LASIK:
Basic steps for great results
ESCRS 2003

A. John Kanellopoulos, M.D.

Associate Professor of Ophthalmology NYU Medical School, NY

Director: LaserVision.gr Eye Institute, Athens, Greece

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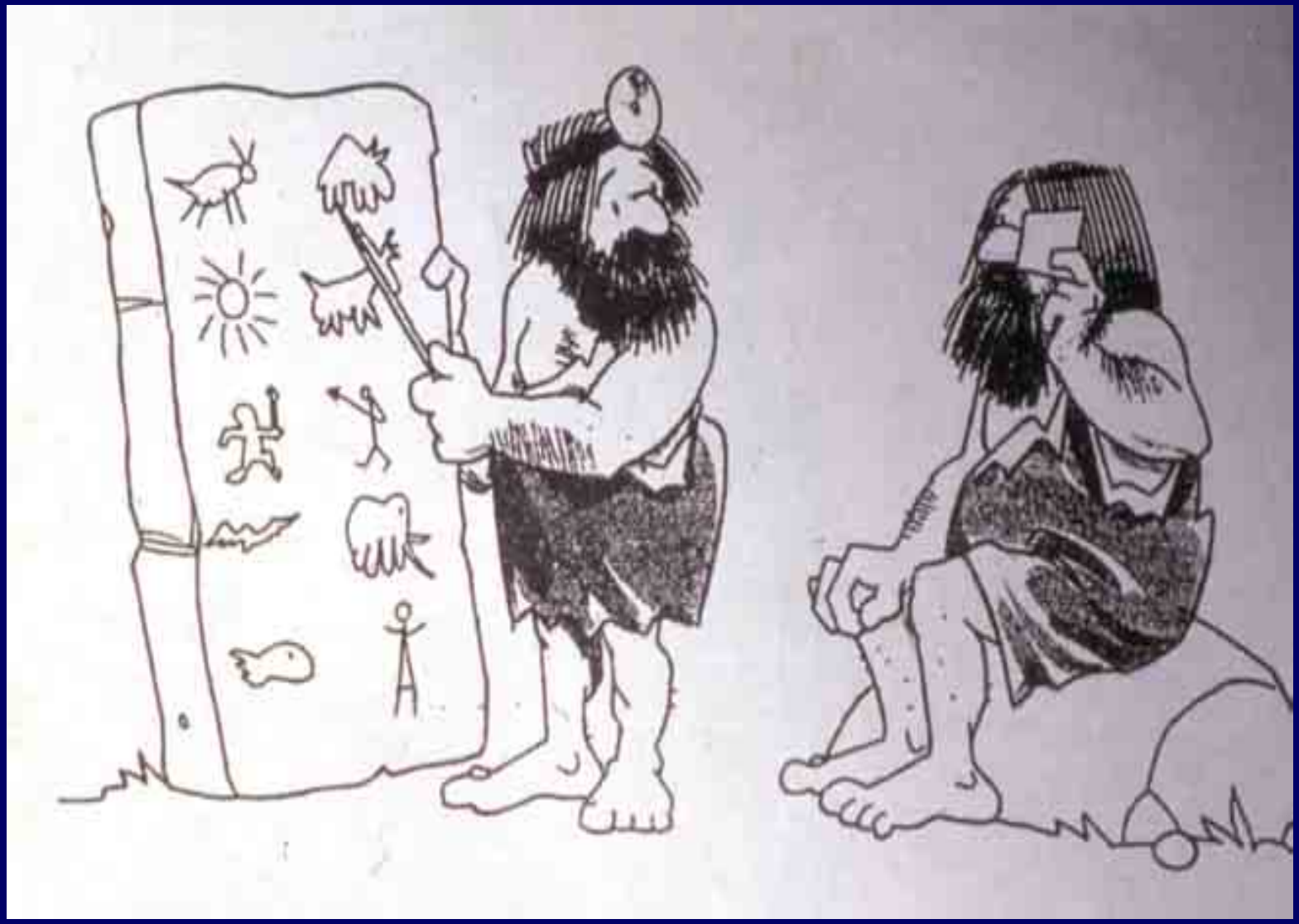
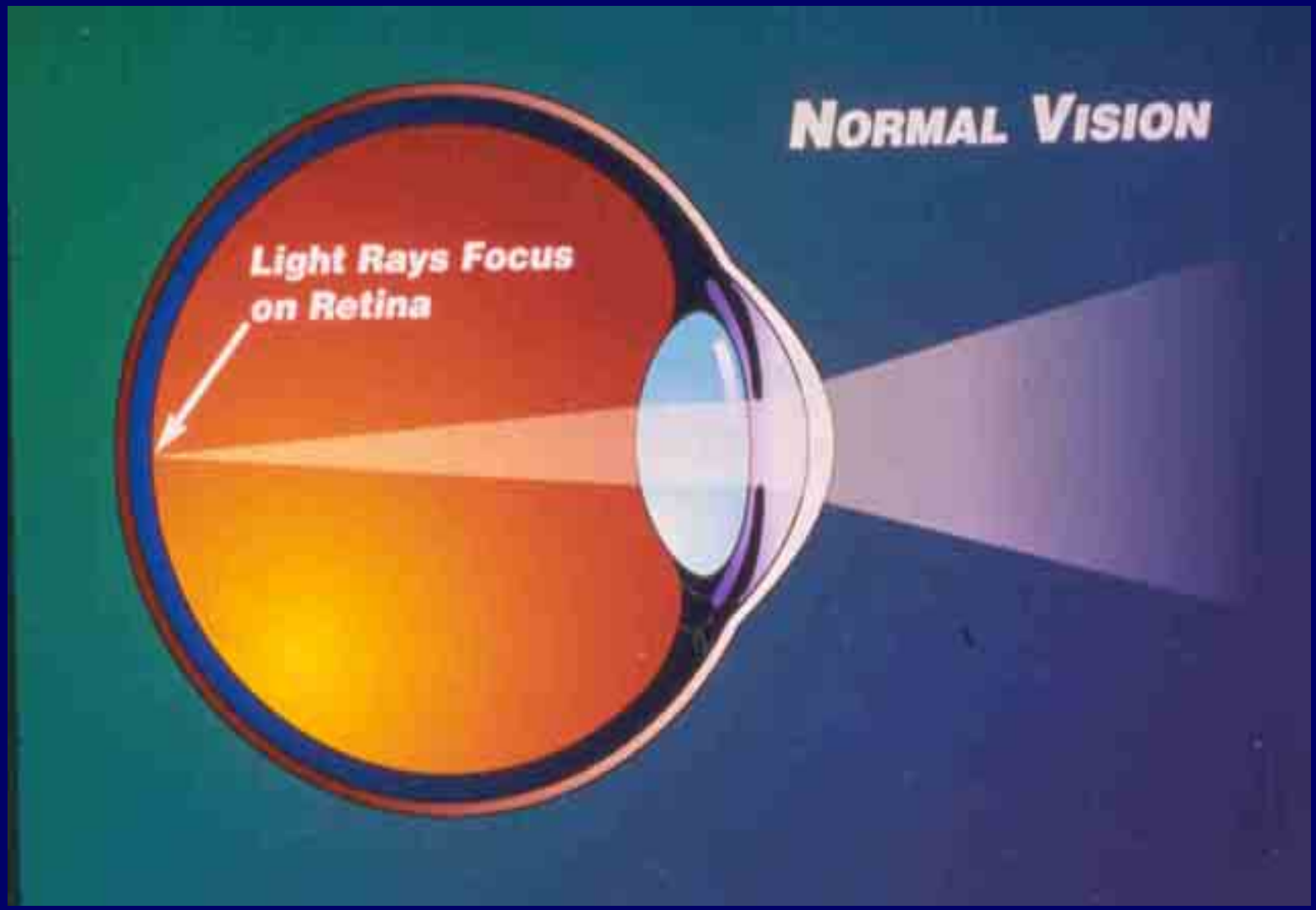
My Background

- 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 11000 LASIK procedures

Experience-Excimer Lasers

- Summit- Apex plus
- VISX-S2 ans S3
- Lasersight
- Nidek
- Alcon-Ladarvision
- B&L: Technolas 217
- Wavelight: Allegretto-Wave





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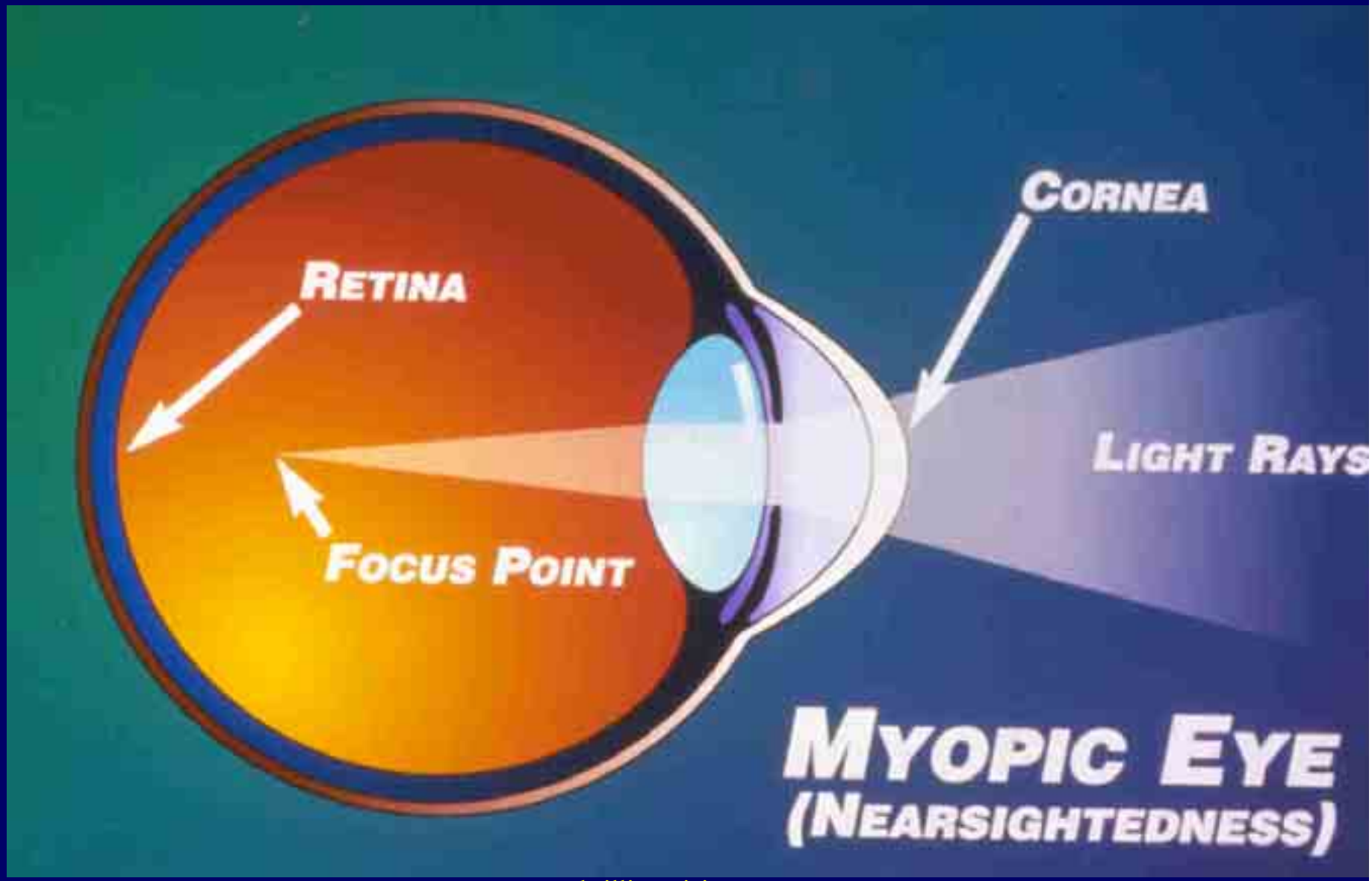

