), index of surface variance (ISV) and index of vertical asymmetry (IVA) (Nidek OPD)

## CONCLUSION

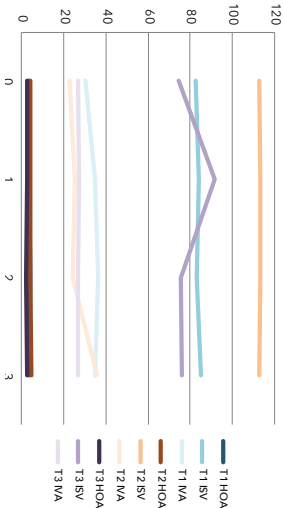
- Iontophoresis and PTK crosslinking efficiency is comparable to epithelium-off 15 months post-treatment
- PTK crosslinking group had more advanced keratoconus
- Visual recovery is faster post PTK compared to iontophoresis and epithelium-off

## RESULTS

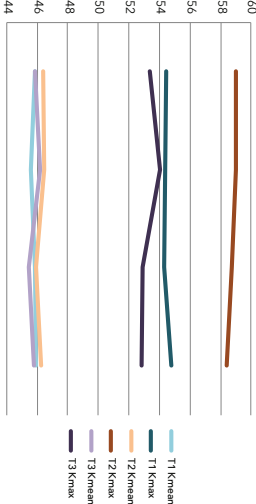
Evolution of best corrected visual acuity with T1, T2 and T3 at baseline and three follow-ups



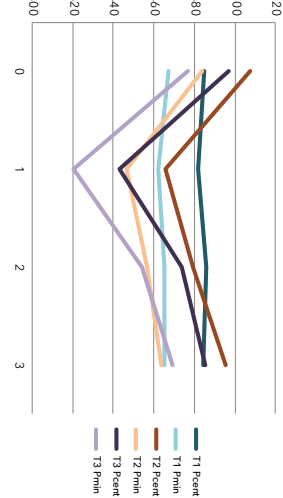
Comparison of higher-order aberrations (HOA), ISV and IVA index with T1, T2 and T3 at baseline and three follow-ups



Comparison of mean (Kmean) and maximum (Kmax) keratometry values for T1, T2 and T3 at baseline and three follow-ups



Comparison of central (Pcent) and minimum (Pmin) pachymetry values for T1, T2 and T3 at baseline and three follow-ups



### BCVA:

- ↑ with T2 and T3 at 15 months
- Significantly higher at any time with T3 compared to T2

### Pachymetry values:

- Minimal thinning with T1

### Keratometry values:

- ↓ with T2 and T3 after 15 months
- Significantly higher with T2 compared to T3 after 15 months

### Aberrations:

- ↓ HOA with T3 only after 15 months
- Significantly higher HOA and ISV with T2 compared to T3 at every visit

	T1	T2	T3
Number of eyes	26	12	67
Age	28.8 ± 9.1	29.3 ± 11.1	26.17 ± 10.2
BCVA	0.7374 ± 0.07353	0.5333 ± 0.13333	0.5374 ± 0.6471
Kmean	45.3692 ± 0.91179	47.3500 ± 4.2500	47.5500 ± 1.09119

## LIMITATIONS

- Unequal number of subjects between groups: results could differ with a larger sample of subjects
- Follow-ups limited to 15 months
- Examiner bias on crosslinking technique selected

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