

# LASIK: Basic steps for great results ESCRS 2008 IC 31



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# My Background

- Harvard Medical School-Cornea Fellow
- Cornell University-Cornea Fellow
- Medical Director- TLC Laser Eye Centers
- Director: Refractive Surgery, NYU
- Director, Laservision.gr Institute
- Associate Professor: NYU Medical School
- Over 15000 LASIK procedures

# Experience-Excimer Lasers

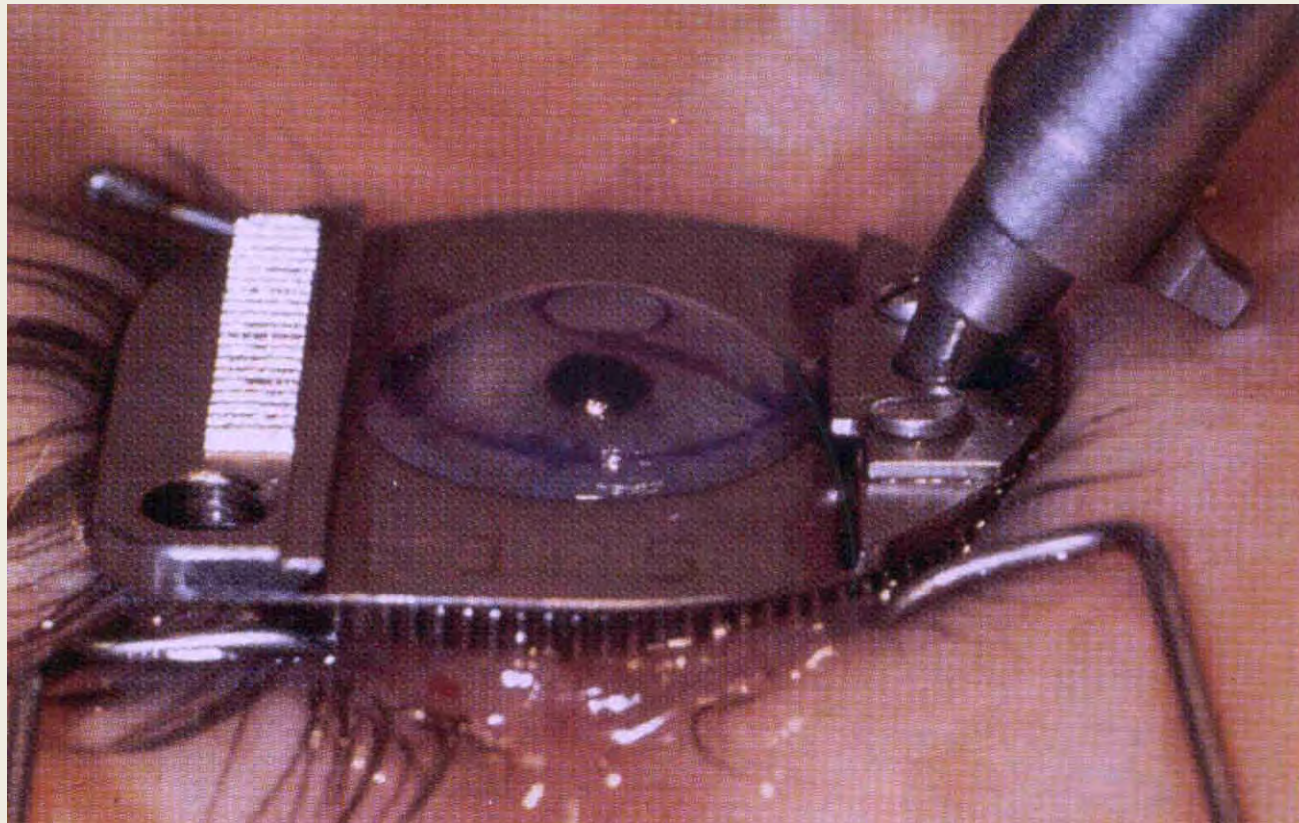
- Summit- Apex plus
- VISX-S2, S3 and S4 Wavescan
- Lasersight
- Nidek
- Alcon-Ladarvision
- B&L: Technolas 217
- Wavelight: 200Hz
- Wavelight eye Q 400Hz
- VISX custom View
- Wavelight Blue line

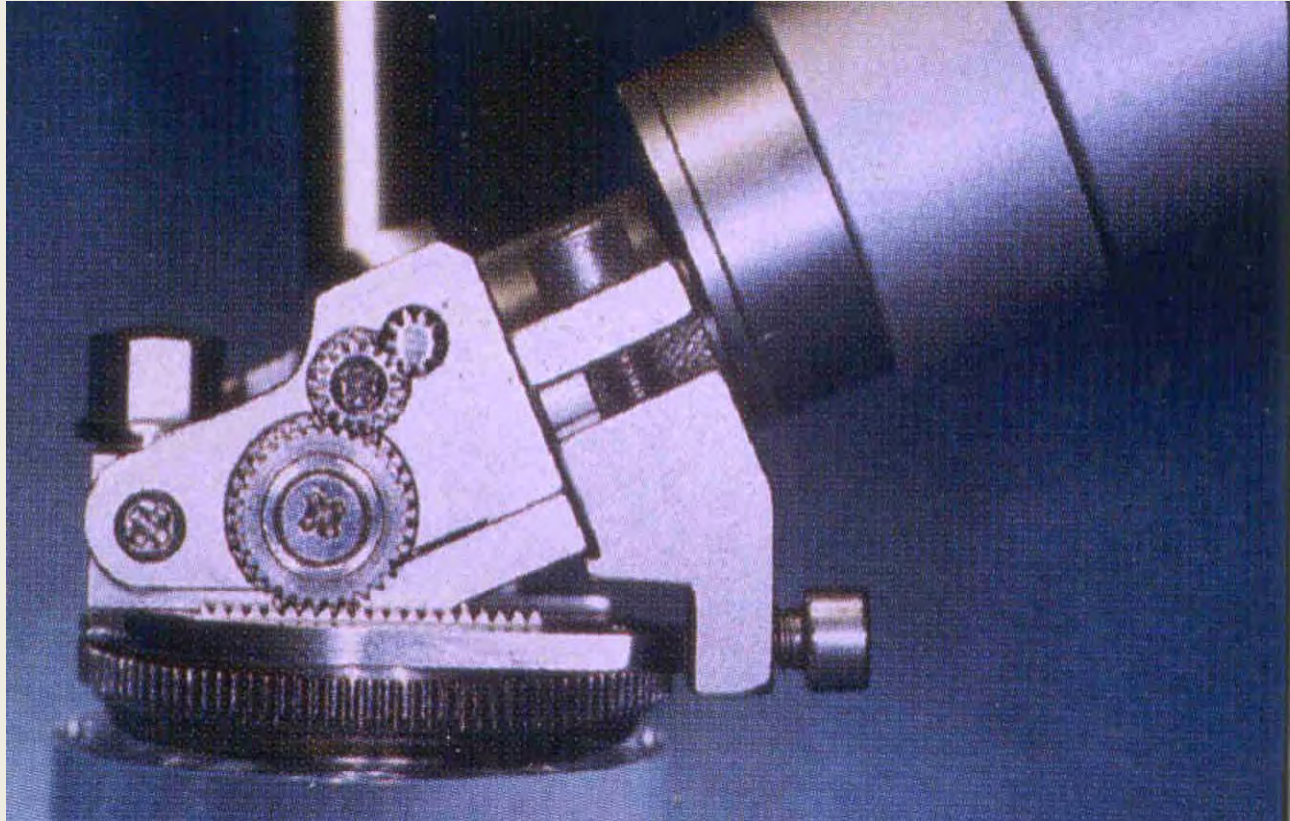
# LASIK

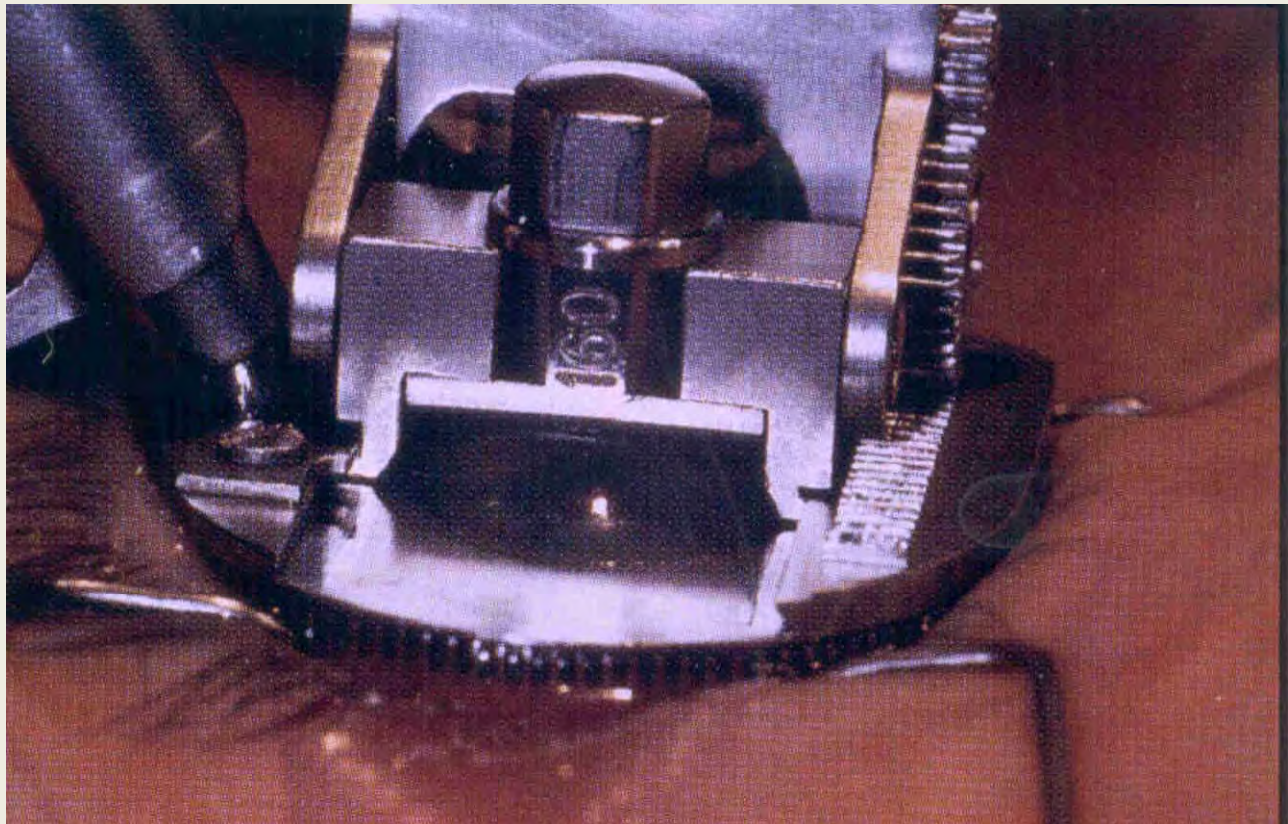
- Has been around for almost 20 years
- About 1.5 million eyes in the US per year
- One of the safest procedures in Medicine
- Permanent vision correction

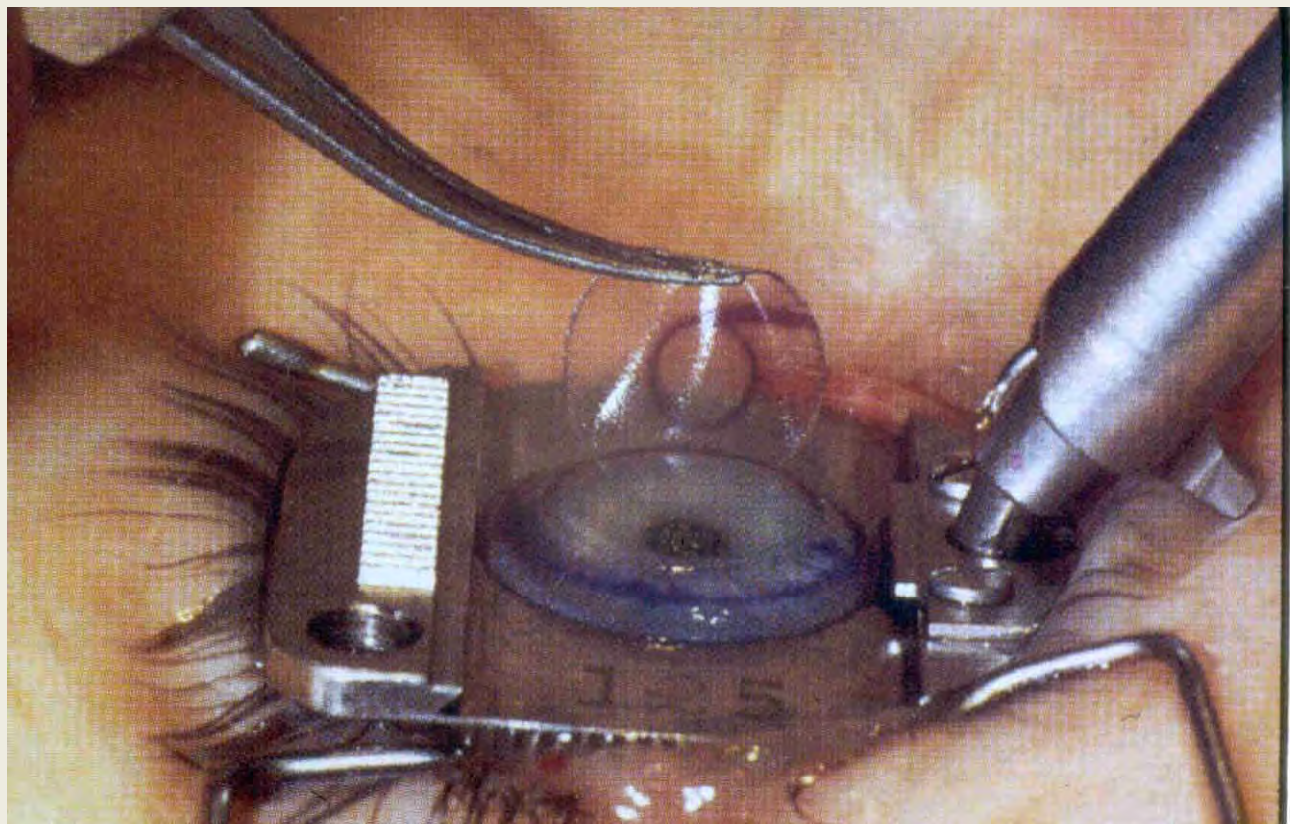
# The procedure

- About 10 minutes
- Eye is anesthetized with drops
- Minimal discomfort
- Rest for the rest of the day
- Medications for 1 week



