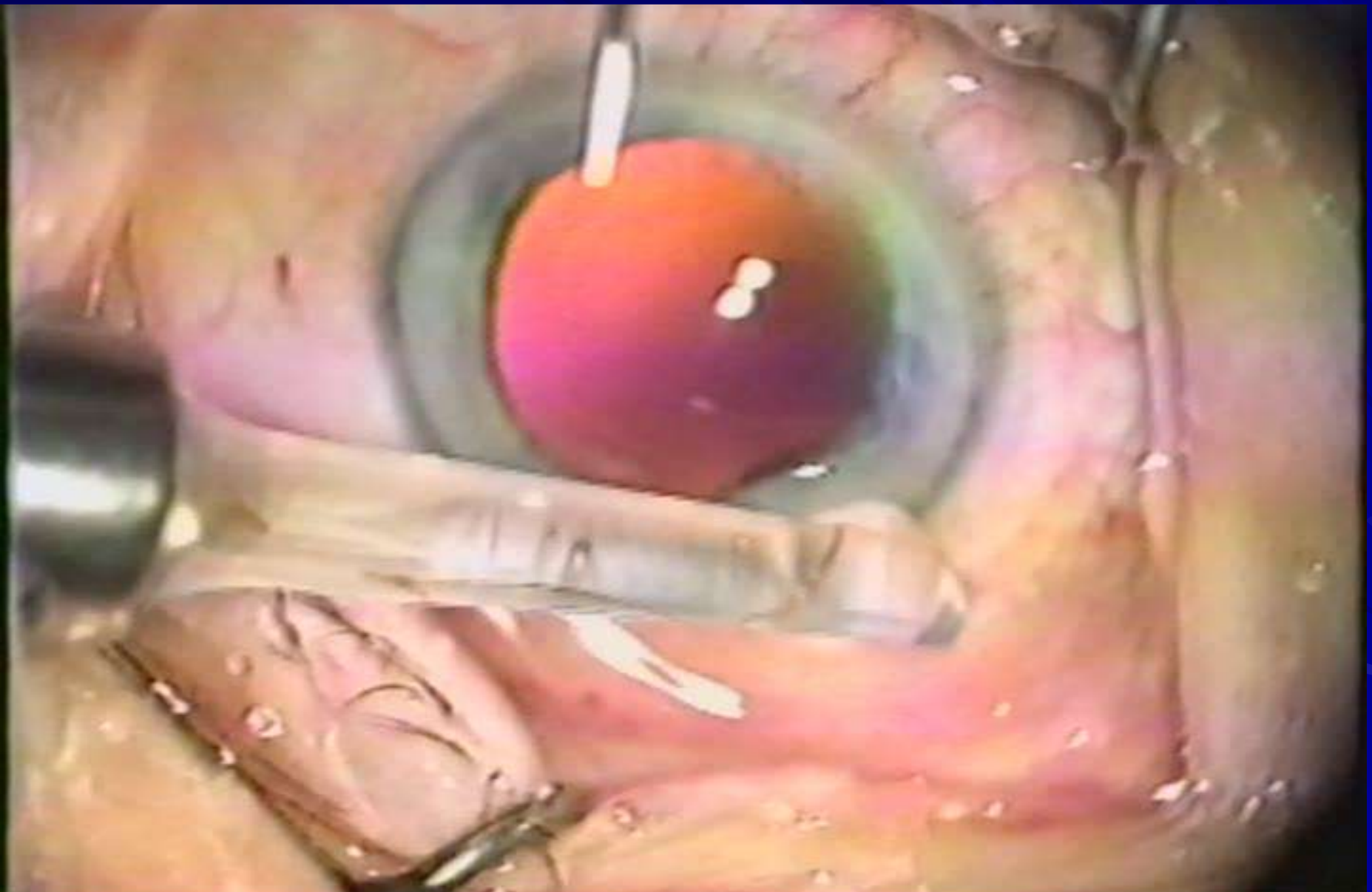
NEBRASKA LASER EYE™
ASSOCIATES

2010: Cataract surgery for the young and young at heart

Mark Edmund Johnston MD FRCSC
markjohnstonlasik.com

1978: Aphakic Spectacles

Starr IOL Injector 1995

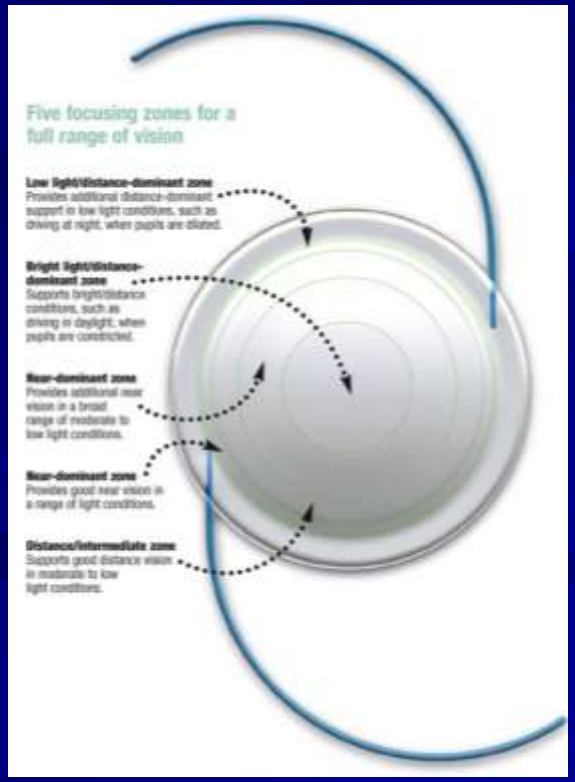


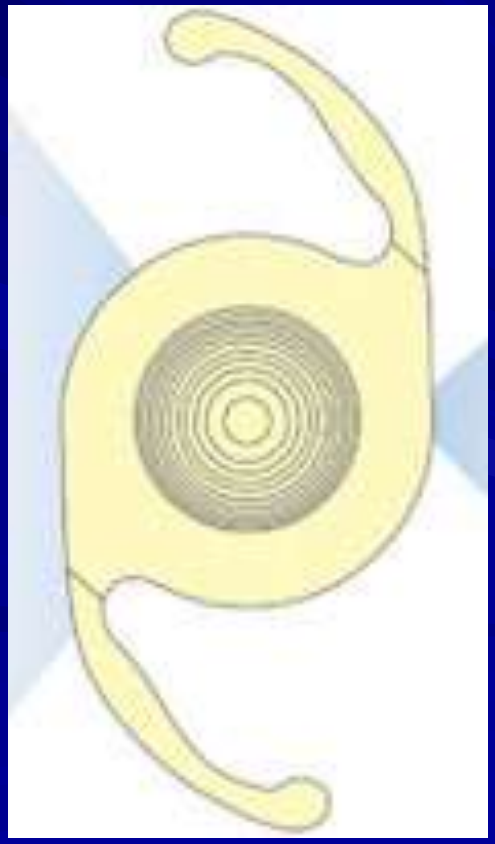
1995

J Cataract Refract Surg. Jul;21(4):437-41.

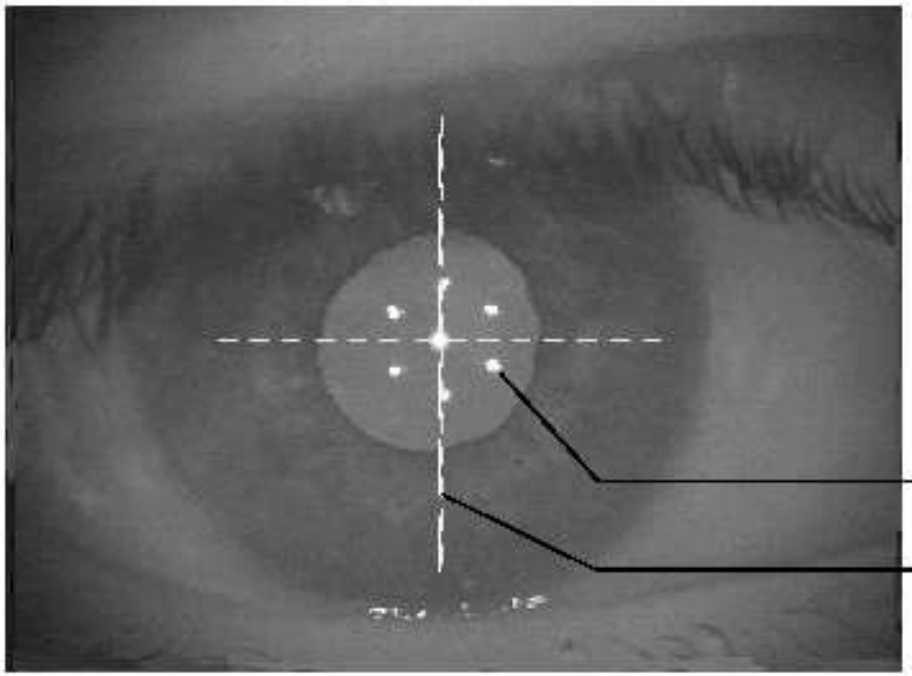
Comparison of the Storz bifocal zonal and the 3M diffractive multifocal intraocular lenses.

Boesten IE, Beekhuis WH, Hassmann E, Pameyer JH, Baarsma GS.





