

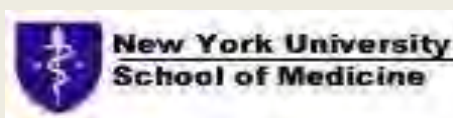
Lasik Xtra in Hyperopia

AK Xtra

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Laservision.gr Institute, Athens, Greece

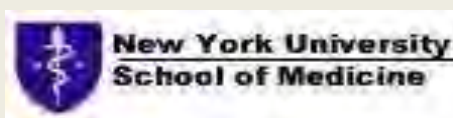
AJK is a consultant for Alcon, Wavelight and Avedro.



Kanellopoulos,MD



Crosslinking and Long-Term Hyperopic LASIK Stability Initial Clinical Findings in Contralateral Eye Study



Kanellopoulos MD www.Drilliantvision.com

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Introduction

- CXL has been an established treatment for ectasia internationally, although not yet FDA approved, there are several US studies in progress
- We introduced prophylactic higher fluence CXL in routine LASIK cases 5 years ago, as a means to stabilize the higher myopic corrections and reduce the chance for ectasia
- Hyperopic LASIK is often thought to regress following the first year. The etiology for this has been elusive, several theories exist:
 - A- latent hyperopia masked by accommodative spasm,
 - B- epithelial hypertrophy, and
 - C- an intrinsic biomechanical effect of hyperopic LASIK, that results in mid-peripheral steepening and central flattening
- We have employed topography-guided excimer ablation in our hyperopic LASIK treatments for almost a decade in order to address significant angle kappa in hyperopia



Purpose

1-Evaluation of safety and efficacy of intrastromal cross-linking in a contralateral eye study in routine hyperopic LASIK.

2-We speculated that the CXL would help stabilize the cornea steepening result of hyperopic LASIK, that may regress within the first 2 years.




Methods

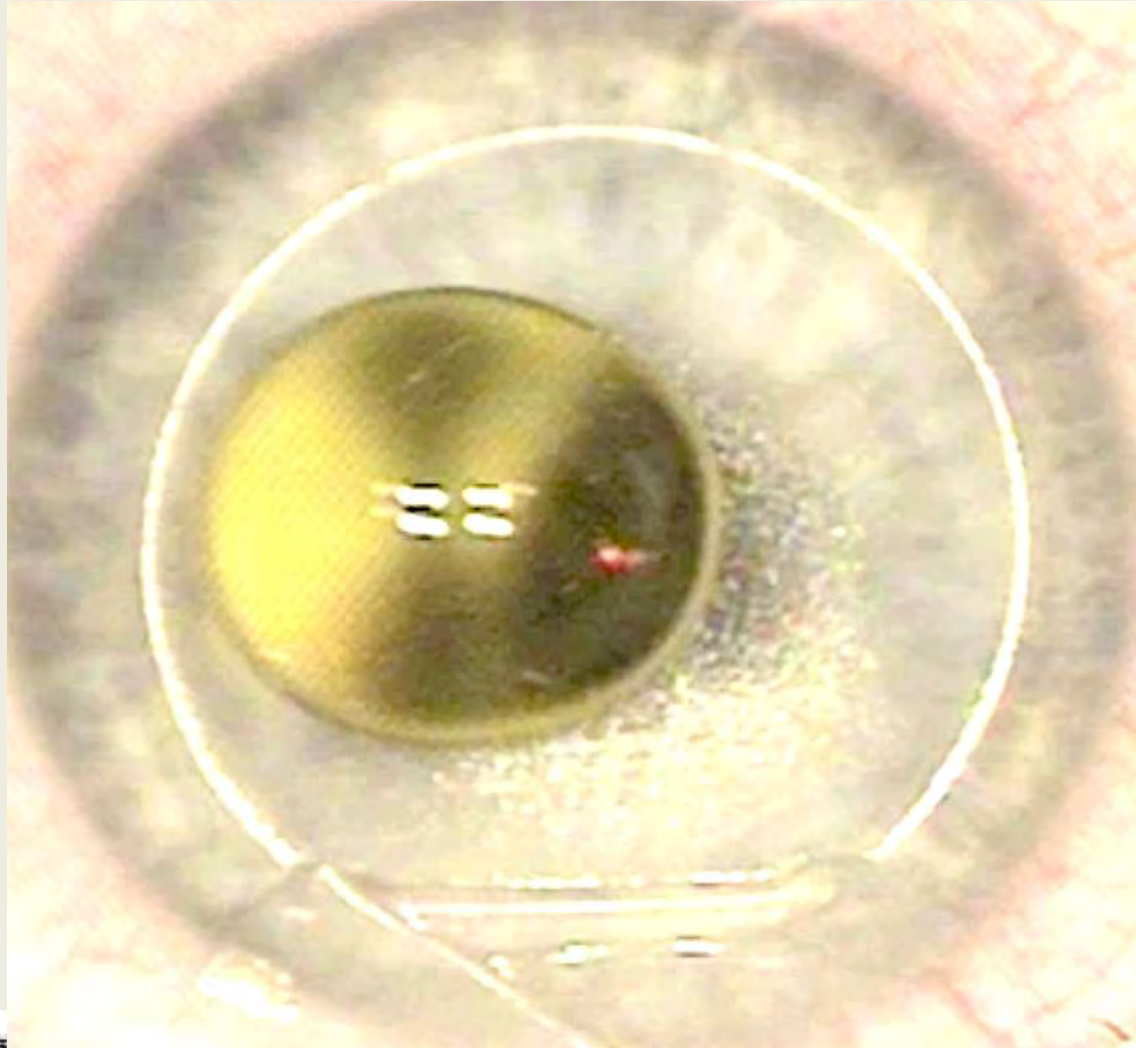
- 27 consecutive patients
 - Mean sphere +3.25 (+1.25 to +6.5)
 - Mean cyl -1.75 (Plano to - 3.25)
- Consecutive hyperopic and hyperopic astigmatic bilateral topography-guided LASIK utilizing the Wavelight (Erlagen, Germany) platform
- Allegretto 400Hxz Eye-Q excimer laser and femtosecond laser flap creation
- Randomized
 - Control group: One eye randomised to no adjunct CXL.
 - Treatment group: the contralateral eye was treated with CXL: 1 minute of 30mW/cm² CXL (KXL device, Avedro, Waltham, MA, USA) after in-the-flap administration of 1 drop of 0.1% sodium phosphate riboflavin
- Mean follow up of 23 months (22-35)