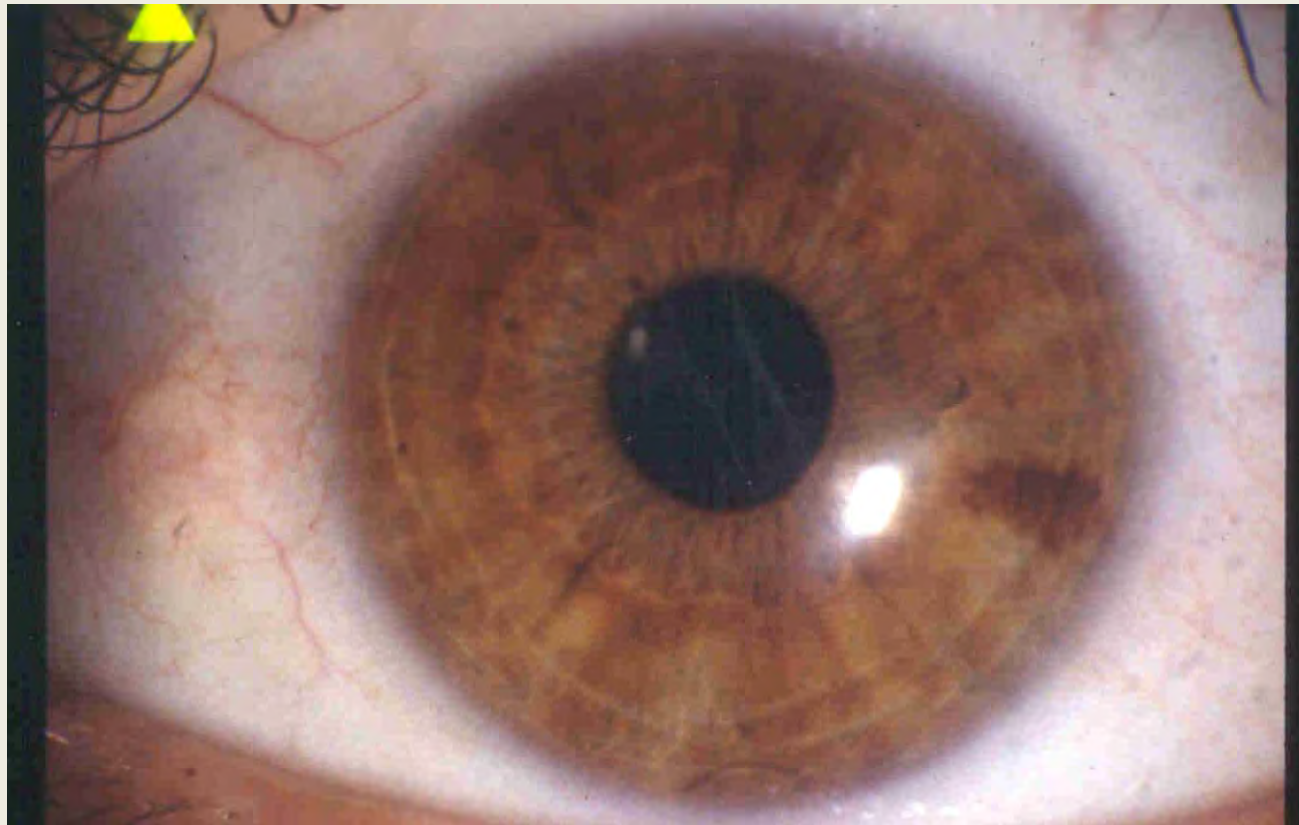








# One of the initial LASIK cases, 1994





# LASIK Advantages

- Minimal discomfort
- Rapid visual recovery
- Both eyes can be done
- Stable correction

# Possible complications

- Glare/Halos
- Over/under correction
- Astigmatism
- Flap wrinkles
- Haze
- Infection

# Other Options

- Intacs
- Phakic IOLs
- Bioptics (LASIK and Phakic IOL)
- Clear lens extraction

# Patient Selection

- Not quite “easy”
- No “cookbook” approach
- A- Physiologic and Anatomic factors
- B- Emotional and Psychological Characteristics

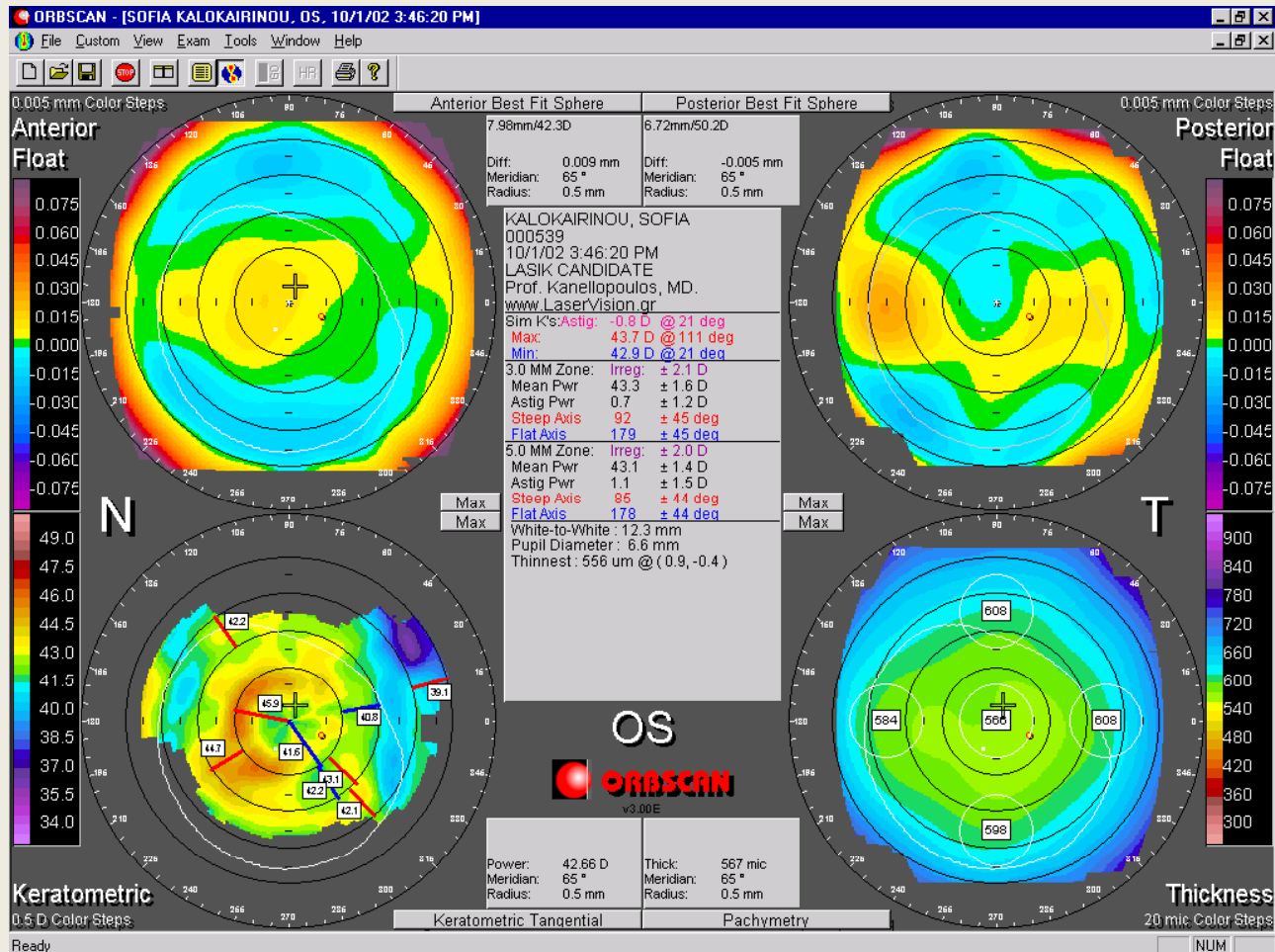
# First “INFO”

- ? Referred patient
- Why does the pt want surgery
- Has the pt had previous consultations

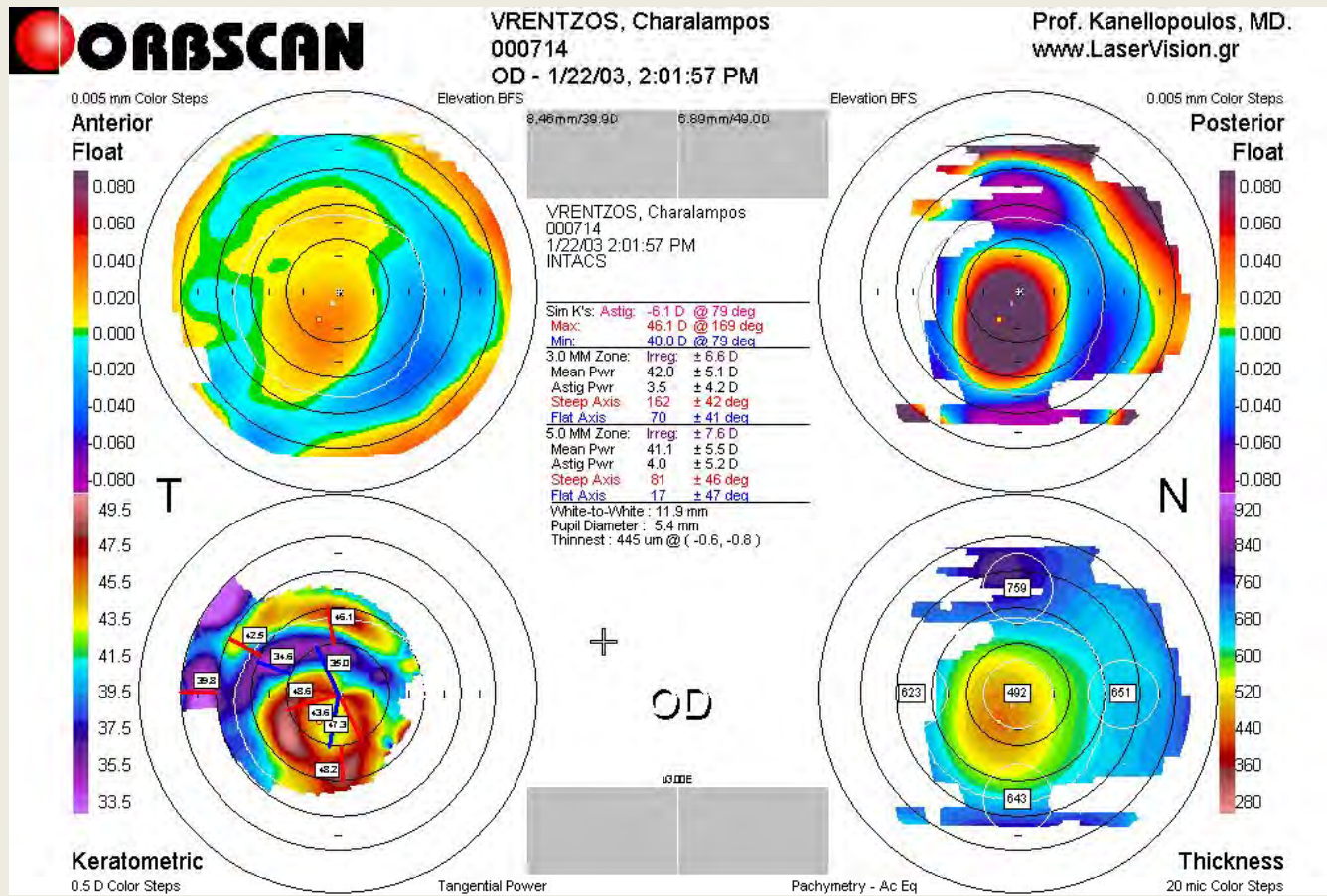
# History Very Important

- FHx Keratoconus? Or PK
- Medical Dx and Meds
- CL history very crucial (RGP vs SCL)
- Presbyopia, any bifocals or previous experience with monovision