2000: IOL Master - Accurate Axial length

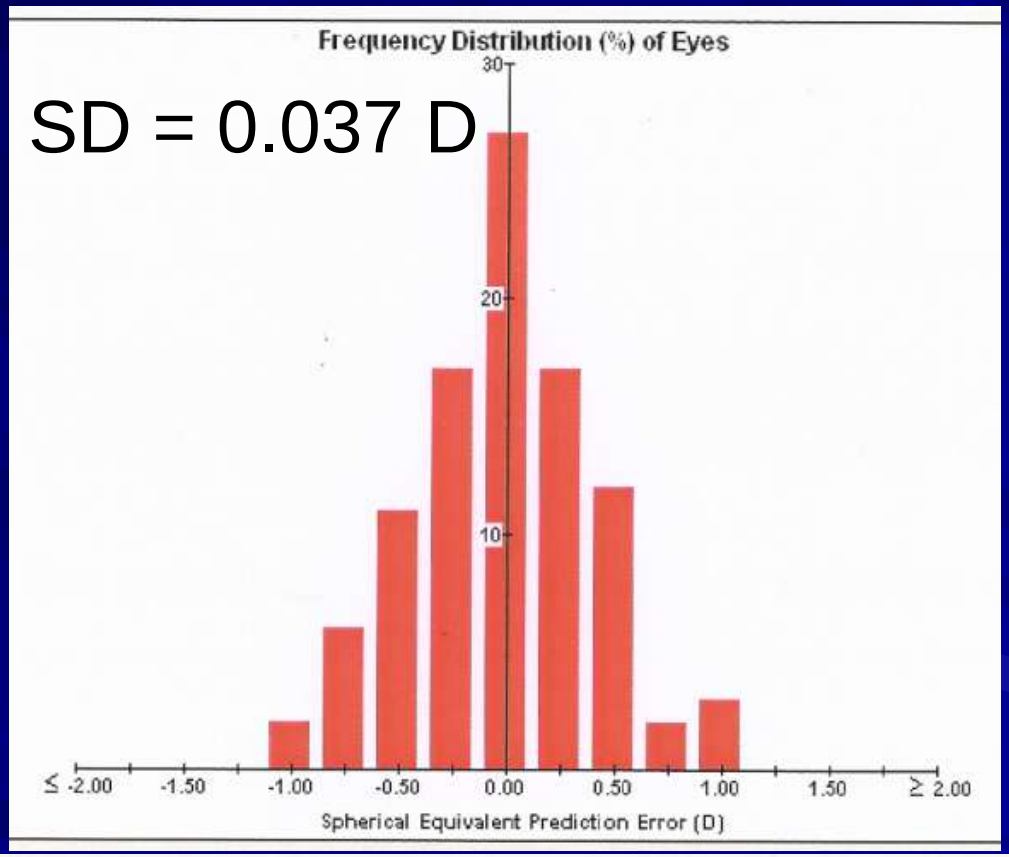


1 Circle of light spots for focusing
2 Cross hairs

Video image of the eye with correctly aligned instrument

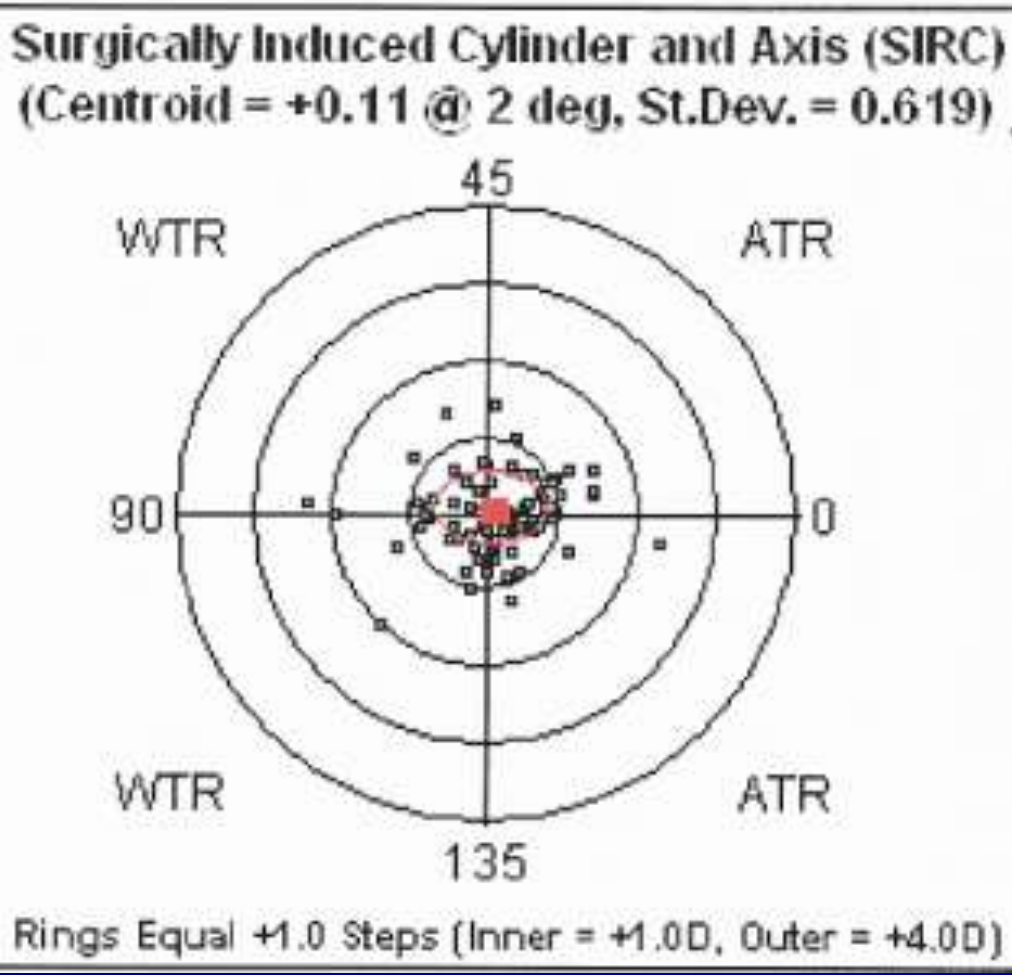
If the target is -0.25 :

- then 66% of patients between -0.62 and + 0.12
- then 95% of patients between -0.99 and + 0.50



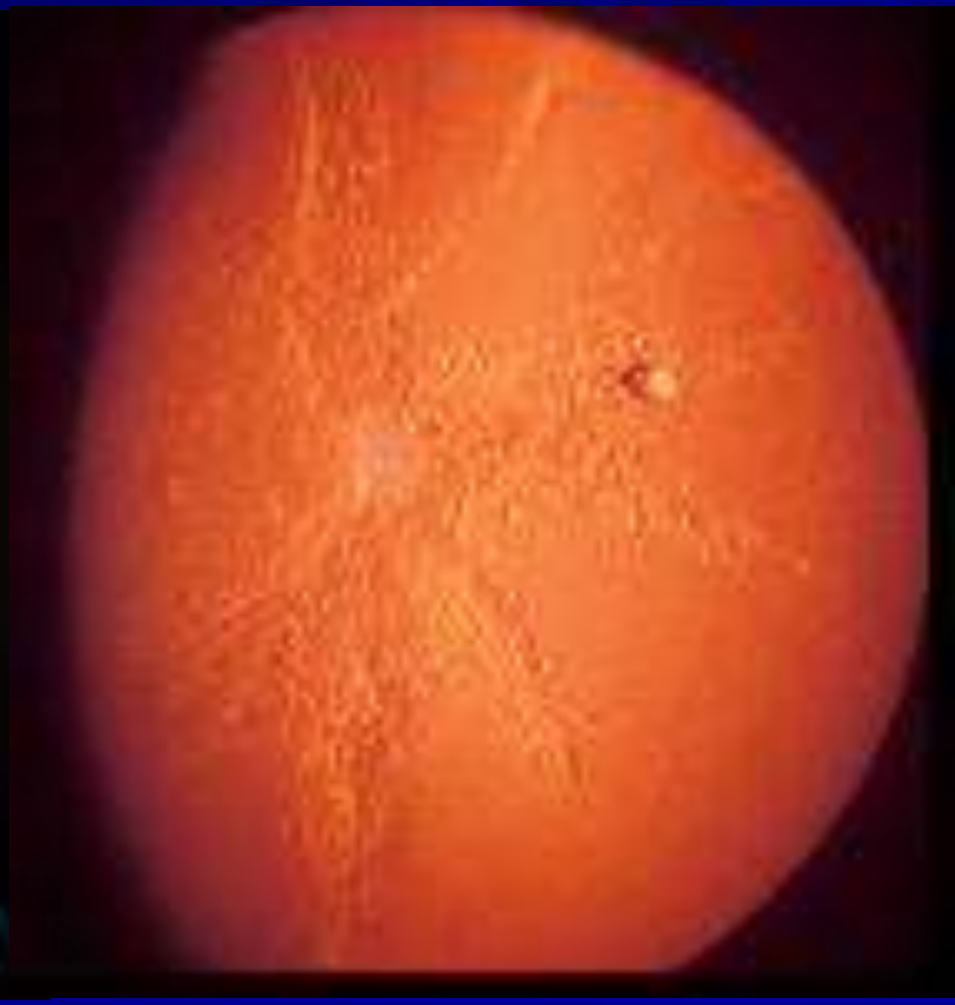
Formula	Number of Cases	Personalized ACD (mm)	Eqv. Form. Constant		Current Form.	Mean Rx Err (D)	Mean Abs Rx Err (D)	Std Dev of Rx Err (D)	Max Rx Err (D)	% cases > +/- 2 D Rx
Holladay II	78	5.463 +/-0.038	ACD:	5.463	5.463	-0.010	0.346	0.440	-1.02	0.0%
Holladay I	78	5.575 +/-0.041	SF:	1.815	1.815	-0.041	0.300	0.372	-0.94	0.0%

Minimal surgically induced cylinder- except at day one



Glare

Posterior sub-capsular cataract



3. Are you bothered by glare on bright days or with oncoming headlights at night?

NEBRASKA LASER EYE™
ASSOCIATES

Date: _____

OD OS

Dear Patient:

Your doctor has diagnosed a cataract in one or both of your eyes. Before you have surgery, Medicare would like to know if you believe your vision is interfering with your daily living activities. Please ask yourself the following questions:

1. Do you avoid driving at night or do you have problems with night driving because of your vision?
2. Did you fail the vision portion of your driver's license exam?
3. Are you bothered by glare on bright days or with oncoming headlights at night?
4. Do people in your car see road signs before you do? Are you worried you will miss a turn by the time you see what a highway sign says?
5. Are you having difficulty reading small print such as newspapers, books or on medicine bottles, even when you are wearing your glasses?
6. Do you have trouble doing close work such as threading a needle?
7. Do you have trouble playing board games such as cards due to vision problems?
8. Do you have trouble recognizing peoples' faces from across the street?
9. Do you have difficulty watching television because of decreased vision?
10. Do you have difficulty with daily tasks such as cooking, cleaning, walking up or down stairs, etc. because of decreased vision?
11. Are you having any other particular problems with your daily living activities as a result of poor vision?