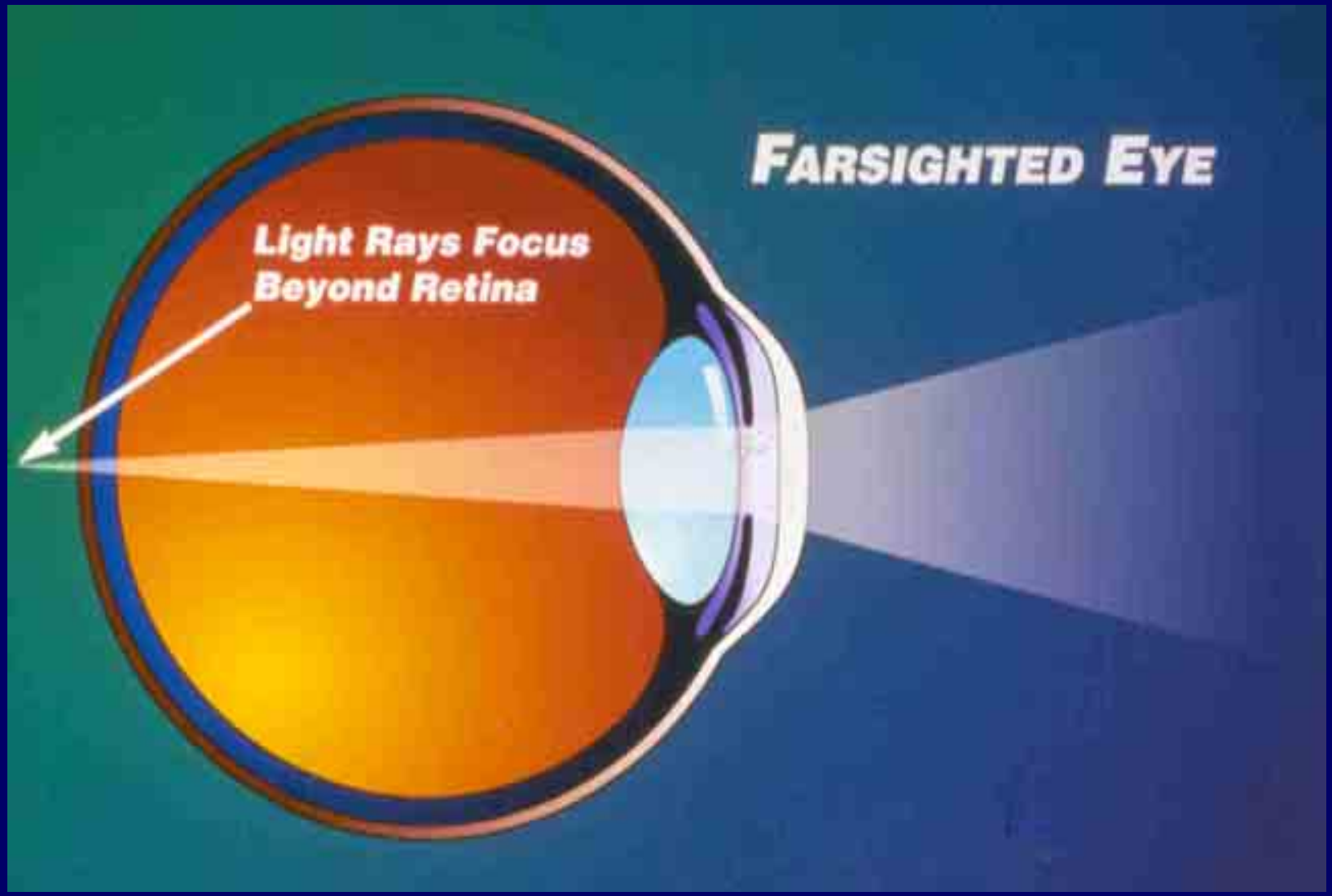

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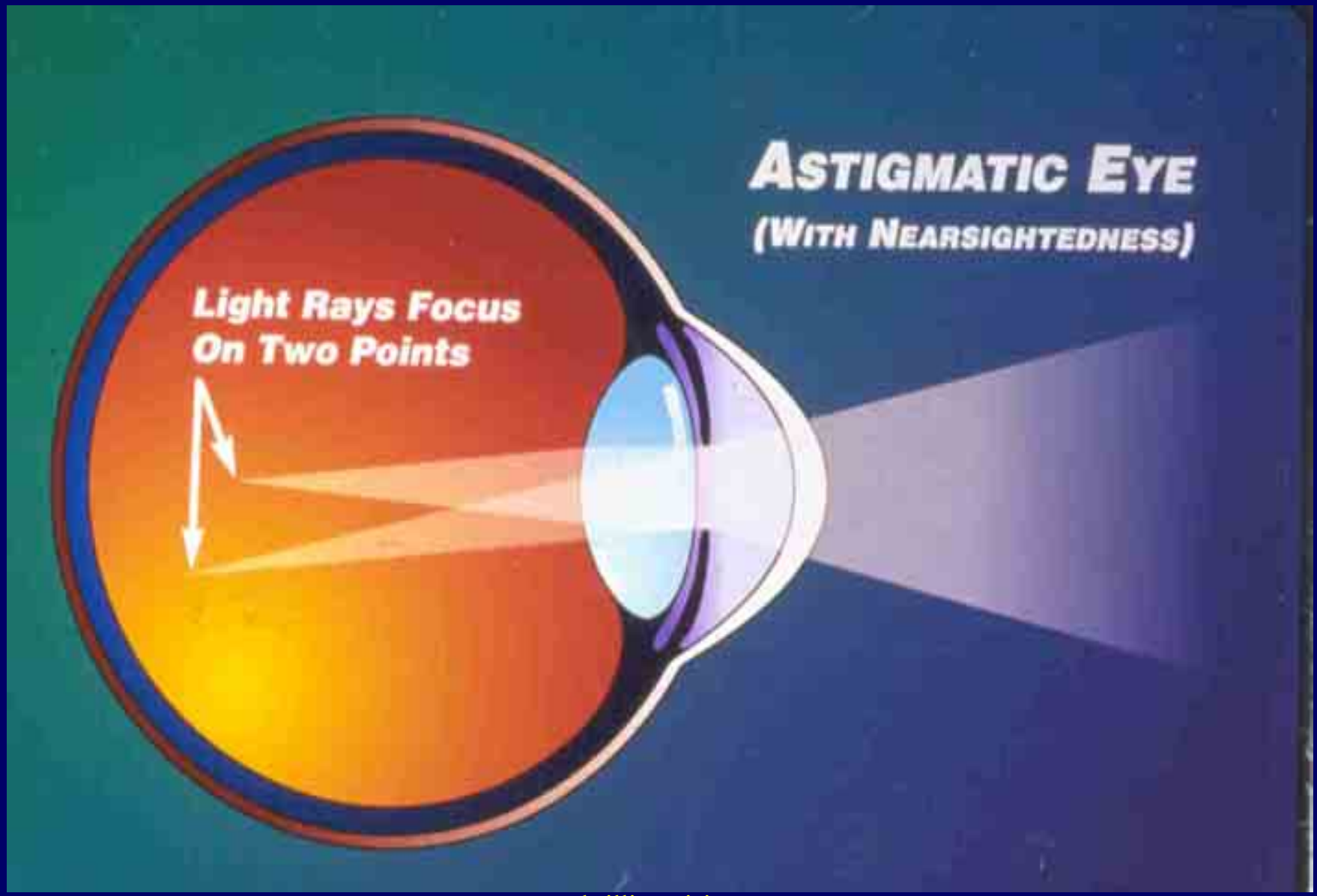
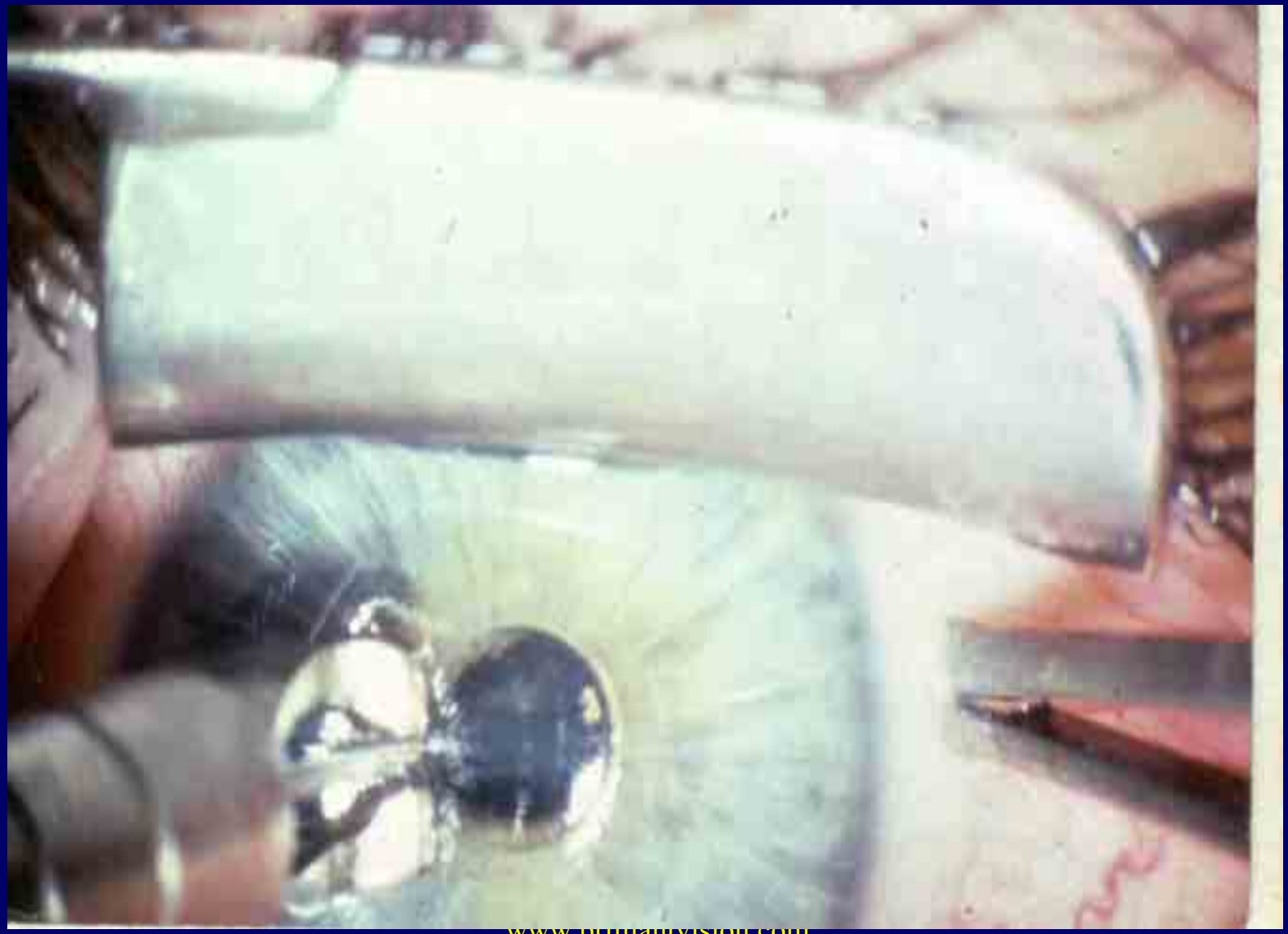
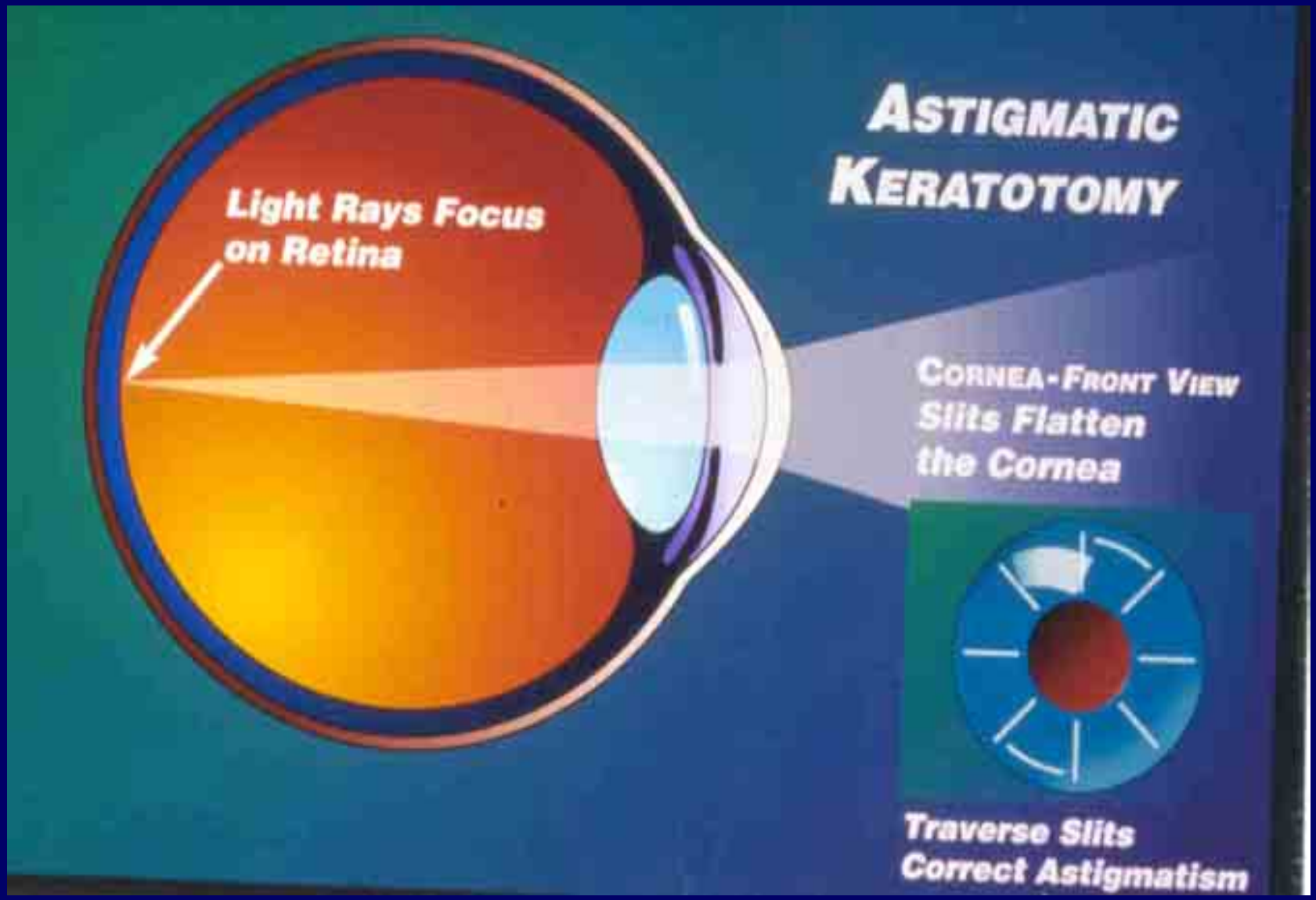
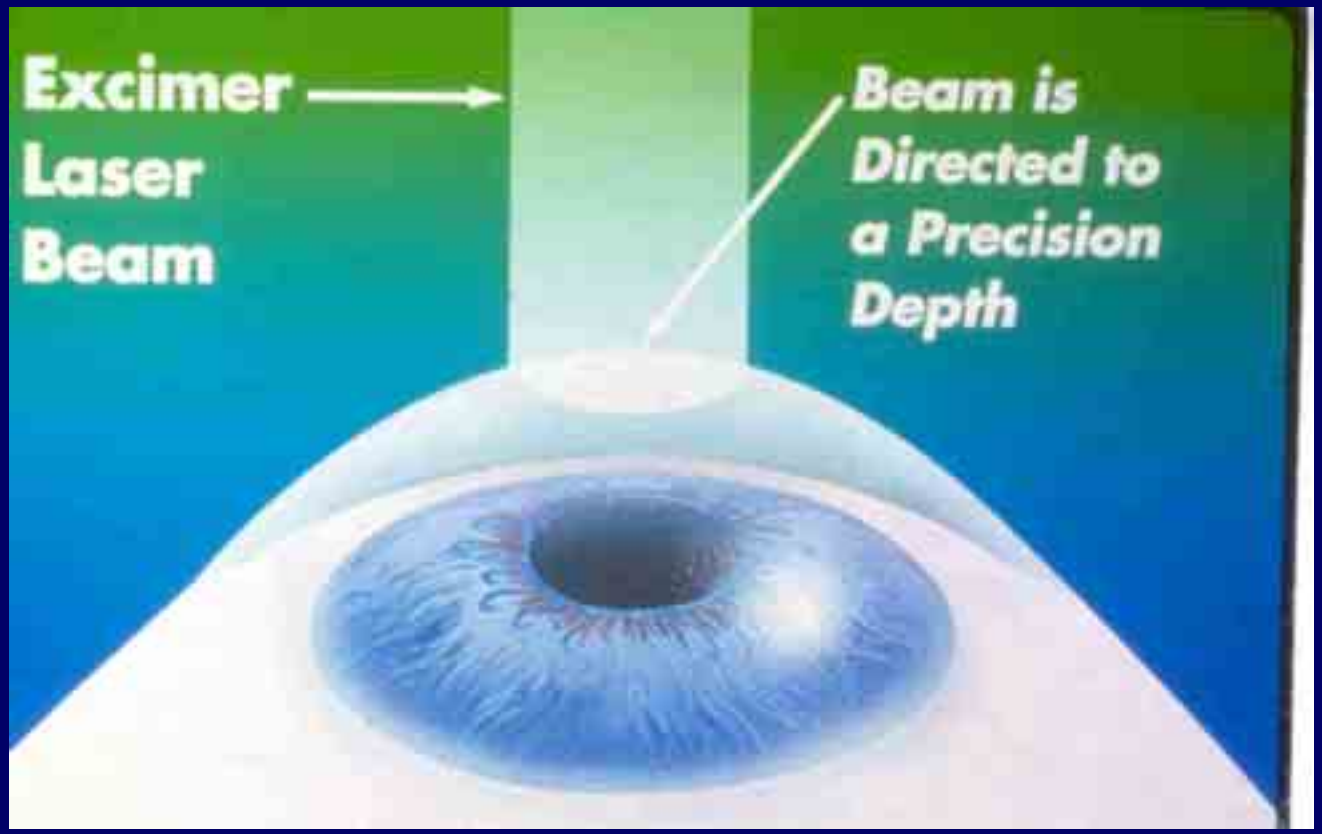

