Topography-Guided Photorefractive Keratectomy (TG-PRK) Using Two Refractive Laser Platforms with Simultaneous Collagen Cross-Linking (CXL) for Ectasia After Laser Assisted in Situ Keratomileusis

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*no financial interests*

**Purpose**

- To evaluate the early efficacy and safety of TG-PRK combined with simultaneous CXL in post-LASIK ectasia for correction of irregular astigmatism using the IVIS and Allegretto platforms
- We will discuss off label use or investigational use in our presentation
- The authors have no financial relationships with any commercial interest related to the content of this presentation
Methods

- Using 2 high-resolution excimer lasers for TG-PRK, modified by TNT (topographical neutralization) - trans epithelial technique (n=37)
- Riboflavin 0.1% in dextran, until aqueous staining
- UV irradiation with riboflavin (up to 20 minutes)
- UV 370 um, 3mW/cm² - 5.4 J/m²
- Hypotonic dextran if <400 um
- Bandage contact lens, standard post PRK management
- pre and post-operative assessment of symptoms
- uncorrected visual acuity (UVA), best corrected visual acuity (BCVA), manifest refraction (MR) predictability, safety
AW TG PRK CXL for ECTASIA

UCVA: 20/400
Pre Re-treat: -6.25-3.50x100
BSCVA: 20/80

12 month post-op
UCVA: 20/30-
RX: +0.50-0.50 x 160   20/30-
iV TG CXL PRK for Ectasia

26 years old male
LASIK x 5 years
UCVA : 20/60
MR:+1.00-2.75x125 20/30
CT : 552

3 months post-op
UCVA: 20/30-
MR:Pl-0.75x180 20/25+
CT : 544
AW TG-PRK CXL for Ectasia

36 years old male
LASIK x 6 years
UCVA: 20/400
MR: +1.25-4.25x100 20/50-
CT: 441

12 months post-op
UCVA: 20/40
MR: +1.50-1.25x150 20/30-
CT: 393
iV TG PRK CXL for Ectasia

61 years-old female
LASIK x 11 years
UCVA: 20/300
MR: -3.25-1.50x120 20/30+
CT: 408

4 months post-op
UCVA: 20/40
Rx: -0.25 20/25
CT: 345
Results

- 23 eyes completed ≥ 6 months follow-up, AW and iVIS have 16 and 7 respectively.
- 70% had ≥20/40 or better UDVA, 12 of 16 AW (75%) and 4 of 7 iVIS (57%).
Results

- 10 AW (63%) and 4 iVIS (57%) had CDVA improved, 8 AW (50%) and 1 iVIS (14%) improved 2 lines or more, 5 AW (31%) and 3 iVIS (43%) had no change, none lost 2 lines or more

CDVA Change in Different Platforms

- Percentage: 0%, 10%, 20%, 30%, 40%, 50%, 60%
- Gain 2 lines or more
- Gain 1 line
- No Change
- Loss 1 line
- Loss 2 lines or more
- AW %
- IVS %
Results

- AW had mean astigmatism decreased from -3.33D pre-operatively to -1.06D
- iVIS had mean astigmatism decreased from -2.46D pre-operatively to -1.11D
Results

- All but two symptomatically improved
- Complications included delayed epithelialization
- No progression of ectasia noted up to 2 years, one at 3 years
- iVIS central corneal regularization does not induce as much myopia as the Allegretto when used with TNT
- iVIS - less gain in CDVA
Conclusions

- Early results of TG-PRK with simultaneous CXL using two laser platforms shows promise as an effective treatment for highly symptomatic patients with post-LASIK ectasia.
- All but two had improved symptoms.
- 70% of patients had 20/40 or better UDVA.
- More than half gained ≥2 lines of CDVA.