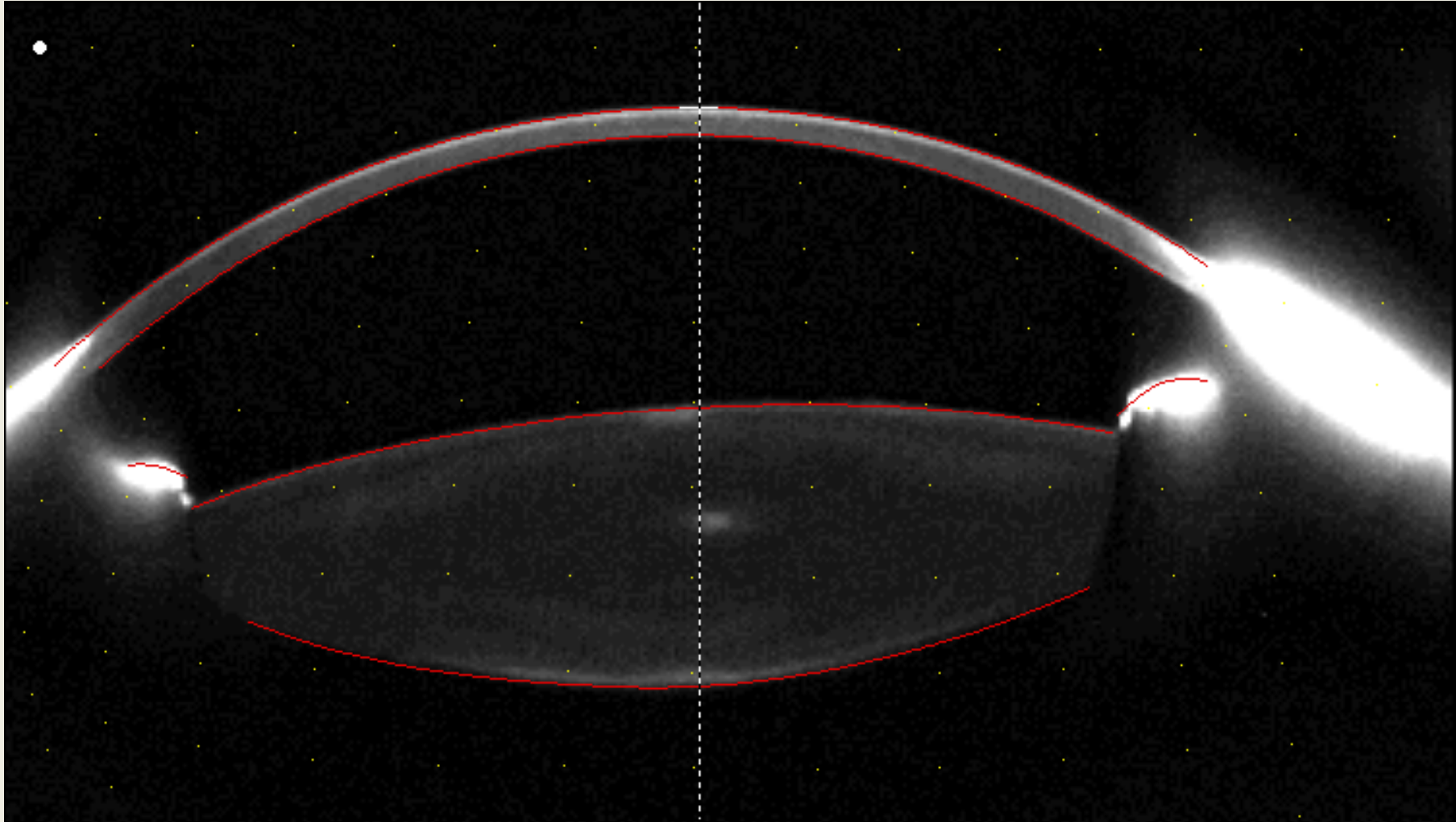
# Topography-pachymetry



# -3.25-2.50 X 95



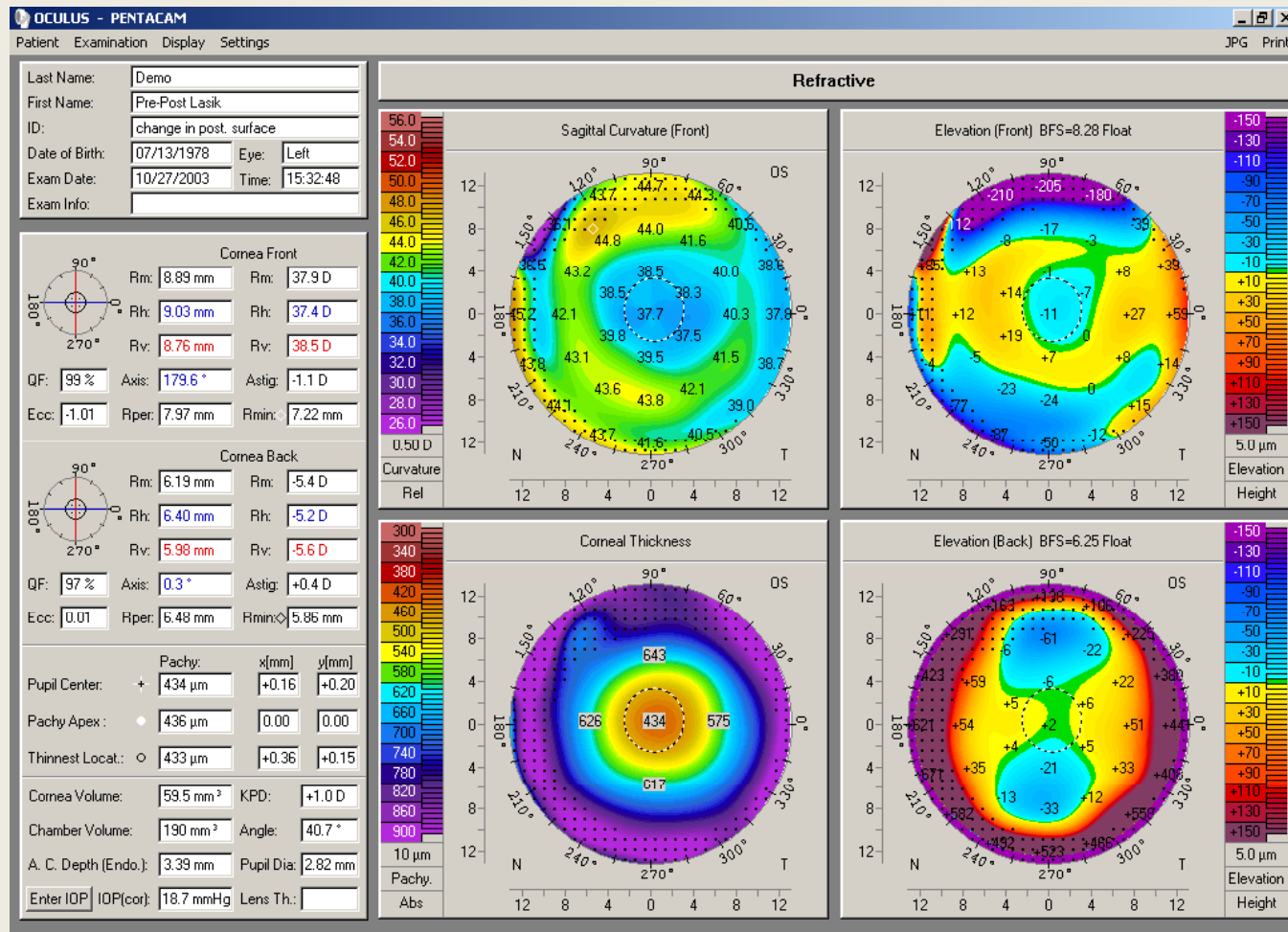
# Edge detection via software



# 4-maps refractive

Application:

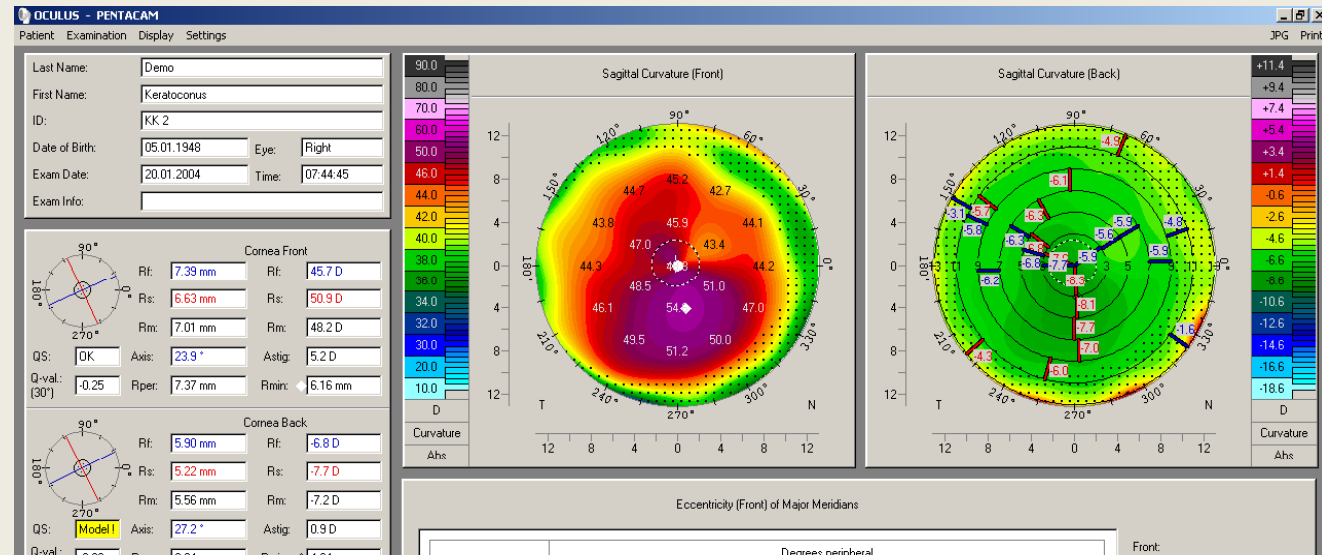
- Enhanced overview for refractive surgeons in values and maps
- Hand-out to patients



# Topometric

## Application:

- Enhanced overview for refractive and cataract surgeons
- Detailed corneal structure analysis
- $Q < 1$  = prolate
- $Q > 1$  = oblate
- $Q = 0$  = sphere



Asphericity (Front) of Major Meridians

		Degrees peripheral				
		20°	25°	30°	35°	40°
Nas	(Q-val.)	-1.50	-0.93	-0.72	-0.78	-0.90
Temp	(Q-val.)	-0.39	-0.41	-0.41	-0.41	-0.44
Inf	(Q-val.)	2.06	1.24	0.70	0.30	-0.07
Sup	(Q-val.)	-0.83	-0.65	-0.57	-0.58	-0.69
Mean Value	(Q-val.)	-0.17	-0.19	-0.25	-0.37	-0.53

Front:

Aspher.

Sag. curvature

Back:

Aspher.

Sag. curvature

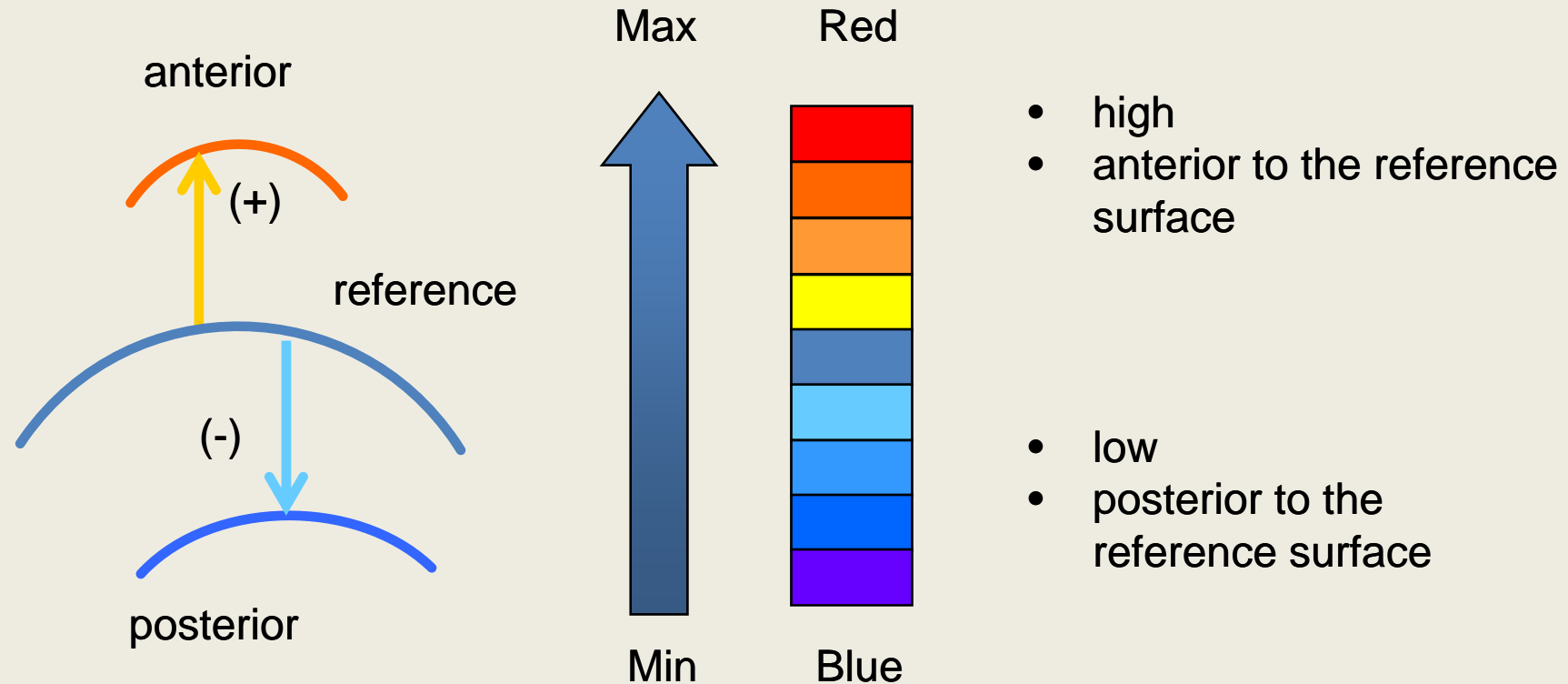
# Concept of Reference Sphere

- To see relevant features, global curvature must be removed



- For the CORNEA, a reference surface (typically, a sphere) is constructed by fitting the reference surface as smooth as possible to the data surface (Best Fit Sphere)
- In corneal topography the reference surface is not some fixed “mean sea-level”, but is movable

# Color Scale: Elevation Map



- Relative elevation measures height difference in microns from a best-fitting reference sphere
- In all elevation maps, green is the reference surface or zero level
- Red is high and positive, Blue is low and negative

# Screening patients

	Pachy:	x[mm]	y[mm]
Pupil Center:	+ 541 $\mu$ m	-0.28	+0.09
Pachy Apex :	● 543 $\mu$ m	0.00	0.00
Thinnest Locat.:	○ 535 $\mu$ m	-1.15	-0.29

Cornea Front	
Rf: 7.64 mm	K1: 44.2 D
Rs: 7.36 mm	K2: 45.9 D
Rm: 7.50 mm	Km: 45.0 D
QS: OK	Axis: 7.4°
Astig: -1.7 D	
Q-val: -0.77	Rper: 8.19 mm
	Rmin: 7.24 mm

Cornea Back	
Rf: 6.78 mm	K1: -5.9 D
Rs: 6.33 mm	K2: -6.3 D
Rm: 6.56 mm	Km: -6.1 D
QS: OK	Axis: 12.4°
Astig: +0.4 D	
Q-val: -0.36	Rper: 6.91 mm
	Rmin: 6.09 mm

Pachy:	x[mm]	y[mm]
Pupil Center: + 541 $\mu$ m	-0.28	+0.09

Cornea Volume:	55.8 mm <sup>3</sup>	KPD:	+0.8 D
Chamber Volume:	148 mm <sup>3</sup>	Angle:	33.0°
A. C. Depth (Int.):	2.58 mm	Pupil Dia:	2.99 mm
Enter IOP   IOP(cor):		Lens Th.:	

Refractive

Sagittal Curvature (Front)

# Screening patients

	Pachy:	x[mm]	y[mm]		
Pupil Center:	<input type="text" value="+ 587 μm"/>	<input type="text" value="+0.02"/>	<input type="text" value="+0.01"/>		
Pachy Apex :	<input type="text" value="587 μm"/>	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>		
Thinnest Locat.:	<input type="text" value="580 μm"/>	<input type="text" value="+0.74"/>	<input type="text" value="-0.37"/>		