If you answered "yes" to any of the questions above, then you may benefit from the cataract surgery your doctor has proposed. However, if in thinking about these questions you realize you are not bothered by your vision, then you may not need cataract surgery at this time. Because cataract surgery almost always is elective, postponing it usually does not present a risk to the health of your eyes. Discuss your options with your doctor.

2000:Medical neccesity for cataract surgery

Although considered a safe and effective procedure, occasional complications related to cataract surgery occur and should be weighted against the potential benefit you expect from cataract removal.

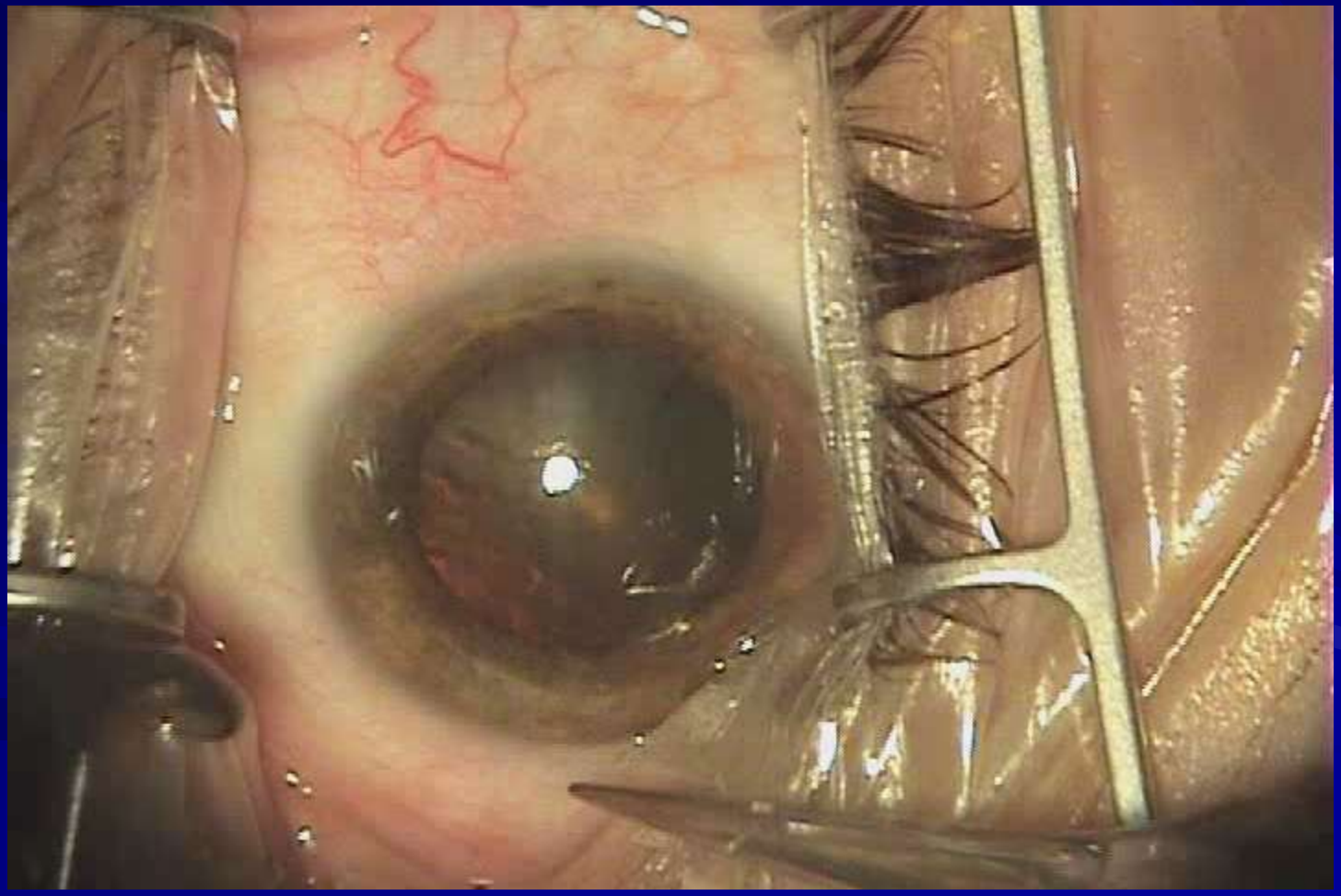
Please read the two statements below, check the box that most closely describes the impact your vision is having on your daily living, then sign in the space below.

_____ I have read the questions above. My vision is affecting my daily living activities enough that I would like to have cataract surgery at this time.

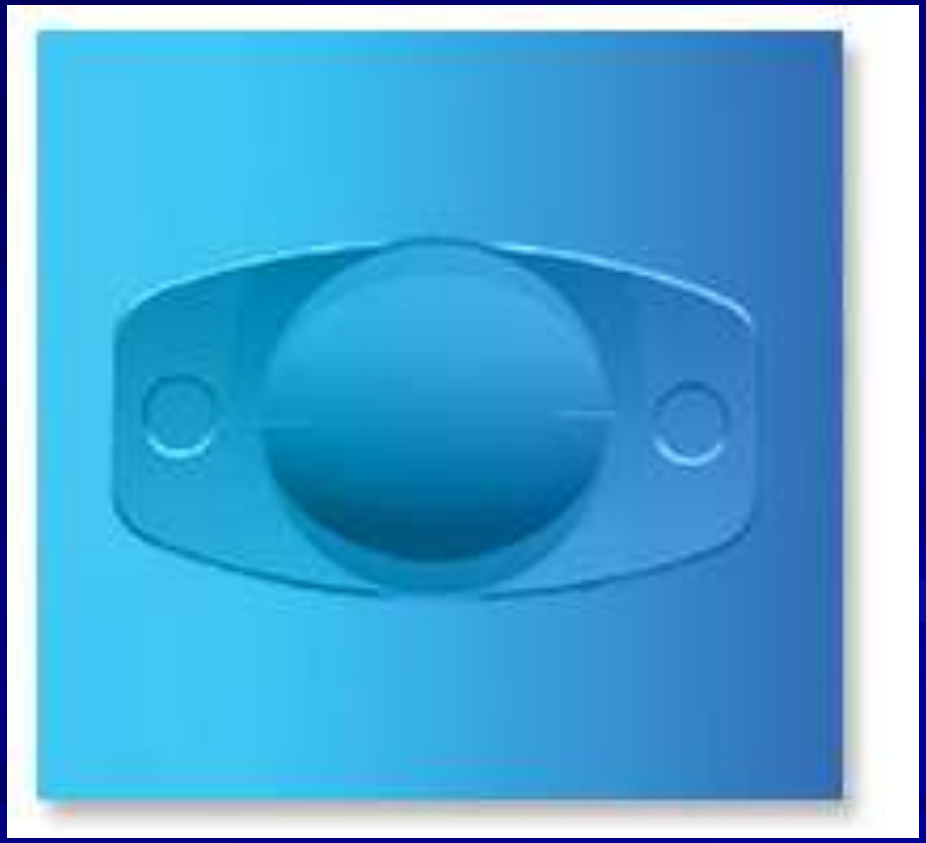
_____ After considering the questions above, I don't think my vision is bothering daily living activities; I would like to postpone surgery for now.

