

Outcome of Topography-Guided Photorefractive Keratectomy with Cross-Linking for Ectasia after Laser Assisted in Situ Keratomileusis

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B. Alcon

Topography guided PRK and Cross-Linking for Ectasia

Introduction of collagen cross linking – possible to consider limited TG PRK

- Kanellopoulos AJ 2007

Initially sequential – later simultaneous

Good efficacy and safety at 1-3 yr

- Tuwaigi WS 2012, Kymionis GD 2012

High patient satisfaction, symptom reduction

- Labiris G 2013

Preliminary report of our series 4.5 years

- KC and Ectasia



Best Candidates

- Motivated, CL intolerant
- K's < 52D
- Pachymetry > 450 μ m
- Central cone
- Younger patients
- Avoid PMD, striae



TG PRK CXL: Methods

- 56 eyes with Ectasia, CL intolerant
- Allegretto Wavelight excimer laser
- Trans-epithelial TG-PRK using TCAT program with simultaneous CXL as per Dresden protocol
- Treatment targeted at -1.25 post-op, based on topographical neutralization technique (TNT), with minimal residual stromal depth 300 microns
- Data evaluated: pre-operatively, 1, 2, 3, 6 and 12 months:
 - uncorrected visual acuity (UCVA), best corrected (BCVA/CDVA), manifest refraction (MR), symptom score, topography and keratometry



TG-PRK CXL for Ectasia

62 years old female

15 years post LASIK

UCVA: 20/300

MR: -1.00-5.50x65 20/40

CT:497 μ m

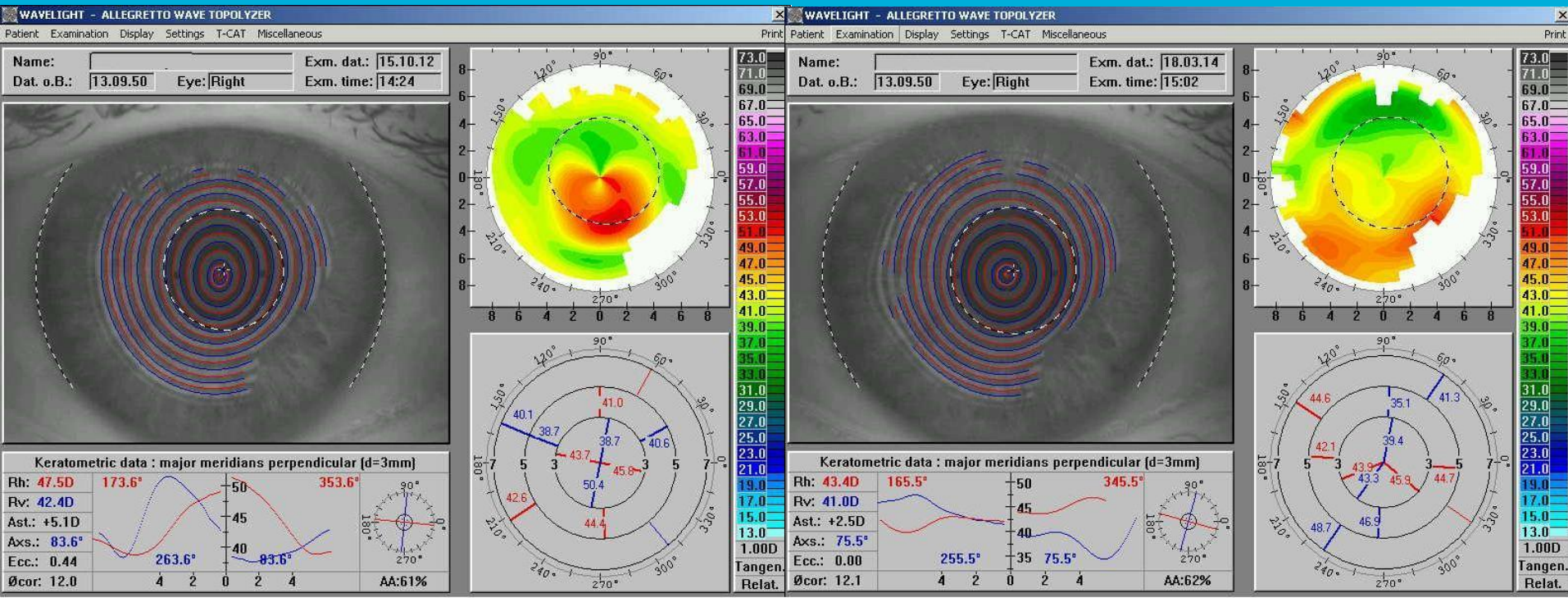
Total Stromal Treatment Depth: 30.08 μ m

