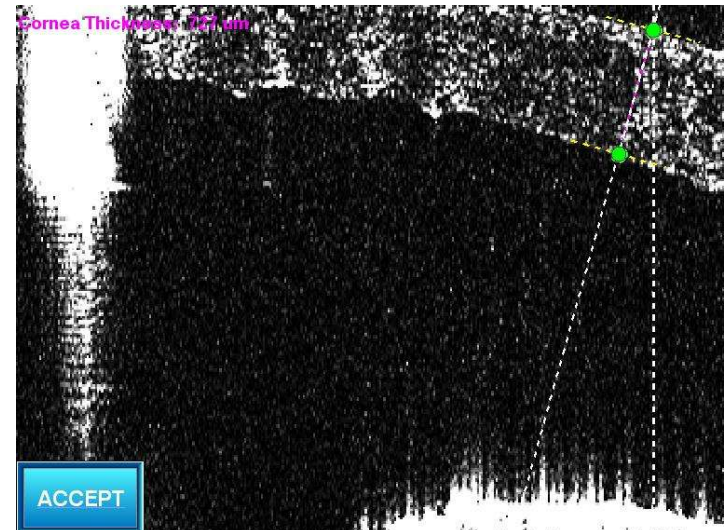
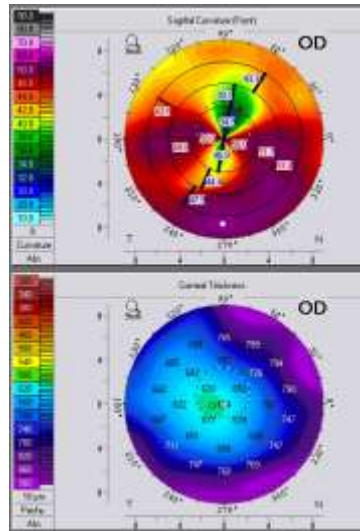
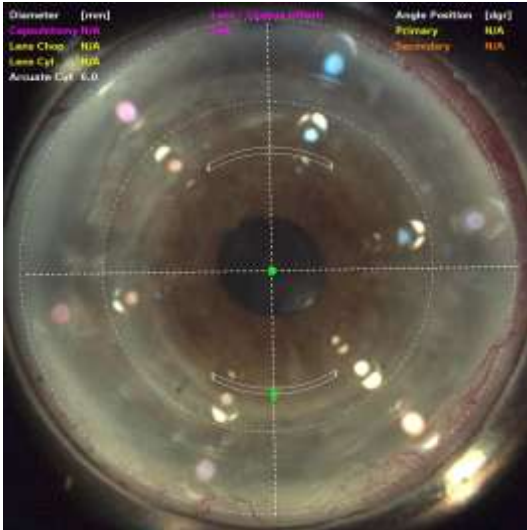


Astigmatic keratotomy 2012

OCT guided femto-assisted AK

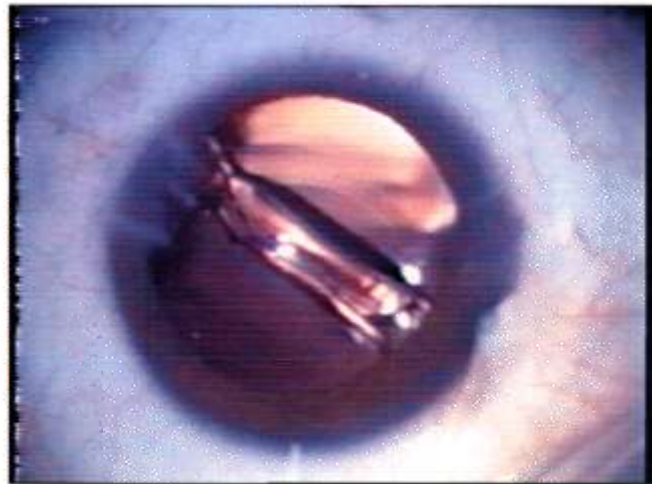
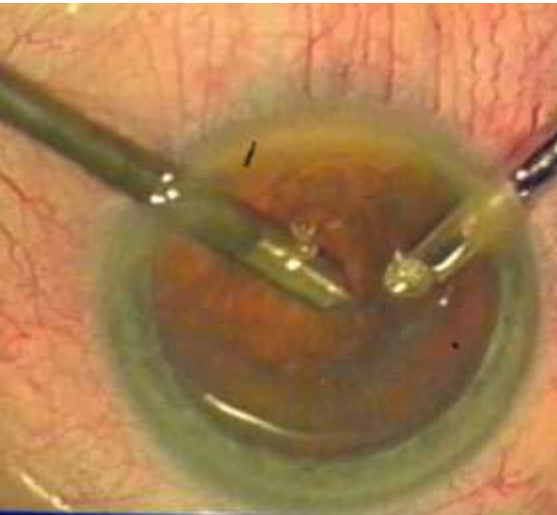


A. John Kanellopoulos, MD
Clinical Professor NYU Medical School, NY
Director, Laservision.gr Institute, Athens, Greece



Laser Cataract Surgery 1999-2 mm barrier

- In pursuit of endocapsular CE
- True accommodative IOL



Ophthalmology Times

2-mm incision barrier is broken in Greece

By David Goldstein
November 3, 1999 (Ophthalmology 127)

Alexis, Kallithea ("Cancer research" with a 2-mm barrier) was performed last year.



Dr. Ioannis Karakostas, MD, is the chief of ophthalmology at the Ophthalmology Department, University of Athens Medical School, Athens, Greece.

Laser cataract removal was done through two clear cornea paracenteses of about 1.5 mm in width.



Figure 1: Intraoperative photograph of a phacoemulsification procedure following laser cataract removal. The incision is 2 mm in width.



Figures 2-5: Intraoperative photographs showing the surgical procedure. Figure 2: The laser cataract removal. Figure 3: The laser cataract removal. Figure 4: The laser cataract removal. Figure 5: The laser cataract removal.



What is the goal of laser-assisted cataract surgery?

- To improve
 - Refractive outcomes
 - Safety profile
 - Patient comfort and satisfaction
- How can this be accomplished?
 - More precise and accurate *capsulotomy*
 - More precise and accurate cataract incision
 - More efficient lens disruption and removal
 - More precise and accurate relaxing incisions



Surgical Systems



Technolas Victus™

Optimedica Catalys™



Surgical Systems



LenSx®



LensAR™

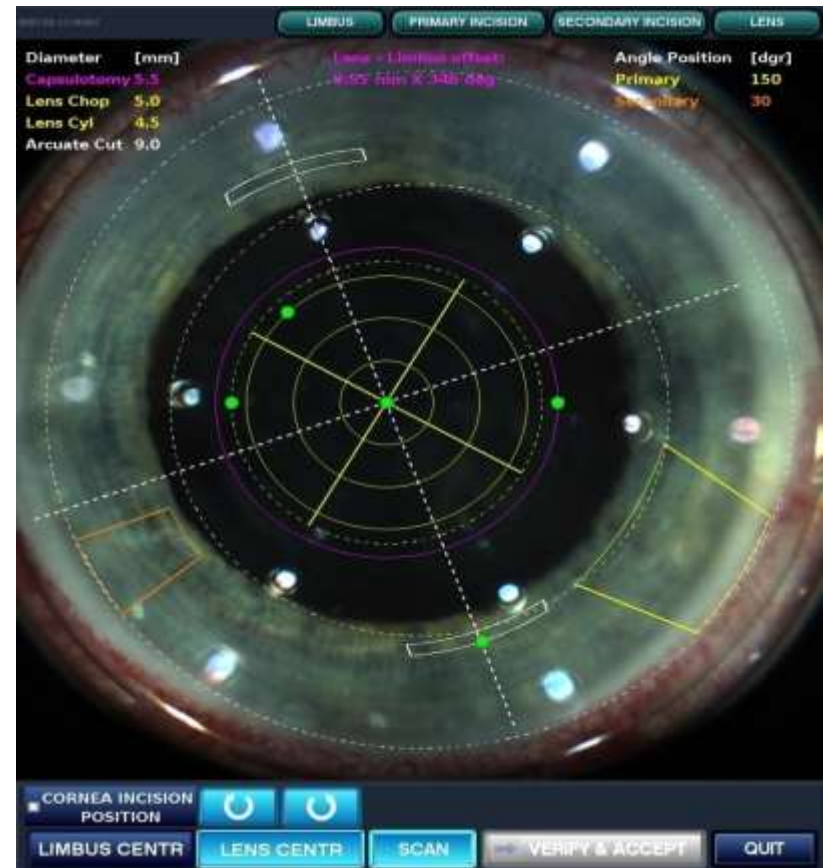
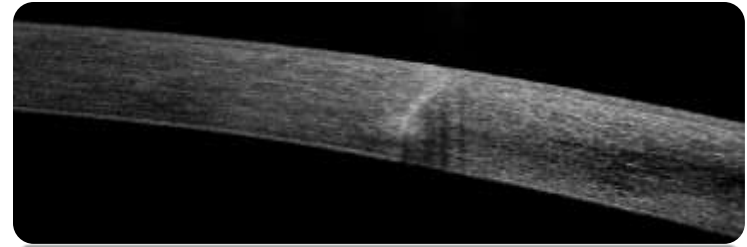