ASTIGMATIC EYE
(WITH NEARSIGHTEDNESS)
Light Rays Focus
On Two Points




ASTIGMATIC
KERATOTOMY
Light Rays Focus
on Retina
CORNEA - FRONT VIEW
Slits Flatten
the Cornea
Traverse Slits
Correct Astigmatism


Corneal Flap is
Hinged Back



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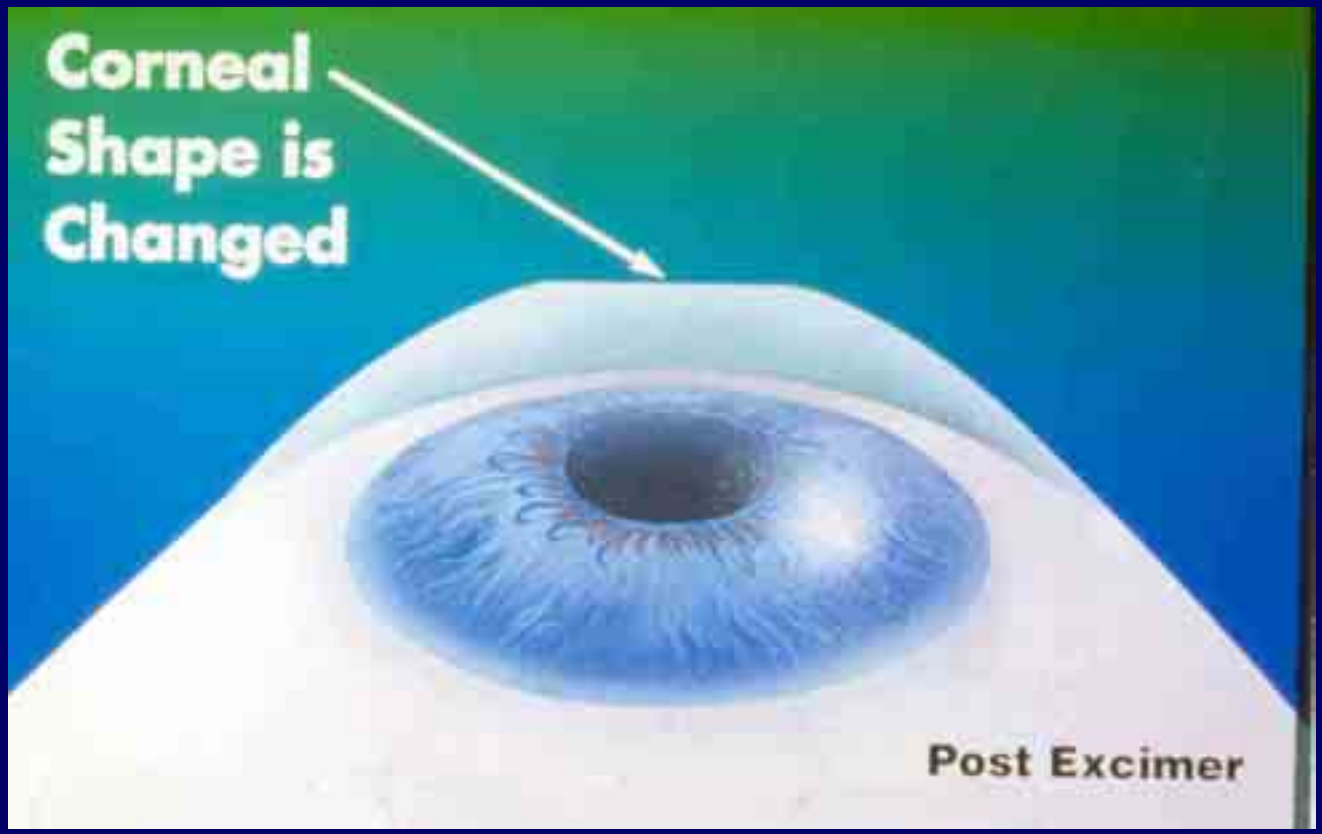

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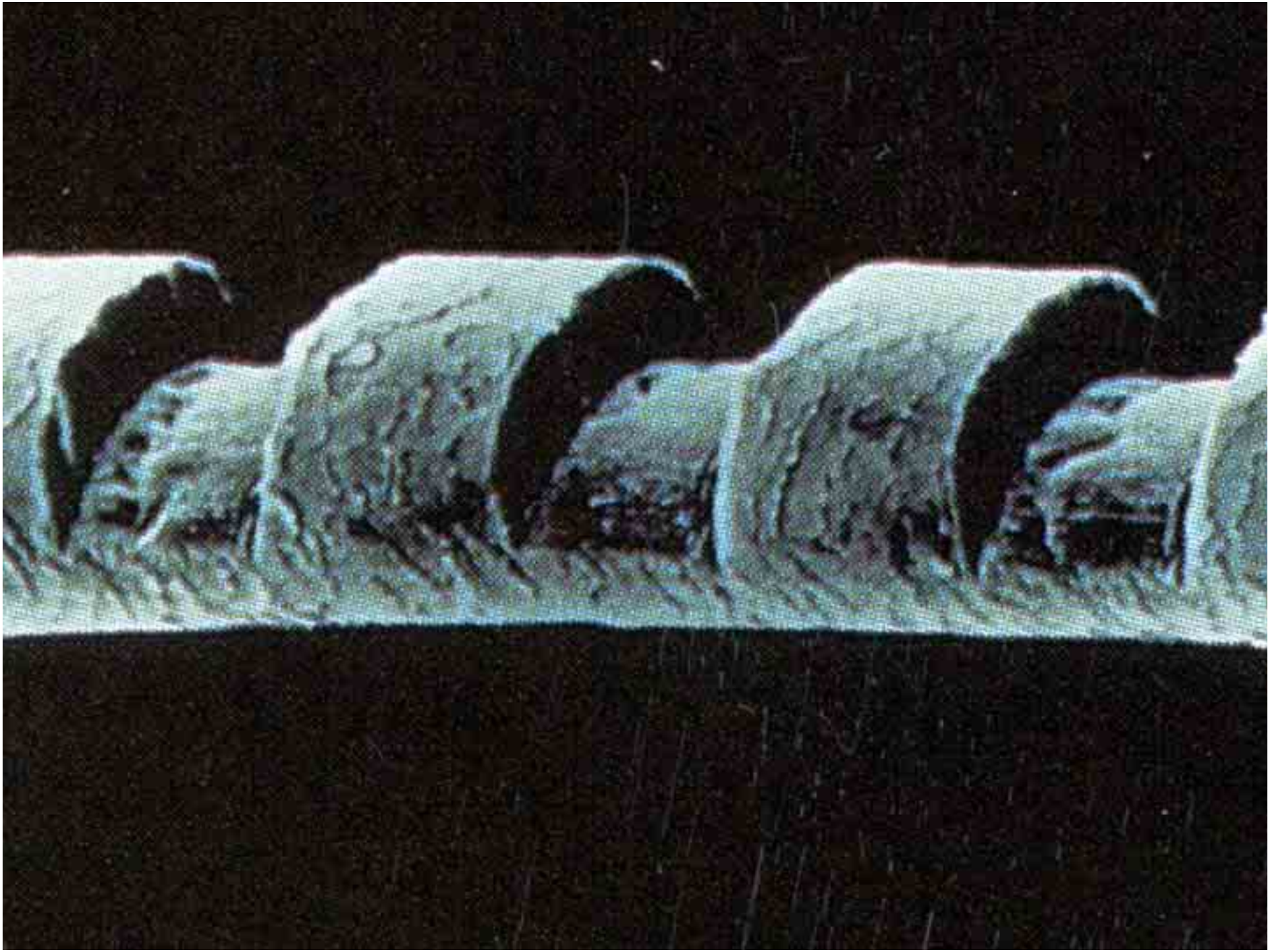

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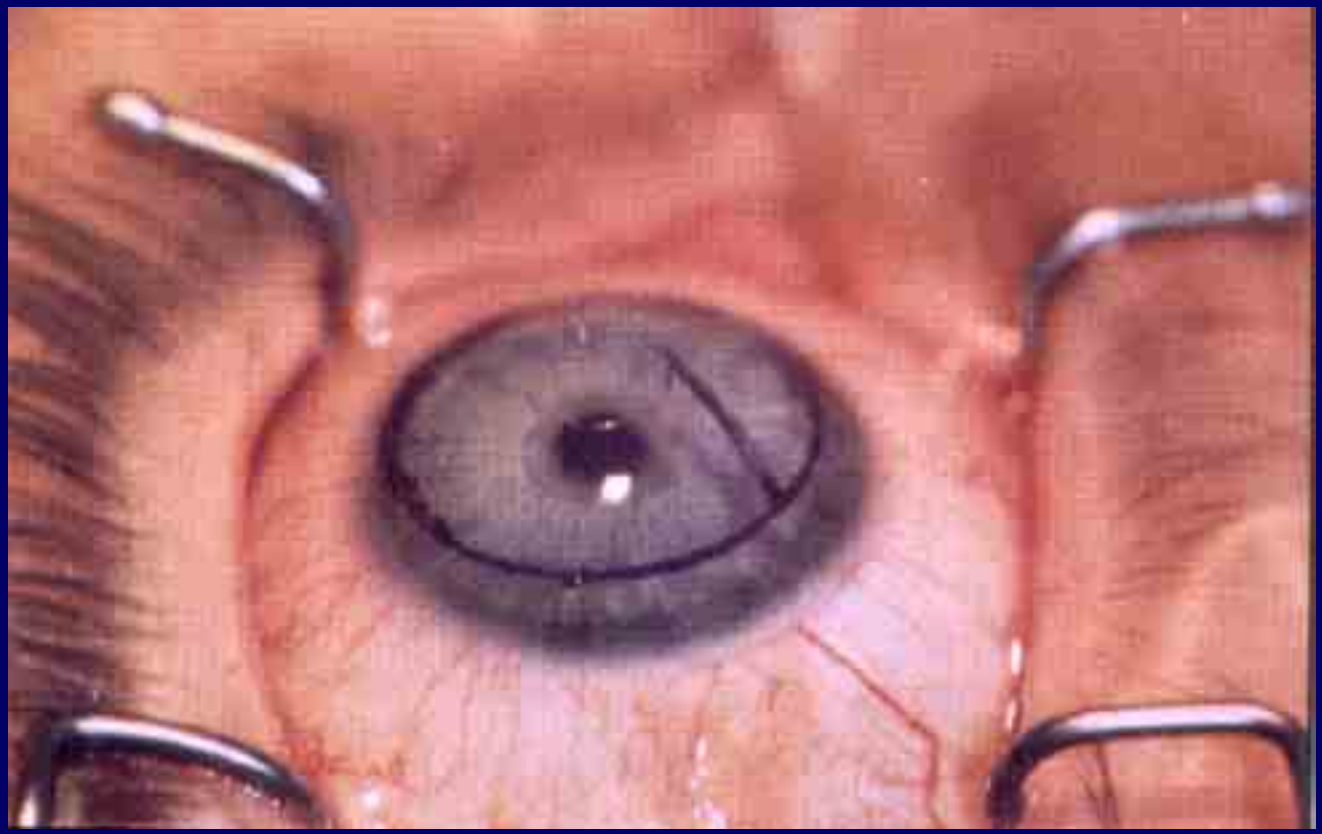
Modern Excimers (flying spot)