18 months post-operative

UCVA: 20/50

RX: +1.75-1.50x65 20/30

CT:407 μ m



Effect of Treatment: Regularizing Corneal Surface

Dat. o.B.: 13.09.50
 Exm. Dat.: 18.03.14
 Eye: Right

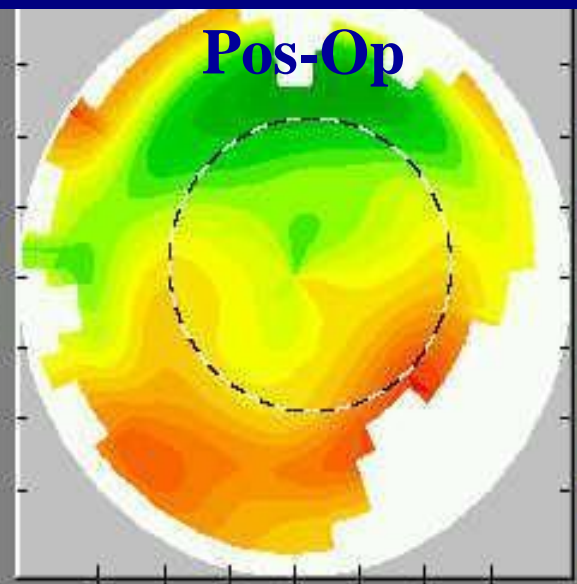
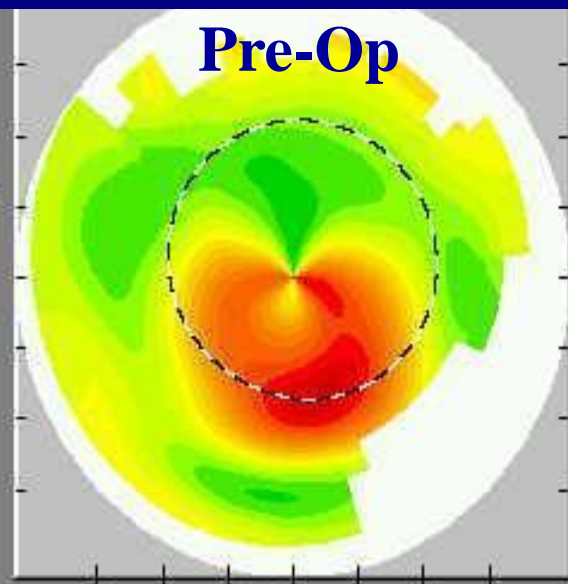
+7.5
 +7.0
 +6.5
 +6.0
 +5.5
 +5.0
 +4.5
 +4.0
 +3.5
 +3.0
 +2.5
 +2.0

Difference (D)

Map

A: (1) (2) (3) (4)