**New York University
School of Medicine**



Laser Refractive Cataract Surgery - Arc Incisions

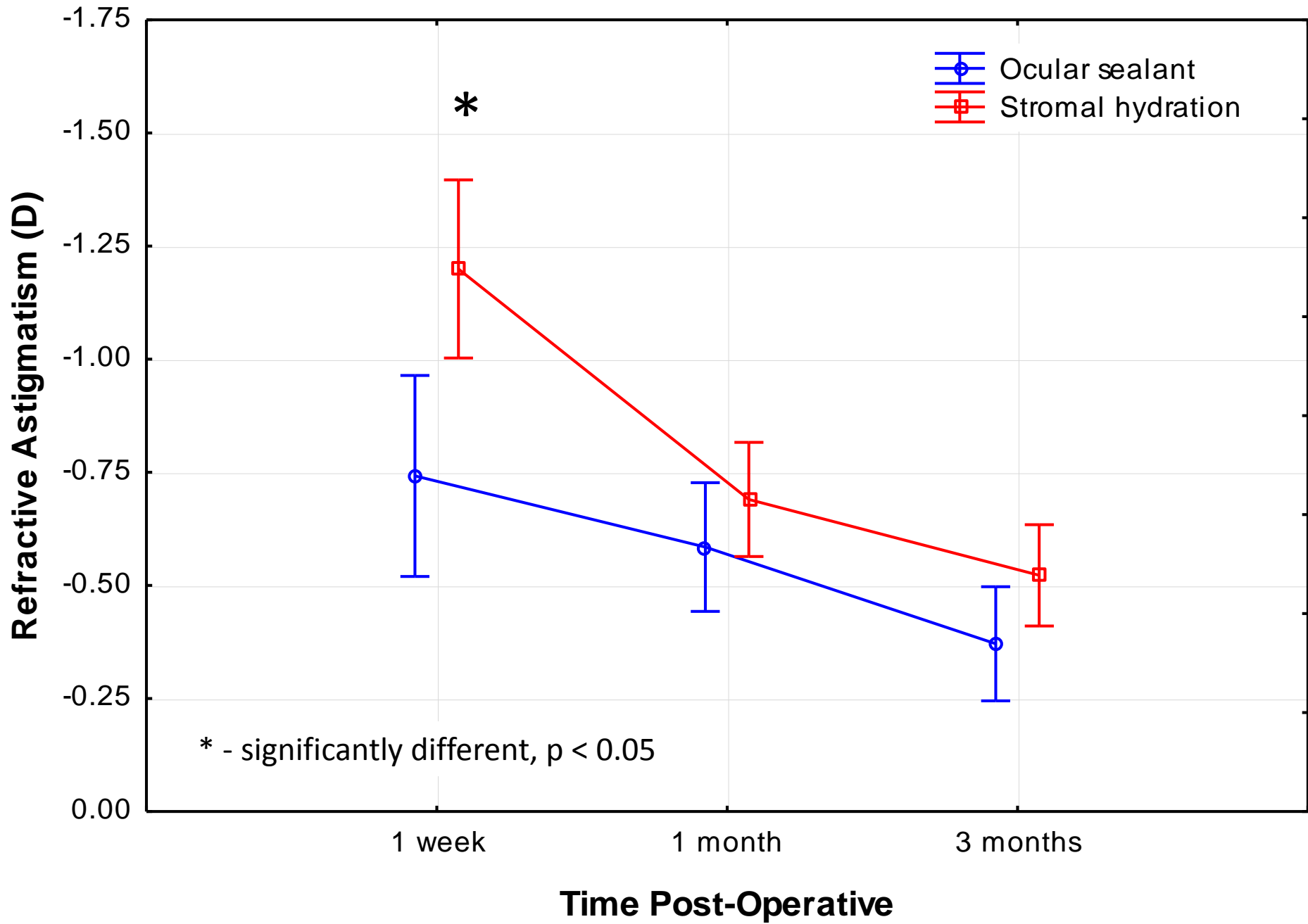
- Fully Customizable and adjustable
- Refractive incisions are no longer an art form. They are a science.
- Place Desired Incisions:
 - EXACT Size
 - EXACT Place
 - EXACT Depth
 - Every Time



- Arcuate Incisions with the LenSx® Laser
- Development of a nomogram for laser created arcuate incisions based previous experience with manual LRI nomogram