LASIK

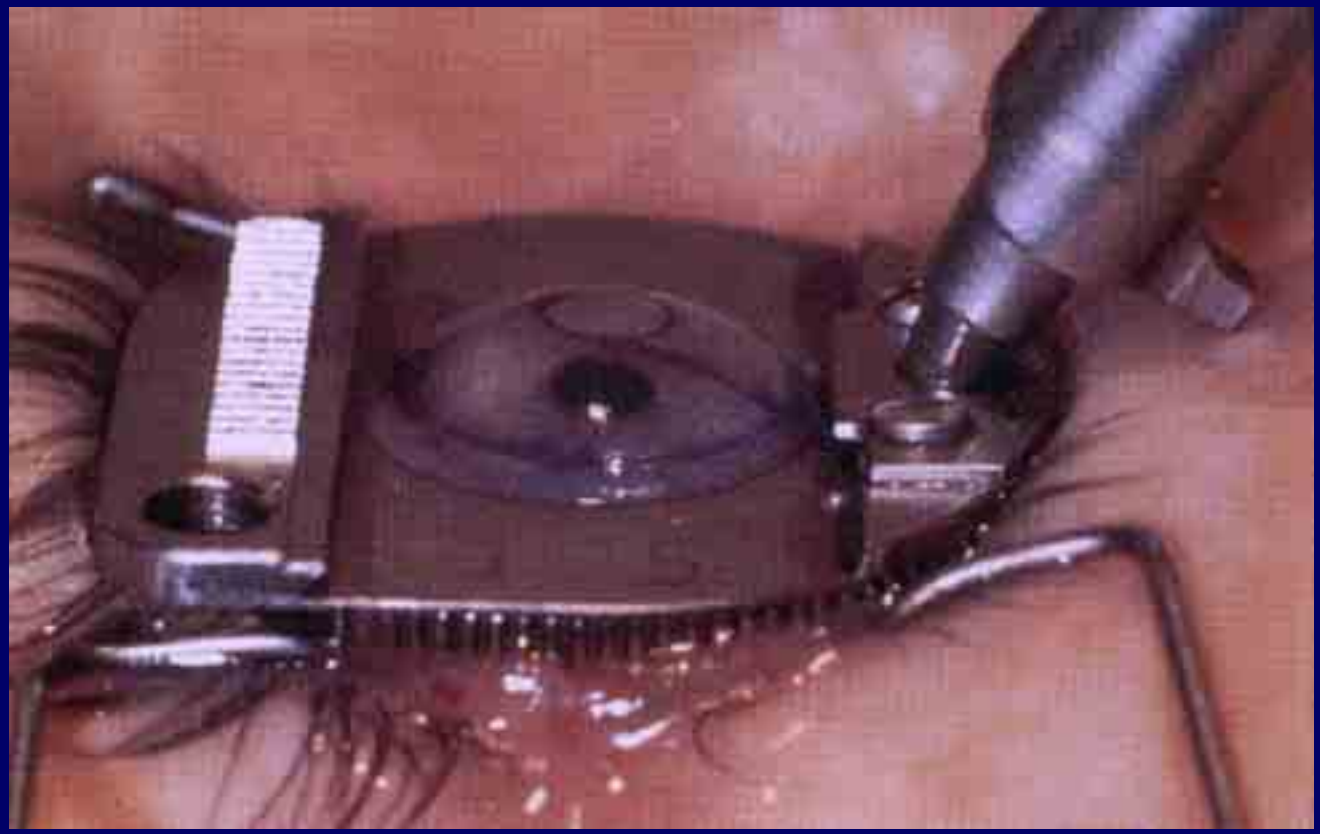
- Has been around for over 15 years
- About 1.5 million eyes in the US a year
- One of the safest procedures in Medicine
- Permanent vision correction


Flap is Hinged
Back in Place



The procedure

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



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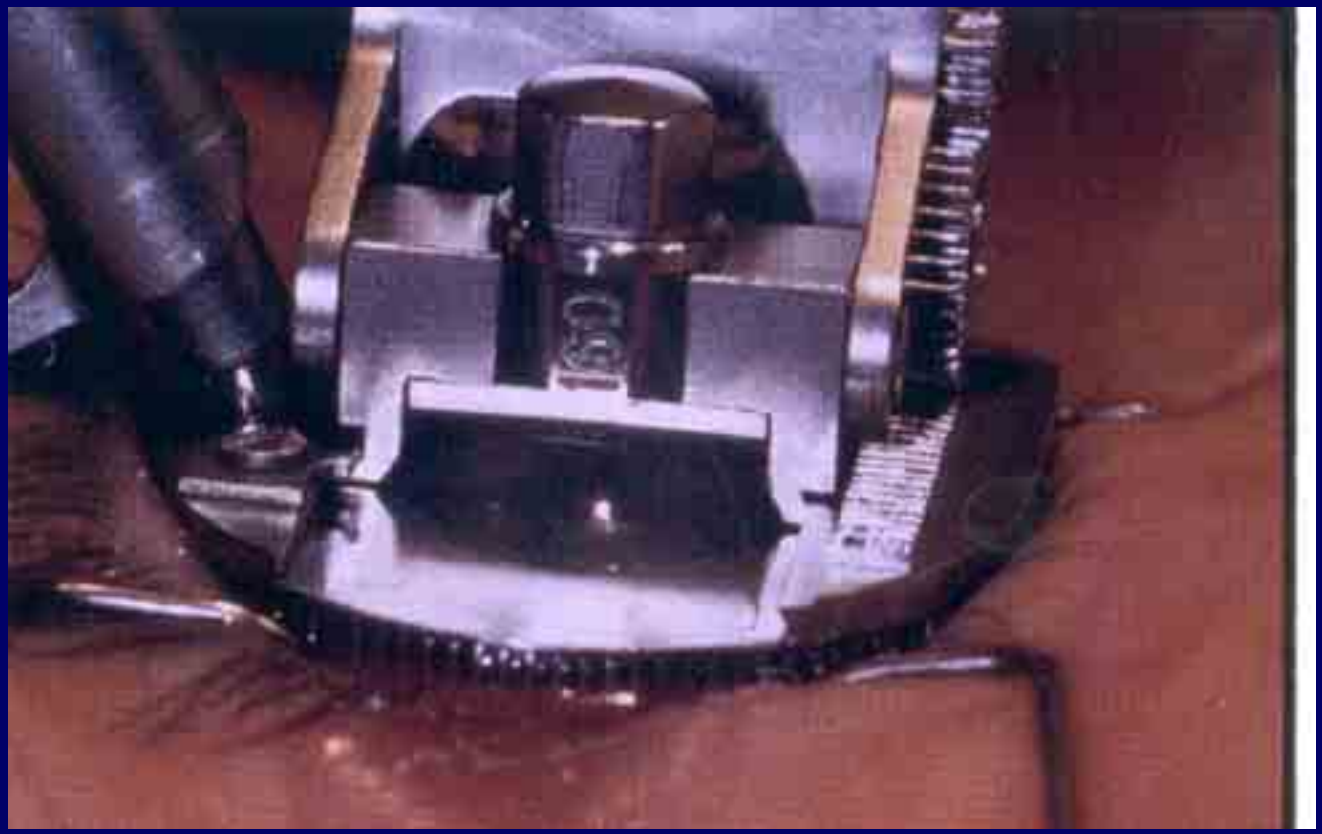

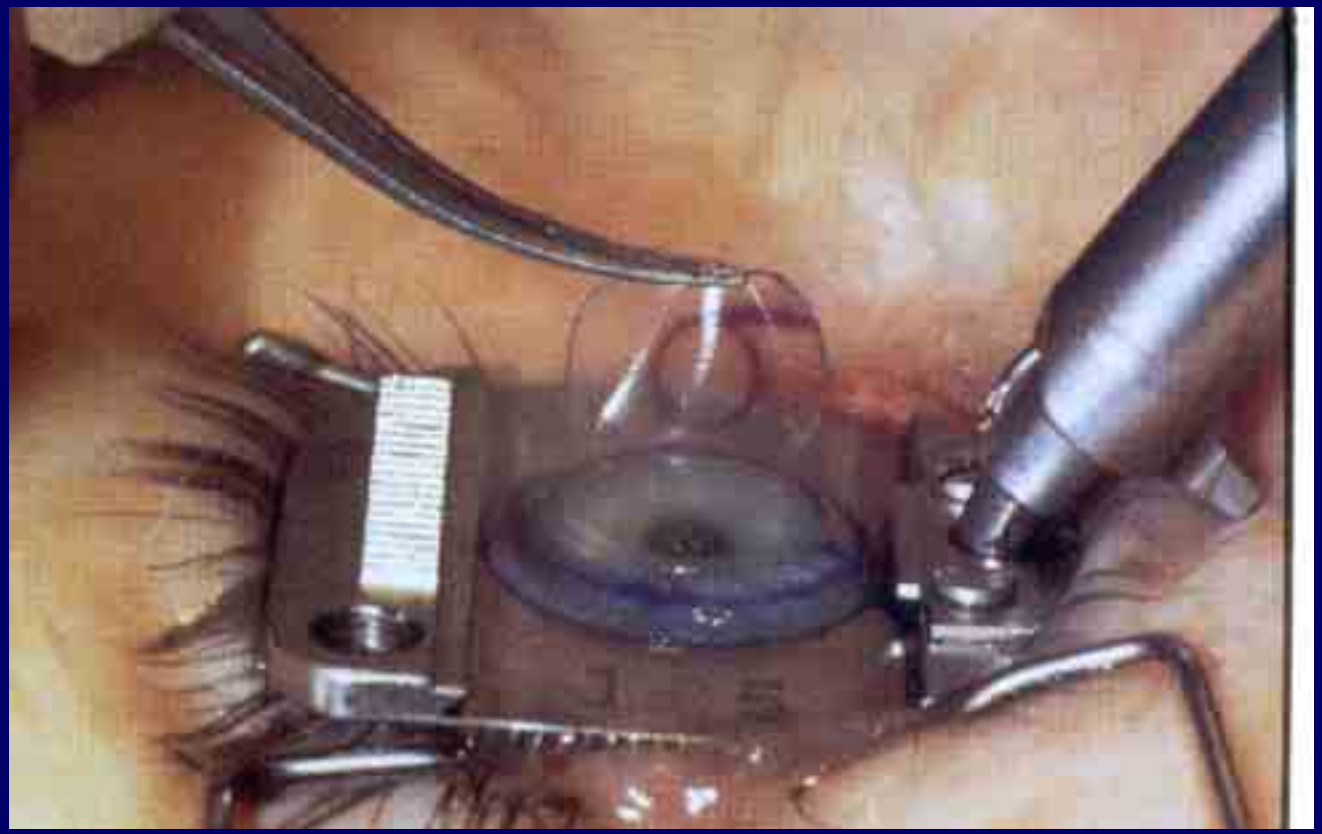

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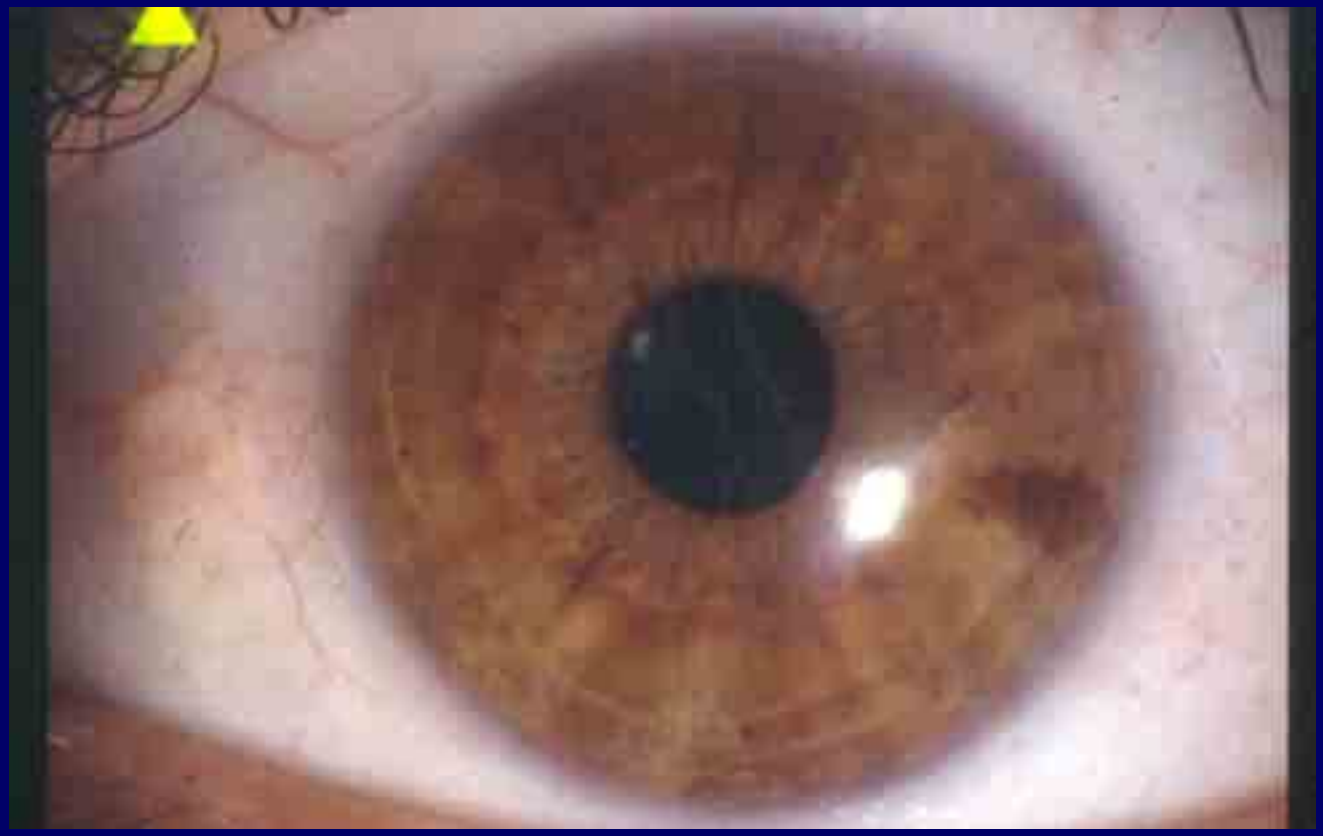
M2 flap making

QuickTime™ and a DV/DVCPRO - NTSC decompressor are needed to see this picture.