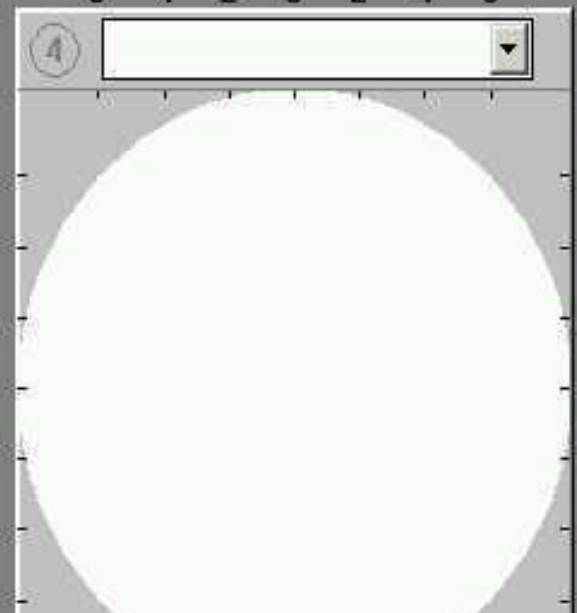
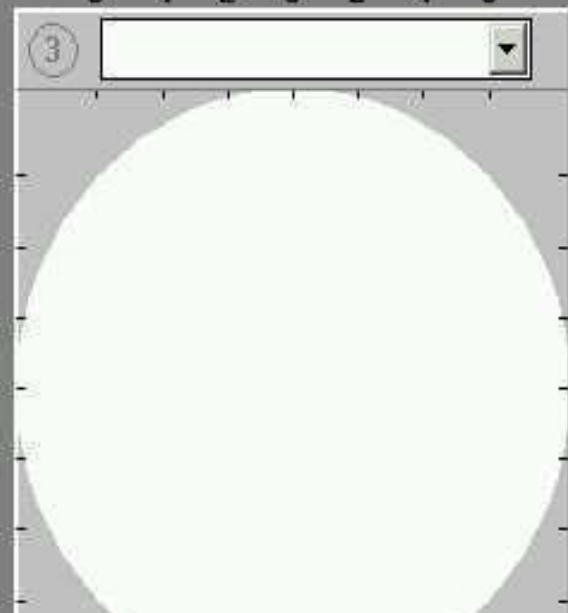
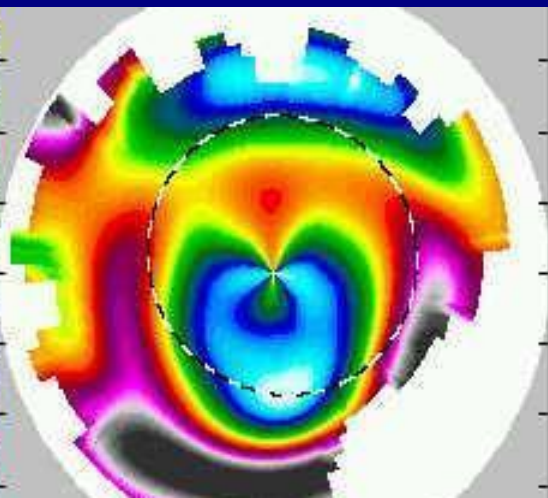
B: (1) (2) (3) (4)



69.0
 67.0
 65.0
 63.0
 61.0
 59.0
 57.0
 55.0
 53.0
 51.0
 49.0
 47.0
 45.0
 43.0
 41.0
 39.0
 37.0
 35.0
 33.0
 31.0
 29.0
 27.0
 25.0
 23.0
 21.0
 19.0
 17.0
 15.0
 13.0
 D

Difference Map

+0.0
 -0.5
 -1.0
 -1.5
 -2.0
 -2.5
 -3.0
 -3.5
 -4.0
 -4.5
 -5.0
 -5.5
 -6.0
 -6.5
 -7.0