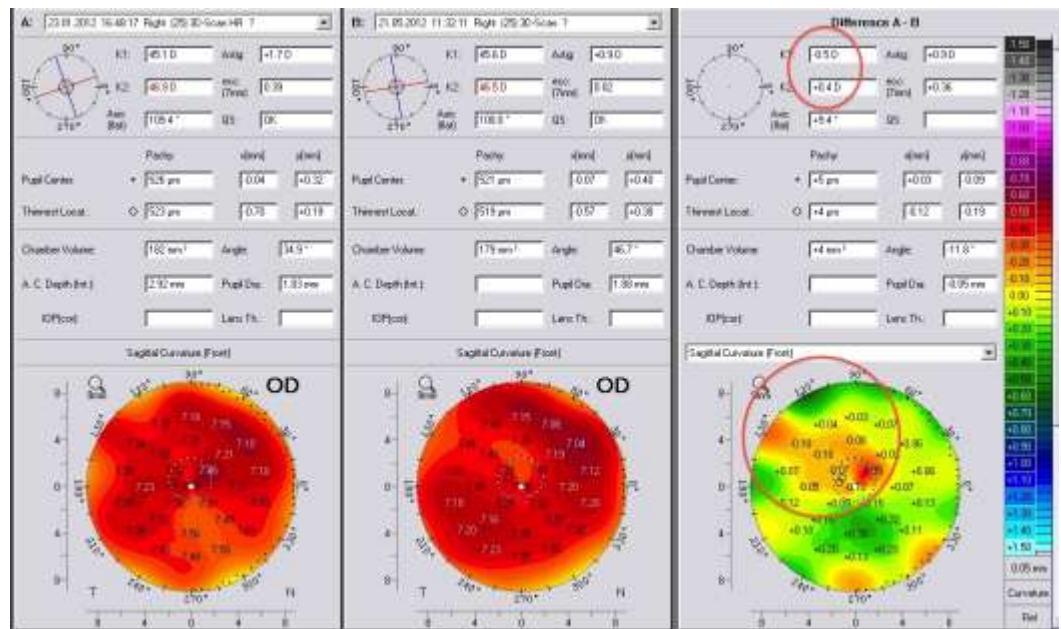


Vertical bars denote 0.95 confidence intervals

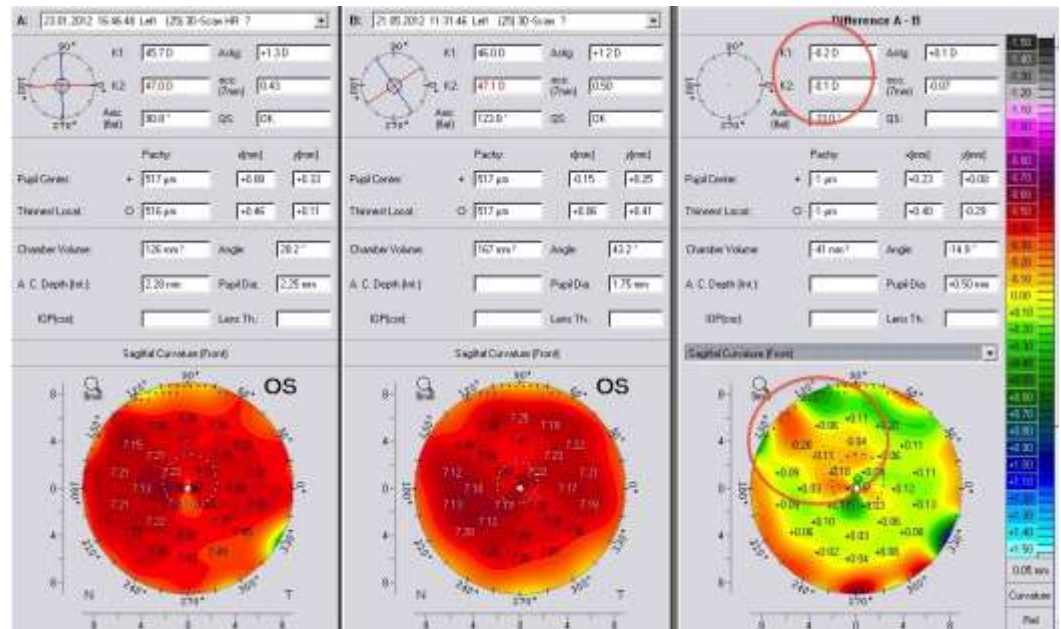


Contralateral eye 2.8mm main incision

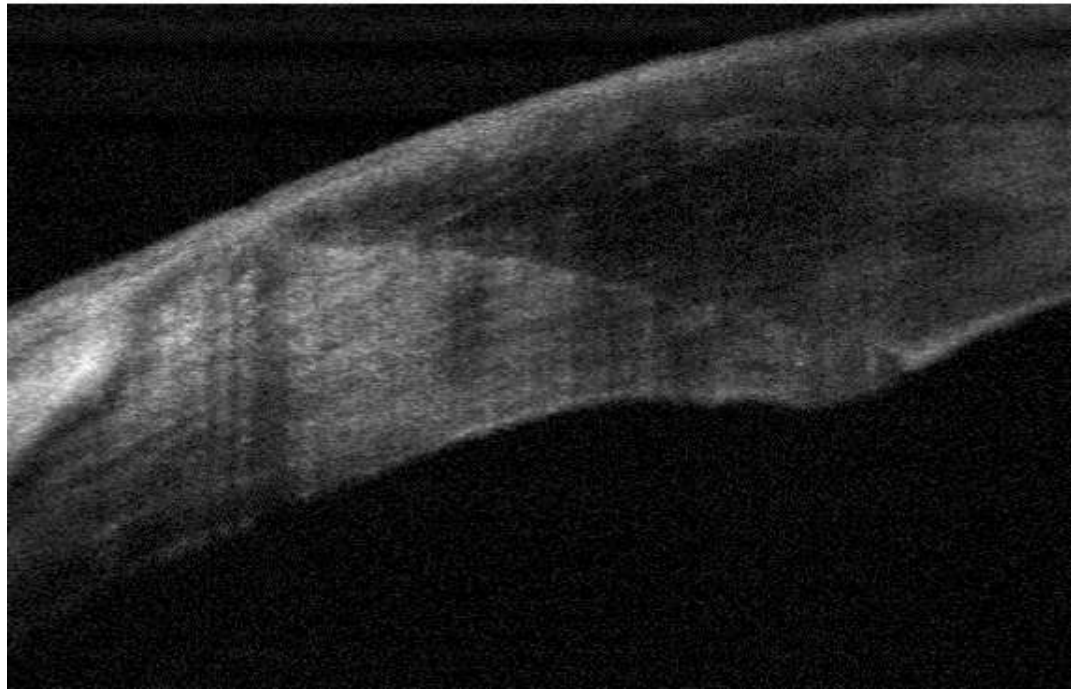
LenSx



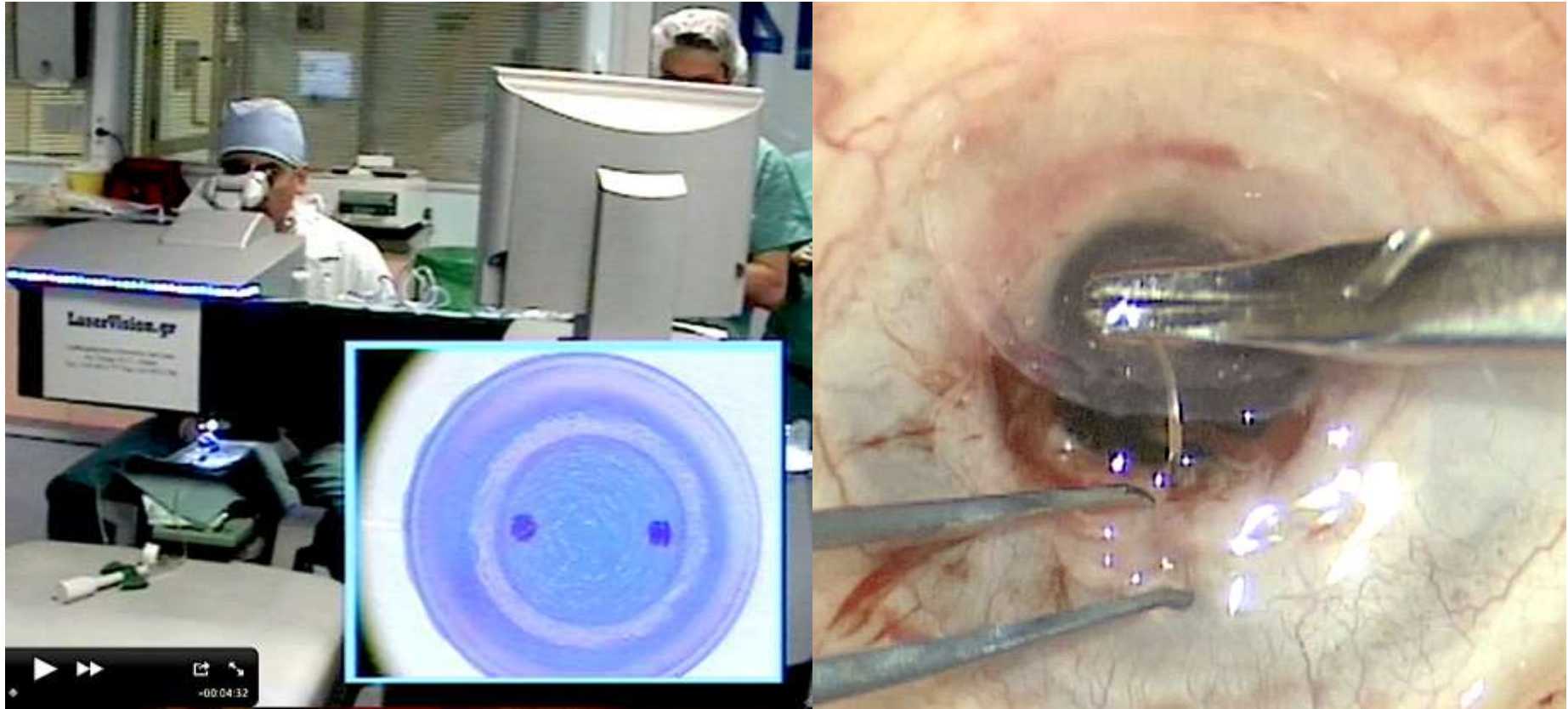
Manual

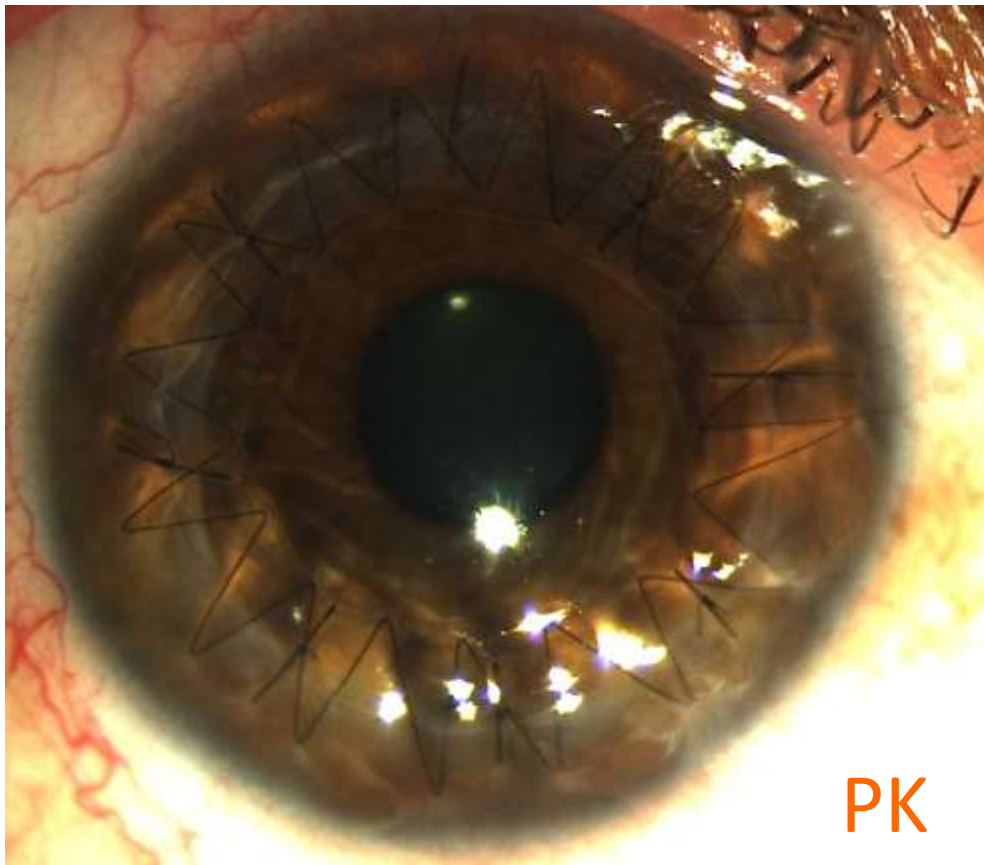


LenSx incisions

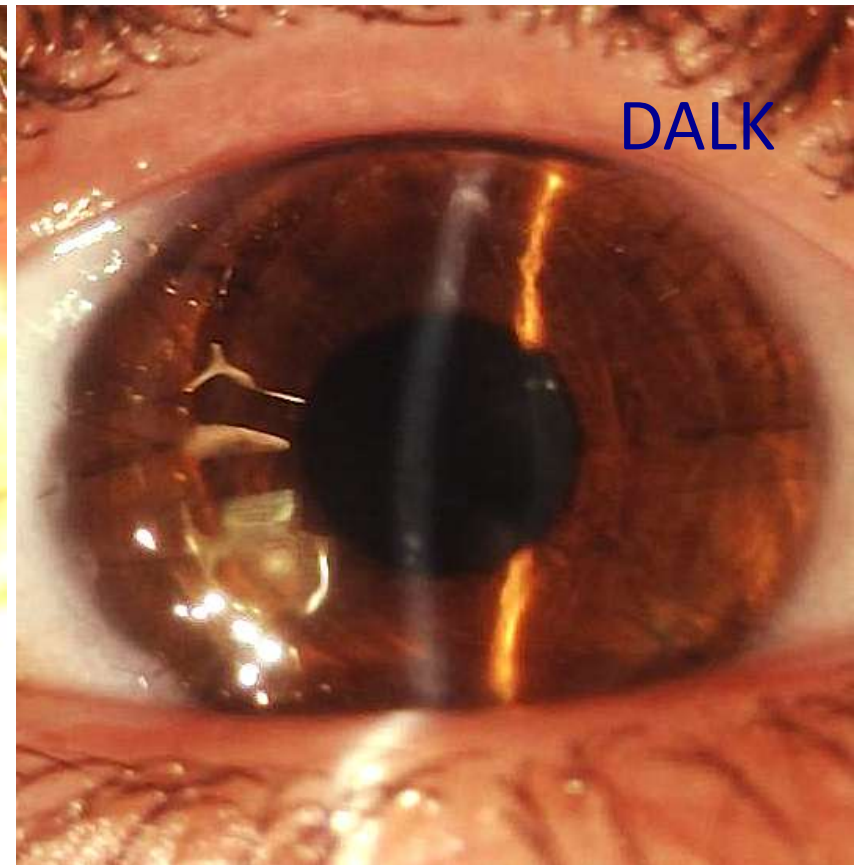


Femto PK

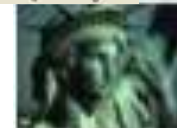
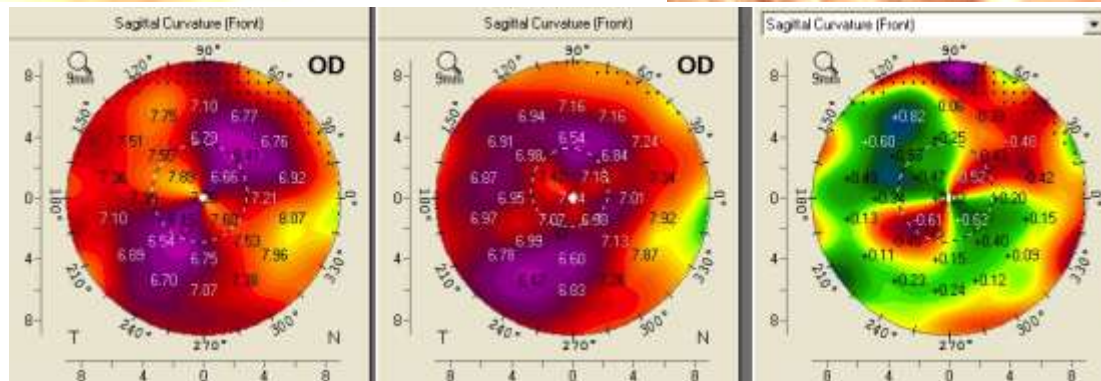




PK



DALK



Methods

- Using the femtosecond laser under topical anesthesia the pair of arcuate incisions were performed at a diameter of 6.5mm within the corneal graft at a 85% depth measured by intraoperative OCT (incorporated in the laser system).
- We evaluated the effectiveness of the laser in reducing the corneal astigmatism and improving the visual acuity.
- Adverse events of the treatment were recorded.
- Follow up visits were at post-op day#1, week#1, and month#1.



The “art” of manual AK

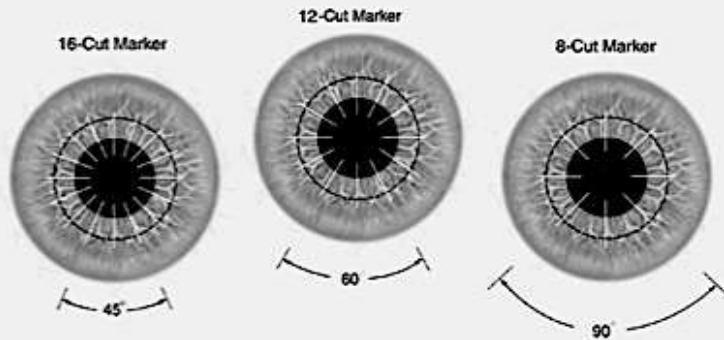