Signed: _____ **Date:** _____

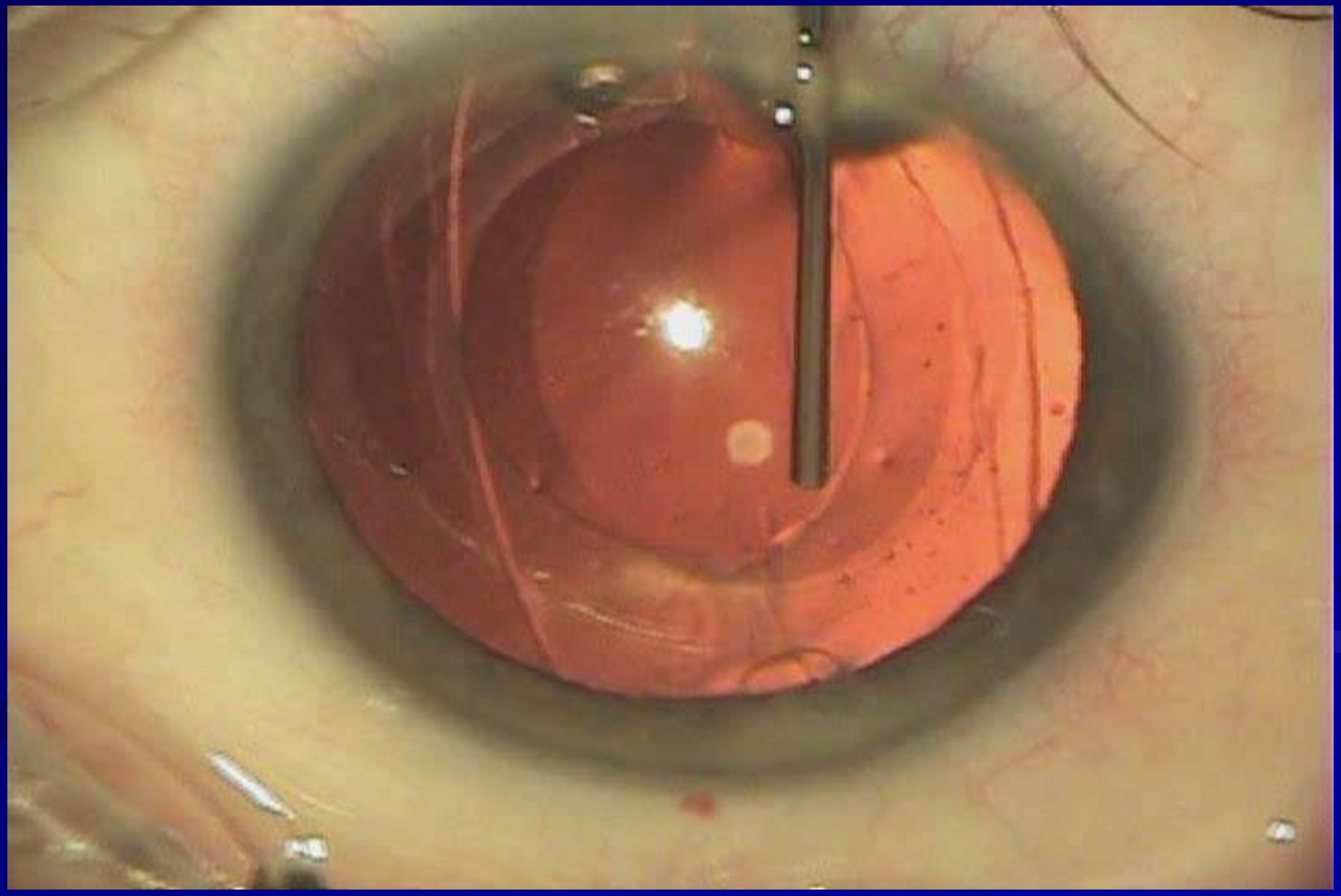
Limbal relaxing incisions



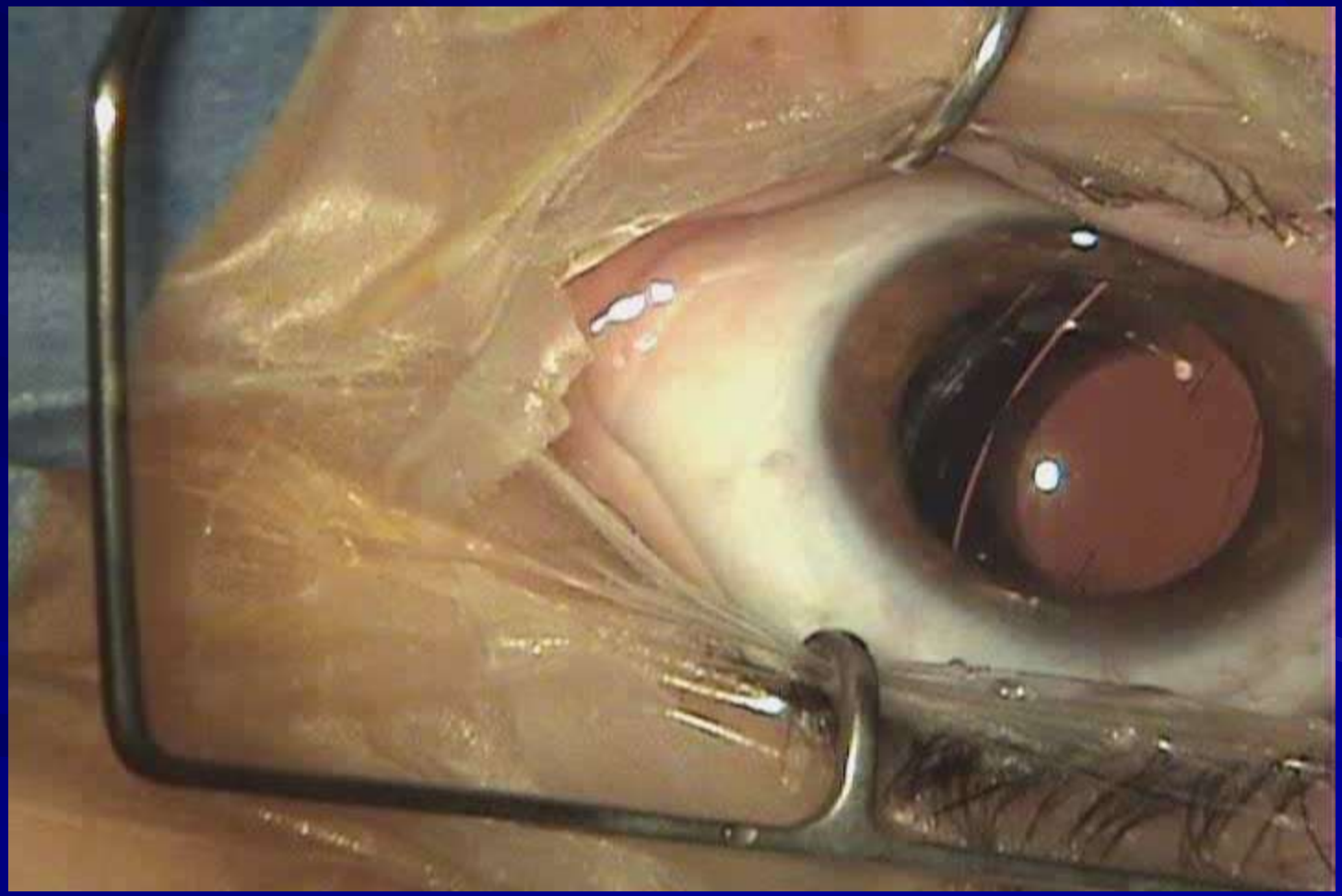
1998: Starr Toric Lens



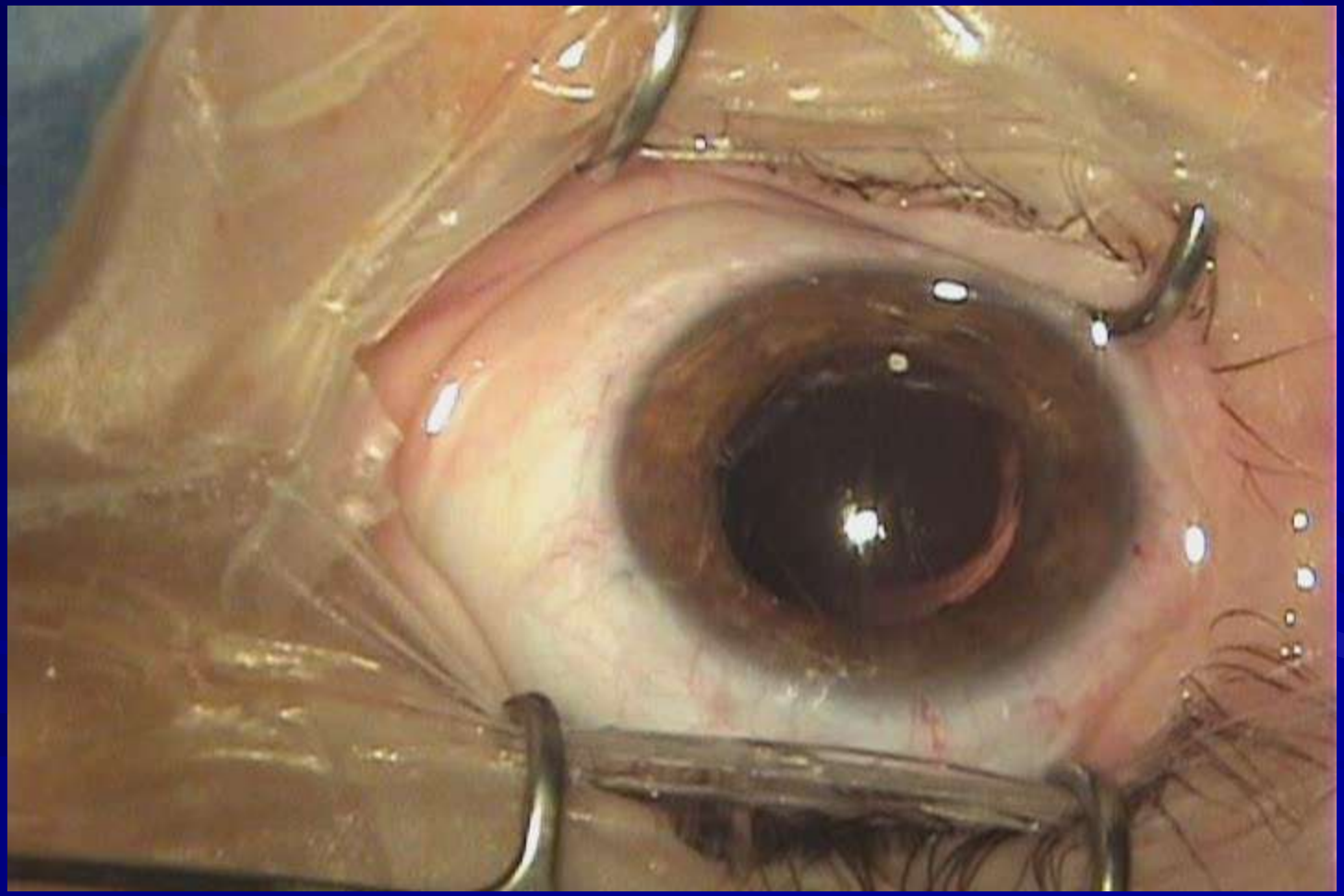
Reposition Toric IOL