	Refractive																																																																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">90°</td> <td colspan="2" style="text-align: center;">Cornea Front</td> <td style="text-align: center;">0°</td> </tr> <tr> <td style="text-align: center;">270°</td> <td>Rf: 7.61 mm</td> <td>K1: 44.4 D</td> <td style="text-align: center;">OS</td> </tr> <tr> <td></td> <td>Rs: 7.46 mm</td> <td>K2: 45.2 D</td> <td></td> </tr> <tr> <td></td> <td>Rm: 7.53 mm</td> <td>Km: 44.8 D</td> <td></td> </tr> <tr> <td>QS: <input type="text" value="OK"/></td> <td>Axis: 87.1°</td> <td>Astig: +0.9 D</td> <td></td> </tr> <tr> <td>Q-val.: (30°) -0.19</td> <td>Rper: 7.67 mm</td> <td>Rmin: 7.33 mm</td> <td></td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">90°</td> <td colspan="2" style="text-align: center;">Cornea Back</td> <td style="text-align: center;">0°</td> </tr> <tr> <td style="text-align: center;">270°</td> <td>Rf: 6.19 mm</td> <td>K1: -6.5 D</td> <td style="text-align: center;">OT</td> </tr> <tr> <td></td> <td>Rs: 6.08 mm</td> <td>K2: -6.6 D</td> <td></td> </tr> <tr> <td></td> <td>Rm: 6.13 mm</td> <td>Km: -6.5 D</td> <td></td> </tr> <tr> <td>QS: <input type="text" value="OK"/></td> <td>Axis: 173.8°</td> <td>Astig: +0.1 D</td> <td></td> </tr> <tr> <td>Q-val.: (30°) -0.45</td> <td>Rper: 6.67 mm</td> <td>Rmin: 5.93 mm</td> <td></td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Cornea Volume:</td> <td><input type="text" value="62.7 mm³"/></td> <td>KPD:</td> <td><input type="text" value="+1.3 D"/></td> </tr> <tr> <td>Chamber Volume:</td> <td><input type="text" value="211 mm³"/></td> <td>Angle:</td> <td><input type="text" value="42.4°"/></td> </tr> <tr> <td>A. C. Depth (Int.):</td> <td><input type="text" value="3.35 mm"/></td> <td>Pupil Dia:</td> <td><input type="text" value="2.17 mm"/></td> </tr> <tr> <td>Enter IOP   IOP(cor):</td> <td><input type="text"/></td> <td>Lens Th.:</td> <td><input type="text"/></td> </tr> </table>	90°	Cornea Front		0°	270°	Rf: 7.61 mm	K1: 44.4 D	OS		Rs: 7.46 mm	K2: 45.2 D			Rm: 7.53 mm	Km: 44.8 D		QS: <input type="text" value="OK"/>	Axis: 87.1°	Astig: +0.9 D		Q-val.: (30°) -0.19	Rper: 7.67 mm	Rmin: 7.33 mm		90°	Cornea Back		0°	270°	Rf: 6.19 mm	K1: -6.5 D	OT		Rs: 6.08 mm	K2: -6.6 D			Rm: 6.13 mm	Km: -6.5 D		QS: <input type="text" value="OK"/>	Axis: 173.8°	Astig: +0.1 D		Q-val.: (30°) -0.45	Rper: 6.67 mm	Rmin: 5.93 mm		Cornea Volume:	<input type="text" value="62.7 mm³"/>	KPD:	<input type="text" value="+1.3 D"/>	Chamber Volume:	<input type="text" value="211 mm³"/>	Angle:	<input type="text" value="42.4°"/>	A. C. Depth (Int.):	<input type="text" value="3.35 mm"/>	Pupil Dia:	<input type="text" value="2.17 mm"/>	Enter IOP   IOP(cor):	<input type="text"/>	Lens Th.:	<input type="text"/>	<p style="text-align: center;">Sagittal Curvature (Front)</p> <p style="text-align: center;">Curvature Abs</p>
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# Pupil size

PupilFit - 3560 [CHRISTOU Konstantinos]

File Edit Image Results View Help

<unknown>  
15 Oct 2005 11:34

*Procyon Instruments*

3560 CHRISTOU Konstantinos

**Navigation**

- Image list
- Image
- Graph
- Summary
- Report

**Common tasks**

Close Patient

Print Report

Mesopic Lo		high		scotopic	
Mean diameters (mm)		Mean diameters (mm)		Mean diameters (mm)	
Right	Left	Right	Left	Right	Left
5.93	5.75	4.85	4.59	6.27	5.97
Range (mm)		Range (mm)		Range (mm)	
Right	Left	Right	Left	Right	Left
0.04	0.16	0.07	0.07	0.06	0.05

**Patient details**


3560  
CHRISTOU Konstantinos

**Mean diameters**

Mesopic Lo  
R: 5.93 mm L: 5.75 mm

high  
R: 4.85 mm L: 4.59 mm

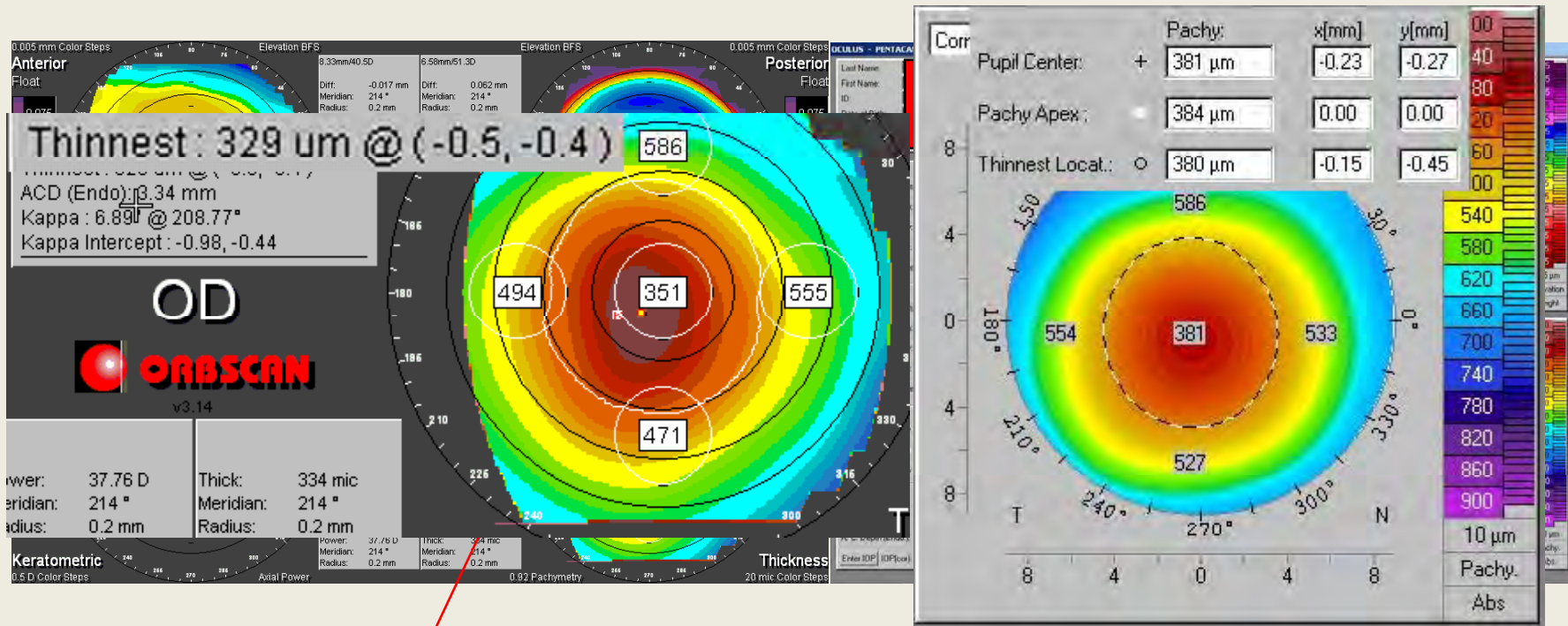
scotopic  
R: 6.27 mm L: 5.97 mm



start PupilFit PupilFit - 3560 [CHRISTOU Konstantinos] 11:34



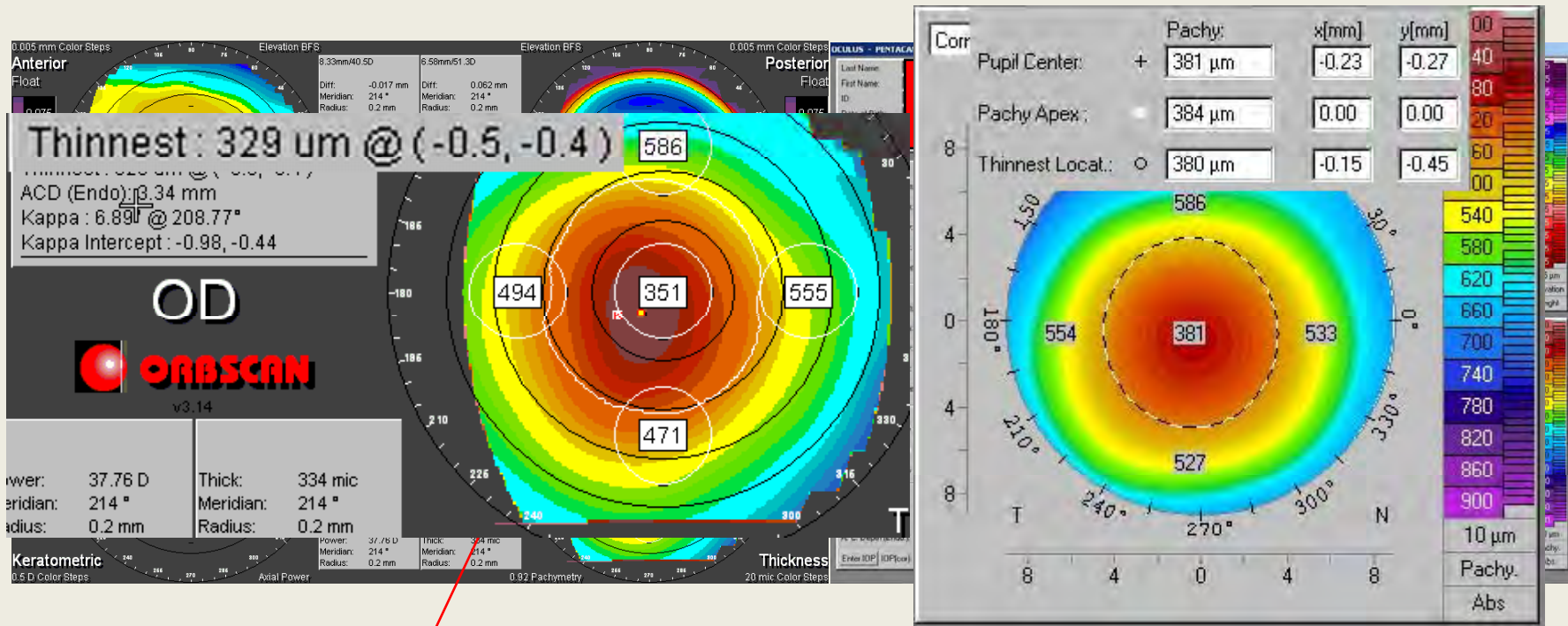
# Case # 11 ORB-Scan-Pentacam, post LASIK, Ectasia?



Yes with ORB-Scan

Not with Pentacam

# Case # 11 ORB-Scan-Pentacam, post LASIK, Ectasia?



Yes with ORB-Scan

Not with Pentacam

# Summarize with Pt

- What are their expectations?
- Va CC and SC
- What is their TOPO, Pach, Pupil, IOP, RE, Hydration state, Seasonal state

# Presbyopia

- In the over 40 Pts discuss CL and spec correction for near
- In the under 40 Pt, demonstrate reading with cyclo (best effect if CL users)
- Remember: not all pts understand presbyopia
- How does your pt spend his/her typical day?

# Monovision demo

- Be different, show your pt that you care prior to suggesting LASIK
- CL or specs trial of mono (remember myope presbyopes see better at near with specs and hyperopes with CLs)

# Personality Warning signs

- Pts request warranty...
- RGPcls
- LISTEN to your staff!
- What exactly have they read on the web?
- Again what is their daily activities?

# Excessive CL use!

- Clinical signs of CL over-use
- They need an “exception”
- 10 days off sCLs
- \$ weeks off RGP CL use per decade of use
- Myopic shift in sphere and cyl seen following cessation of CLs (especially RGPs)

# Problem Pts:

- Impatient/Hostile
- Pts that repeat findings not discussed
- Most Pts will still “hear” selective info
- The 50 y/o who wants to be 25...
- The Pt with 3 pages of typed questions...

# The problem Pt

- Asks not only your surgical experience but type of equipment and has opinion of his own
- Pt is unhappy with previous procedure
- Pt is “shopping” for a competitive price
- The divorcee...

# The problem Pt:

- Engineers: expect textbook tissue response
- Teachers: Always very demanding
- Pts with multiple problems desperate for a “good” outcome
- The confused patient

# Physiologic Contraindications

## Systemic:

- RA/ Collagen VD
- IDDM
- Immunomodulated pts

# Physiologic Contraindications

## Ocular:

- AMD
- Eyelid diseases
- Functional “Monoculars”
- POAG with ON damage, most cataracts, small orbits, high buckles, ? Previous Vit
- RE outside your range

# Physiologic Contraindications

## Ocular:

- Bizarre keratometric and refractive data
- ? Poor pupil dilators and wide pupils
- Very dry eyes, severe eyelid imbrication and lagophthalmos (may require smaller MK cut)

# Physiologic Contraindications Corneal:

- Neurotrophic Keratitis
- Fuchs' dystrophy
- Very flat (myopes) Very steep (hyperopes)
- Scars in Vaxis
- Hx of HSV keratitis
- Previous refractive surgery?
- KCN, other K ectasias

# Measurements

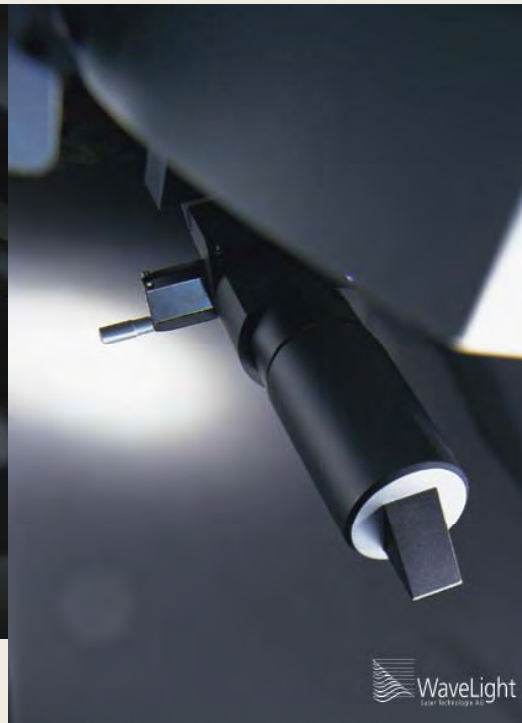
- Topography (regularity, keratometry)
- Pachymetry
- Pupil size
- Refraction
- ? Wavefront
- Complete eye exam

# Key specifications that are important for the clinician:



- - the frequency of the flying spot treatment is 400 Hz
- - the spot size is 0.9 mm;
- - its active eye-tracking system involves an infrared camera and three individual illumination modules to sense the eye movement (by fixing on the pupillary reflex) with a detection frequency of 250 Hz and a reaction time 6 to 8 msec

# Key Features



# Experience-Microkeratomes

- B&L: ACS, Hansatome
- Alcon:SKBM
- Allergan: Amadeus
- Moria: LSK, M2, epiK
- Intralase 30 and ow 60FS
- Wavelight: Rondo

**Allegretto - [ ]** File Treatment Allegretto Setup ?

**Patient data**

Last Name:

First Name:

Eye:  **OS**

Enhancement:

Sex:

Date of Birth:  DD.MM.yyyy Age:

Date of Treatment:  DD.MM.yyyy

**Examination**

Examiner:

K1:  D @  °

K2:  D @  °

Pachymetry:  μm Pupil size:  mm

Remark:

**Refraction / Aim**

Vertex distance:  mm (see Setup)

Surgeon:

Manifest Refraction: SPH  CYL  Axis  ° **Myopia Astigmatism**

Refract. aim:

Optical Zone:  mm

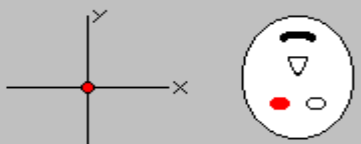
Center: dx  μm dy  μm

**Treatment Data**

Surgeon:

	SPH	CYL	Axis
Correction:	<input type="text" value="-3.50"/>	<input type="text" value="-0.75"/>	<input type="text" value="5"/>
Optical Zone:	<input type="text" value="6.5"/>	mm	
Ablation zone:	<input type="text" value="8.1"/>	mm Outer diameter	
Ablation depth:	<input type="text" value="63"/>	μm Maximum	
Flap thickness:	<input type="text" value="160"/>	μm Nominal value (see Setup)	
Remaining:	<input type="text" value="277"/>	μm stromal thickness	
Center:	dx <input type="text" value="0"/>	μm	dy <input type="text" value="0"/> μm

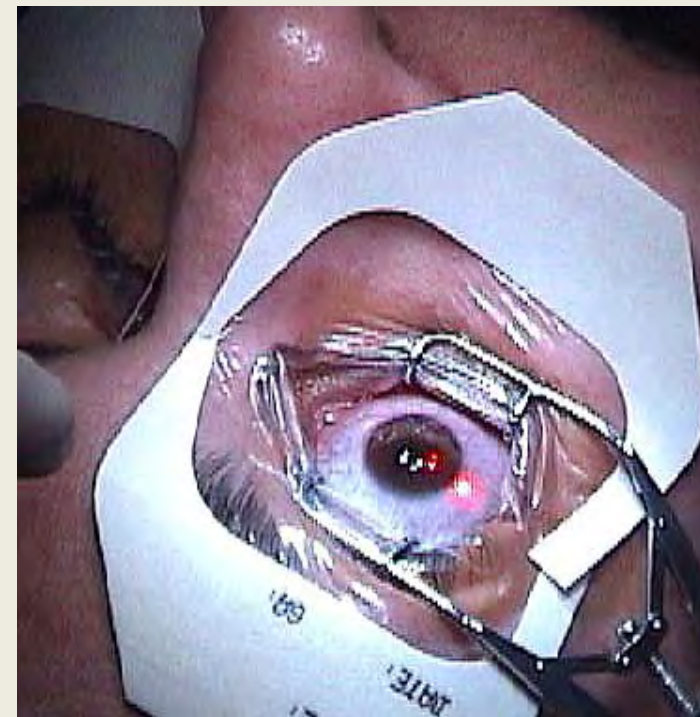
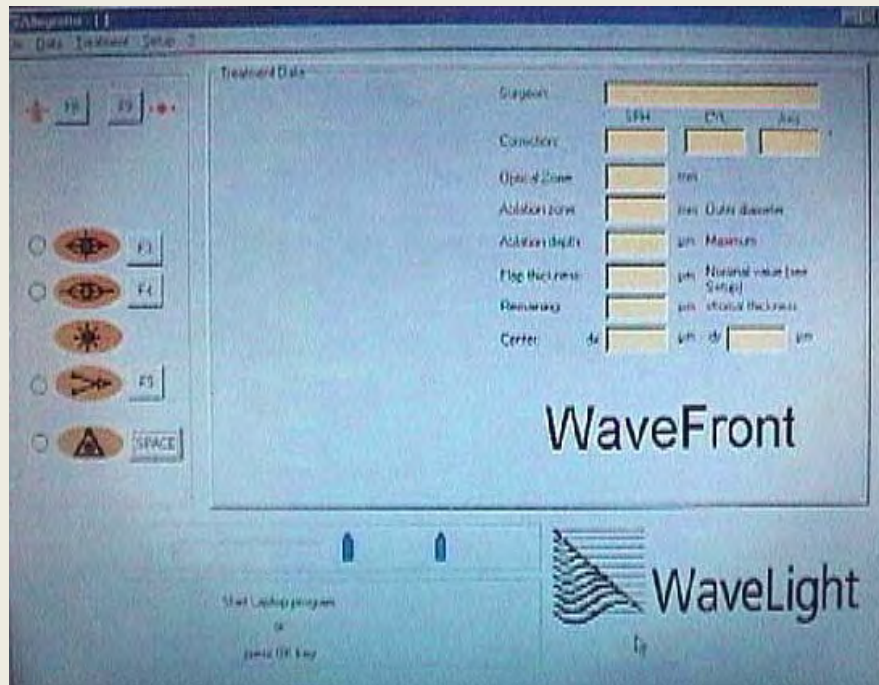
**Warnings**



# Methods:

- We evaluate
- amount of myopia and astigmatism,
- pre- and post-operative:
- UCVA and BSCVA, IOP, endothelial cell count IOL Master, autoR, and wavefront, Pentacam.
- We utilized the Intralase 60FS, previously the M2.
- Informed consent

# My Technique



# Placement of the M2



# Microkeratome pass

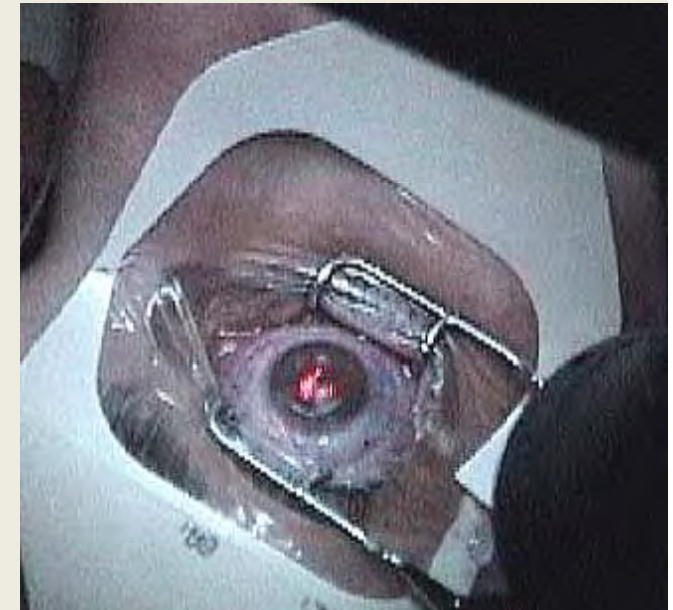
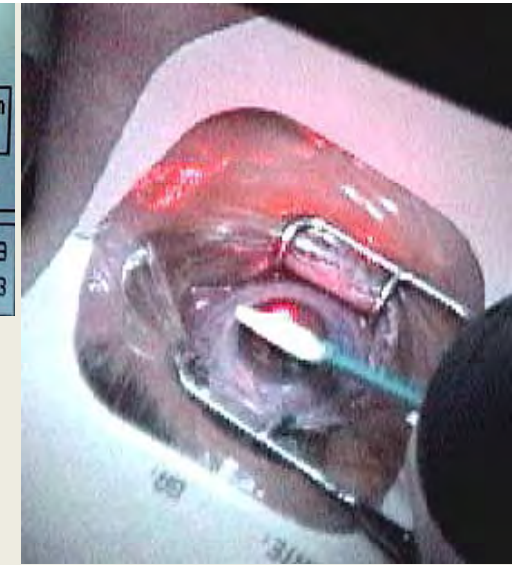


# Folding of flap, even moisture on stromal bed

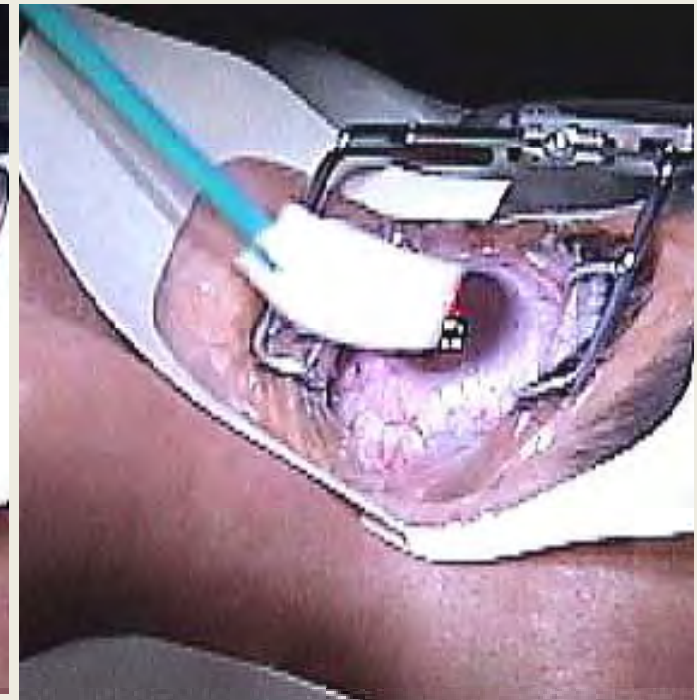


# Check parameters Intraoperative moisture eq

PTK	DEPTH	DIA	WaveFRONT	
LASIK	-2.54	-0.32	0°	6.5mm
D	SPH	D	CYL	AXIS
Treatment active				
ArF	N <sub>2</sub>	READY	center	E 69 V 83



# Irrigation of flap and careful wipe



# “milky” drop to delineate gutter



# 2' observation interval



# My technique

- **1 Drop of Alcaine**
- Betadine drape
- Isolate eyelids with drape
- Aspirating speculum
- Lubricate blade and rotating parts with Alcaine!!!



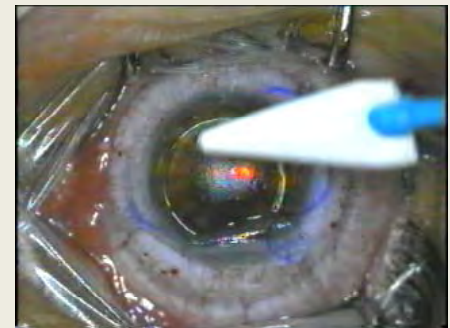
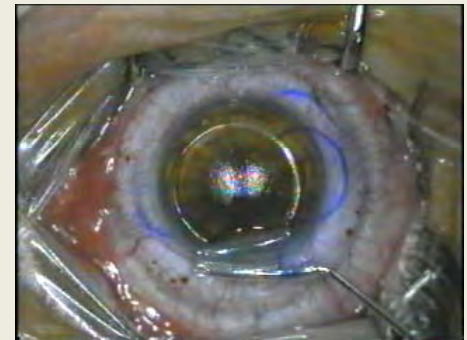
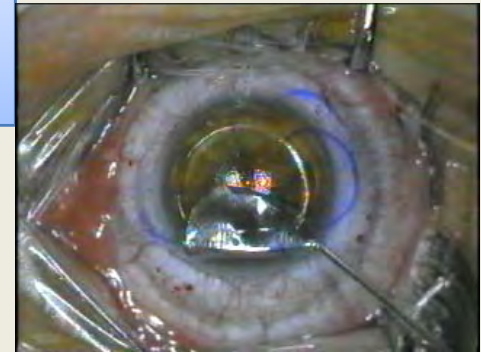
# My technique

- Careful check of lock
- Alcaine during MK assembly on eye
- Technician observes tubing
- Avoid pt squeeze



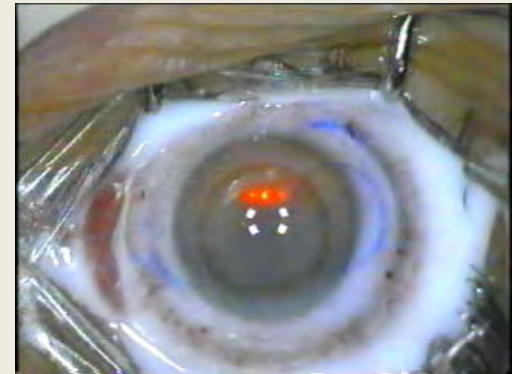
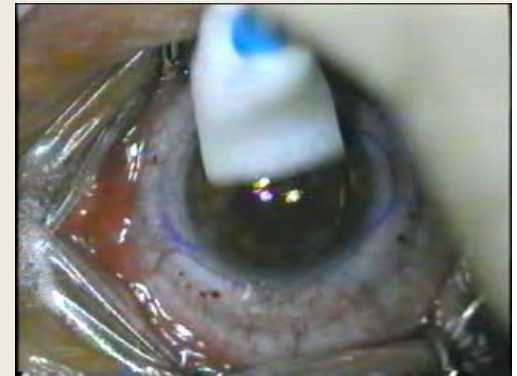
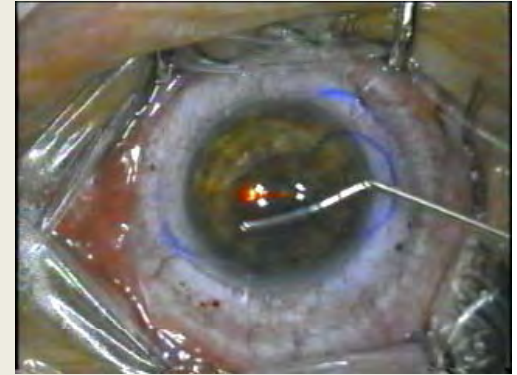
# My technique

- “Taco” flap to minimize Dehydration
- Even bed hydration very important



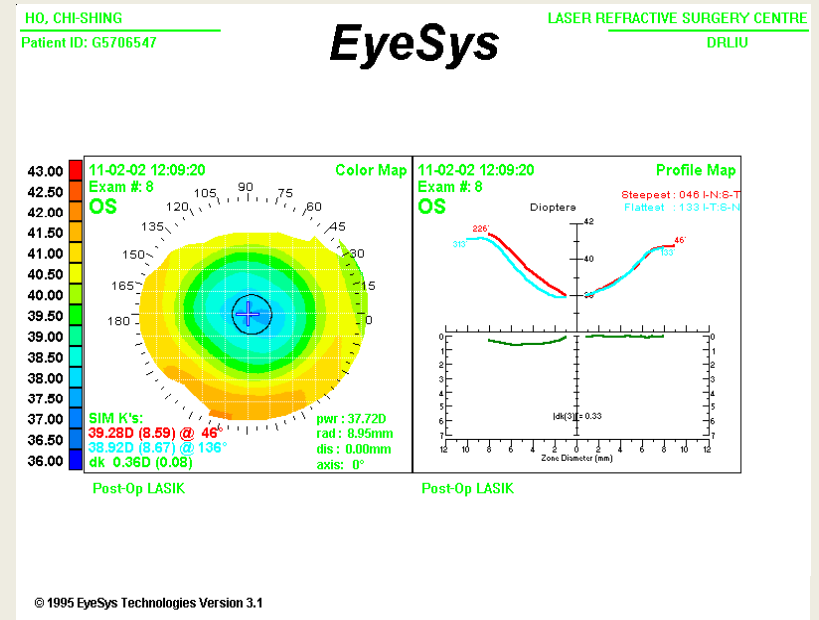
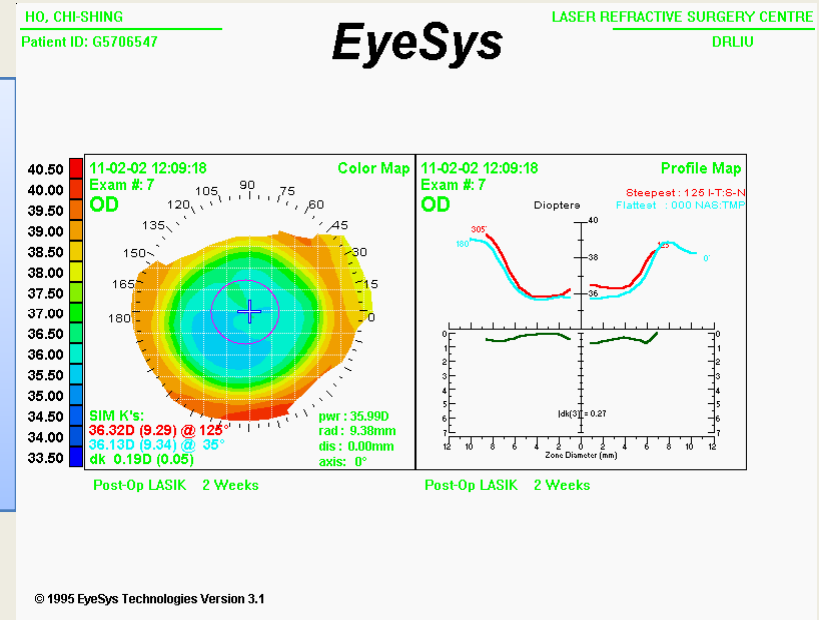
# My technique

- Irrigation very important
- “Squeeze” out excess fluid and Striae with moist Weck-cell
- “Milky” steroid can help delineate gutter and flap striae



# -7D myopia corrected in same pt

- One eye (top) with the Allegretto-Wave
- The other eye (bottom) with the Technolas 217c
- Larger ablation with the Allegretto is a result of better approach to prolate cornea



Comparison of topography-guided (TGL) to standard LASIK (SL) for hyperopia. How important is adjustment for angle kappa?  
ESCRS 07



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# Hyperopia-standard treatment

## Kanellopoulos-JRS 2006

Initial topography guided Hyperopic and Hyperopic Astigmatism LASIK  
Experience with the WaveLight ALLEGRETTO WAVE  
excimer laser in 120 Consecutive Eyes  
ARVO 2006-JRS 2006

### LASIK for Hyperopia With the WaveLight Excimer Laser

A. John Kanellopoulos, MD, Joseph Navarro, MD, Lawrence J. Booy, MD

#### ABSTRACT

**PURPOSE:** To evaluate the safety and efficacy of the ALLEGRETTO WAVE excimer laser system (WaveLight Laser Technology, Inc., Erlangen, Germany) in LASIK for hyperopia and hyperopic astigmatism.