Fig. 7. Sixteen-cut RK marker is useful to delineate 45° arcuate keratotomy. Twelve-cut RK marker is useful to delineate 60° arcuate keratotomy. Eight-cut RK is useful to delineate 90° arcuate keratotomy.

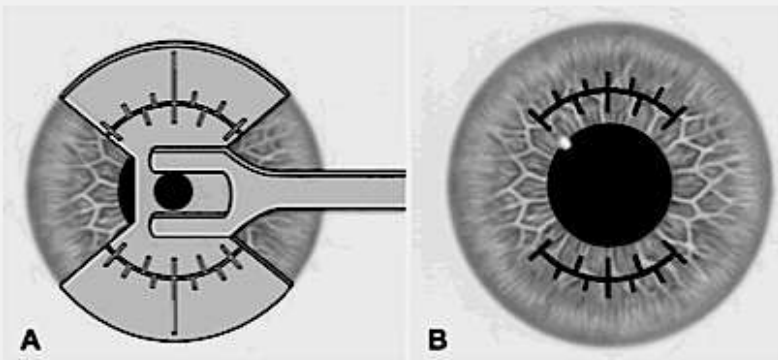


Fig. 8. A special arcuate keratotomy marker (**A**) delineates the desired optical zone as well as a graduated scale (**B**).



AK nomogram (Yoo)

TABLE 1. FEMTOSECOND LASER-ASSISTED ARCUATE KERATOTOMY NOMOGRAM FOR NATURALLY OCCURRING ASTIGMATISM

Amount of astigmatism (D)	Zone diameter (mm)	Incision depth (%)*	Angular length (degrees)
1.50 – 2.50	7.25	90	60
2.60 – 3.60	7.00	90	70
3.70 – 4.80	7.00	90	80
4.90 – 5.90	6.75	90	80
6.00 – 7.00	6.75	90	90
7.10 – 8.00	6.50	90	90

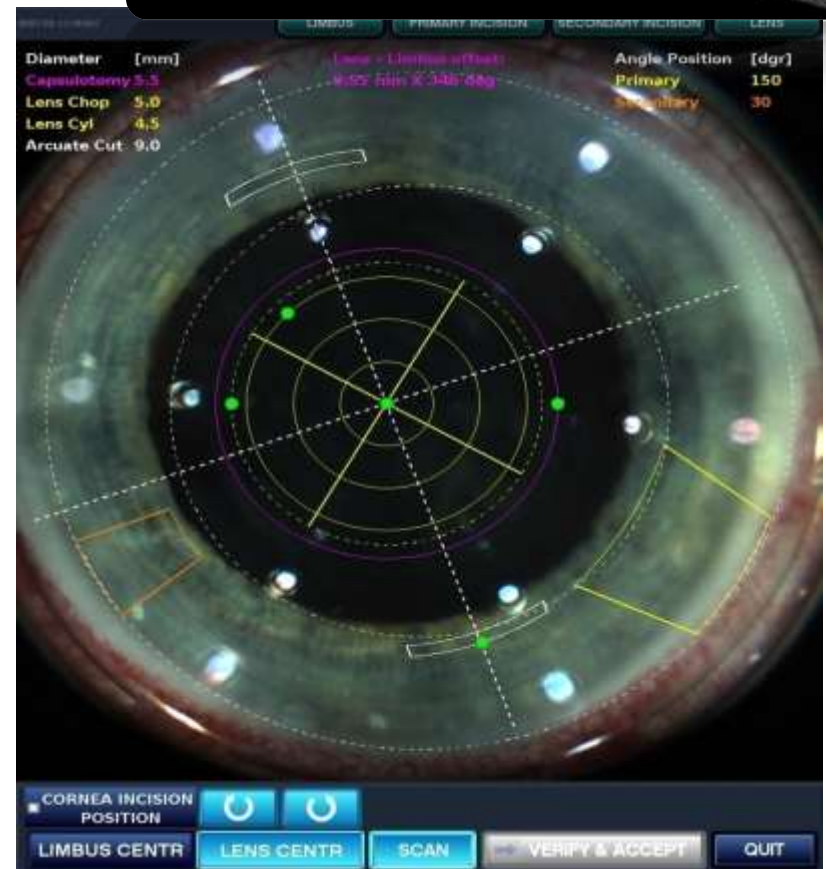
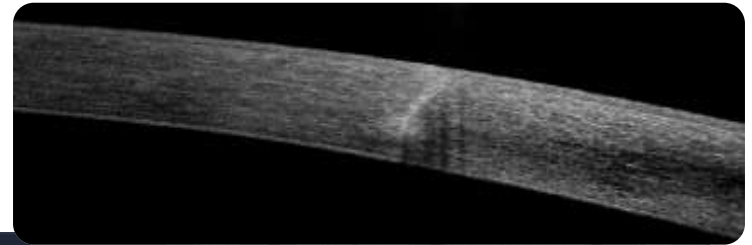
* The depth of incision is calculated from the lowest pachymetry reading.
 Add 0.05 D per year for each year under 30 years of age. Subtract 0.05 D per year for each year over 30 years of age.
 Subtract an additional 0.02 D per year for each year after 50 years of age.