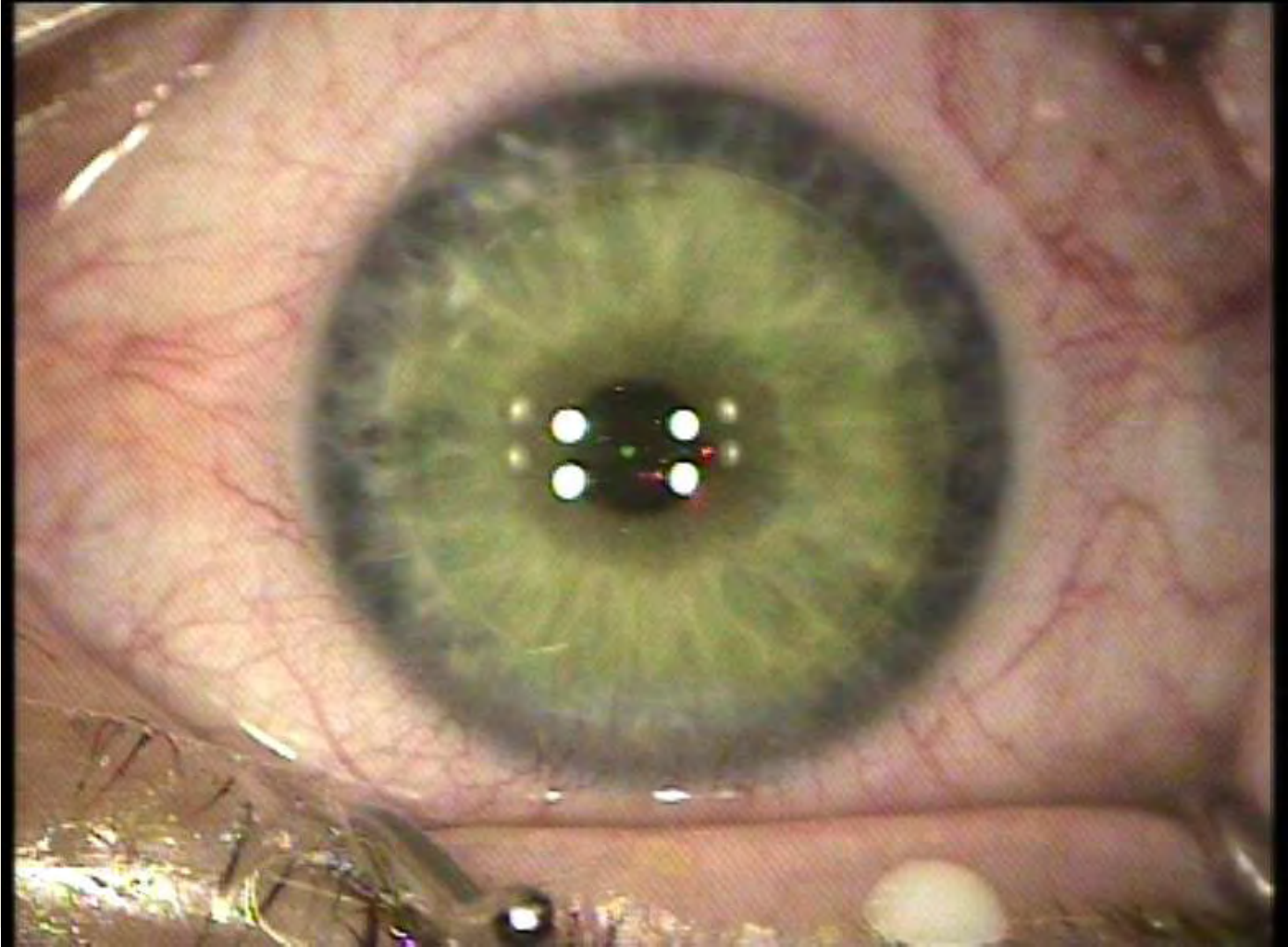
A FS200 femto (Alcon, Ft Worth, USA) 9.5mm hyperopic LASIK flap. It's nasal decentration is evident in reference to the red circle that represents the pupil-this is done in order to accommodate the topography-guided ablation that will be also nasaly decentered to accommodate angle kappa

Treatment Parameters (Standard)				Treatment Screenshot (Standard)			
Ablation							
Abl. Zone	Max. Depth	Min. Pachy	Res. Stroma				
9.0 mm	104 µm	597 µm	353 µm				
Flap							
Diameter	Thickness	Side Cut Angle	Canal Width				
9.5 mm	130 µm	70°	1.3 mm				
Hinge							
Position	Length	Angle	Width				
00°	3.6 mm	45°	0.4 mm				
Laser pulse energy (measured)							
Bed Cut		Side Cut					
0.8 µJ		0.9 µJ					
Laser separations							
Bed Cut		Side Cut					
Spot Separations	Line Separations	Spot Separations	Line Separations				
8.0 µm	8.0 µm	5.0 µm	3.0 µm				
Comments							