**METHODS:** One hundred twenty consecutive ALLEGRETTO WAVE LASIK eyes without astigmatism treated with the ALLEGRETTO WAVE excimer laser were prospectively evaluated up to 12 months postoperatively. Patients were selected into three groups according to their refractive errors at a spherical equivalent (SE) of +0.00 to +0.25 D, +0.25 to +0.50 D, and +0.50 to +1.00 D of SE. A minimum hyperopic residual was +0.25 D. Preoperative corneal topography at  $\pm 1.00$  D of SE and wave topographic mean sphere  $\pm 0.25$  D or greater  $\pm 0.25$  D of SE. Flaps were created with the Moria M2 microkeratome (Moria, Antony, France). Postoperative evaluation was pre- and postoperative refractive error, corrected distance acuity, best spectacle-corrected visual acuity (BSCVA), night and glare adaptation, and contrast sensitivity.

**RESULTS:** One hundred twenty eyes (120) were evaluated for 12 months. The average preoperative hyperopic error was  $+0.49 \pm 0.19$  D of the refractive error. For the refractive error group and the high refractive error group, 74% and 71% of eyes, respectively, were within  $\pm 0.25$  D of the refractive error. No eye had  $\pm 2$  times of BSCVA. An increase in higher order aberrations was noted in 0.5% of eyes. Topographic mean sphere from 0.47 to 0.000 to 0.000 and 0.000 to 0.000 D. The average change in light scatter at all angles was noted to be 0.001 to 0.001 refractive hyperopic error.

**CONCLUSIONS:** Hyperopia treated using the WaveLight ALLEGRETTO WAVE excimer laser appears to be safe and effective in the correction of low, moderate, and high hyperopia and hyperopic astigmatism. (J Refract Surg. 2006;22:20-26)

**F**ixing eye lasers have enhanced the safety and efficacy of hyperopia and astigmatic corrections with LASIK over the past several years.<sup>1-6</sup> In this study, we evaluated the safety and efficacy of the ALLEGRETTO WAVE excimer laser system (WaveLight Laser Technology AG, Erlangen, Germany) and the Moria M2 microkeratome (Moria, Antony, France) in our LASIK clinical practice for hyperopia with or without astigmatism. Subsequent to our study, the WaveLight technology gained Food and Drug Administration (FDA) approval in the United States for use in hyperopic and hyperopic astigmatism.<sup>7</sup>

#### MATERIALS AND METHODS

One hundred twenty consecutive eyes of 60 patients underwent LASIK for hyperopia, hyperopic astigmatism. The refractive error was hyperopia up to  $+6.00$  diopters (D) and astigmatism up to 0.50 D, with a maximum spherical equivalent refraction of  $+6.00$  D. Patients aged  $>18$  years and those with a history of corneal surgery, hereditary eye disease, ocular dystrophy, current or past keratoconus, severe dry eye, and collagen vascular disease were excluded from this study.

Preoperative evaluation included uncorrected visual acuity (UCVA), refraction (manifest and cycloplegic), best spectacle-corrected visual acuity (BSCVA), slit-lamp examination, fundus evaluation, corneal topography with the Orbscan T (Bausch & Lomb, Rochester, NY) and the ALLEGRETTO WAVE

From the Department of Ophthalmology, Morristown Eye, Ear, and Throat Associates, Inc., East of Morristown, Tennessee, and the Department of Ophthalmology, New York University Medical School, New York, NY (Kanellopoulos, Navarro, Booy) and the Department of Ophthalmology, Mount Sinai Hospital, New York, NY (Kanellopoulos, Booy).

Presented in part as a poster at the Symposium for Research in Vision and Ophthalmology Annual Meeting, April 8-12, 2005, Orlando, FL.

Presented in part as a poster for the European Society of Cornea and Refractive Surgery Annual Meeting, September 8-10, 2005, Munich, Germany.

The authors have no financial interest in the materials presented herein.

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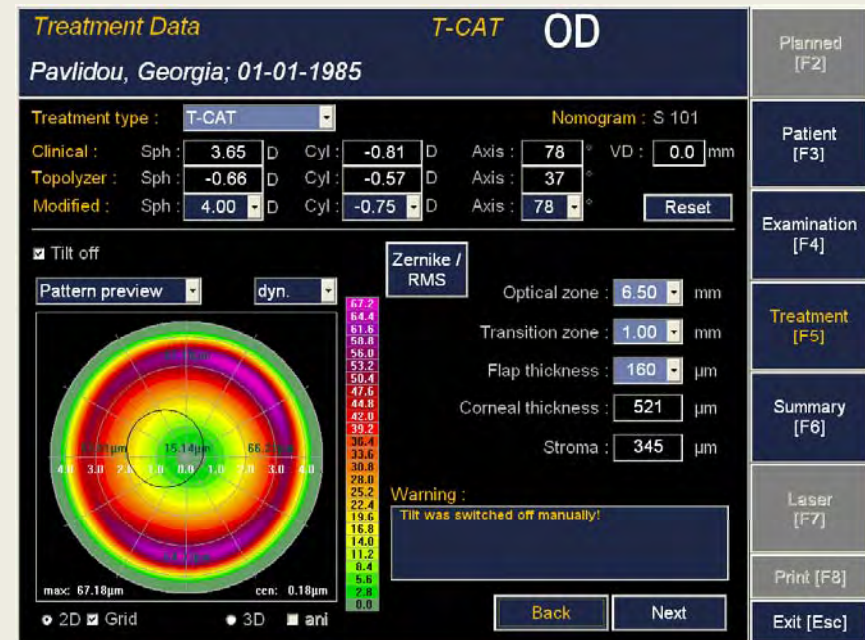
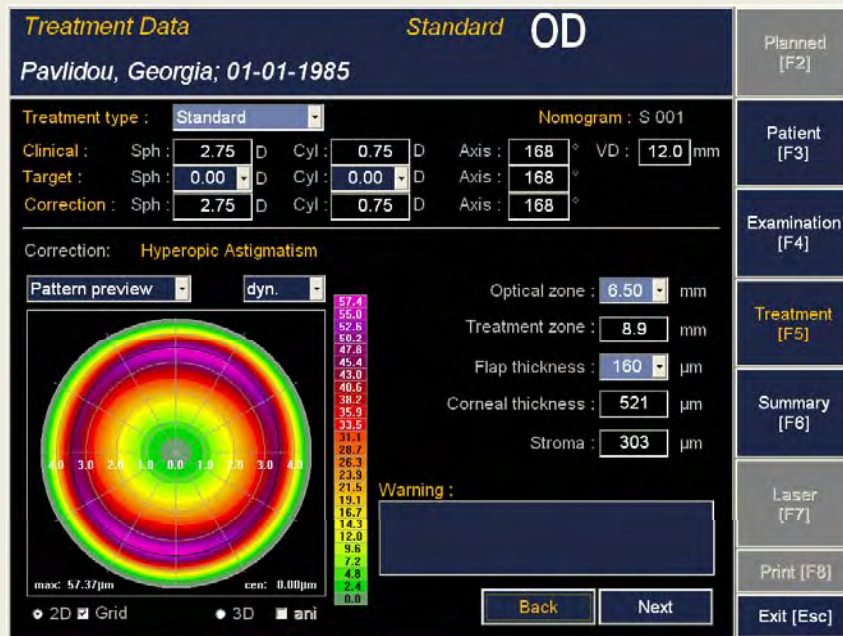
Received June 4, 2005

Accepted March 21, 2006

# Is Angle kappa significant in hyperopes?

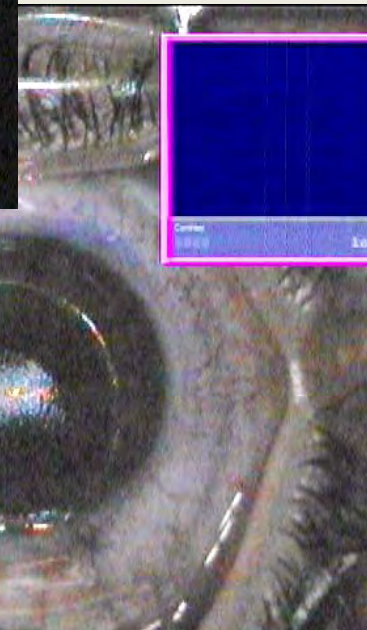
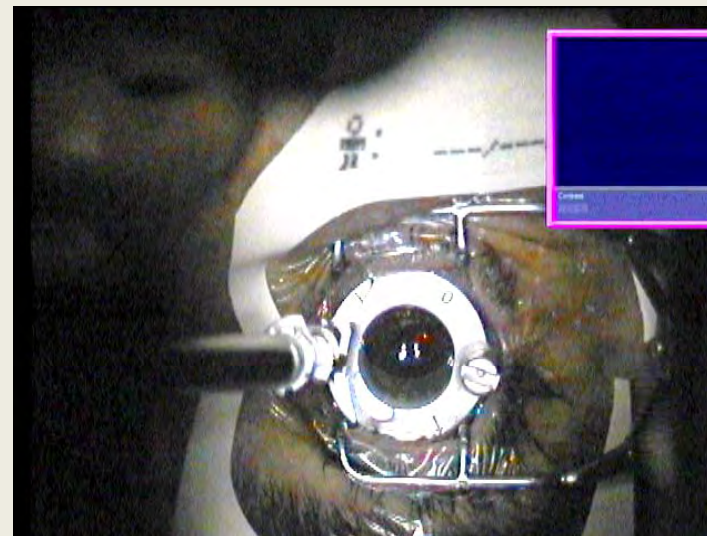
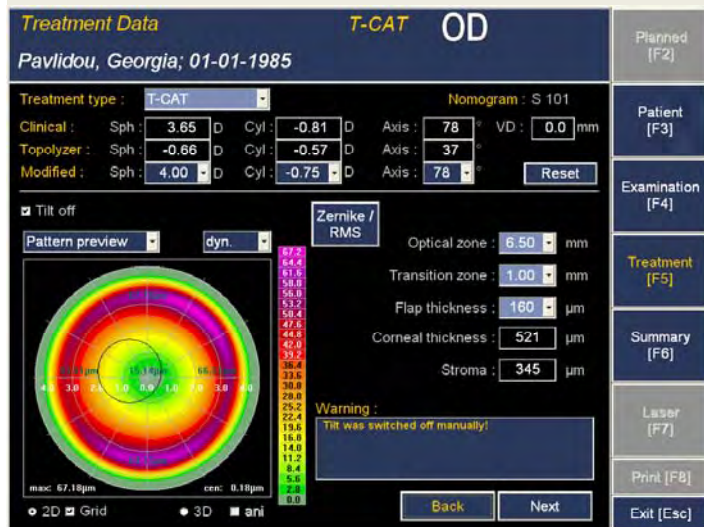
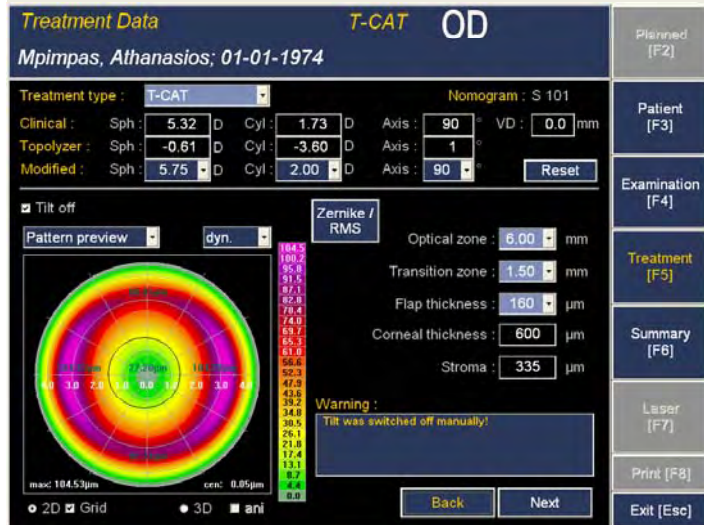
- 2007 J Refract Surg-in
- **Measurement of angle kappa with synoptophore and Orbscan II in a normal population**
- Hikmet Basmak, MD<sup>1</sup>; Afsun Sahin, MD<sup>2</sup>; Nilgun Yildirim, MD<sup>3</sup>; Thanos D. Papakostas, MD<sup>4,5</sup>; and A. John Kanellopoulos, MD<sup>4,5</sup>
- There is a significant correlation between positive refractive errors and large positive angle kappa values. Refractive surgeons must take into account angle kappa especially in hyperopic patients in order to avoid complications related to decent ration of ablation zone.