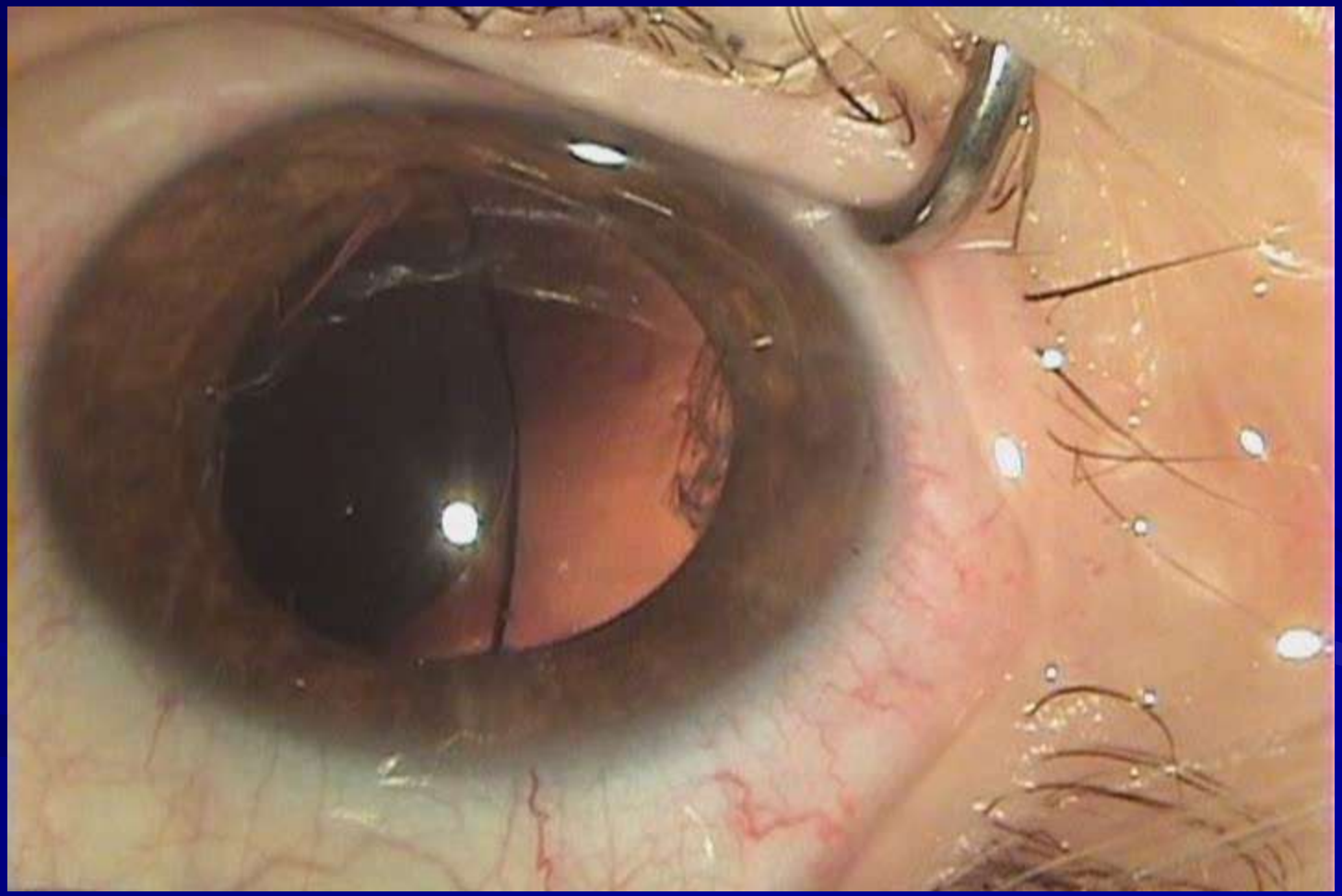
Loose toric IOL following trauma



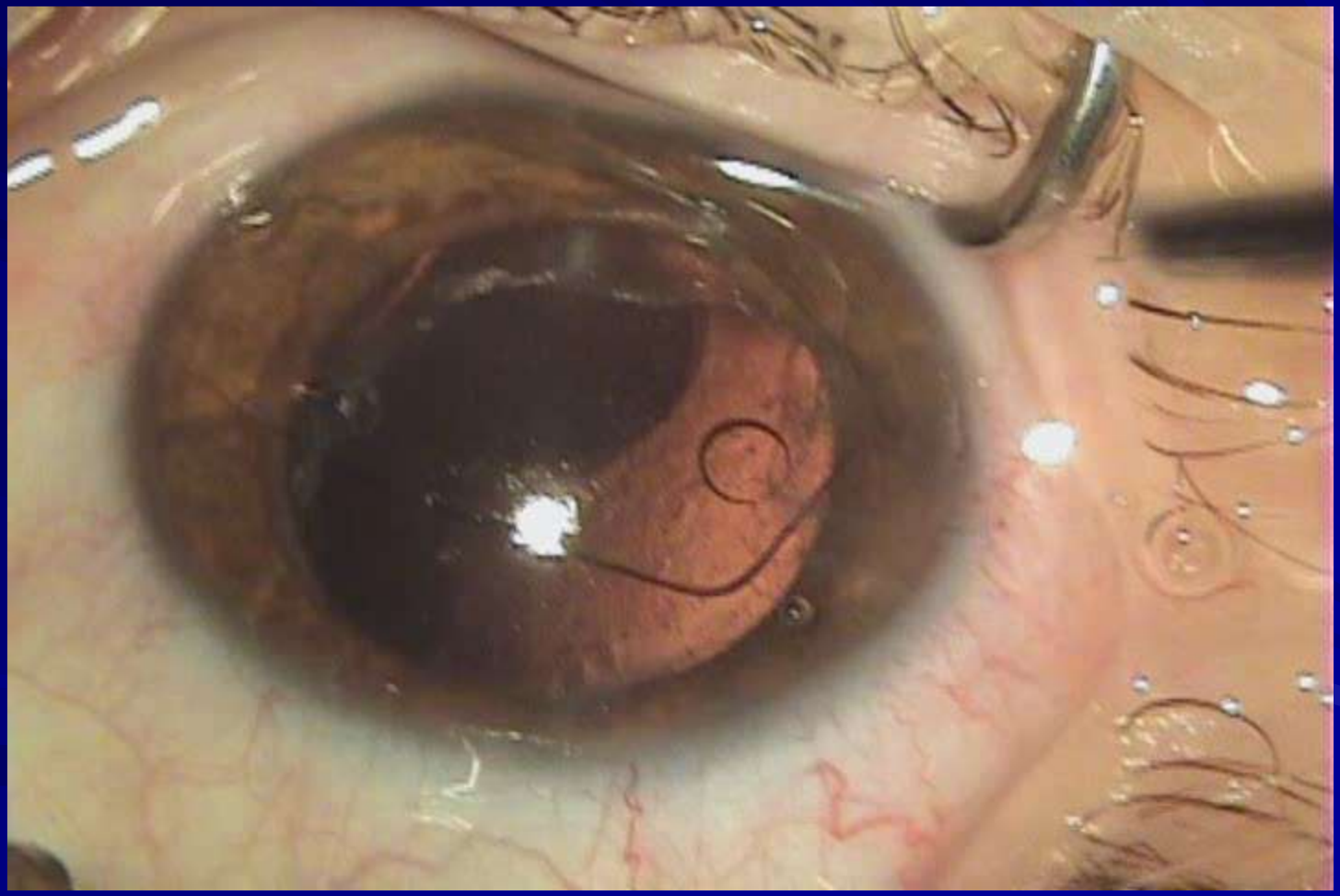
Visco-elastic positioning of a loose toric IOL



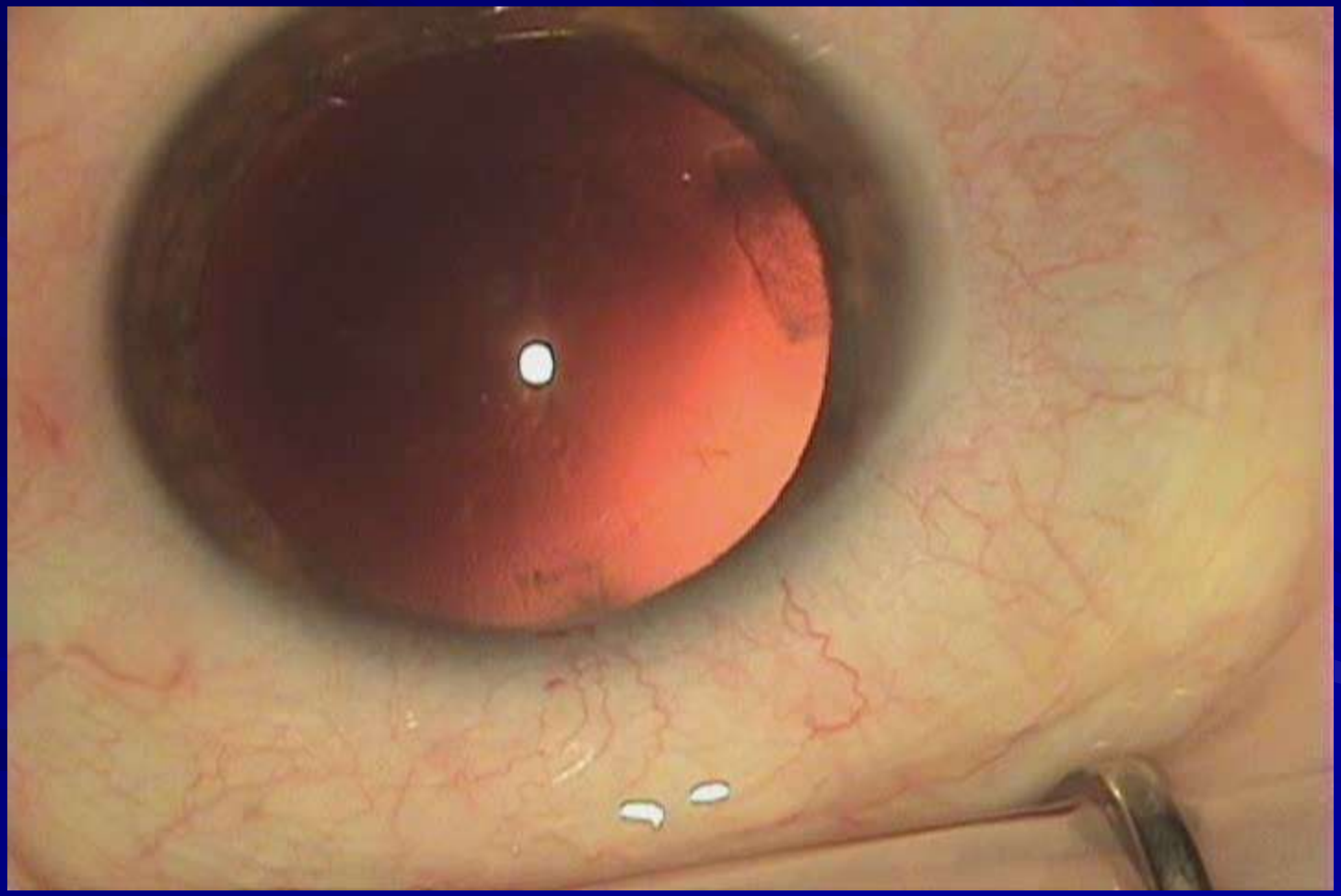
Reposition Toric IOL into the anterior chamber