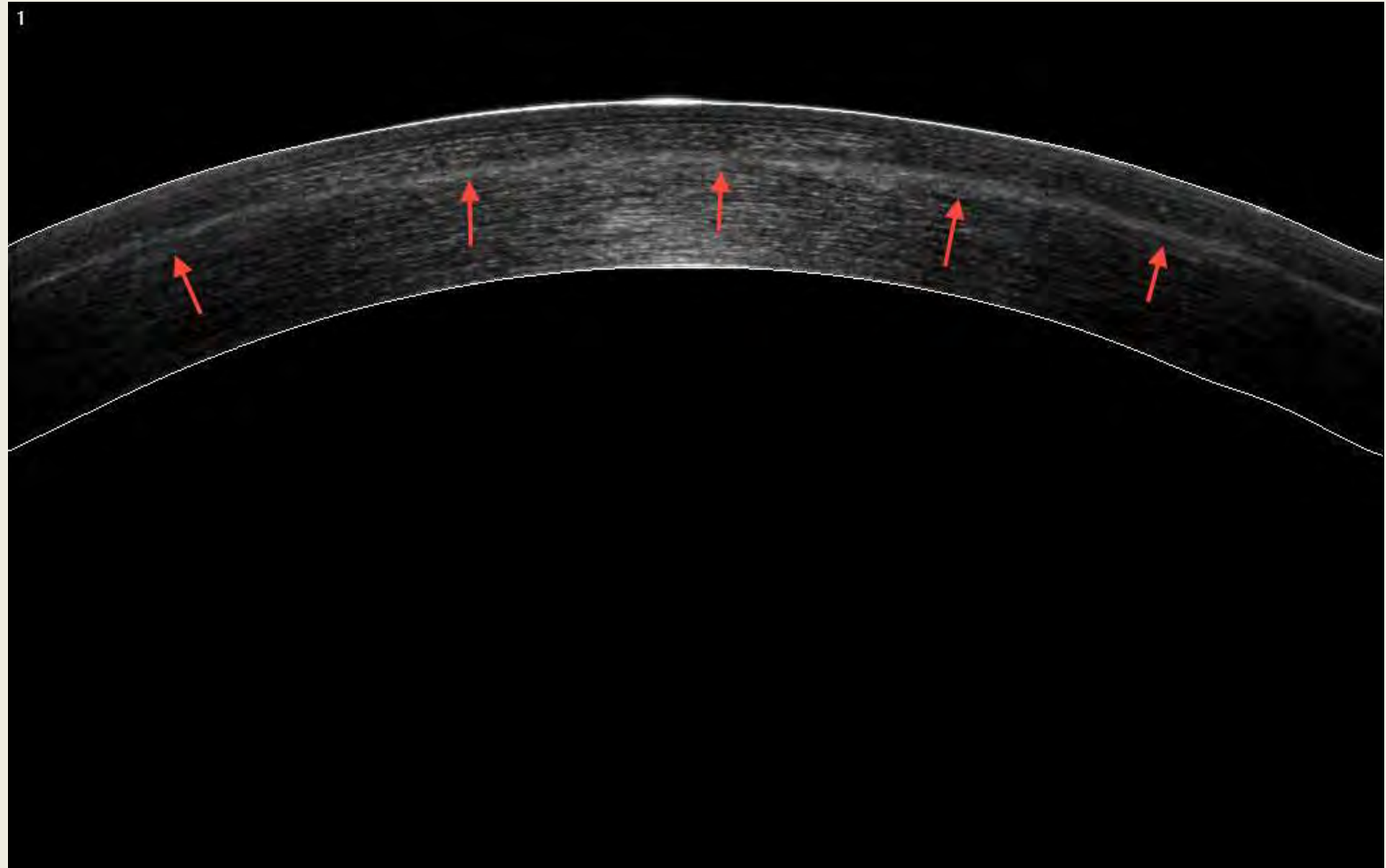
A drop of 0.1% riboflavin sodium phosphate solution, just prior to its spread over the exposed stromal bed
(prepared for us by Leiter's pharmacy (CA, USA))



Flap repositioned following stromal soak with riboflavin, that is now visible as yellow tinge in the stroma



CXL evidence viewed in corneal OCT (Optovue, CA, USA) in LASIK Xtra group



Results

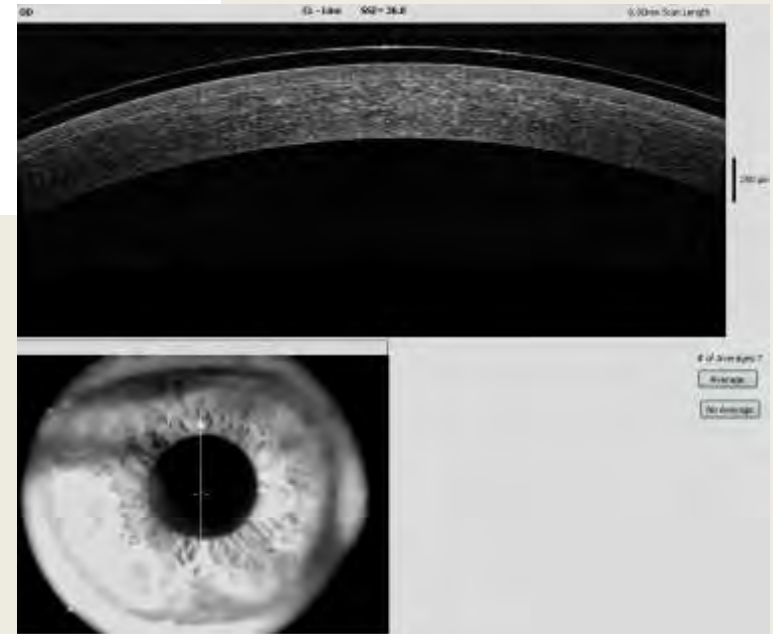
- Outcome measures:
 - Peri-operative refractive error
 - Keratometric, topographic and topometric measurements
- Mean regression from treatment:
 - Control cases: +0.72 D
 - CXL cases: +0.22 D