# Angle kappa adjustment topo-link

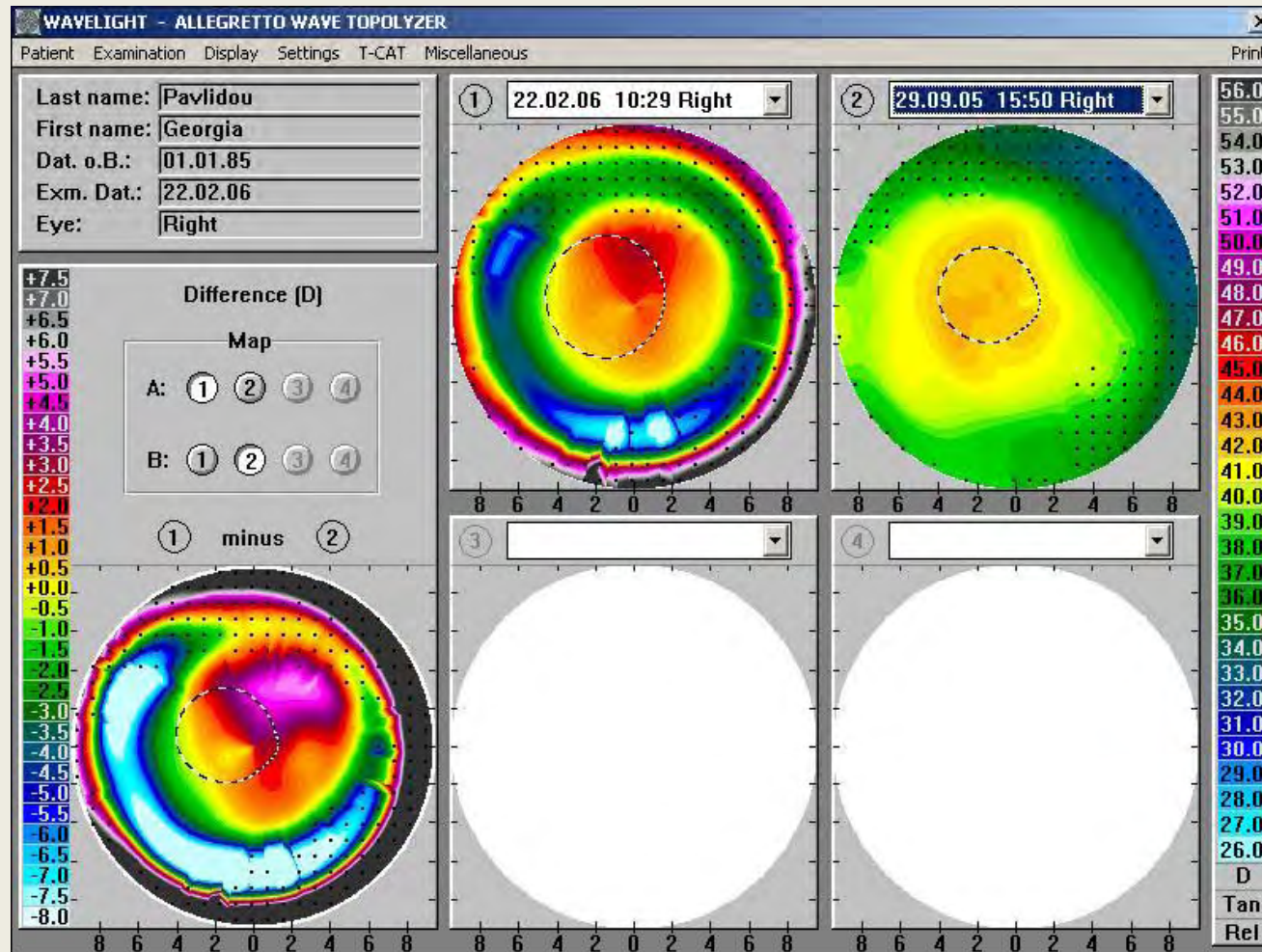


These figures depict the same planned excimer profile for the correction of hyperopic astigmatism on the left: centered on the pupillary center and on the right :adjusted by topography to take into consideration and adjust for angle kappa

# LASIK flap needs to be de-centered as well to accommodate Challenging for surgeon, Intralase?



# Treatment axis is centered on the visual axis and not pupil center





WAVELIGHT - ALLEGRO OCULYZER

Name: Diaggelakis, Christos ID: Date of Birth: 01.01.1958

Exam A: 05.04.2007 02:29:04 Right (25)		Exam B: 05.04.2007 02:28:01 Left (25)	
<p><b>Cornea Front</b></p> <p>Rh: 7.43mm K1: 45.4D Rv: 7.41mm K2: 45.6D Rm: 7.42mm Km: 45.5D</p> <p>QS: Blink! Axis: 168.0° Astig: -0.2D ecc: (7mm) 0.92 Rper: 8.17mm Rmin: 7.33mm</p>	<p><b>Sagittal Curvature (Front)</b></p>	<p><b>Cornea Front</b></p> <p>Rh: 7.03mm K1: 48.0D Rv: 6.97mm K2: 48.4D Rm: 7.00mm Km: 48.2D</p> <p>QS: OK Axis: 40.7° Astig: -0.4D ecc: (7mm) 1.29 Rper: 8.42mm Rmin: 6.60mm</p>	<p><b>Sagittal Curvature (Front)</b></p>
<p><b>Cornea Back</b></p> <p>Rh: 6.55mm K1: -6.1D Rv: 6.23mm K2: -6.4D Rm: 6.39mm Km: -6.3D</p> <p>QS: Blink! Axis: 10.0° Astig: +0.3D ecc: (7mm) 0.61 Rper: 6.81mm Rmin: 6.16mm</p>	<p><b>Elevation (Back) BFS=6.61 Float</b></p>	<p><b>Cornea Back</b></p> <p>Rh: 6.55mm K1: -6.1D Rv: 6.33mm K2: -6.3D Rm: 6.44mm Km: -6.2D</p> <p>QS: OK Axis: 178.3° Astig: +0.2D ecc: (7mm) 0.49 Rper: 6.75mm Rmin: 6.14mm</p>	<p><b>Elevation (Back) BFS=6.49 Float</b></p>
<p><b>Pachy:</b> x[mm] y[mm]</p> <p>Pupil Center: 544µm + -0.22 +0.20 Pachy Apex: 545µm 0.00 0.00 Thinnest Locat: 536µm -1.08 -0.58</p> <p>Cornea Volume: 57.6mm² KPD: +1.0D Chamb. Volume: 140mm² Angle: 31.3° ACD (Int.): 2.71mm Pupil D: 2.81mm IOP(Sum): ±0.0 Lens T:</p>		<p><b>Pachy:</b> x[mm] y[mm]</p> <p>Pupil Center: 535µm + +0.04 -0.11 Pachy Apex: 537µm 0.00 0.00 Thinnest Locat: 518µm +0.72 -1.37</p> <p>Cornea Volume: 56.6mm² KPD: +0.4D Chamb. Volume: 147mm² Angle: 27.5° ACD (Int.): 2.79mm Pupil D: 2.88mm IOP(Sum): +0.6 Lens T:</p>	

# Conclusions

- TGL and SL appear to be safe and effective for hyperopia. TGL appears to be superior in regard to regression, residual astigmatism, CS and EAD
- This platform achieves superior visual axis centration with a smaller re-treatment rate compared to our previously published series.
- It reduces the chance of a surgeon-related de-centration error.
- Oculyzer-link maybe faster and more-accurate

# Methods

- 1000 consecutive cases in our refractive surgery center in Athens, Greece are screened for the following elements:
  - 1-Dry and dilated (1% mydriacyl) refraction, dry and
  - 2-dilated auto-refraction (Nikon speedy-K),
  - 3-pentacam topography (Wavelight oculyzer),

## Methods (2)

4-wavefront analysis (Wavefront Tsernning analyzer),

5-pupilometry (Procyon),

6-contrast sensitivity (Vector Vision)

7-and a complete slit lamp biomicroscopy including dilated fundus exam.

## Methods (3)

For patients over 40 a trial with contact lenses is performed reflecting several monovision scenario to accomplish patient eye dominance and preference.

The results were compared with a matched group of 1000 cases treated previously with the M2 microkeratome and the same excimer laser

# Treatment form

## LaserVision.gr

PATIENT NAME	DOB
--------------	-----

PUPIL SIZE	<input type="text"/>	DOMINANT EYE	<input type="text"/>	PACHYMETRY	<input type="text"/>	U/S	<input type="text"/>
PENTACAM	<input type="text"/>	TOPO	<input type="text"/>	LCS	<input type="text"/>	IOL	<input type="text"/>
ECC	<input type="text"/>	WF	<input type="text"/>				

RECOMMENDED SURGERY: LASIK  PRK  EPI  PTK  AK  ENHANCEMENT

CONTACT LENS USE: ..... D/C

<b>K</b>	Steep Axis			<b>K</b>	Steep Axis		
	Sphere	Cylinder	Axis		Sphere	Cylinder	Axis
AR	<input type="text"/>	<input type="text"/>	<input type="text"/>	W (VA)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Wearing	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manifest	<input type="text"/>	<input type="text"/>	<input type="text"/>	BCVA	<input type="text"/>	<input type="text"/>	<input type="text"/>
Cyclo	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
AR/Cycl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
WF	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

## Procedure

DATE.../.../... Std  A-cat  T-cat  F-cat

INTRALASE	head 90 <input type="checkbox"/> 110 <input type="checkbox"/> 130 <input type="checkbox"/>
<input type="text"/>	blade <input type="text"/>

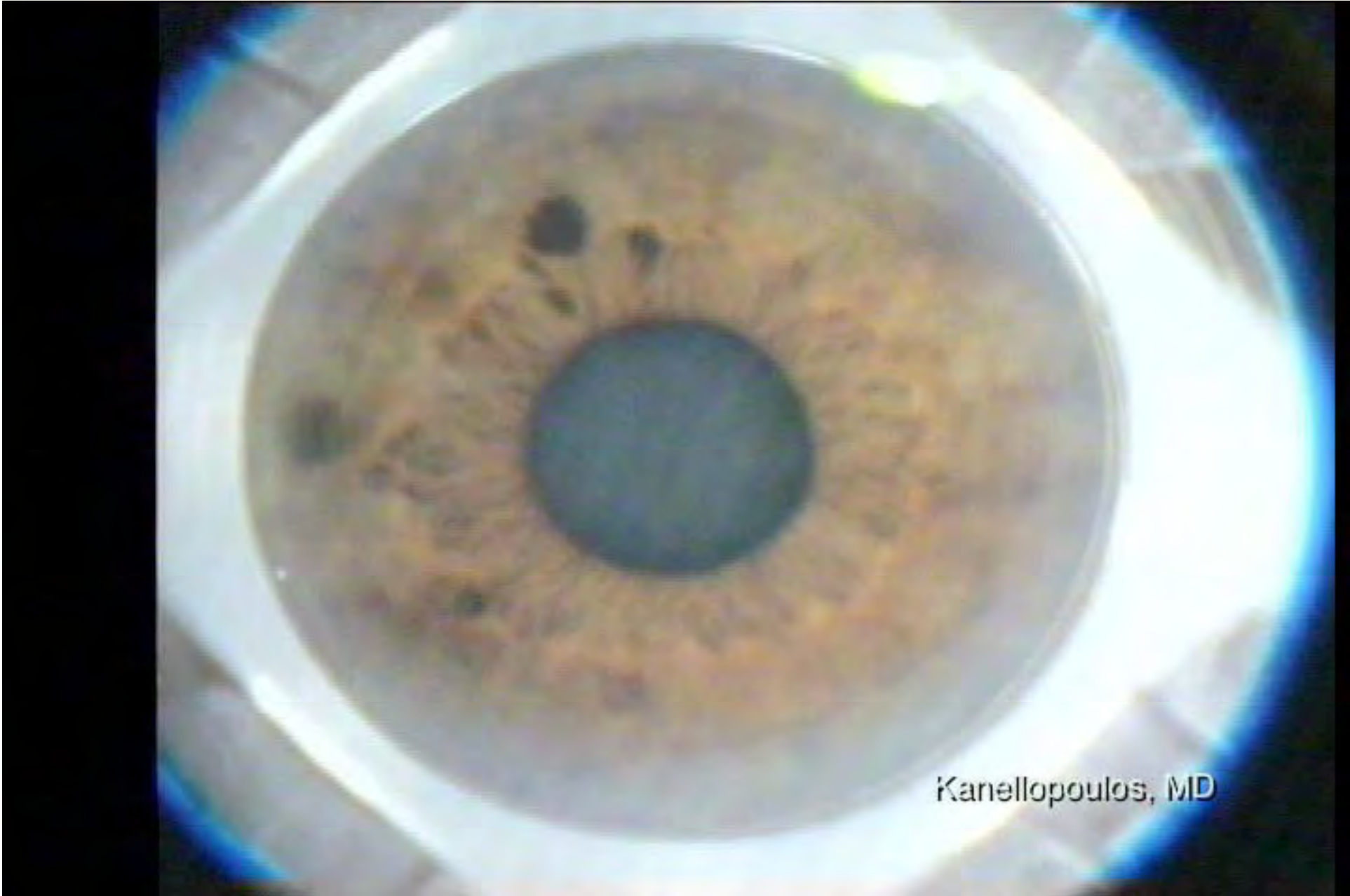
Intra-op pach  pre  post  Q-value

Sphere	Cylinder	Axis
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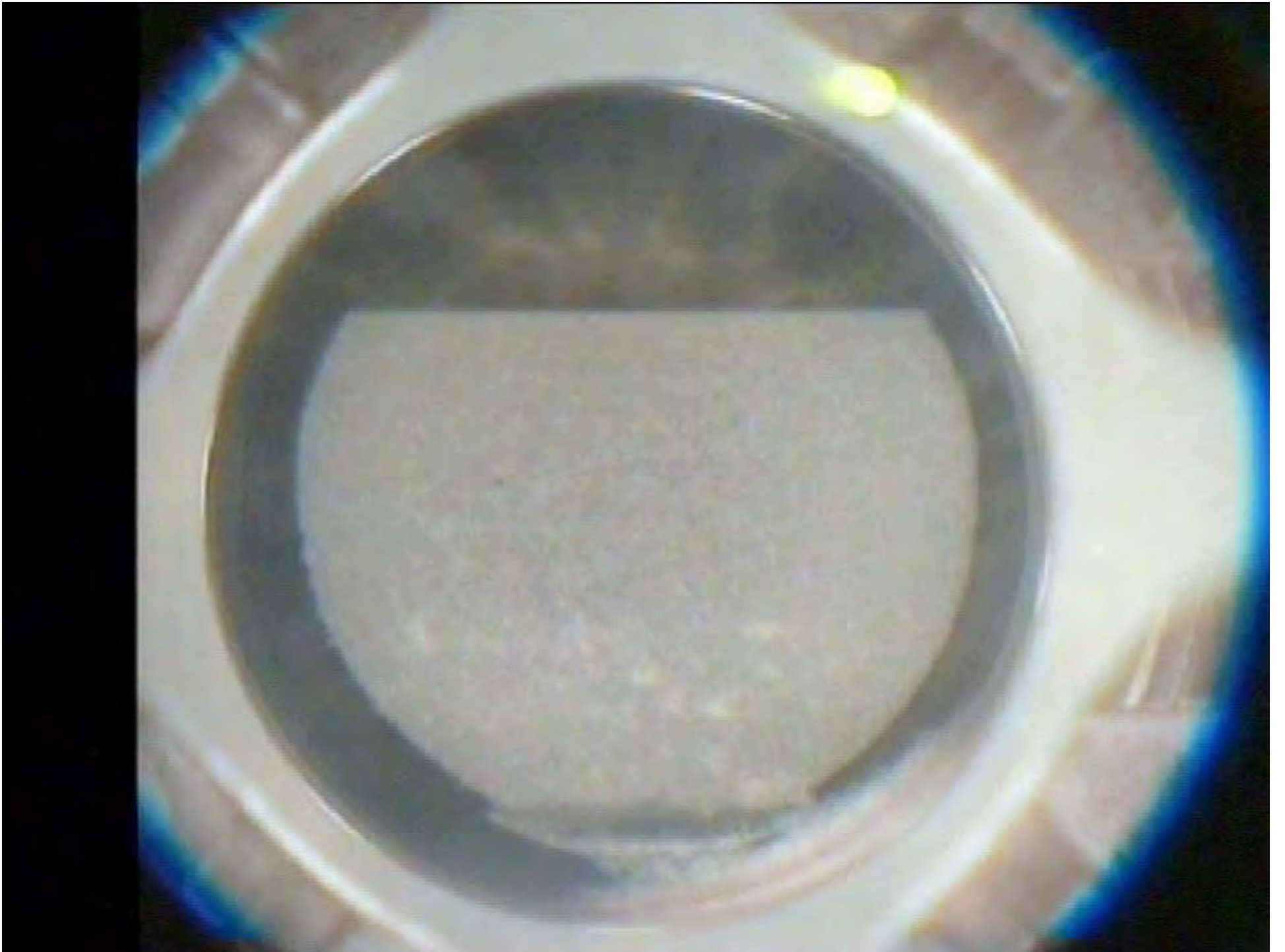
Intra-op pach  pre  post  Q-value