Removal toric IOL with watertight incision



2005: Acrylic Toric IOL



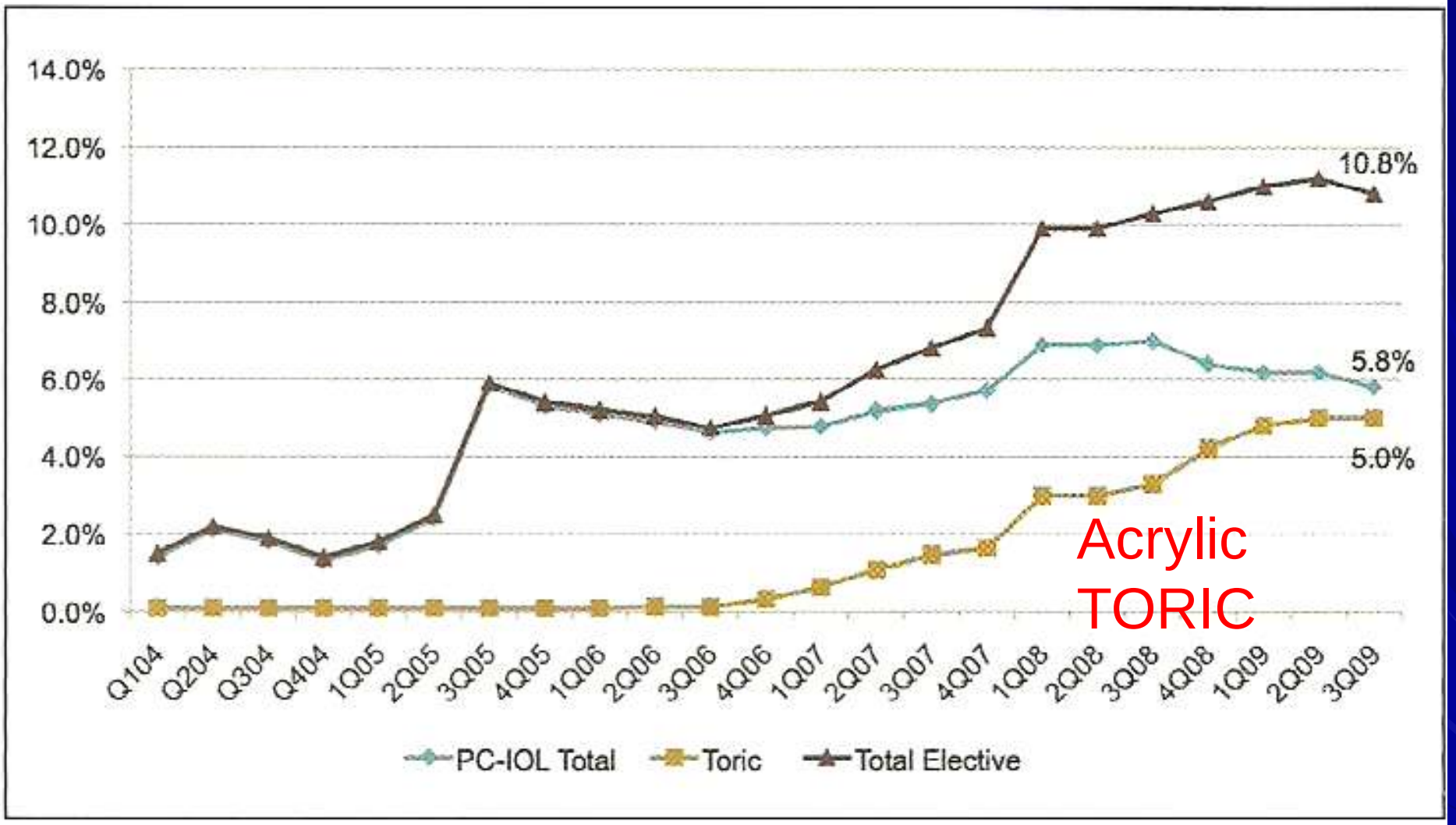
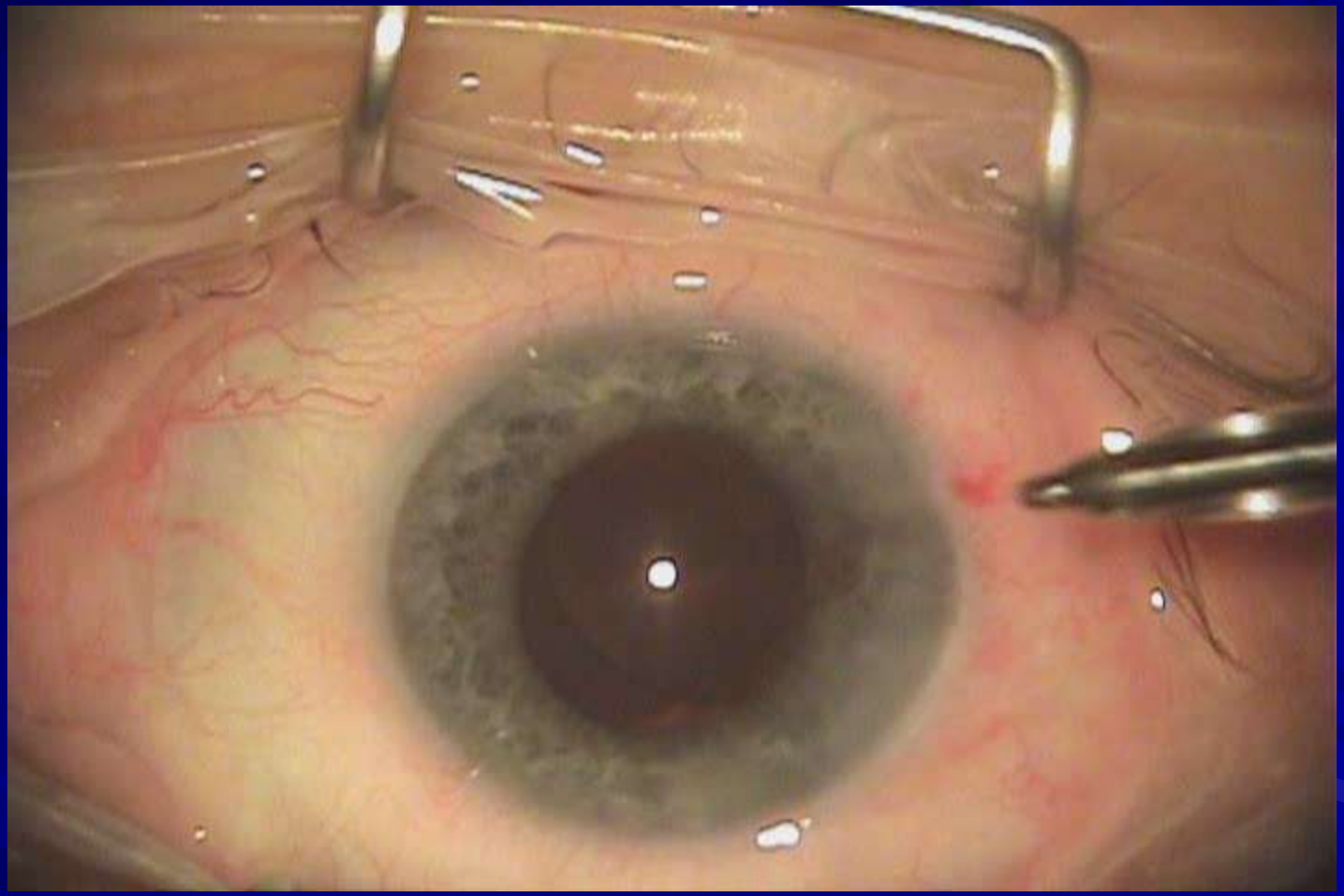
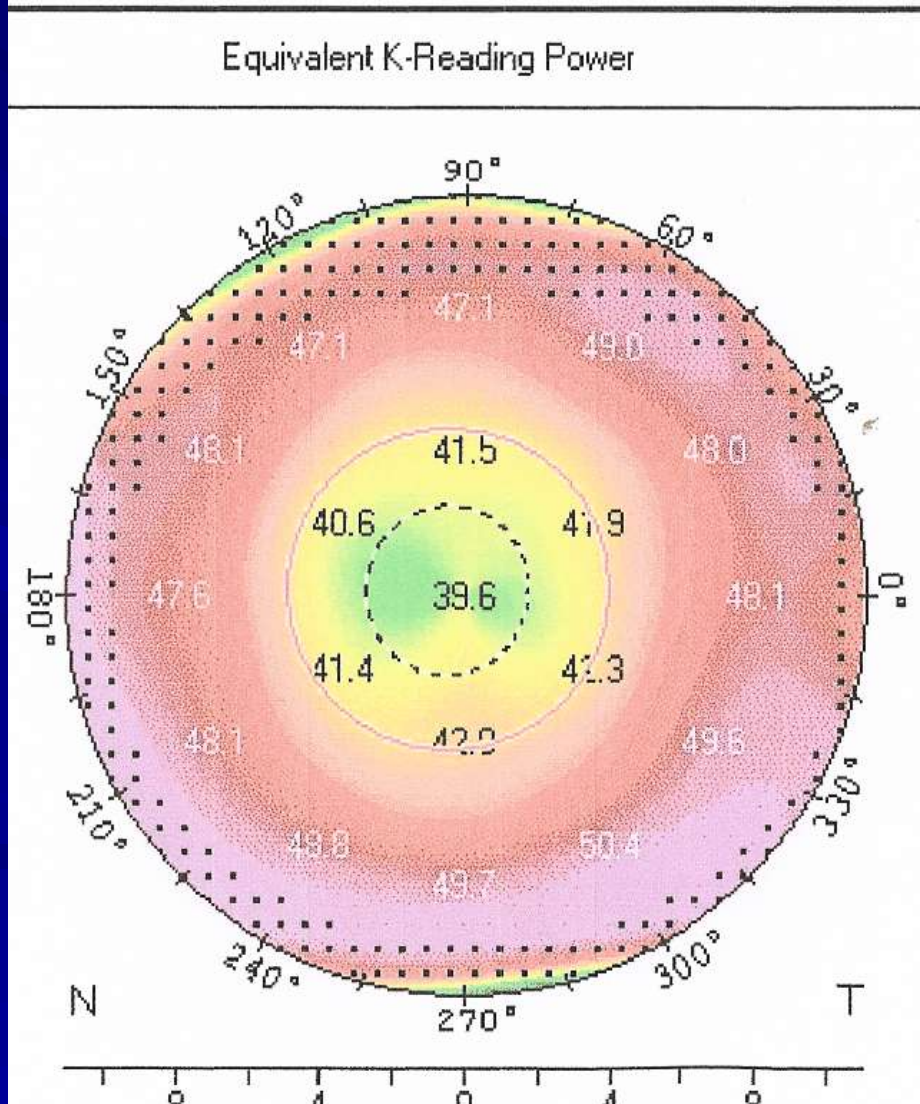