Laser Refractive Cataract Surgery - Arc Incisions

- Fully Customizable and adjustable
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- Place Desired Incisions:
 - EXACT Size
 - EXACT Place
 - EXACT Depth



Starting Laser Nomogram

Donnenfeld Nomogram for Limbal Relaxing Incisions

0.50 D 1 Incision, 1 ½ Clock Hours (45 Deg. Each)

0.75 D 2 Incisions, 1 Clock Hour (30 Deg. Each)

1.50 D 2 Incisions, 2 Clock Hours (60 Deg. Each)

3.00 D 2 Incision, 3 Clock Hours (90 Deg. Each)

*Use 5 degrees more for against-the-rule-astigmatism

*Use 5 degrees more for younger patients

*Use 5 degrees less for older patients

LenSx Nomogram for 9 mm Arc Incisions

1 Incision, 1 Clock Hours (30 Deg. Each)

2 Incisions, 2/3 Clock Hour (20 Deg. Each)

2 Incisions, 1 1/3 Clock Hours (40 Deg. Each)

2 Incision, 2 Clock Hours (60 Deg. Each)

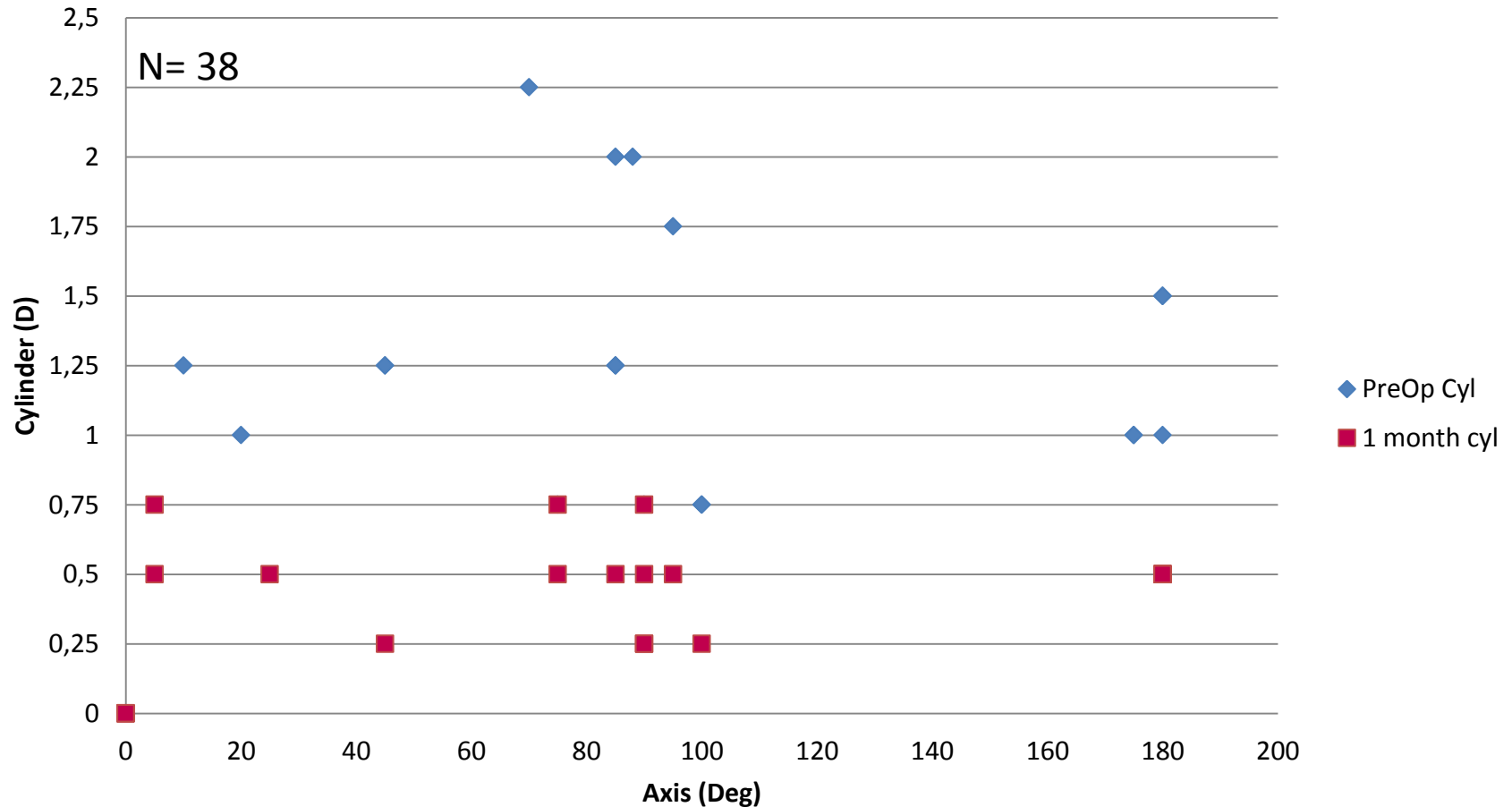
85% Depth



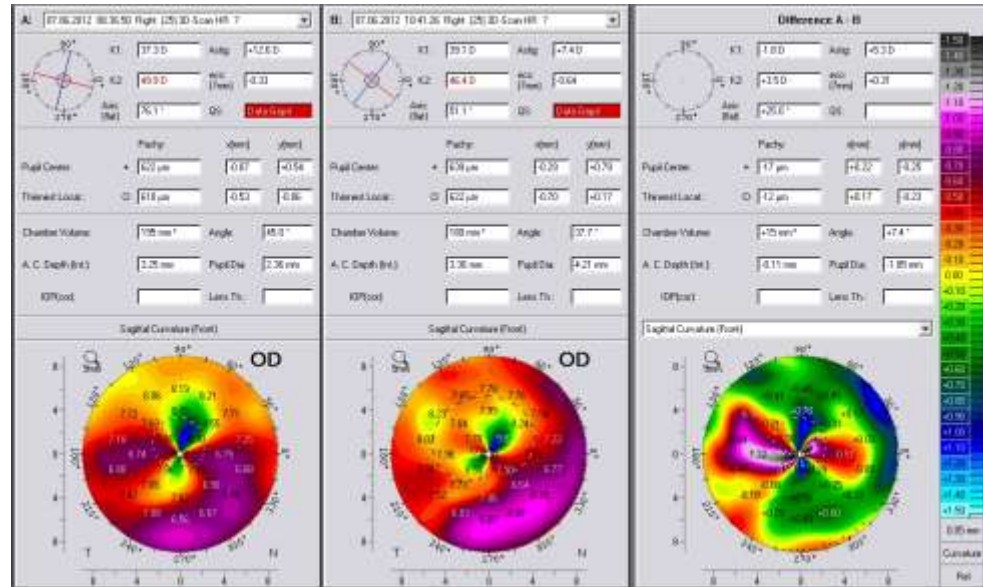
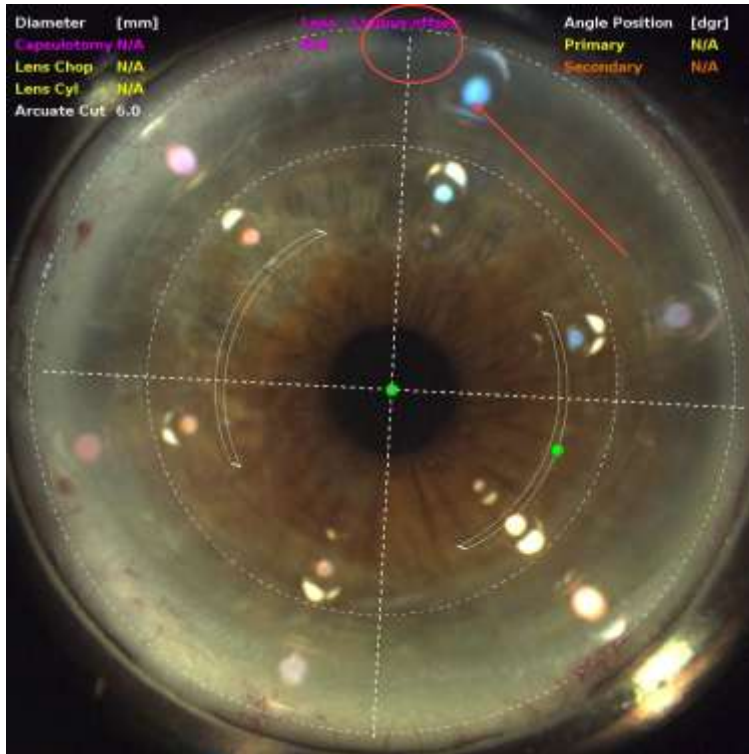
Pre Op Cyl vs. One Month Post Op