One of the initial LASIK cases, 1994



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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

Patient Selection

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

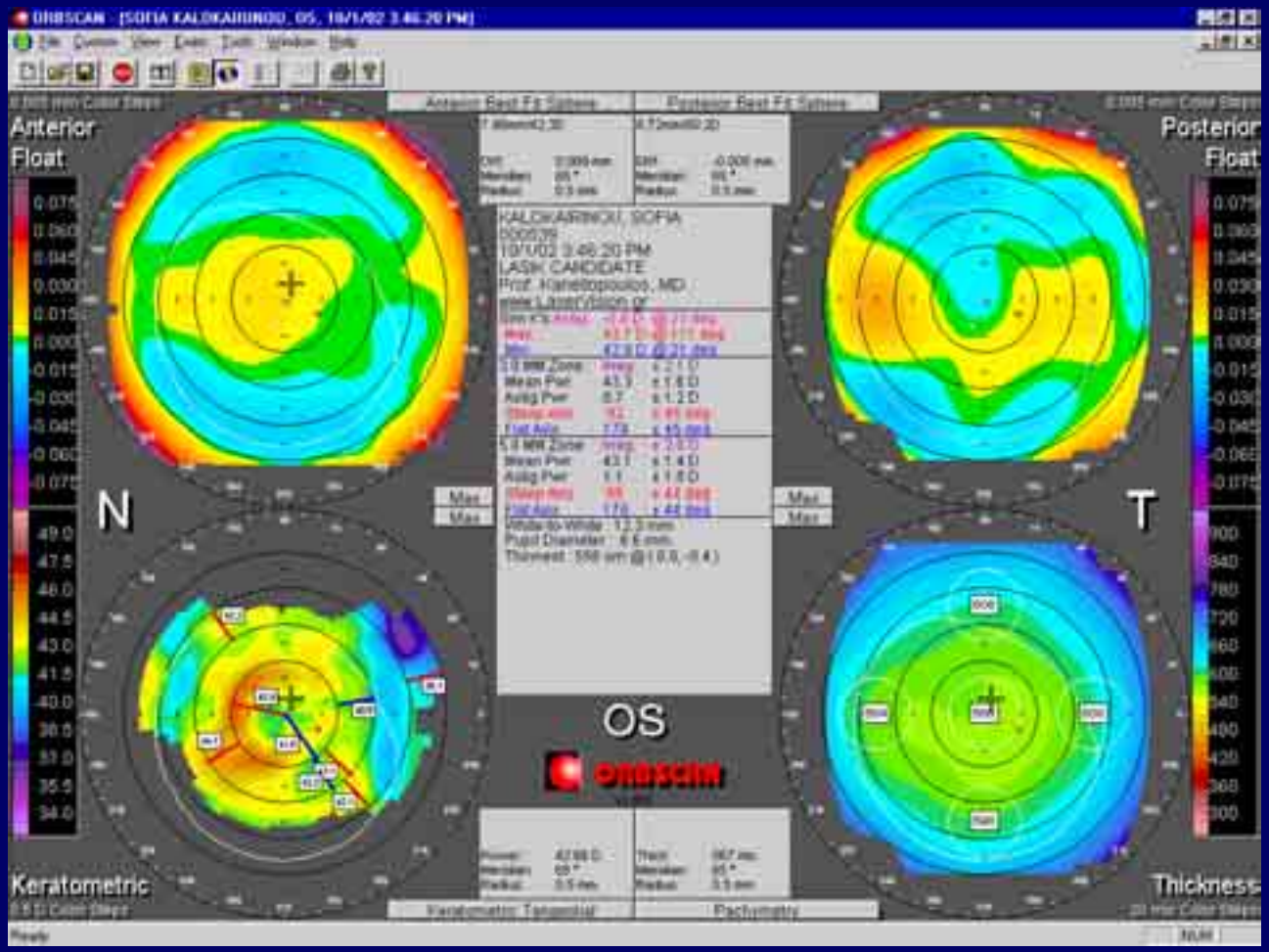
First “INFO”

- ? 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



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 200 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

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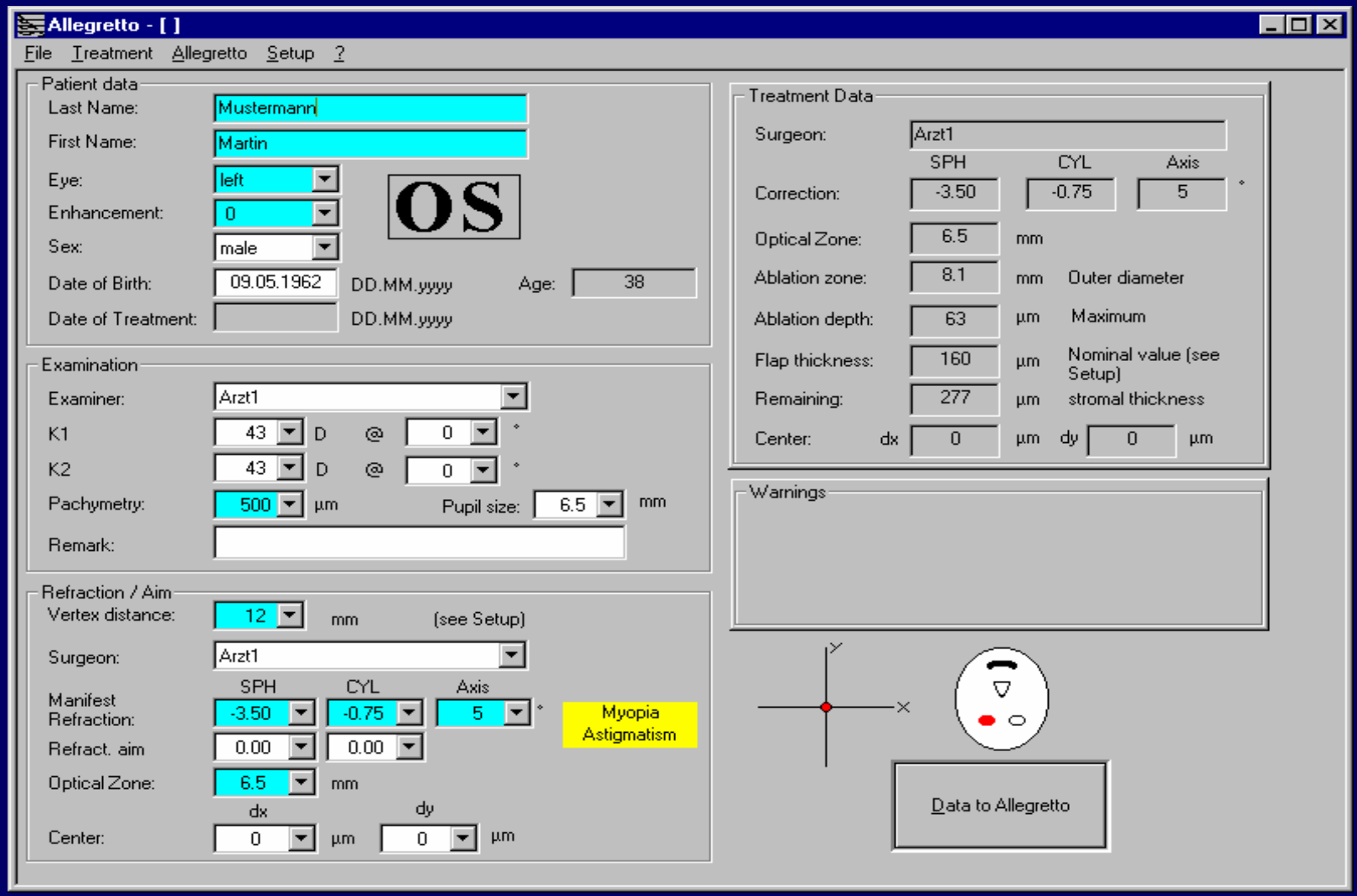
Experience-Microkeratomes

- B&L: ACS
- B&L: Hansatome
- Alcon:SKBM
- Moria:LSK
- Allergan: Amadeus
- Moria: One step
- Moria:M2

Methods:

- 287 consecutive eyes, underwent LASIK for myopia or myopic astigmatism.
- The Allegetto-Wave treats by a gaussian-profile flying-spot of 0.9mm, with 200Hz frequency and a 250Hz active eye-tracker.



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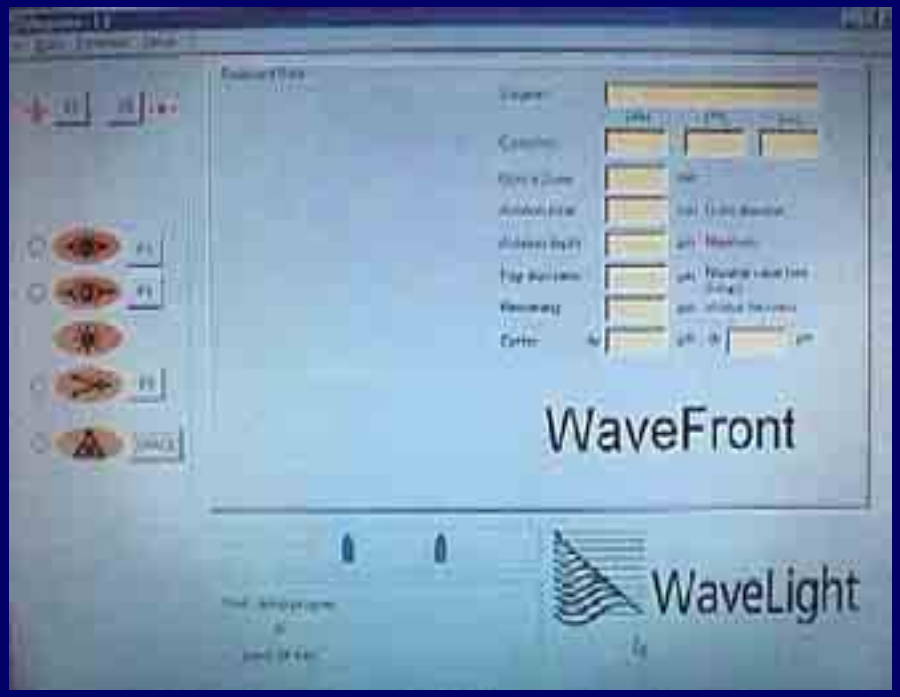
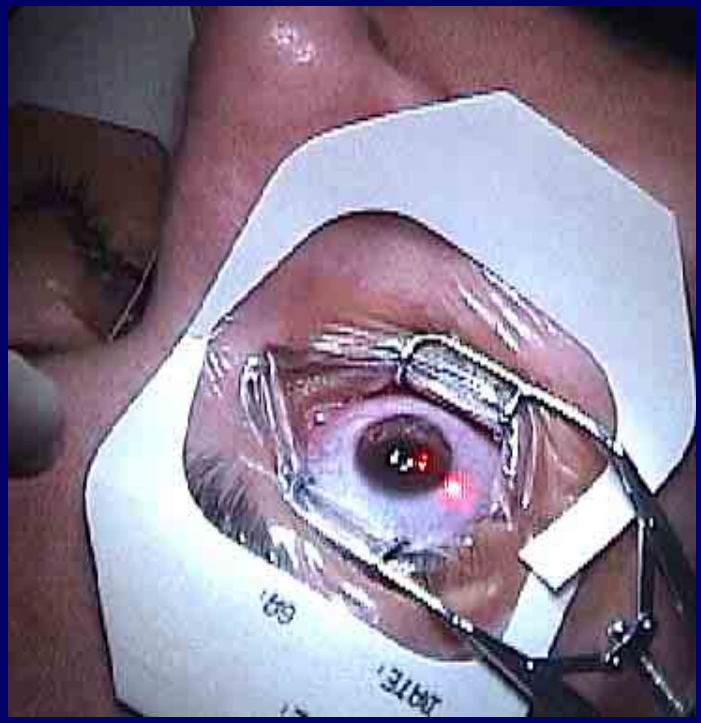
Methods:

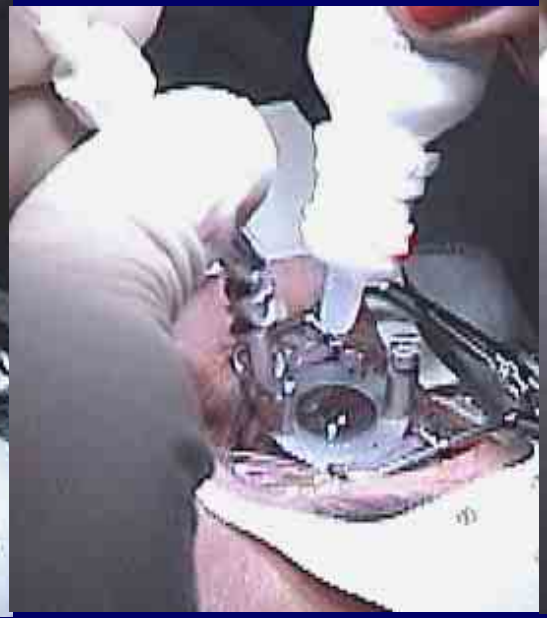
- We evaluated amount of myopia and astigmatism, pre- and post-operative: UCVA and BCVA, IOP, endothelial cell count and wavefront analysis by the Wavelight Tscherning aberrometer.
- We utilized the M2 (Moria, France) microkeratome (110-130 plates).
- Mean follow-up was 5-11 months (8)