Ectasia after LASIK

21 years-old male

LASIK Z160, flap: 140 μ m

UCVA: 20/200

MR: -1.75sph 20/20

CT: 622 μ m, ablation: 38.7 μ m

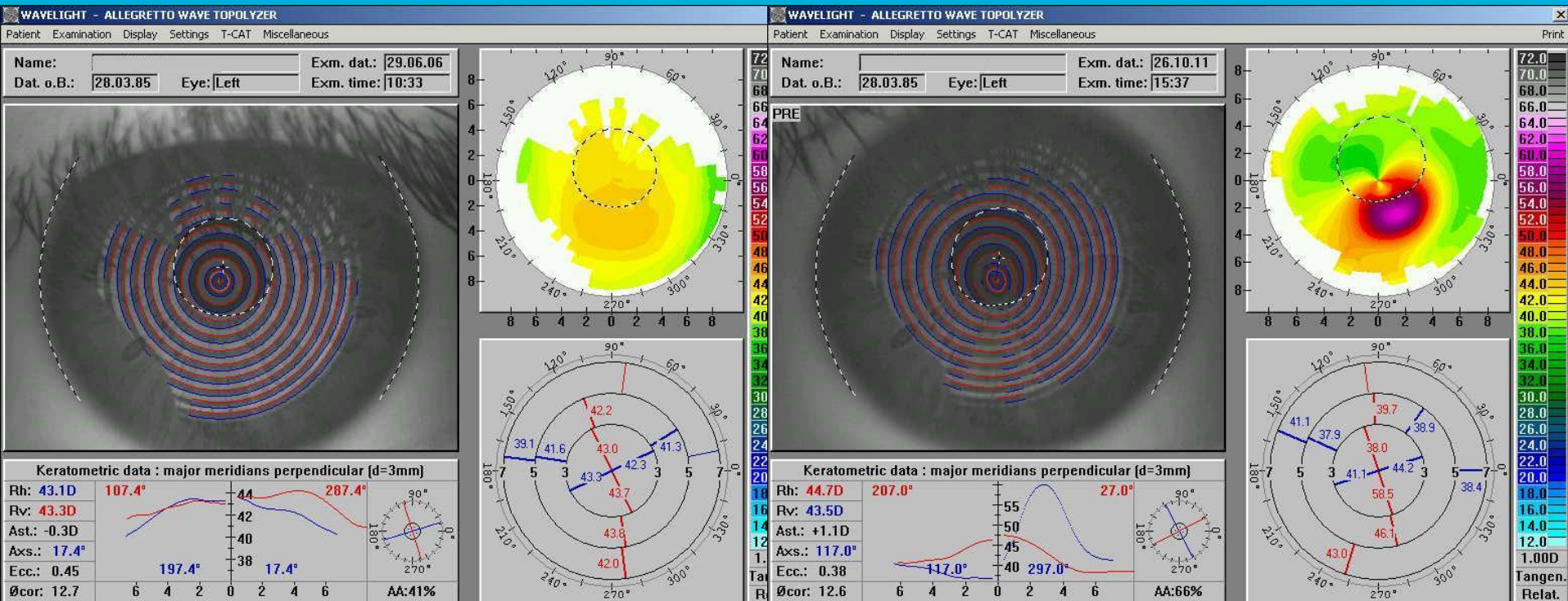
Residual Stromal Thickness: 443.3 μ m

5 years post-op

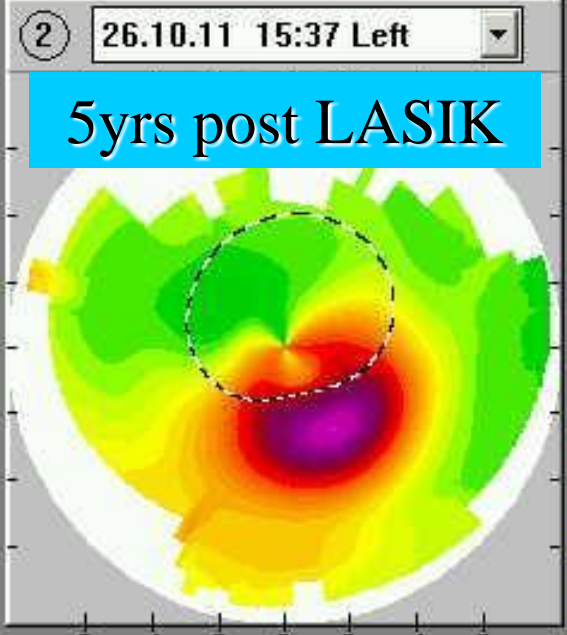
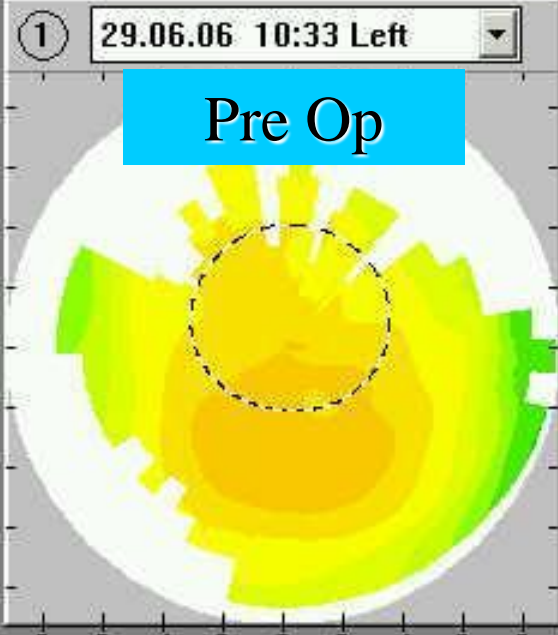
UCVA: 20/60