Pre Op Mean: 1.11 ± 0.41 D

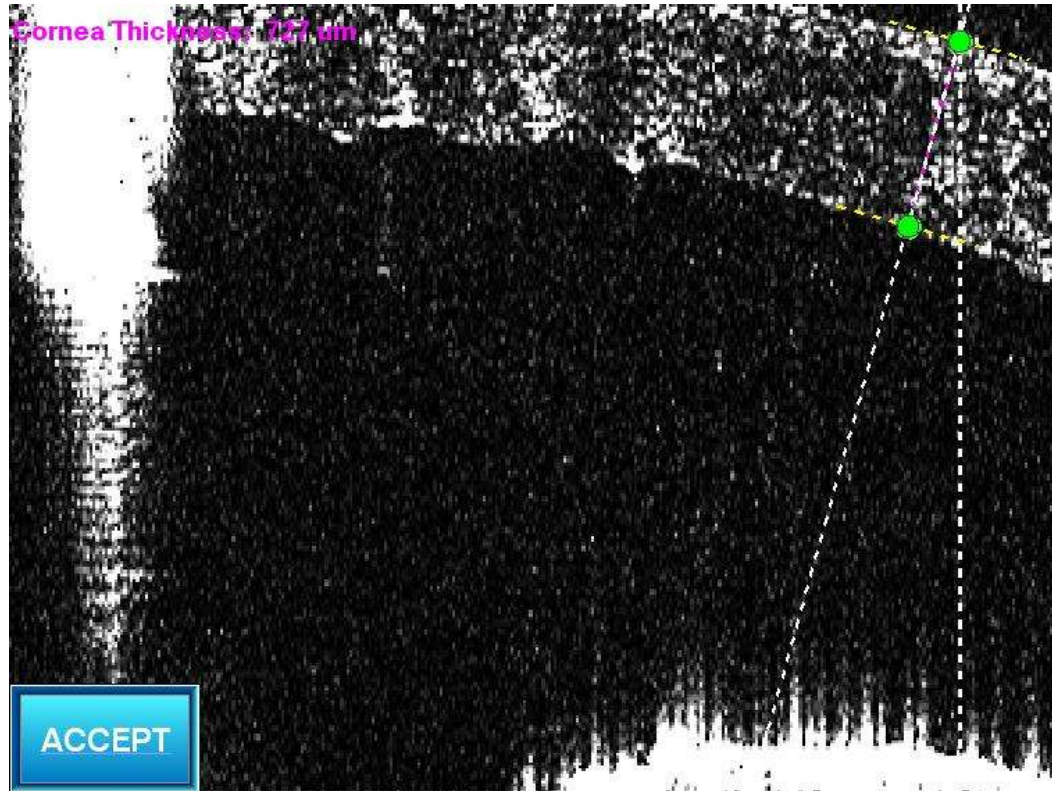
Post Op Mean: 0.33 ± 0.23 D



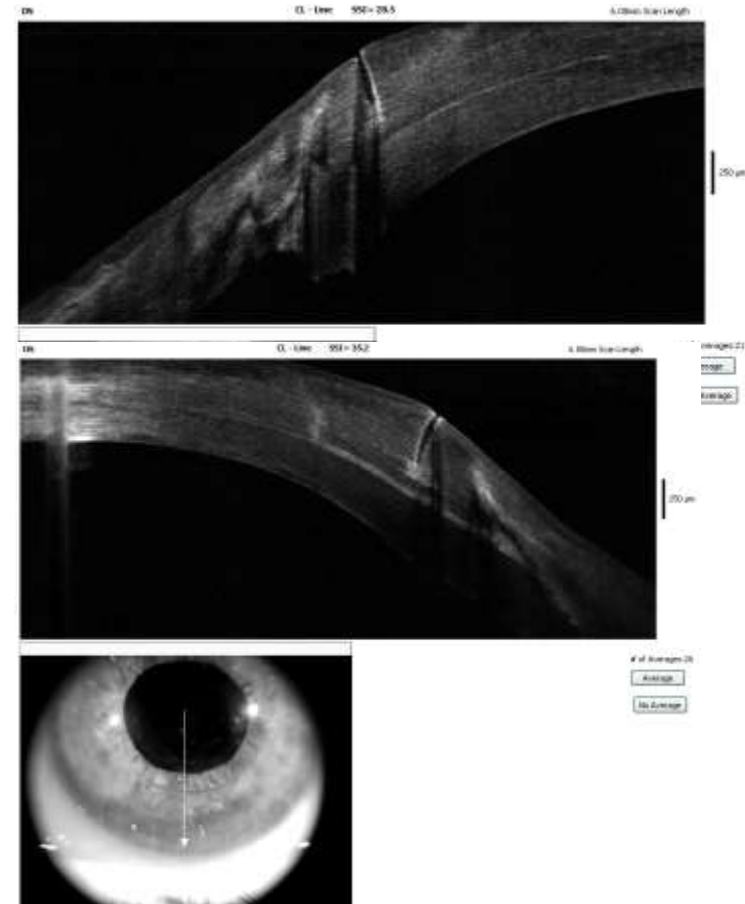
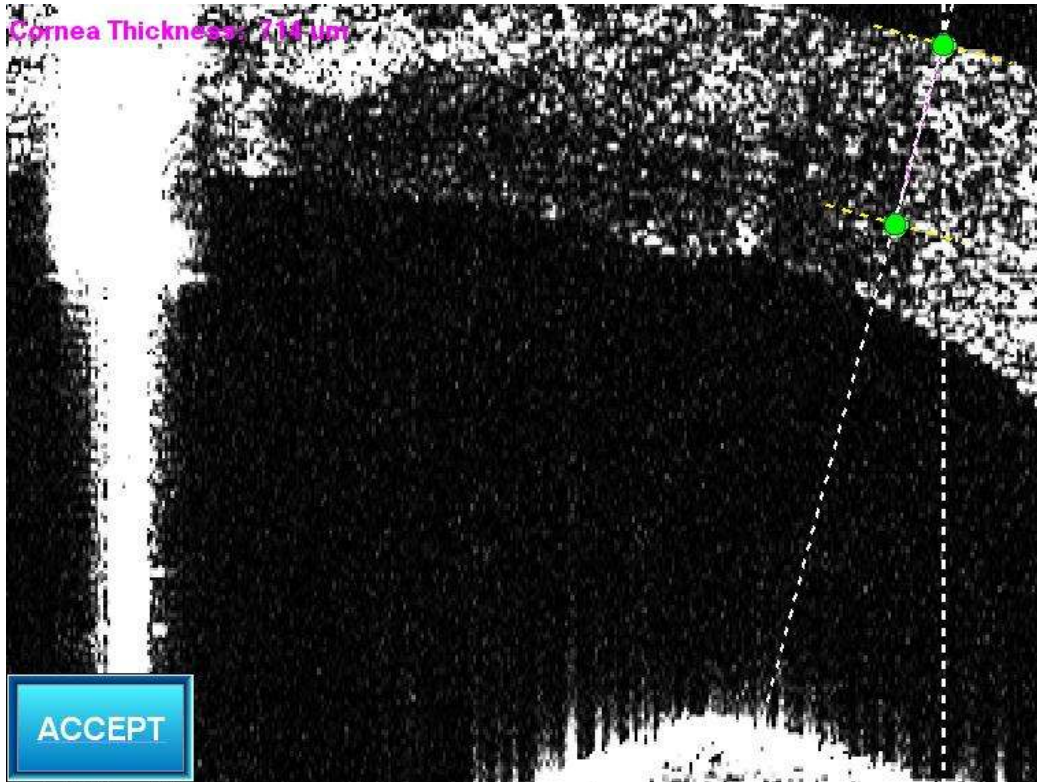
Rotating on 6° clock mark