My Technique



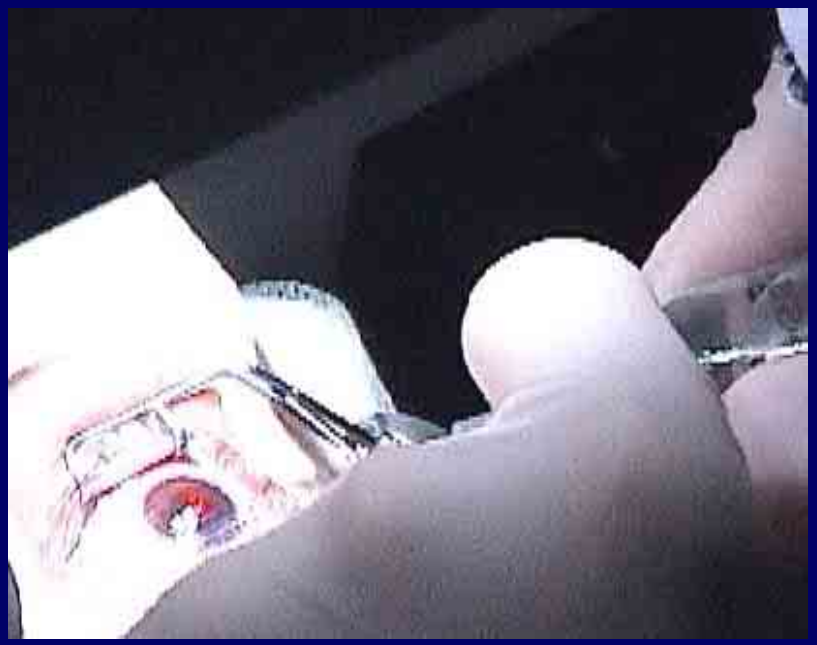


Placement of the M2

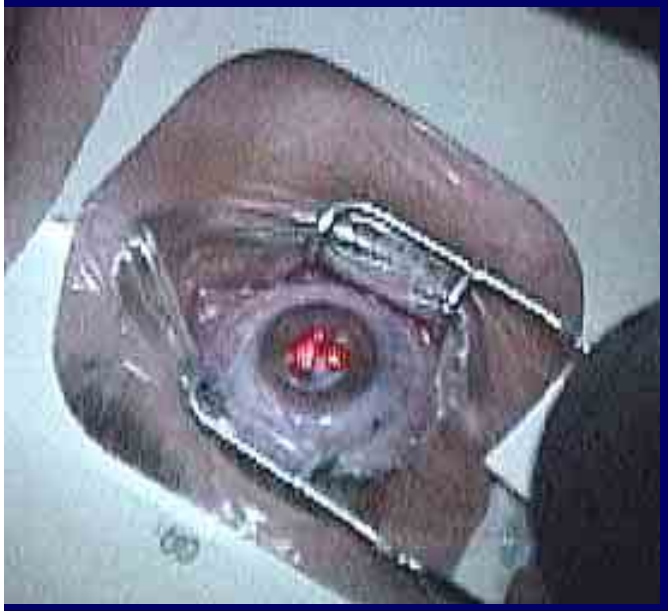


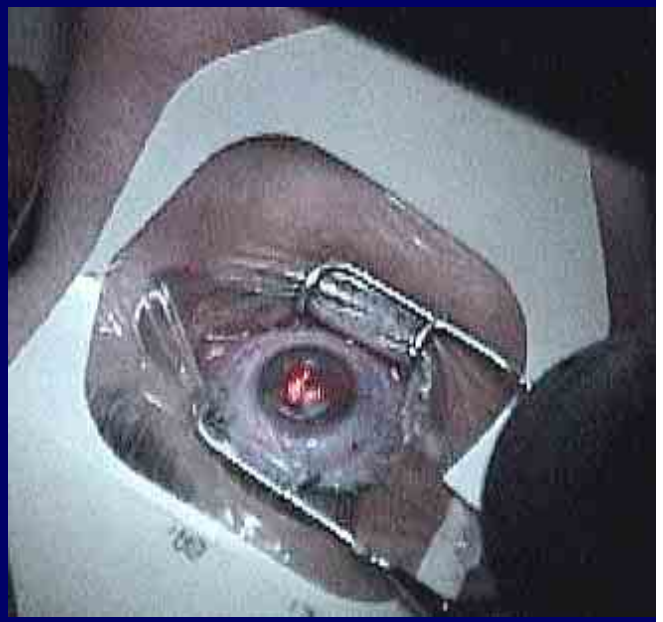
Microkeratome pass

Folding of flap, even moisture on stromal bed



Check parameters Intraoperative moistute eq





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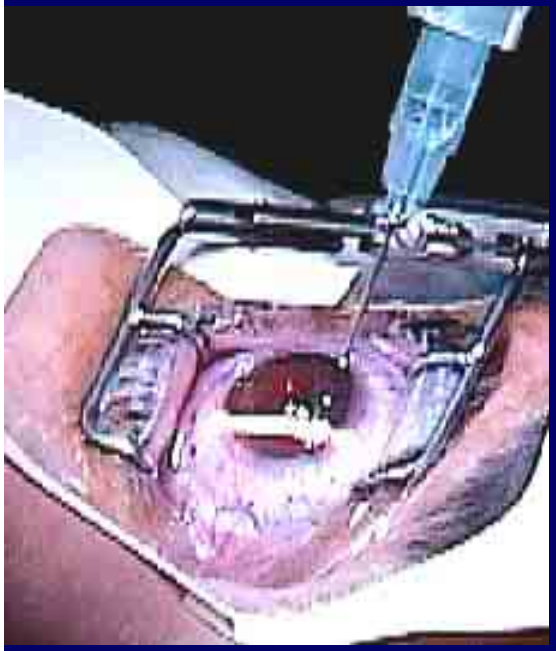
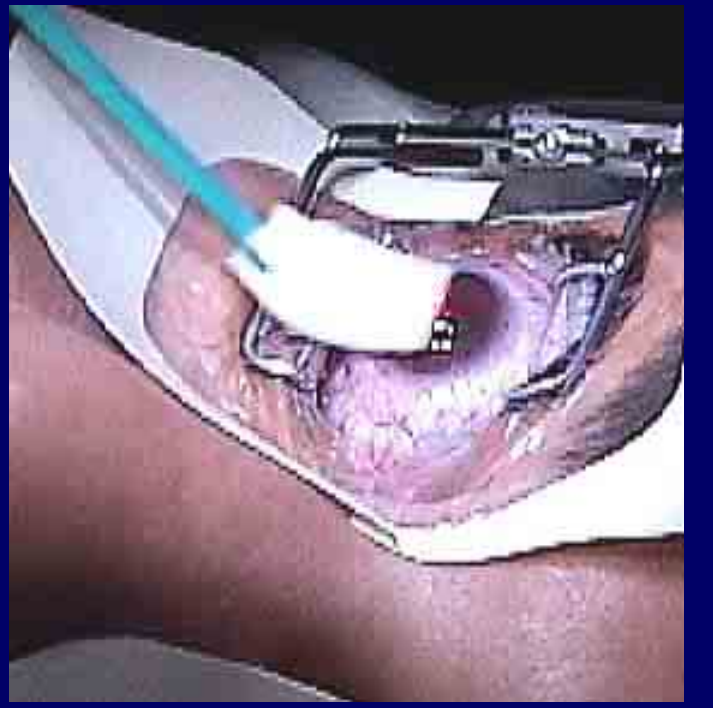
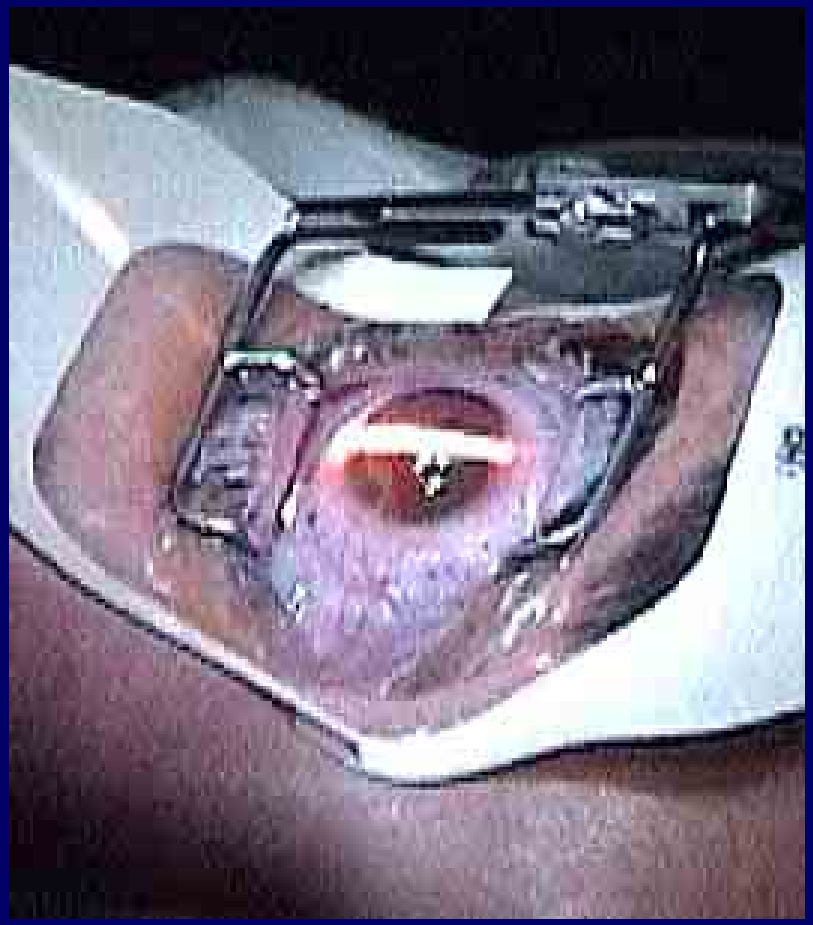
Irrigation of flap and careful wipe





“milky” drop to delineate gutter

2’ observation interval



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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 sqeeze

My technique

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

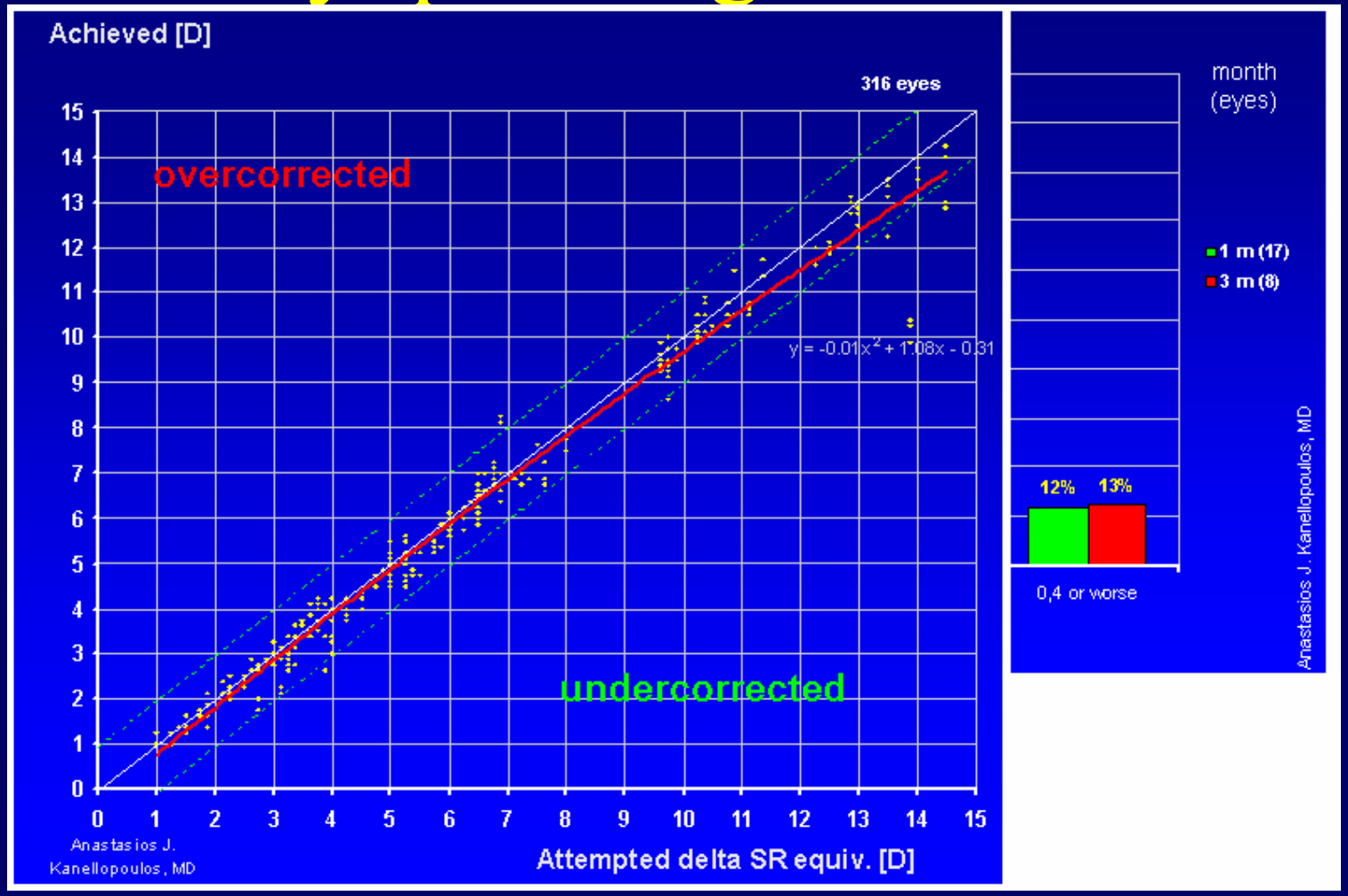
My technique

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

Video

QuickTime™ and a DV/DVCPRO - NTSC decompressor are needed to see this picture.