Figure 2. Quarterly elective IOL market share in the United States, from Q1 2004 through Q3 2009. *

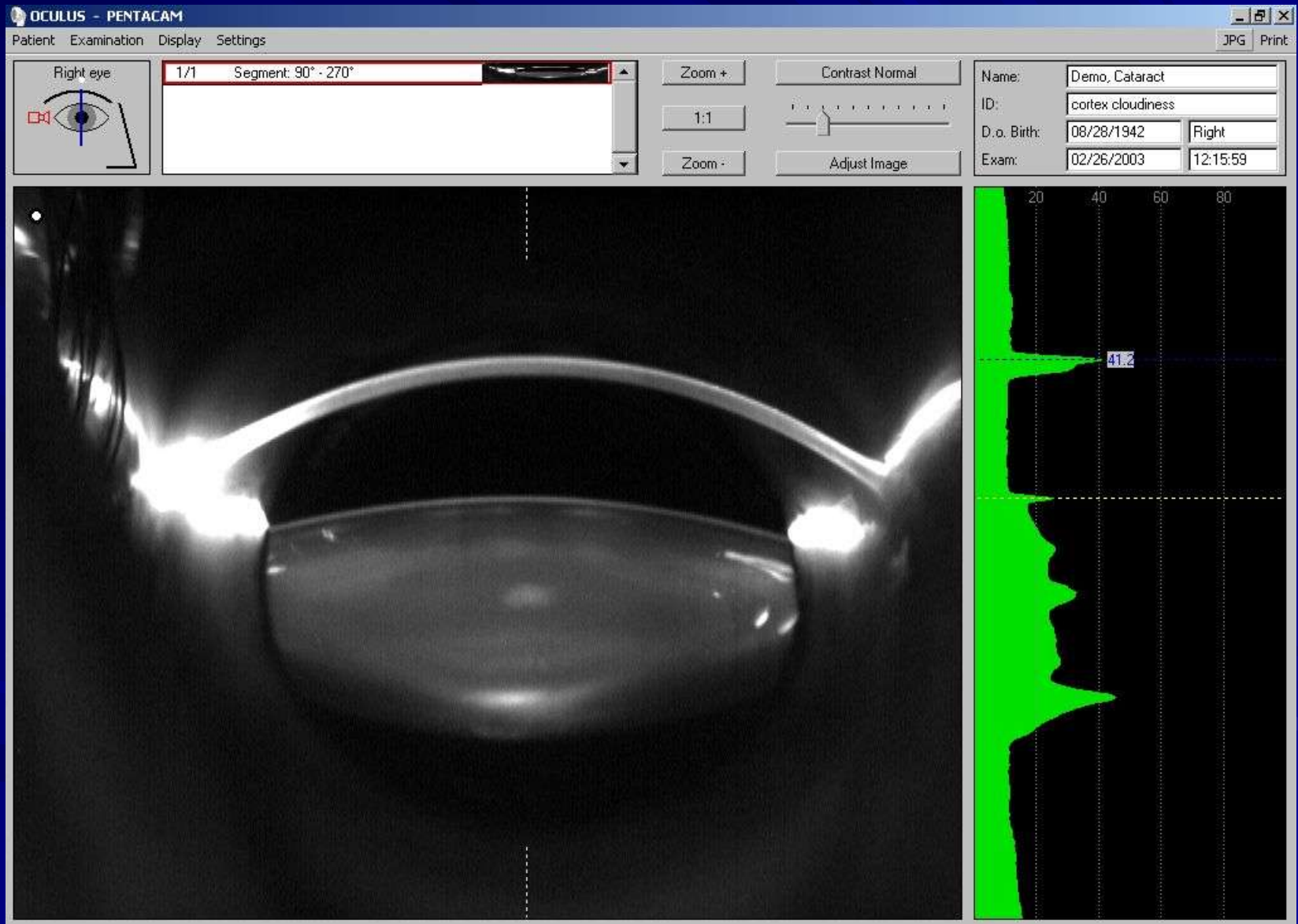


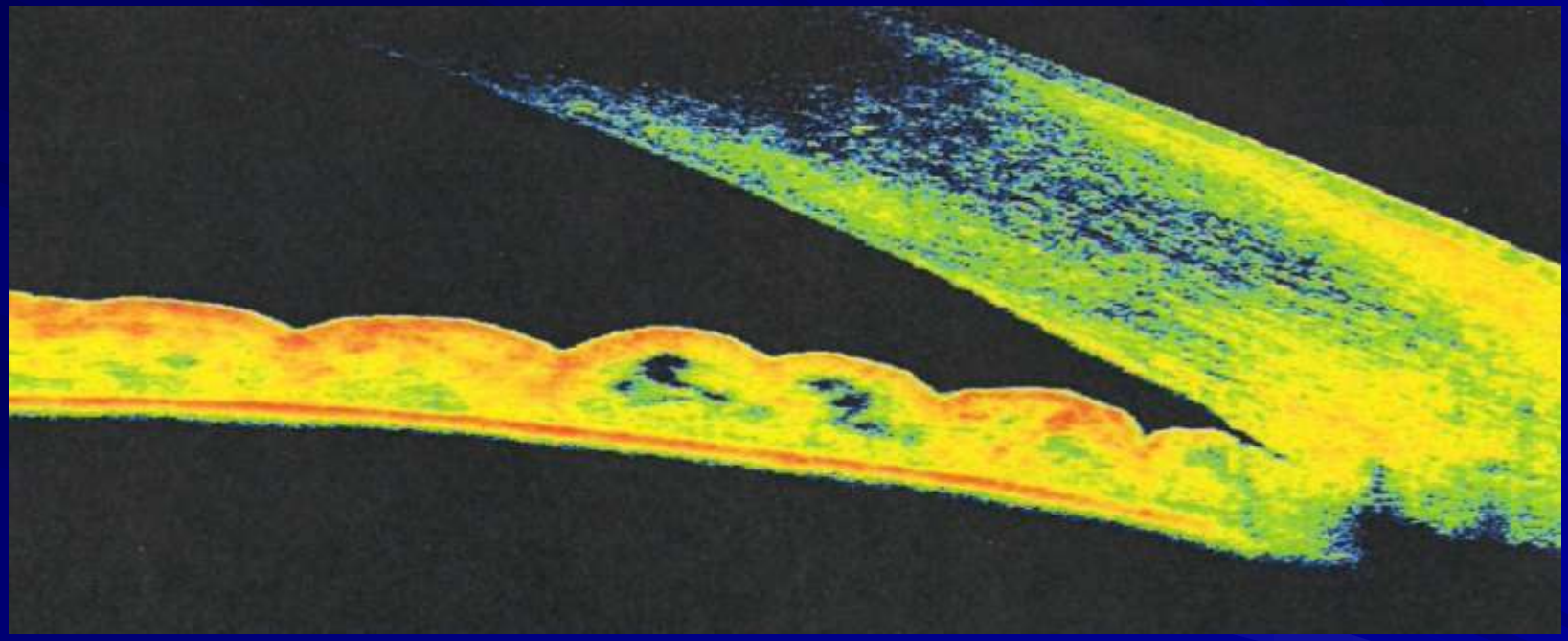
Tahiti 2010

OCULUS Pentacam: Rotating Scheimpflug Camera



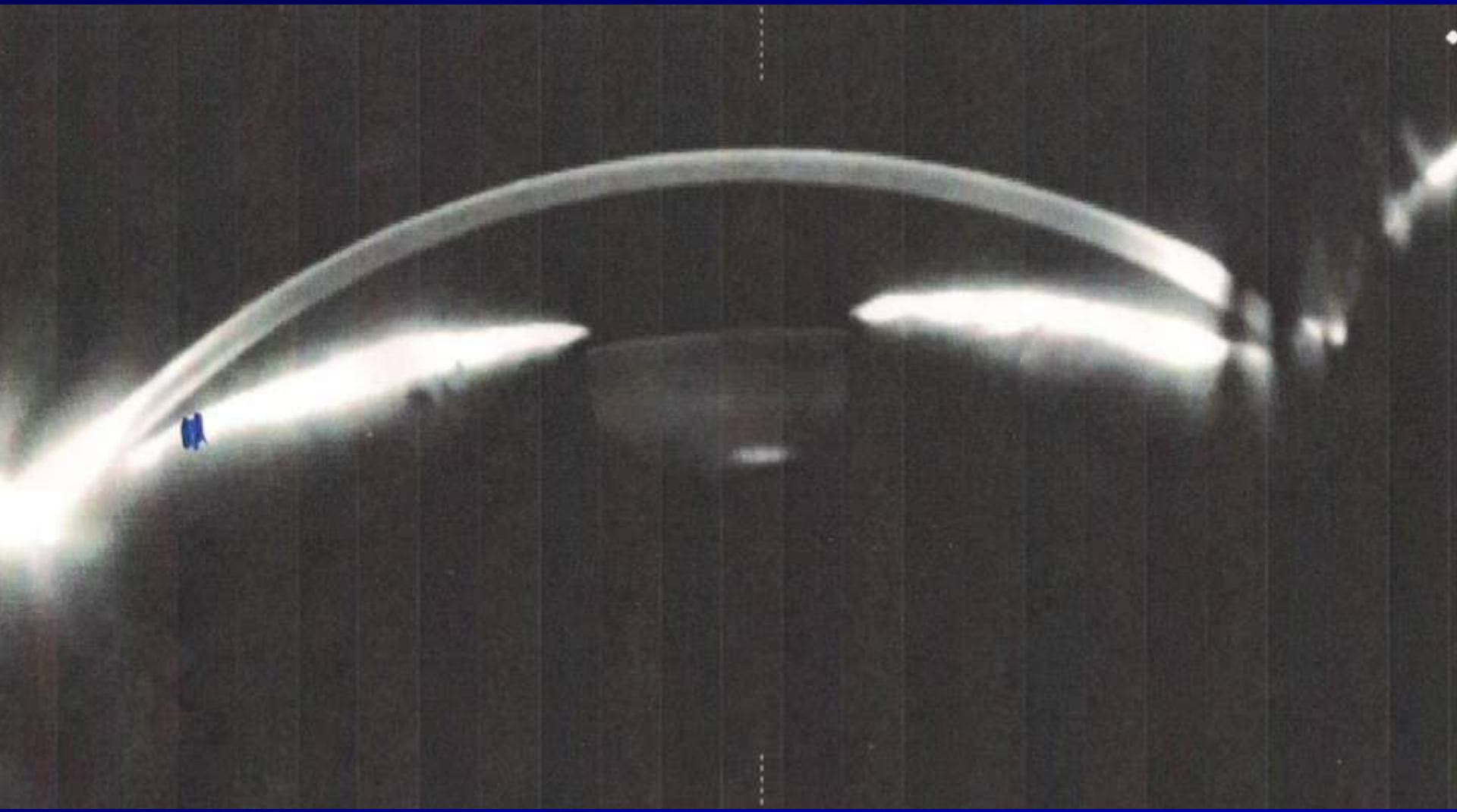
Cataract


OCULUS - PENTACAM
Patient
Examination
Display
Settings
JPG
Print
Right eye
1/1
Segment: 90° - 270°