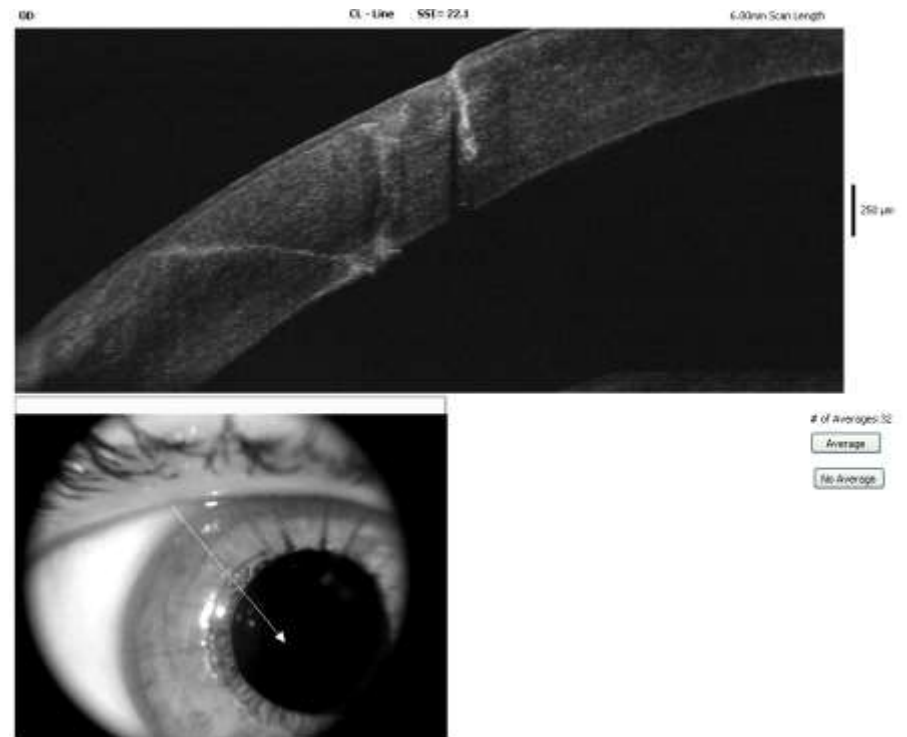
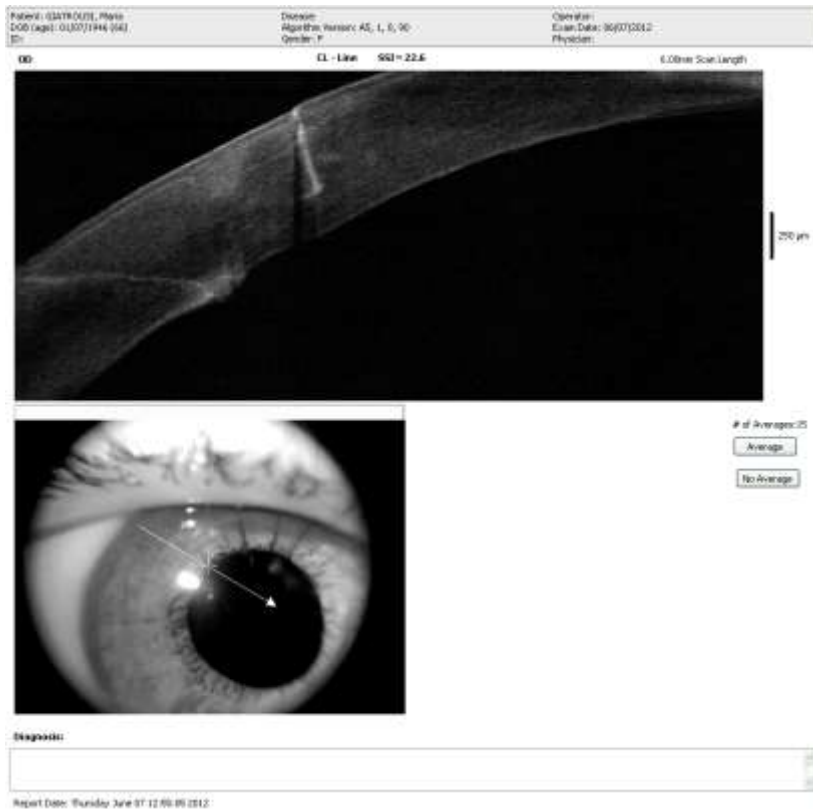
Adjusting thickness/depth



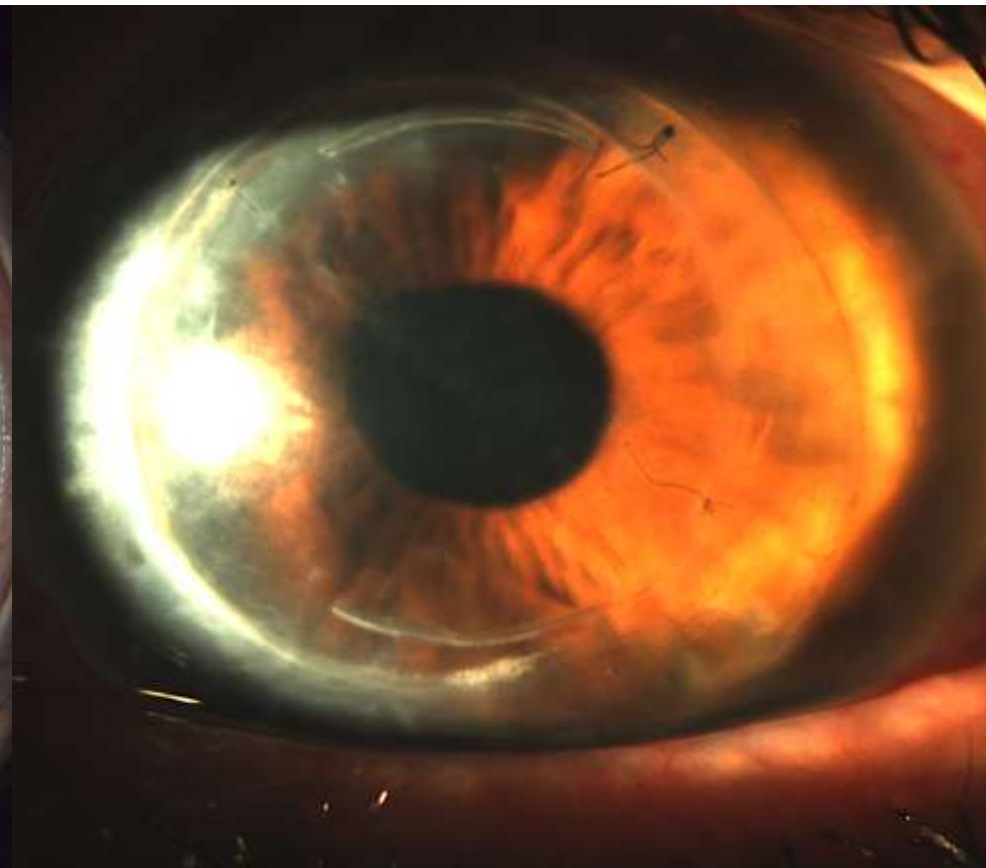
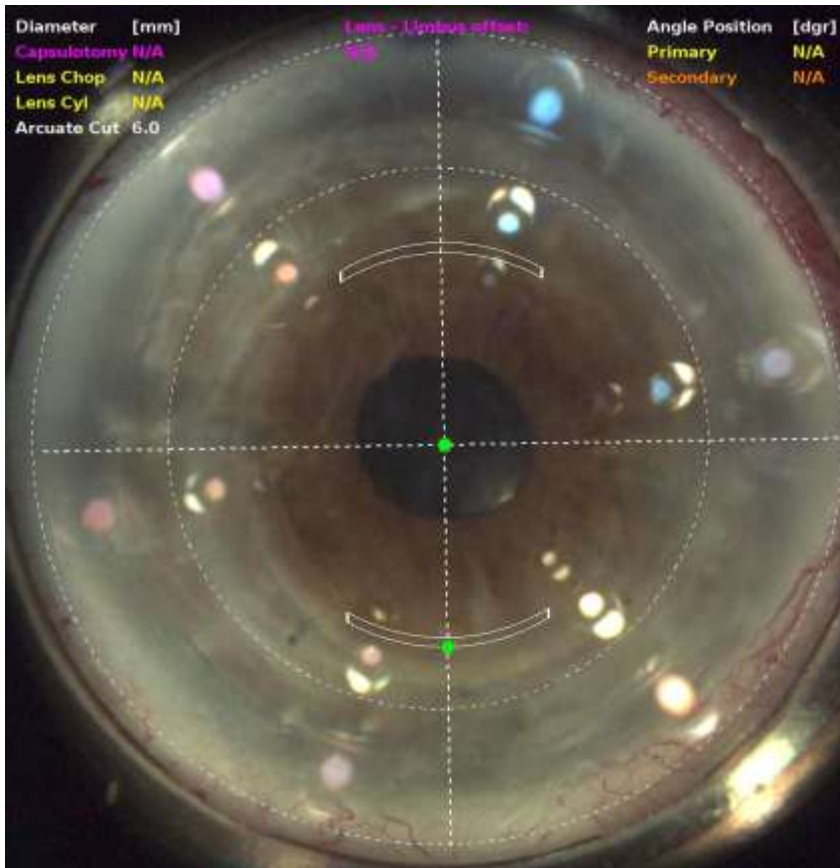
AK in DSAEK