Results in 520 consecutive cases myopic astigmatism



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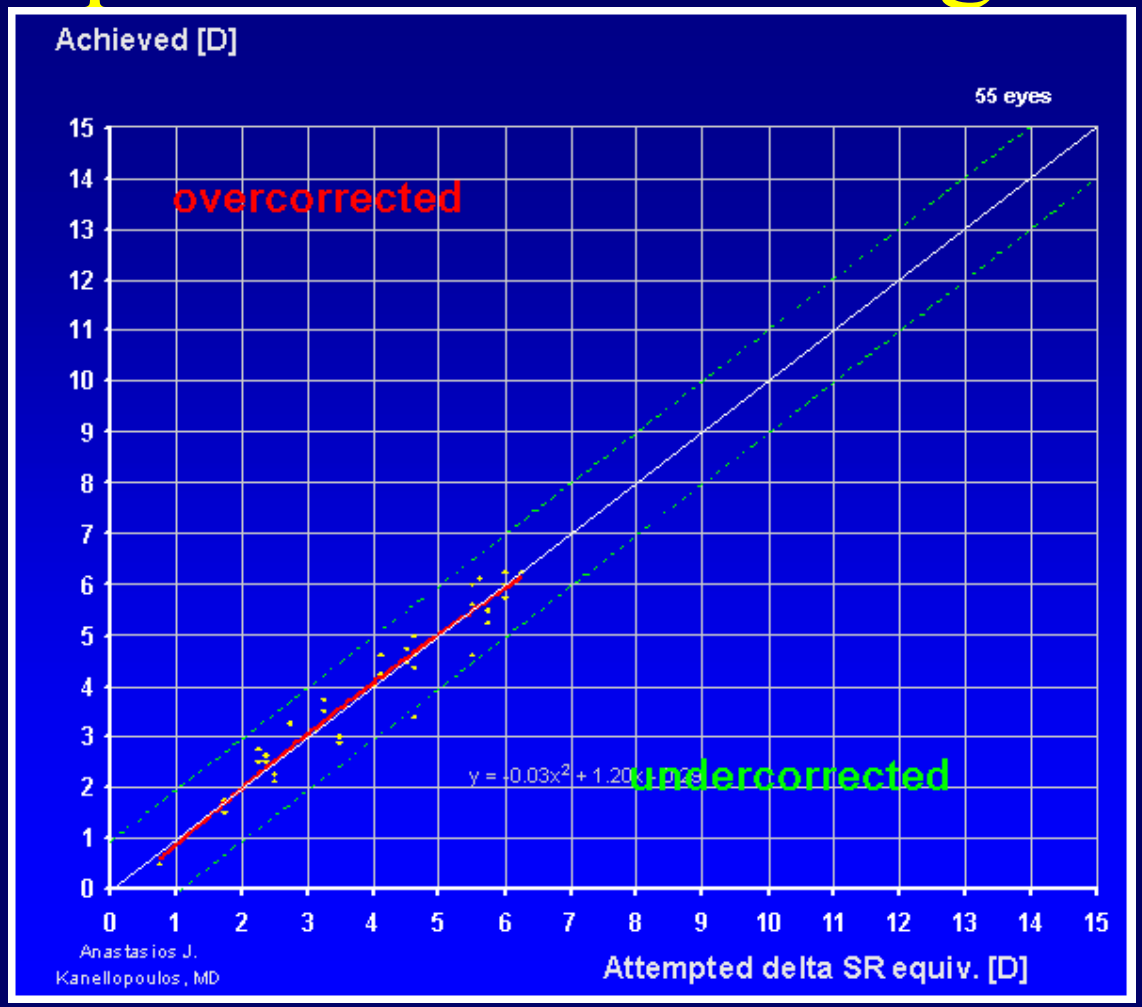
Results in 105 consecutive cases Hyperopia and mixed astigmatism



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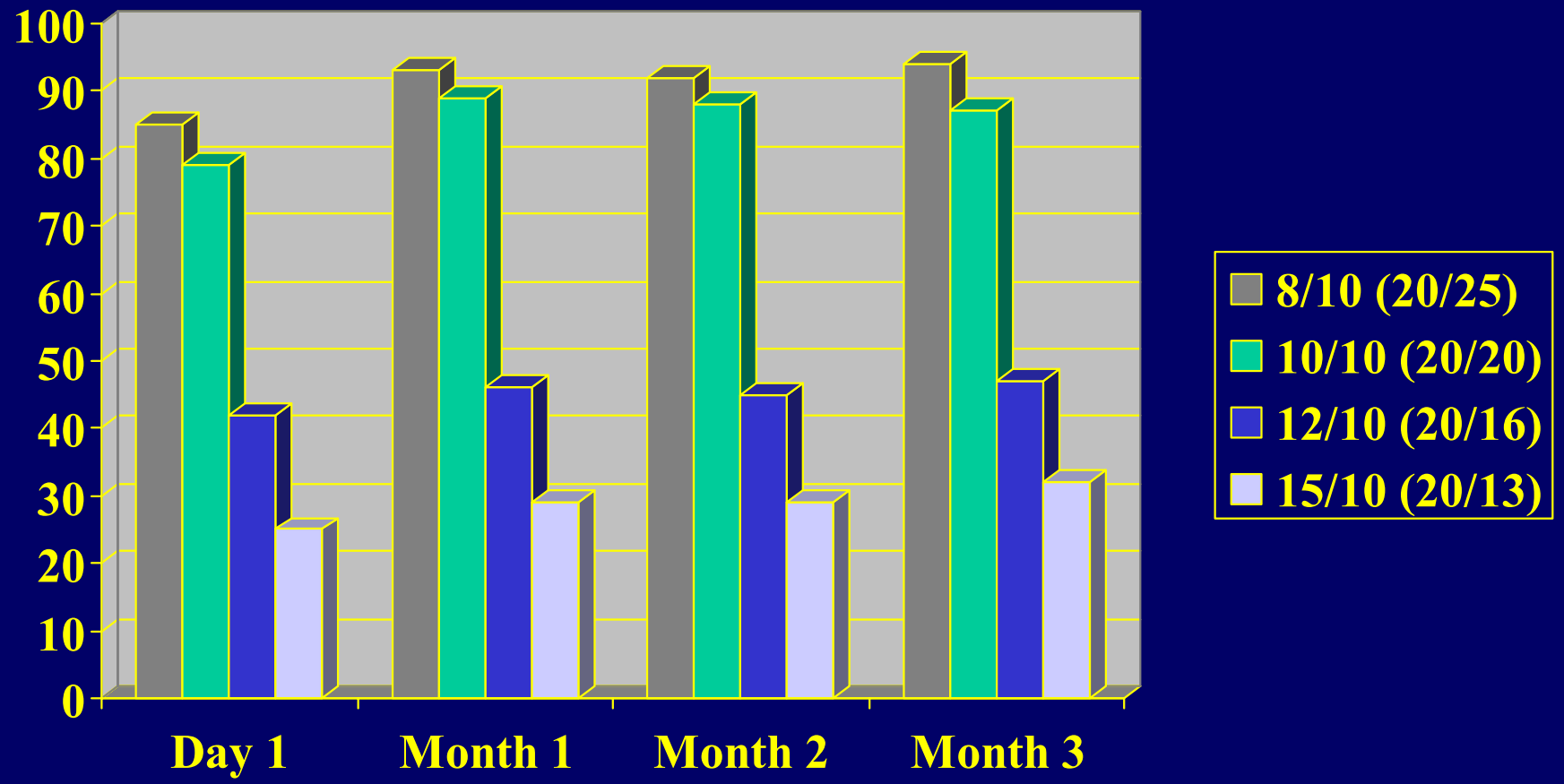
Results:

- Mean values: The mean pre-operative sphere was – 4.75 D (-1.00 to –12.50) and the cylinder –1.25 (-0.25 to –3.75)
- UCVA improved from 20/200 to 20/25. At 3 months 87% of the eyes were 20/20, 47% 20/15 and 32% 20/10. 100% of eye were within +/- 1D at 3 months.

Results

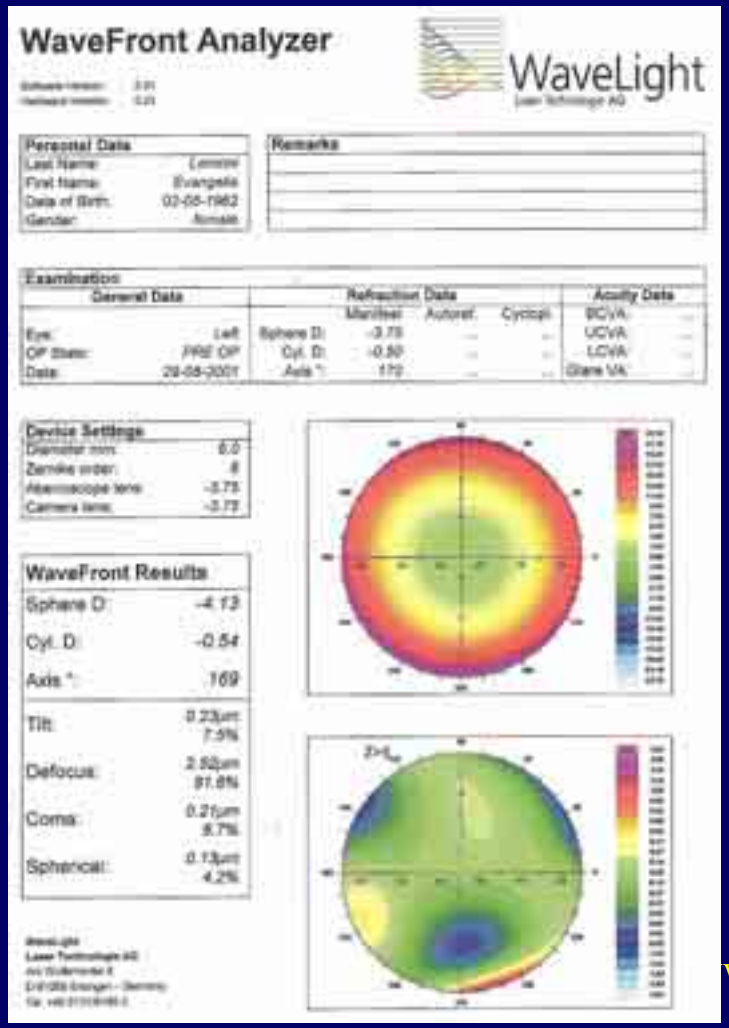

100
90
80
70
60
50
40
30
20
10
0
Day 1
Month 1
Month 2
Month 3
8/10 (20/25)
10/10 (20/20)
12/10 (20/16)
15/10 (20/13)

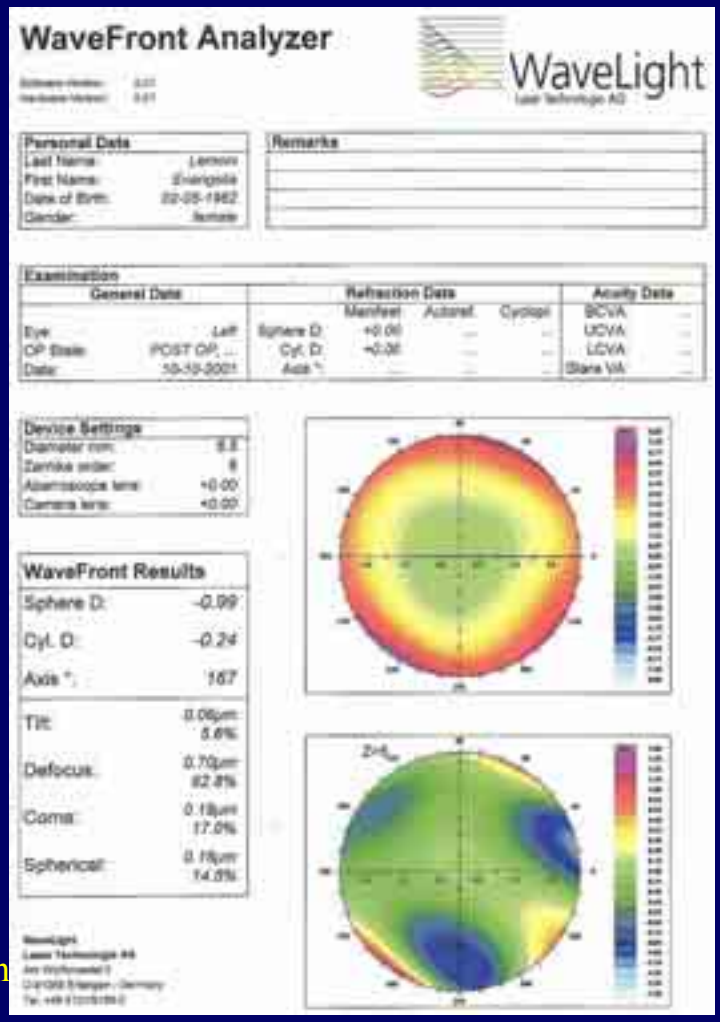
Results:

- Wavefront analysis showed a postoperative increase in coma of only 35% (mean coma of 6% pre-op to 9% post-op)
- 37% of eyes gained at least 1 line of BCVA
- No complications were noted in this limited group