MR : +1.00-2.75x125 20/30

CT : 552 μ m



Last name: _____
 First name: _____
 Dat. o.B.: _____
 Exm. Dat.: 29.06.06
 Eye: Left



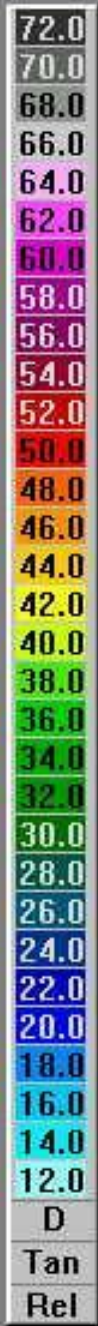
Difference [D]

Map

A: ① ② ③ ④

B: ① ② ③ ④

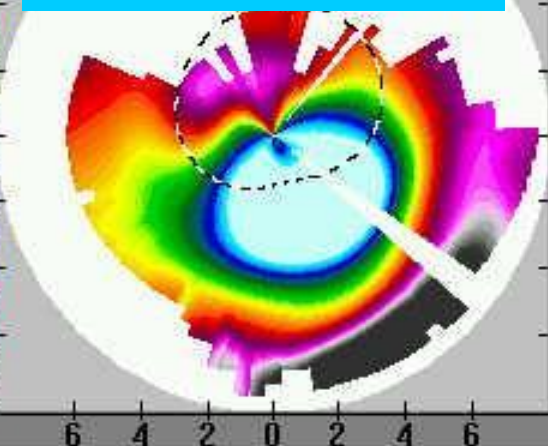
③ minus ②



**Pos-Pre TG PRK
CXL**

6mth post TG PRK CXL

**2nd Tx PosOp:
UCVA: 20/30
MR: pl-0.75x180
20/20**

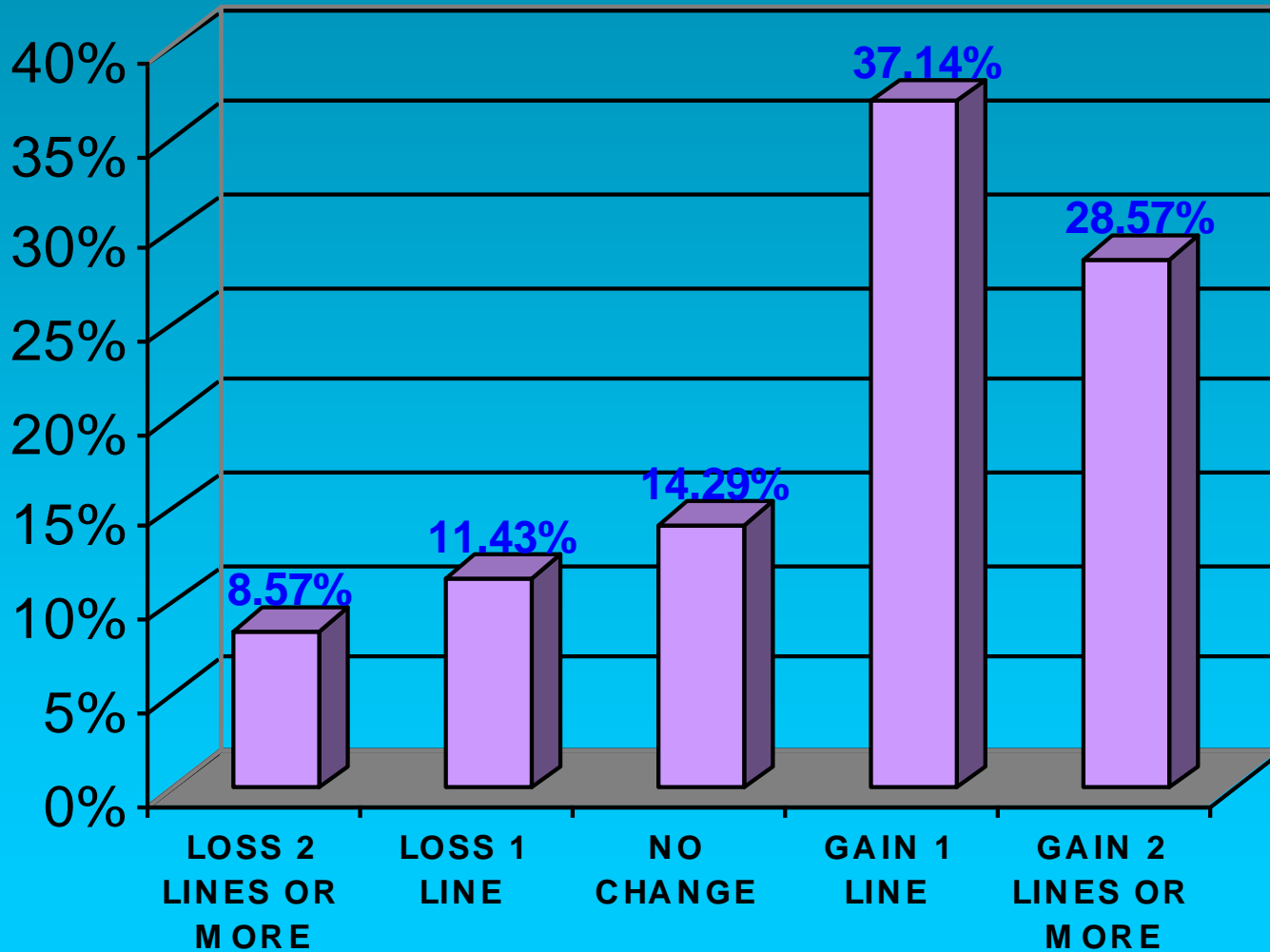


Ectasia - TG PRK CXL: Results

- 35/56 cases - sufficient data for analysis
≥ 6 months post-operatively
- 19/35 (54%) had UCVA of ≥20/40
- 23 (66%) had improved BCVA while 10 (29%)
gained 2 lines or more
- Mean reduction in astigmatism $2.47 \pm 1.87D$
- Symptoms improved in 28, no change in 3
- Complications included:
 - delayed epithelialization – 3 cases
 - visually symptomatic haze – 1 case



Change in Best Corrected Visual Acuity at 6 months Post Op



TG PRK with CXL for post-LASIK Ectasia: Concerns

- Thinning an already thin cornea - long term stability unknown
- Predictability - hyperopic surprises - less than expected even with -1.25 target
- Endothelial damage , delayed epithelialization



Conclusion: TG PRK with CXL for post-LASIK Ectasia

- Useful option for CL intolerant ectasia patients
- Early results show satisfactory efficacy and safety for treatment for post-LASIK ectasia
- More than half achieved UCVA of 20/40 and also improved BCVA
- All but 3 had improved symptoms
- Potential issues with long term stability