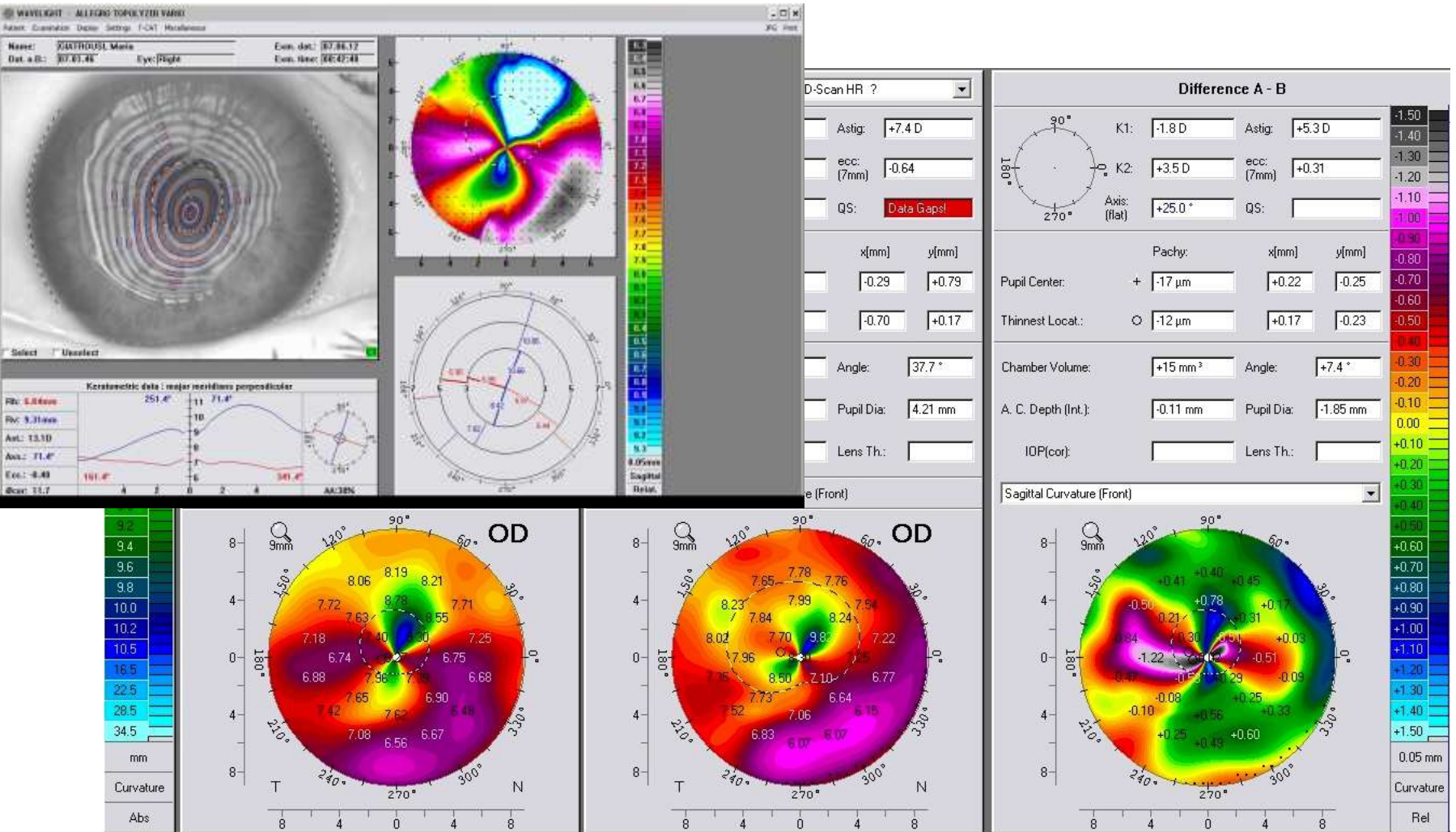
Before and after “opening” with Sinskey



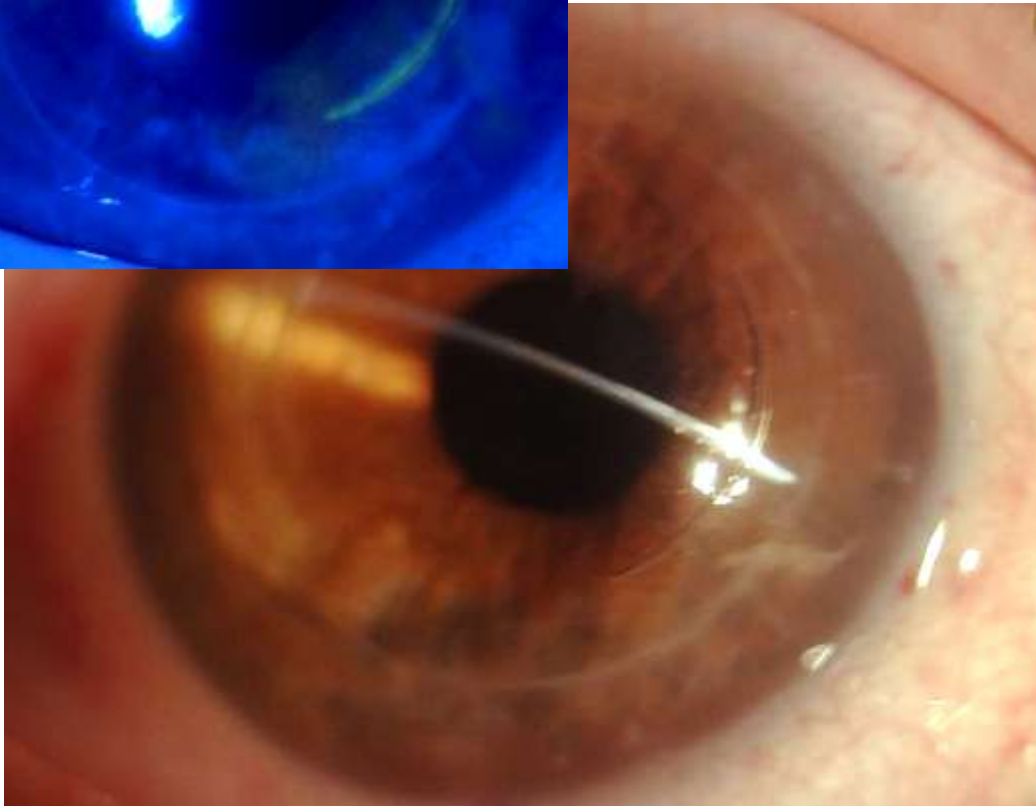
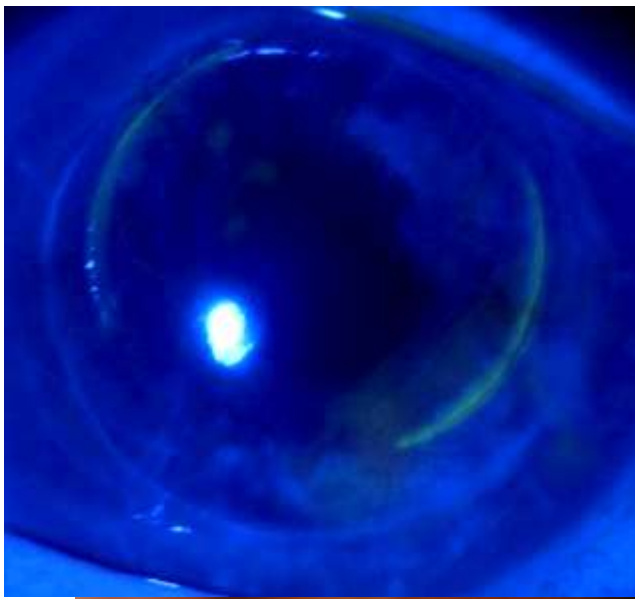
7mm OZ 60 degrees X 2



Before after LenSx AK



Precision: LenSx AK axis



Conclusions

- LenSx AK a superior tool in customised correction of cylinder
- The incisions have proven fast, reproducible, customizable, adjustable, precise, and safe in our patient group with improvements in corneal astigmatism and visual acuity that is maintained several months out.
- develop a precise nomogram and predictable algorithm for optimal surgical outcomes
 - Next step is 90% depth and leave surface uncut-adjustable.



Thank you
www.brilliantvision.com