Sphere	Cylinder	Axis
<input type="text"/>	<input type="text"/>	<input type="text"/>

Total.....	Total.....
Nomo	Nomo
Goal	Goal



Kanellopoulos, MD



# 1000 i-LASIK cases

## Lasevision.gr Institute, Athens

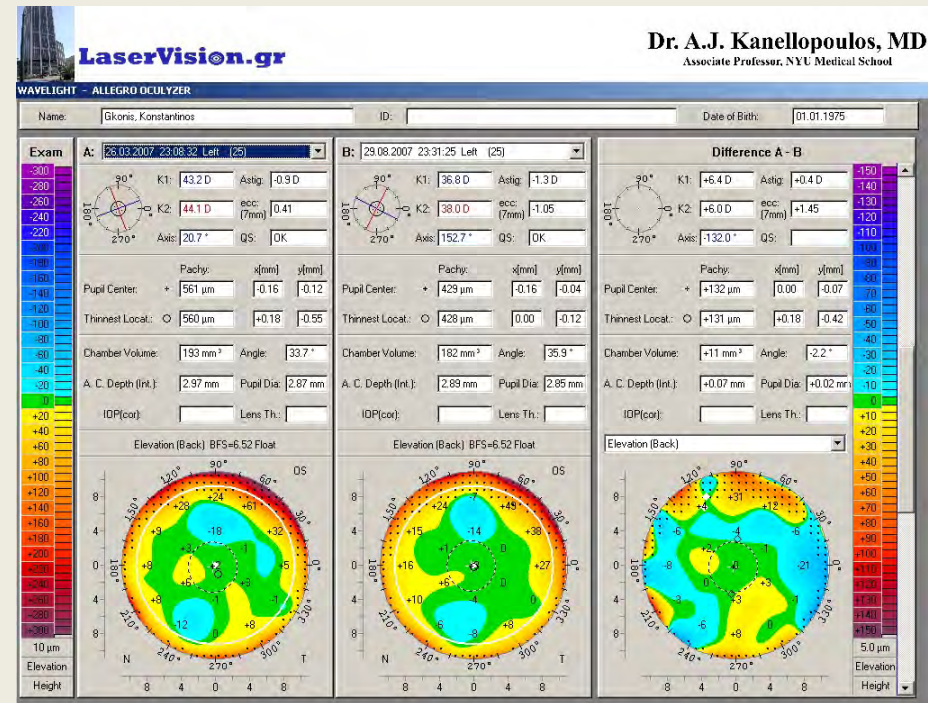
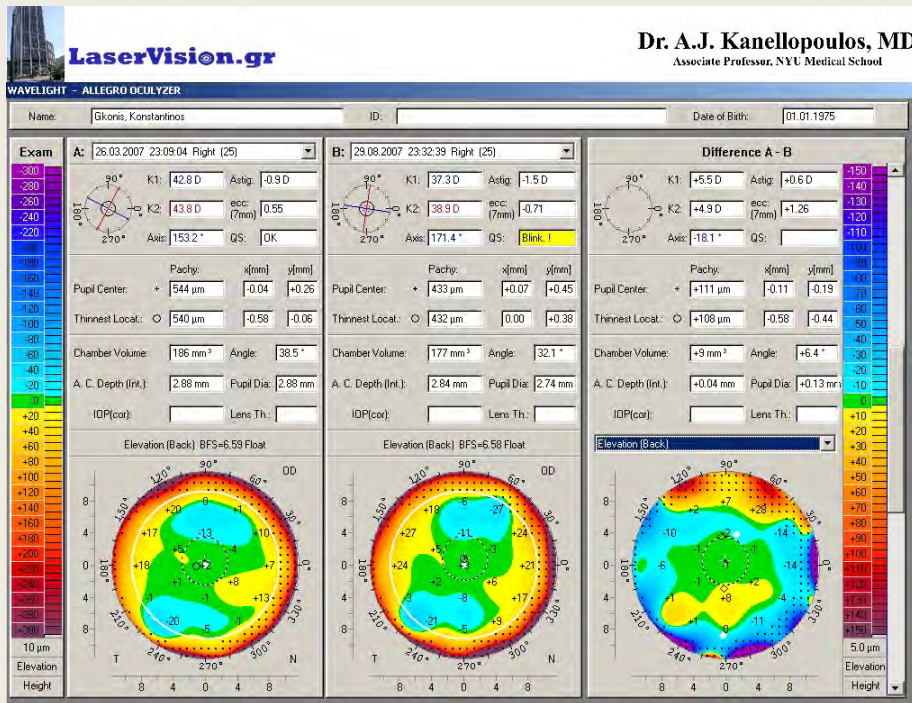
Started on October 2006

- 780 myopic, 220 hyperopic
- Retrospective comparison with 1000 consecutive M2 cases
- M2 flaps aim 100 to 110 microns myopia
  - Large cut 130SU in hyperopia
  - Femto: 110 microns for myopia, 130 hyperopia

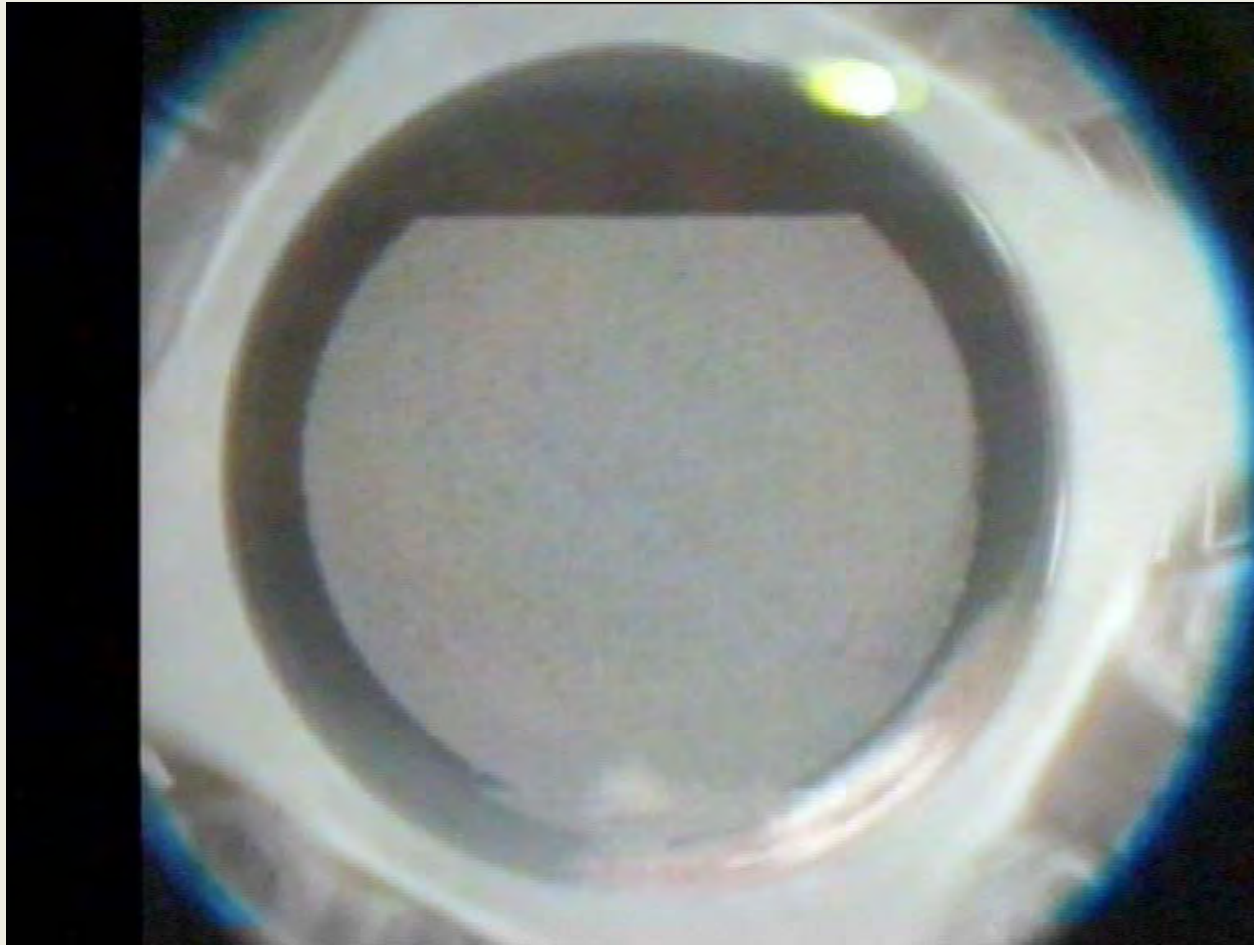
# Intralase FS 60 Vs M2 1000 cases

incomplete flaps	3 2-Completed 1-PRK	6- all PRK
Flap striae-suturing	0	6
Epi ingrowth	0	22
flap myopia	105 +/- 5 8.1mm	100 +/-25 8.9mm
flap hyperopia	135 +/- 7 9.4mm	127 +/- 35 8.9 mm
buttonhole	1	3
Epi-abrasion (ABM dyst)	2	65
DLK	0 (maybe 1 late post abrasion)	0
Light HSS	0	0

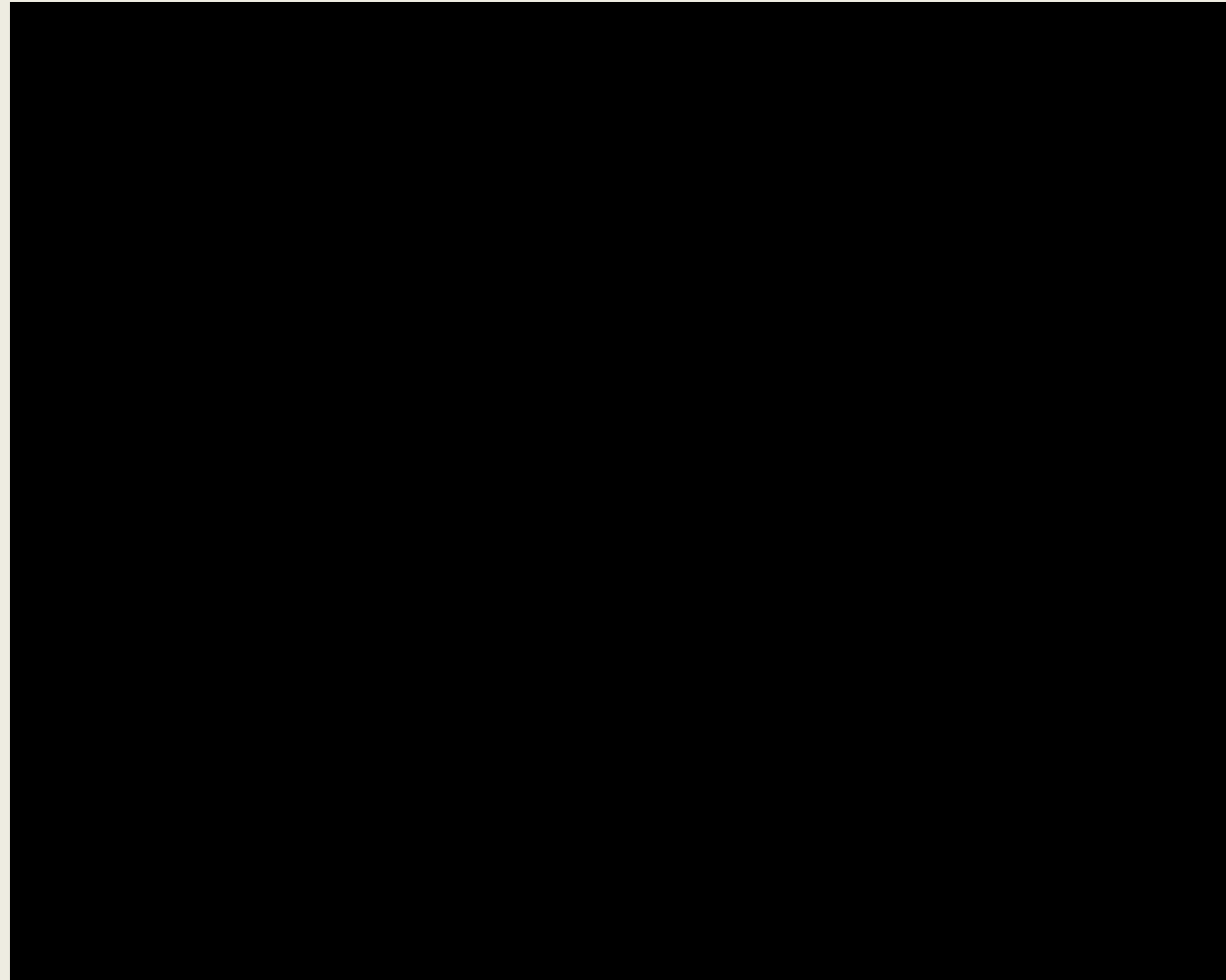
# Posterior cornea surface change I-LASIK and M2 LASIK



# Prophylactic CCL



# Flap suturing



# Conclusions

- Thorough preoperative screening and disposable instrumentation in Femtosecond and excimer refractive surgery reduces the risks for DLK, and flap complications such as striae and epithelial ingrowth and results in safer, more effective visual rehabilitation

# Our current protocol

- Myopes: 70% standard prolate-optimized treatment
- F-CAT with the Eye-Q, 400Hz, Q-value adjustment  
RMSH>0.4 Wavefront-guided  
High cylinder: topo-guided
- Hyperopes: 100% topo-guided with q-value adjustment
- Enhancements: 100% custom

Thank you

[www.brilliantvision.com](http://www.brilliantvision.com)