LASIK Control Group

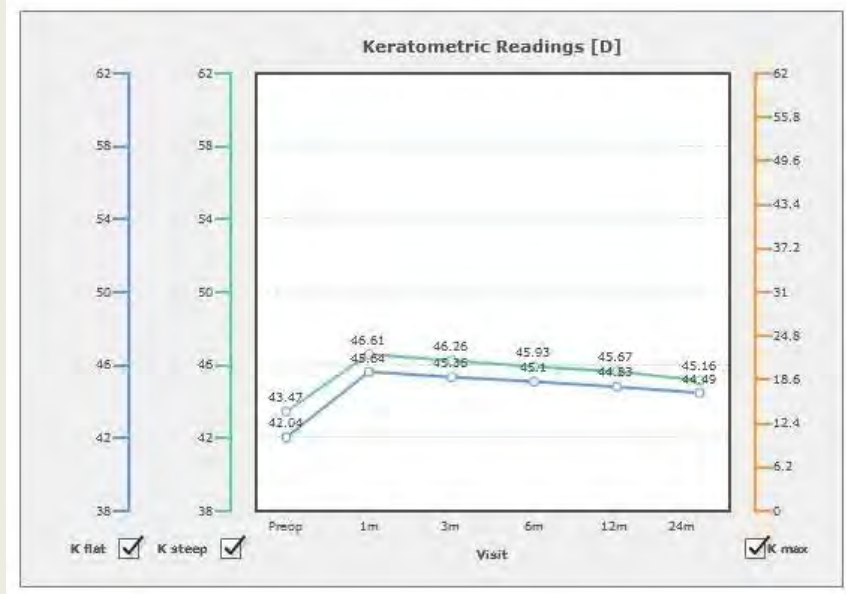
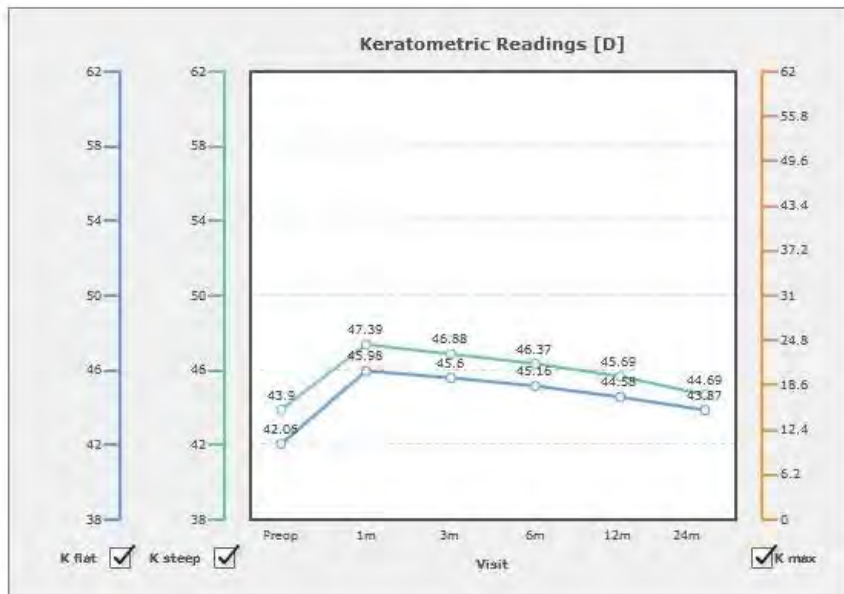


Lasik Xtra Group

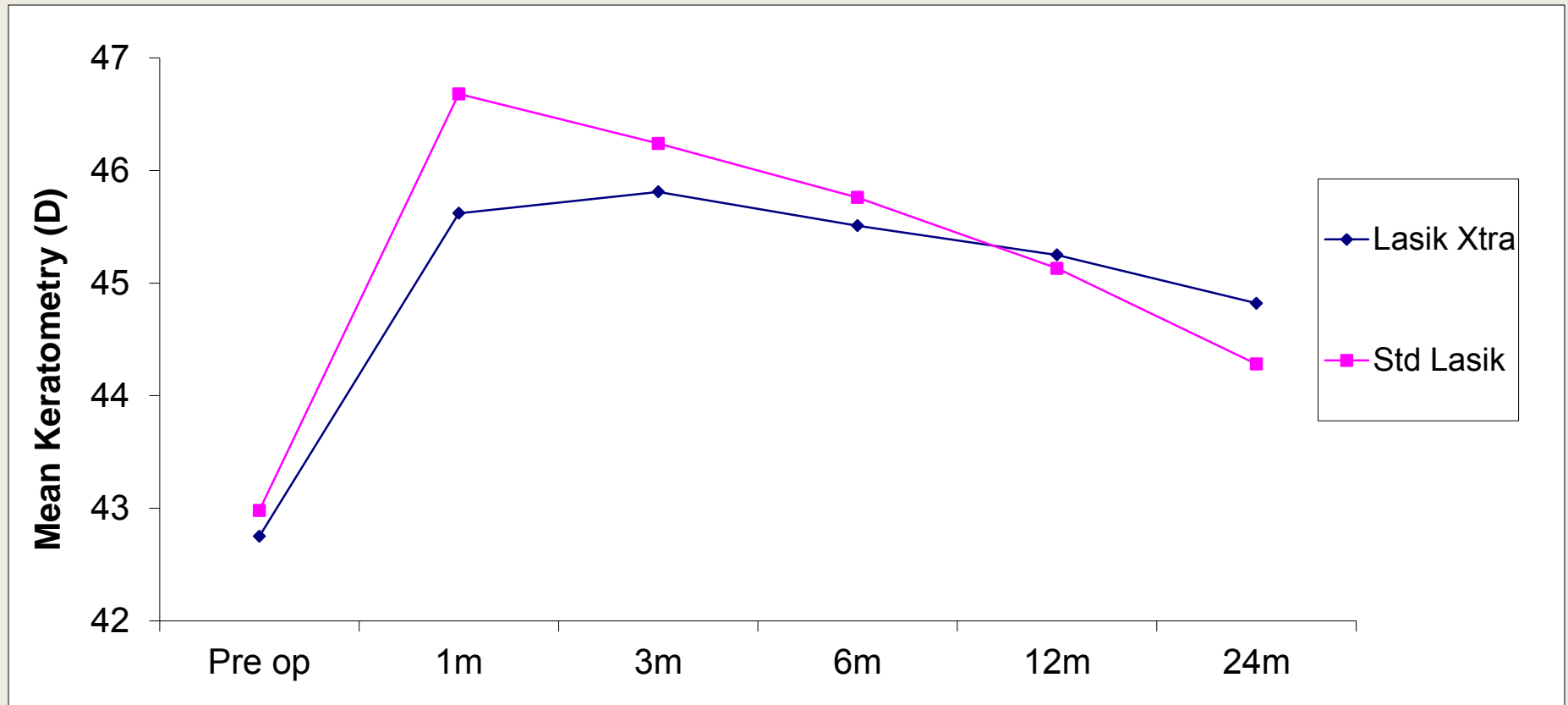


LASIK Control Group

Lasik Xtra Group



Comparison of Keratometric Stability



LASIK Control Group 1 year

K1: Astig:
 K2: ecc: (7mm)
 Axis: (flat) QS:

Pachy: x[mm] y[mm]
 Pupil Center: +
 Thinnest Locat.: ○

Chamber Volume: Angle:
 A. C. Depth (Int.): Pupil Dia:
 IOP(cor): Lens Th.:

K1: Astig:
 K2: ecc: (7mm)
 Axis: (flat) QS:

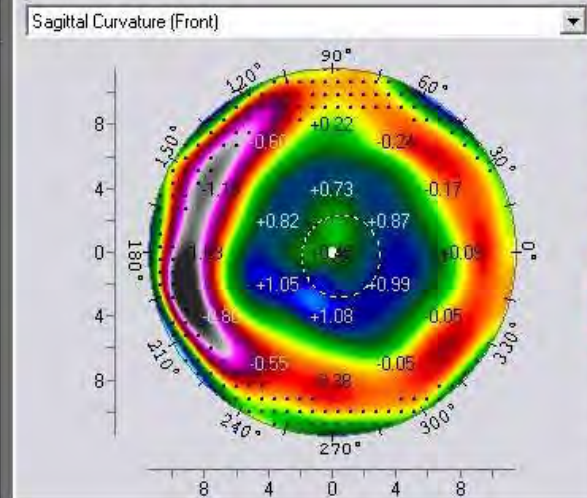
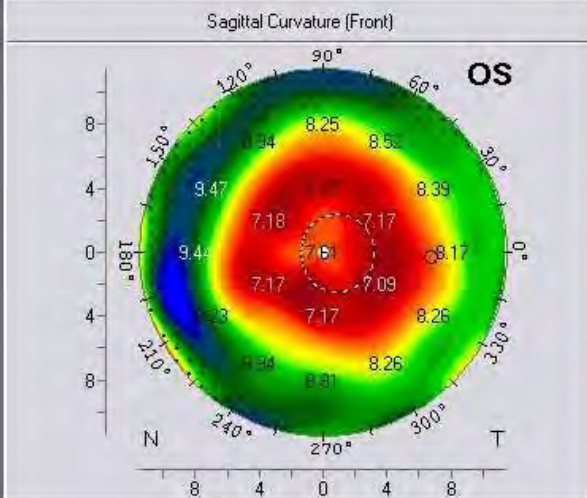
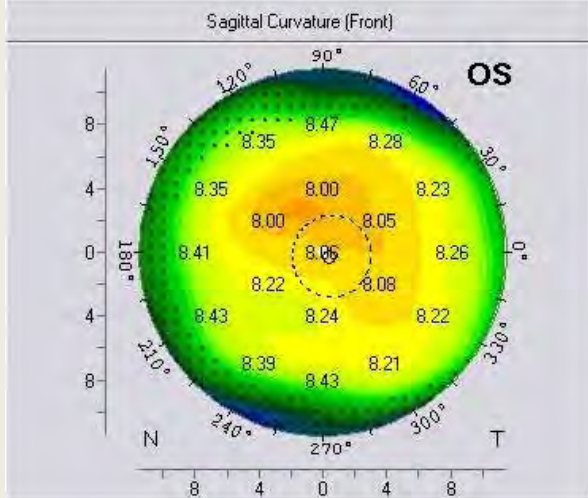
Pachy: x[mm] y[mm]
 Pupil Center: +
 Thinnest Locat.: ○

Chamber Volume: Angle:
 A. C. Depth (Int.): Pupil Dia:
 IOP(cor): Lens Th.:

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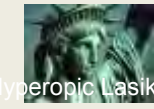
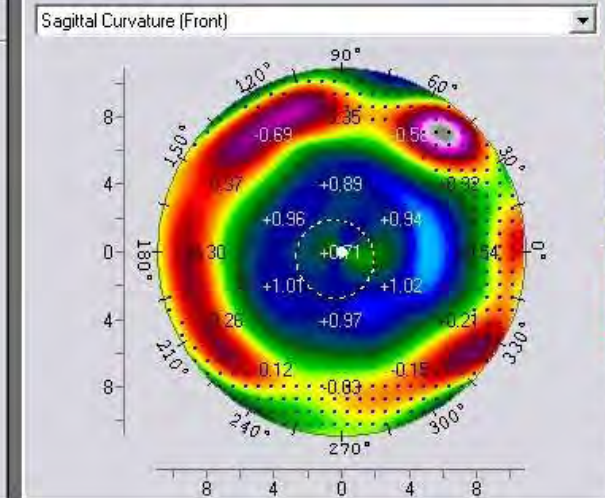
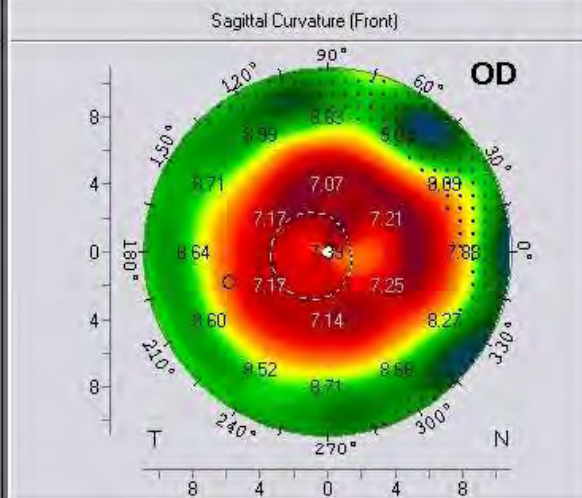
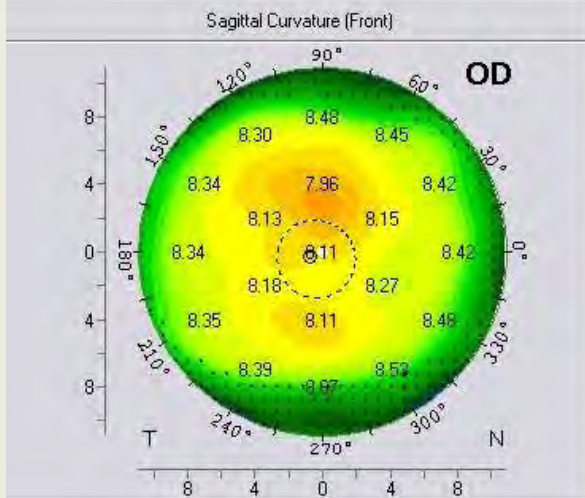
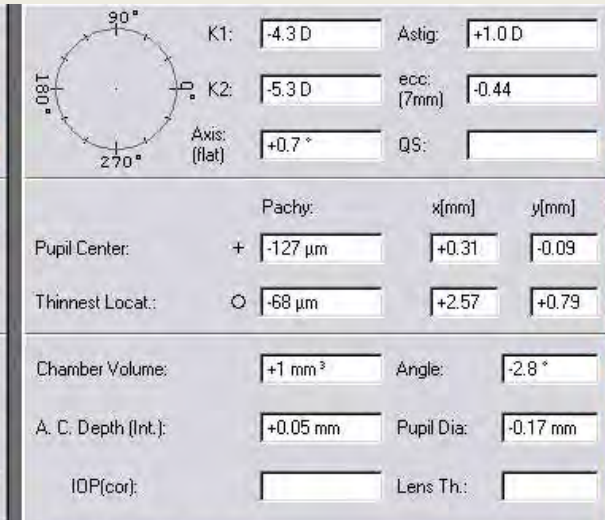
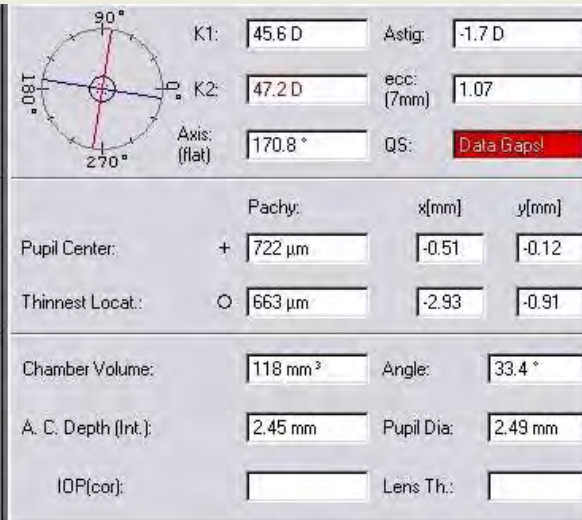
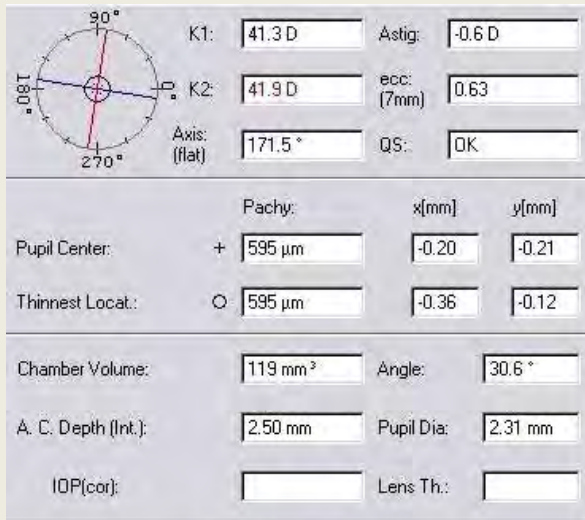
Pachy: x[mm] y[mm]
 Pupil Center: +
 Thinnest Locat.: ○

Chamber Volume: Angle:
 A. C. Depth (Int.): Pupil Dia:
 IOP(cor): Lens Th.:



LASIK CXL Group

1 year



Conclusions

- Combination of CXL in routine hyperopic and hyperopic-astigmatic LASIK appears to significantly stabilize its long term effect, possibly by modulating a hyperopic LASIK biomechanical response.
- These data support our theory that long term regression in hyperopic and hyperopic-astigmatic LASIK may involve corneal biomechanical changes.



Enhancement of femtosecond astigmatic keratotomy (fsAK) with combined simultaneous high fluence CXL (hfCXL)



Methods

- 15 eyes of 13 consecutive patients
- Standard follow-up up to 6 months
- Protocol:
 - Two 30° arcuate OCT guided fsAK incisions were performed with the LenSx laser at the 7mm OZ, 85% depth
 - manual incision separation with a Sinsky hook
 - 1 drop of 0.1% riboflavin sodium phosphate was administered in one of the incisions
 - 60 seconds soak



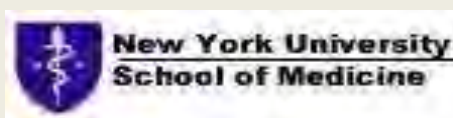
Results

The CXL incisions showed statistical significance in the meridional astigmatic change to the non-CXL incisions:

- at day1 (2.75D to 1.75D)
- week 1 (2.50D to 1.65D)
- month1 (2.25D to 1.45D)
- month 3 (2.25D to 1.25D).