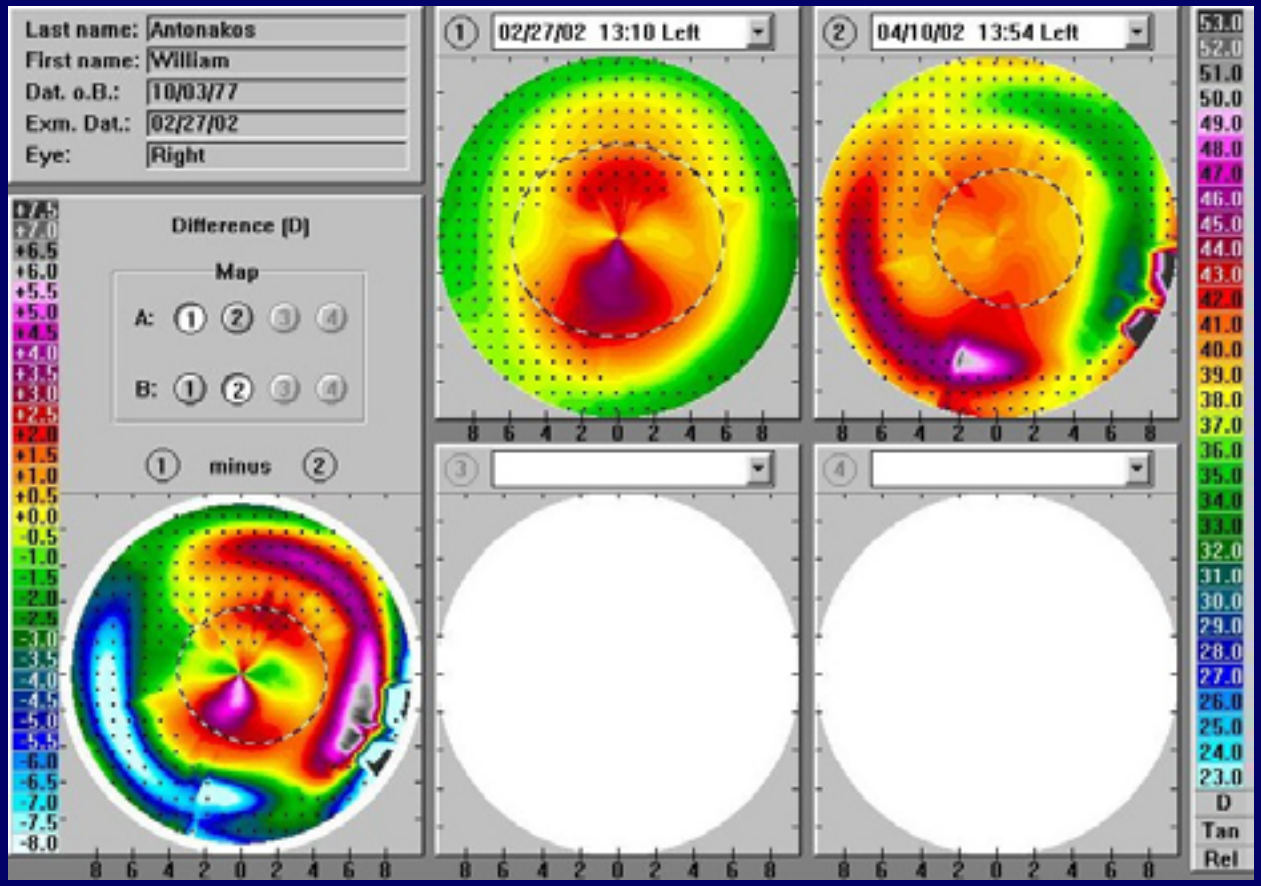
Pre- and Post-op Wave

BCVA improved 10/10 to 12/10





+2.00 –7.00 x 167 BCVA 6/10
3m post:+0.50 -0.50 x 19 UCVA 9/10



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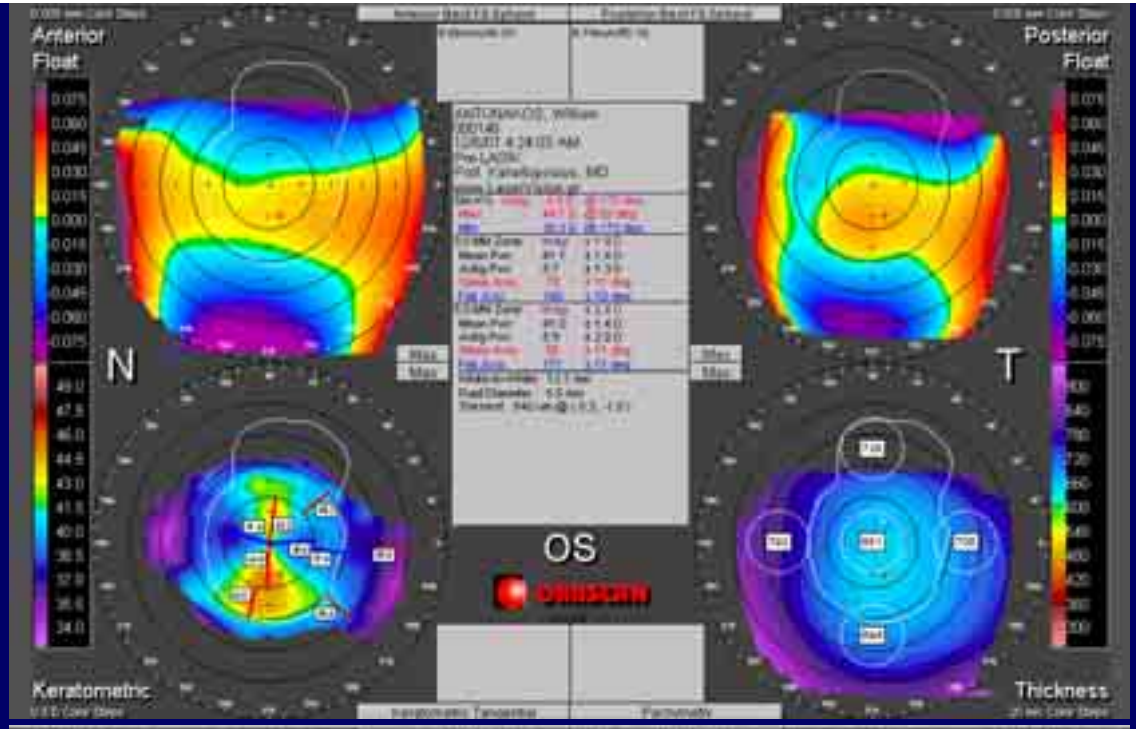
Anterior
Float
Posterior
Float
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T
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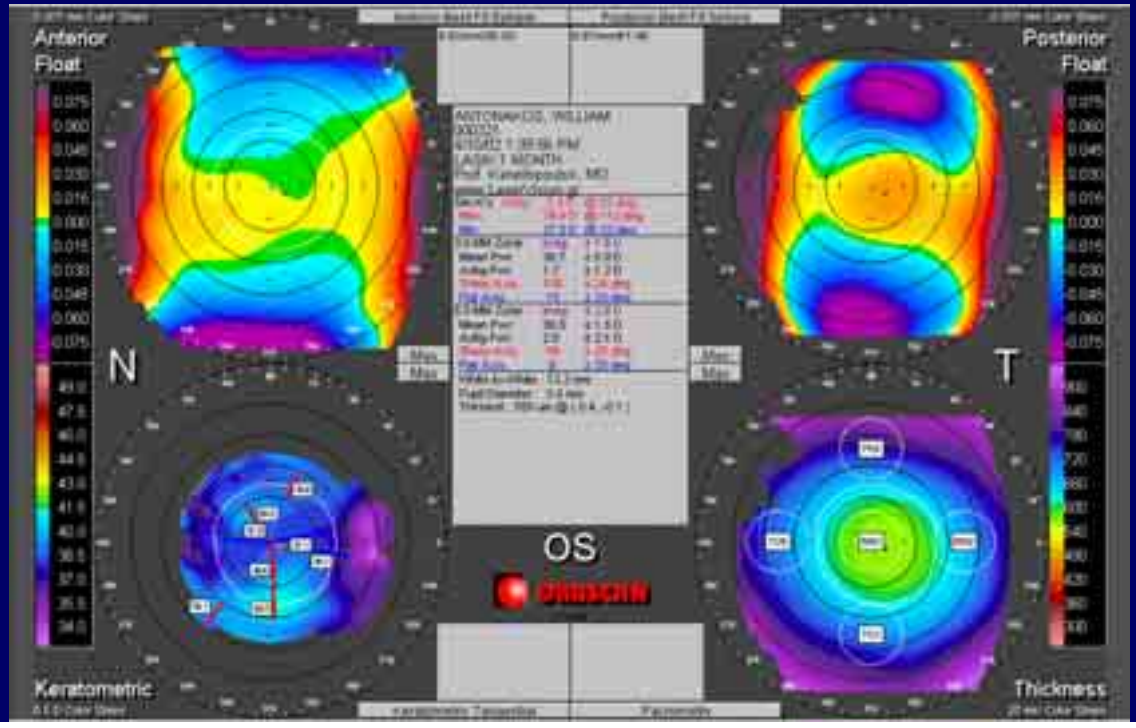
Keratometric
Thickness


Anterior
Float
Posterior
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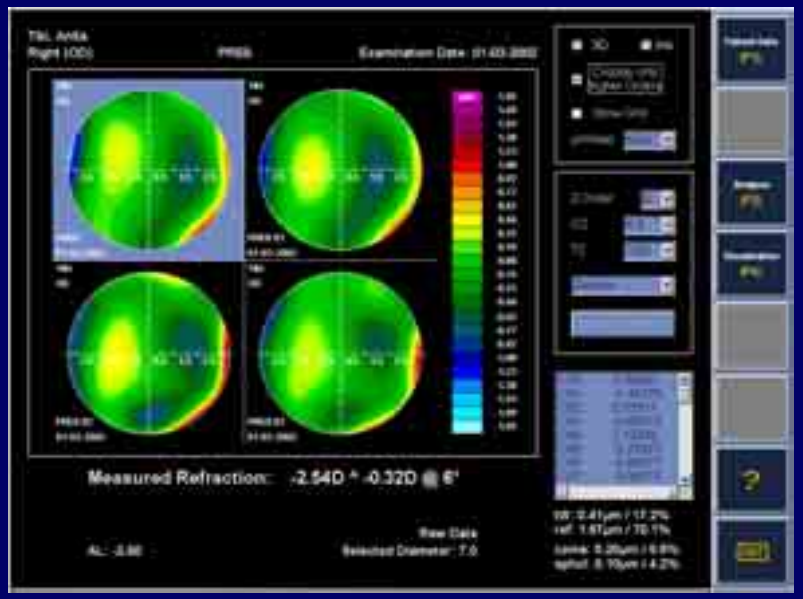
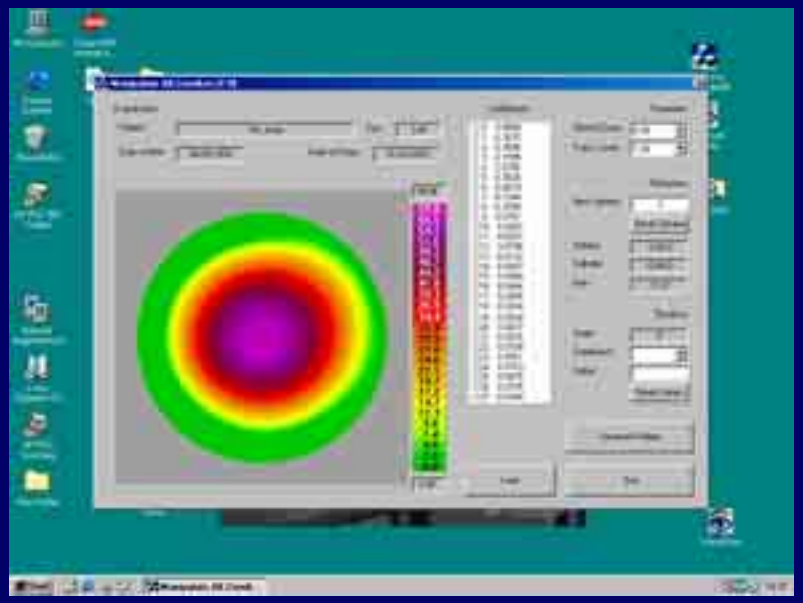
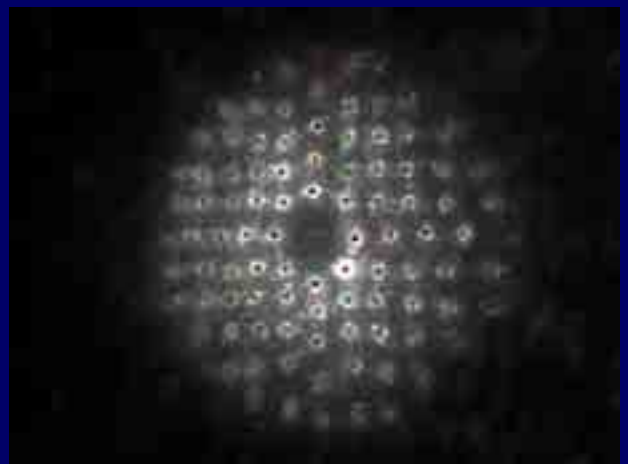
Keratometric
Thickness

Wavefront-guided

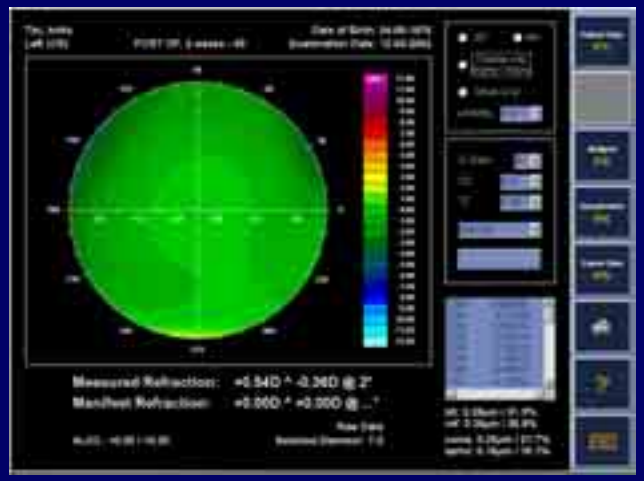






Wavefront-guided

- 10 patients
- One eye wave, one non
- Wave: RMSh pre-op 0.12-0.35 (0.17), post-op 0.11
- Non-wave: pre-op 0.165 post-op: 0.195



Conclusions:

- LASIK has become a safe and effective mainstream medical procedure throughout the globe
- Careful patient selection, education, informed consent as well as thorough surgical planning based on pupil size, topography, pachymetry and possibly wavefront-may lead to excellent results and high patient satisfaction

Conclusions:

- The surgeon and the associate optometric and technical staff should place standards for these measurements and possible areas of pre-op concern
- Thorough knowledge of the microkeratome apparatus as well as the excimer may prove helpful as well.

Thank you

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