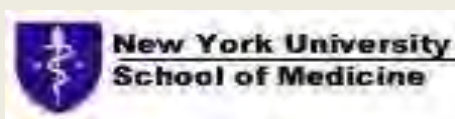
AK Xtra Post Penetrating Keratoplasty



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video



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Patient: MARKOULIS, Margaritis
DOB (age): 02/08/1932 (80)
ID:

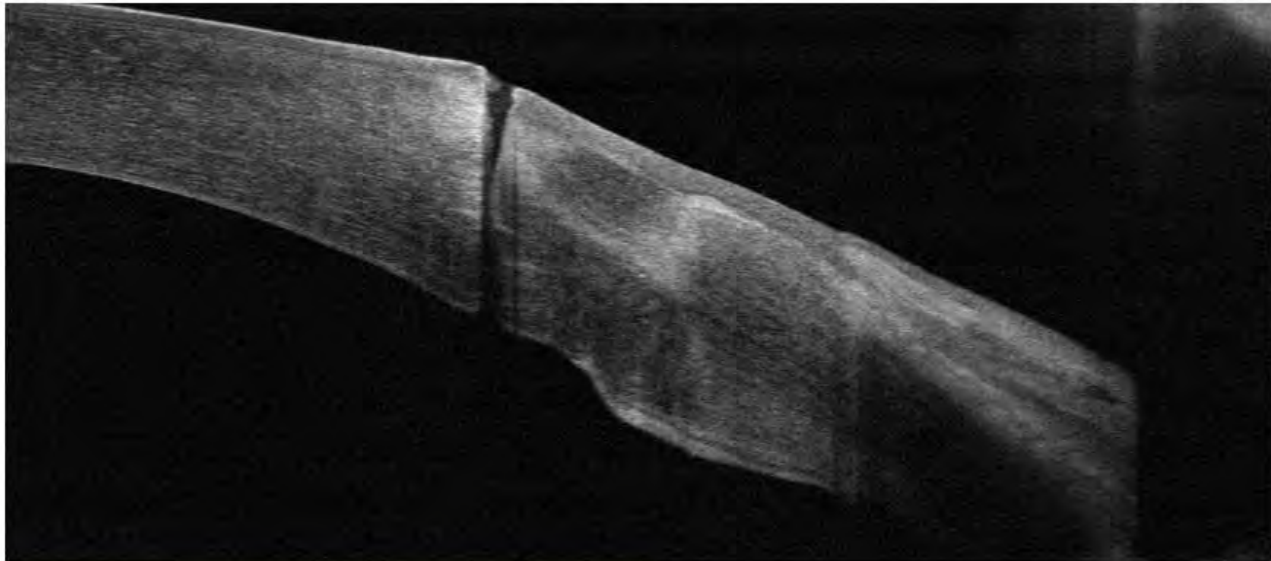
Disease:
Algorithm Version: A5, 1, 0, 90
Gender: M

Operator:
Exam Date: 10/17/2012
Physician:

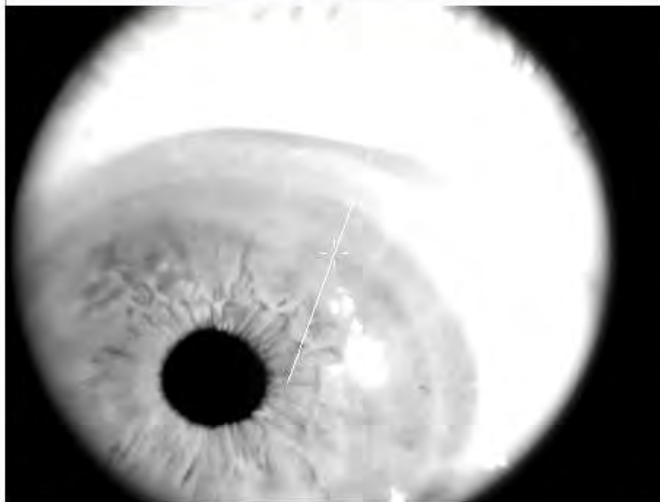
05

CL - Line SSI= 35.0

6.00mm Scan Length



250 μm



of Averages:25

Average

No Average

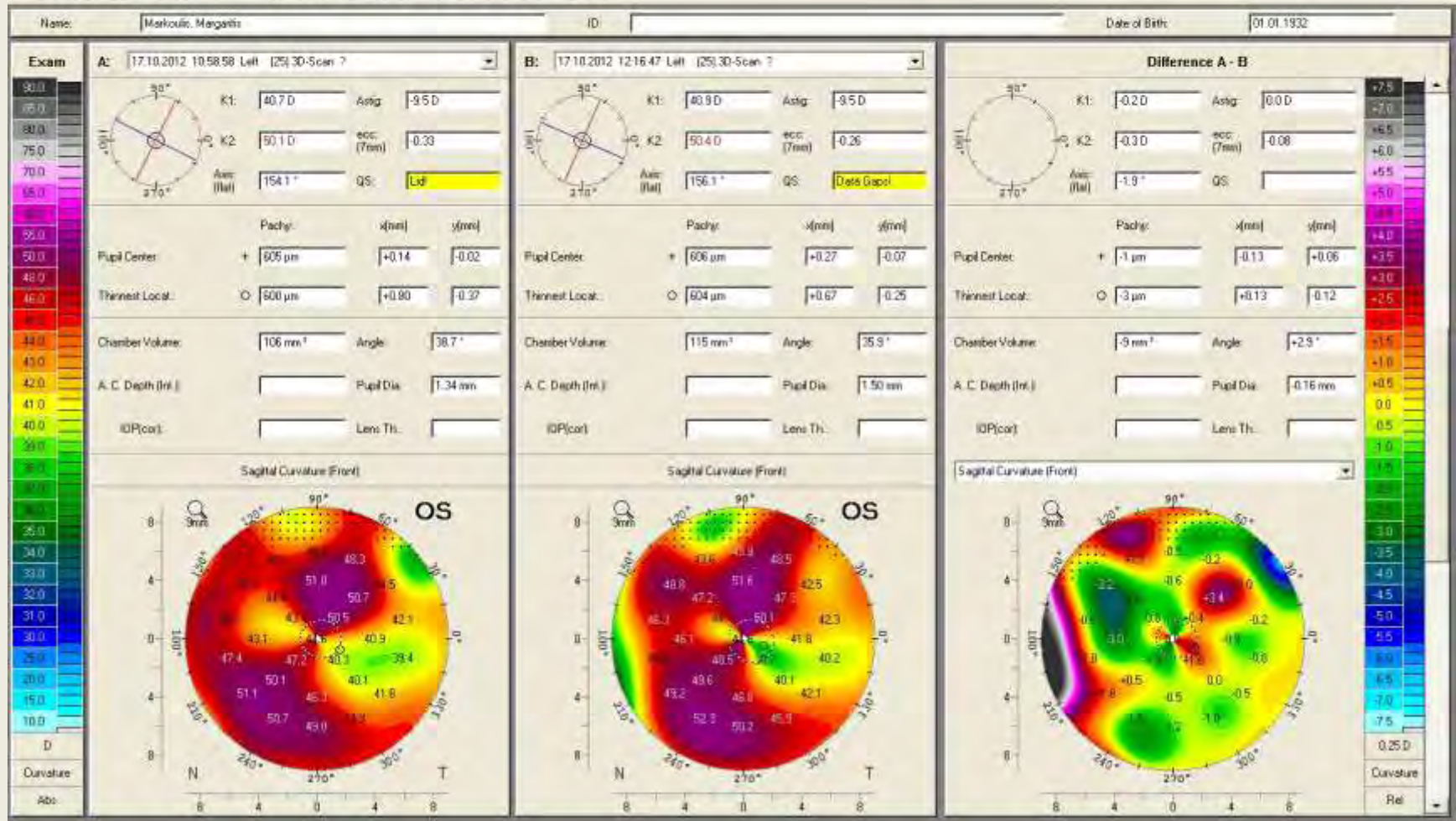
Diagnosis:

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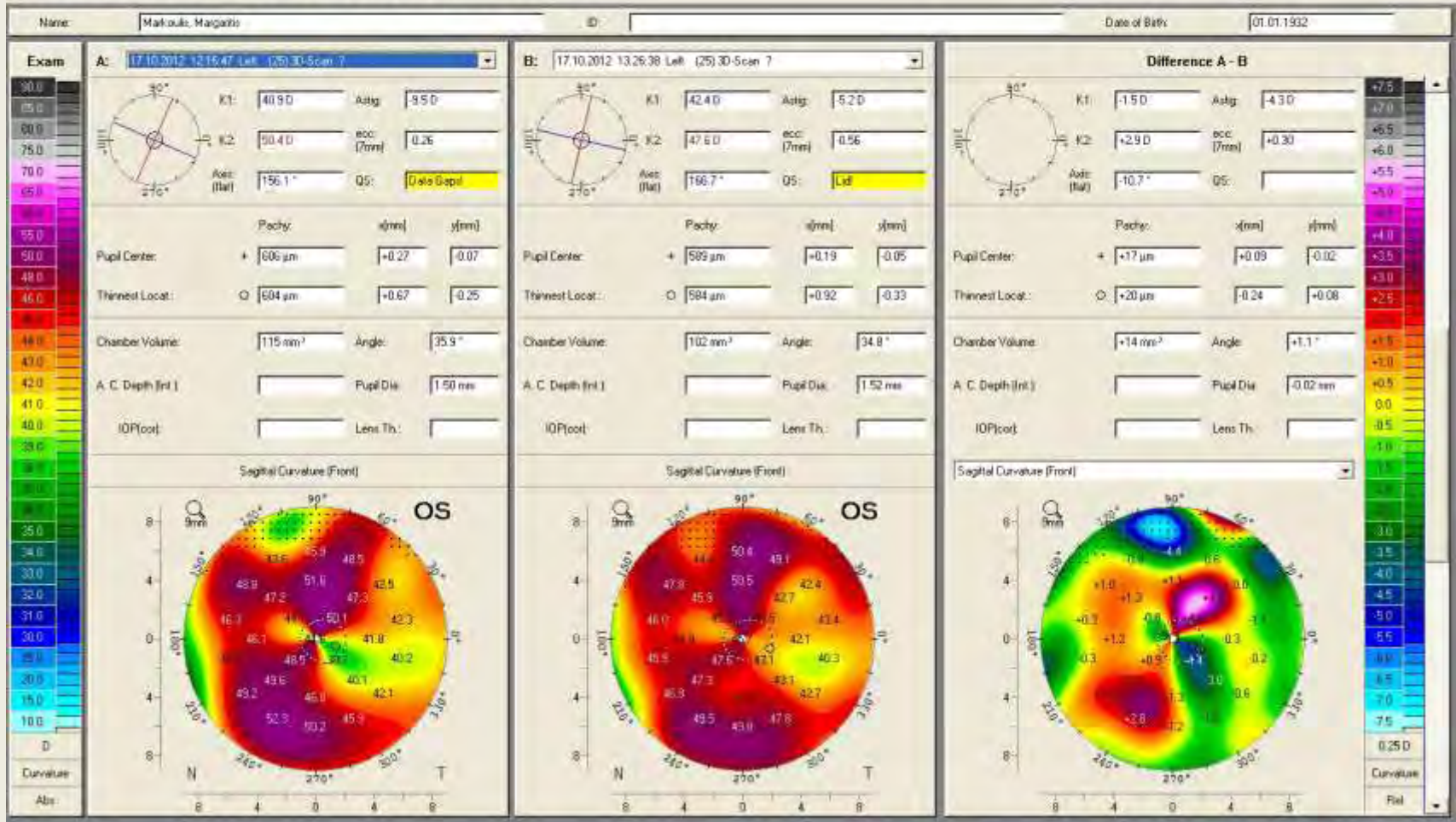
Report Date: Thursday October 18 16:54:58 2012



WAVELIGHT - ALLEGRO OCULYZER



WAVELIGHT - ALLEGRO OCULYZER



Conclusions

This novel combination of hfCXL may significantly enhance fsAK efficacy allowing for a smaller arc treatment, potentially higher stability and lesser ocular surface symptoms.