Zoom +
1:1
Zoom -
Contrast Normal
Adjust Image
Name:
Demo, Cataract
ID:
cortex cloudiness
D.o. Birth:
08/28/1942
Right
Exam:
02/26/2003
12:15:59
20
40
60
80
41.2



Courtesy: Heartland Eye Associates

Narrow angle glaucoma

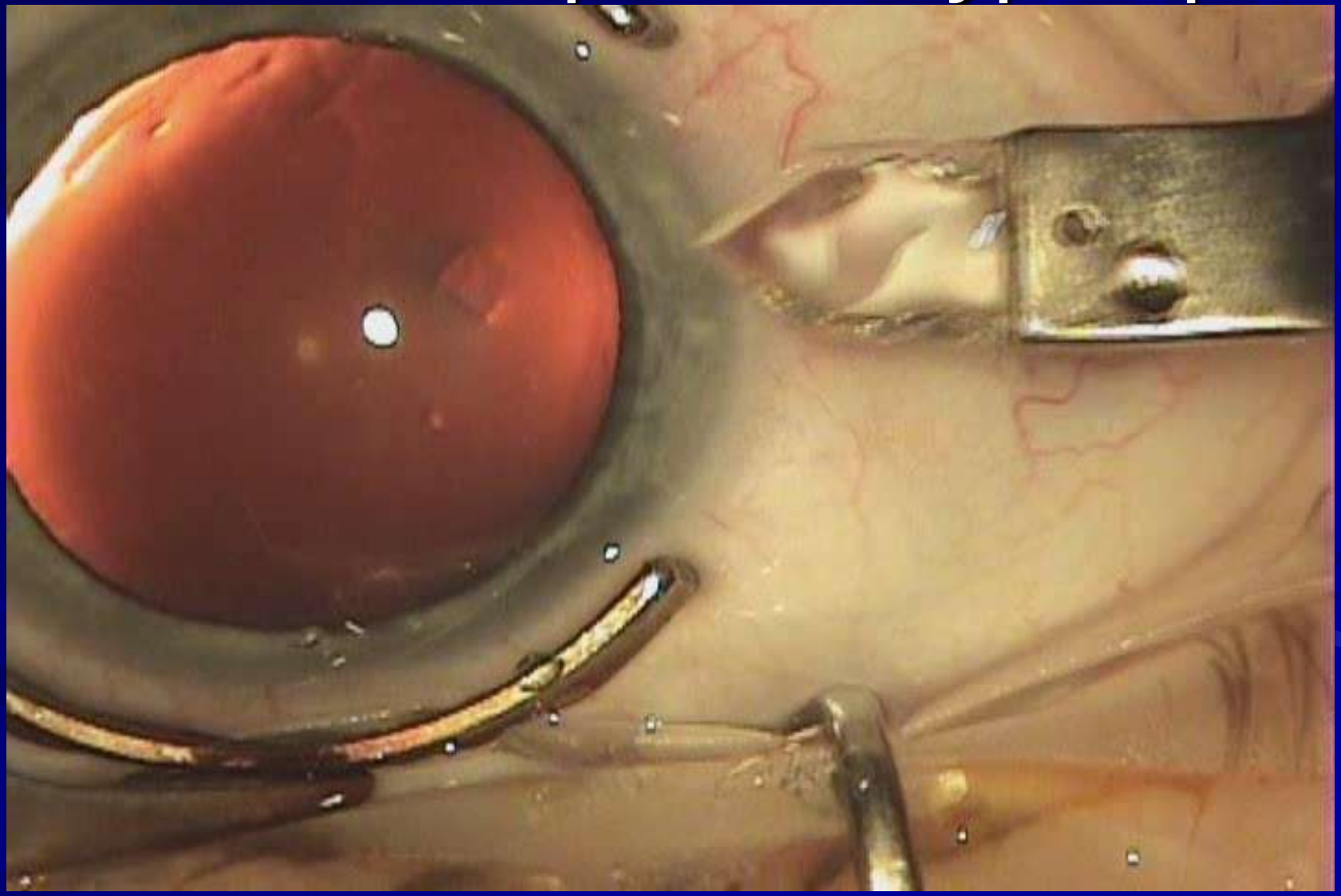


Laser iridectomy

Pre

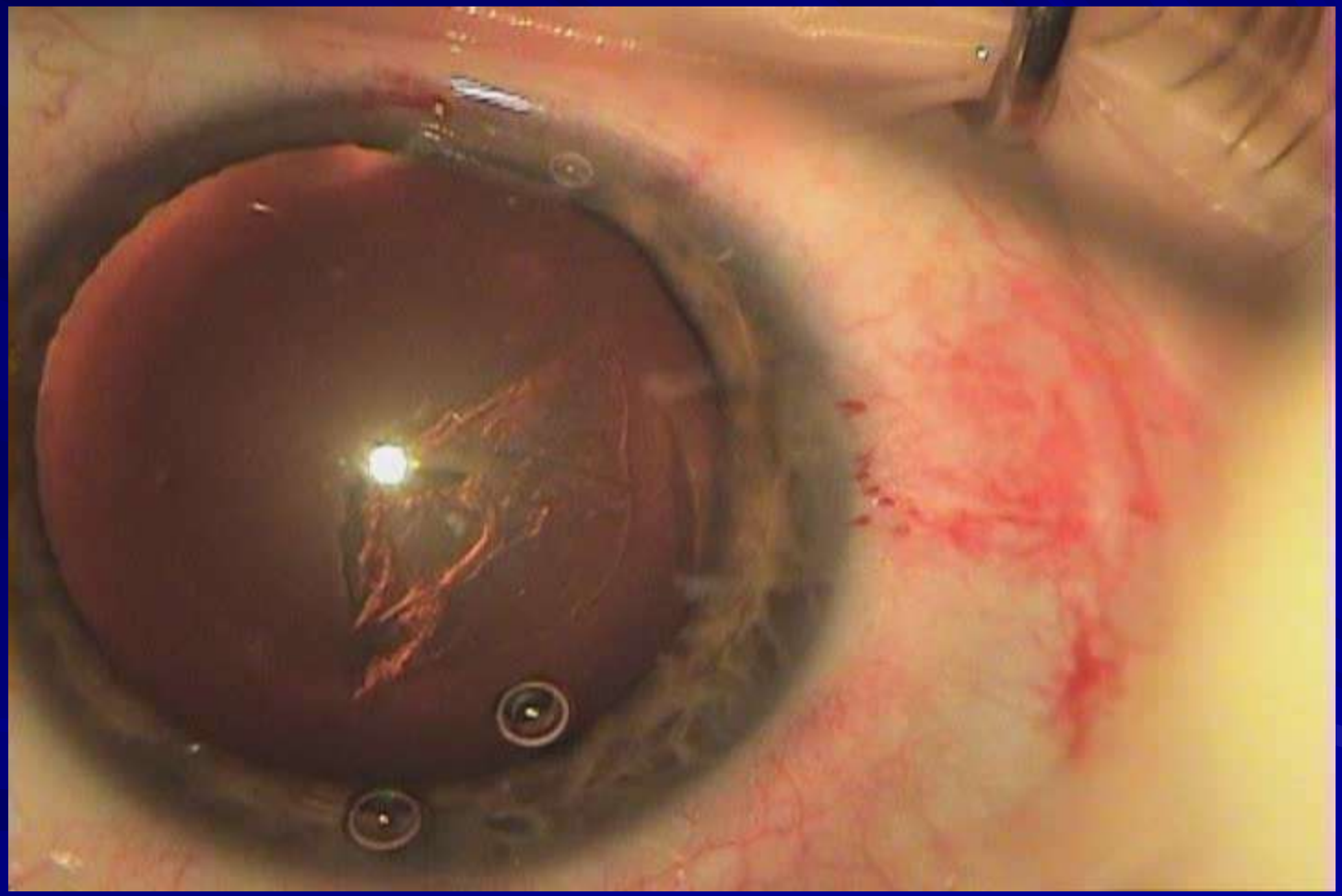
Post

“Clear lensectomy” for Anisometropia and hyperopia

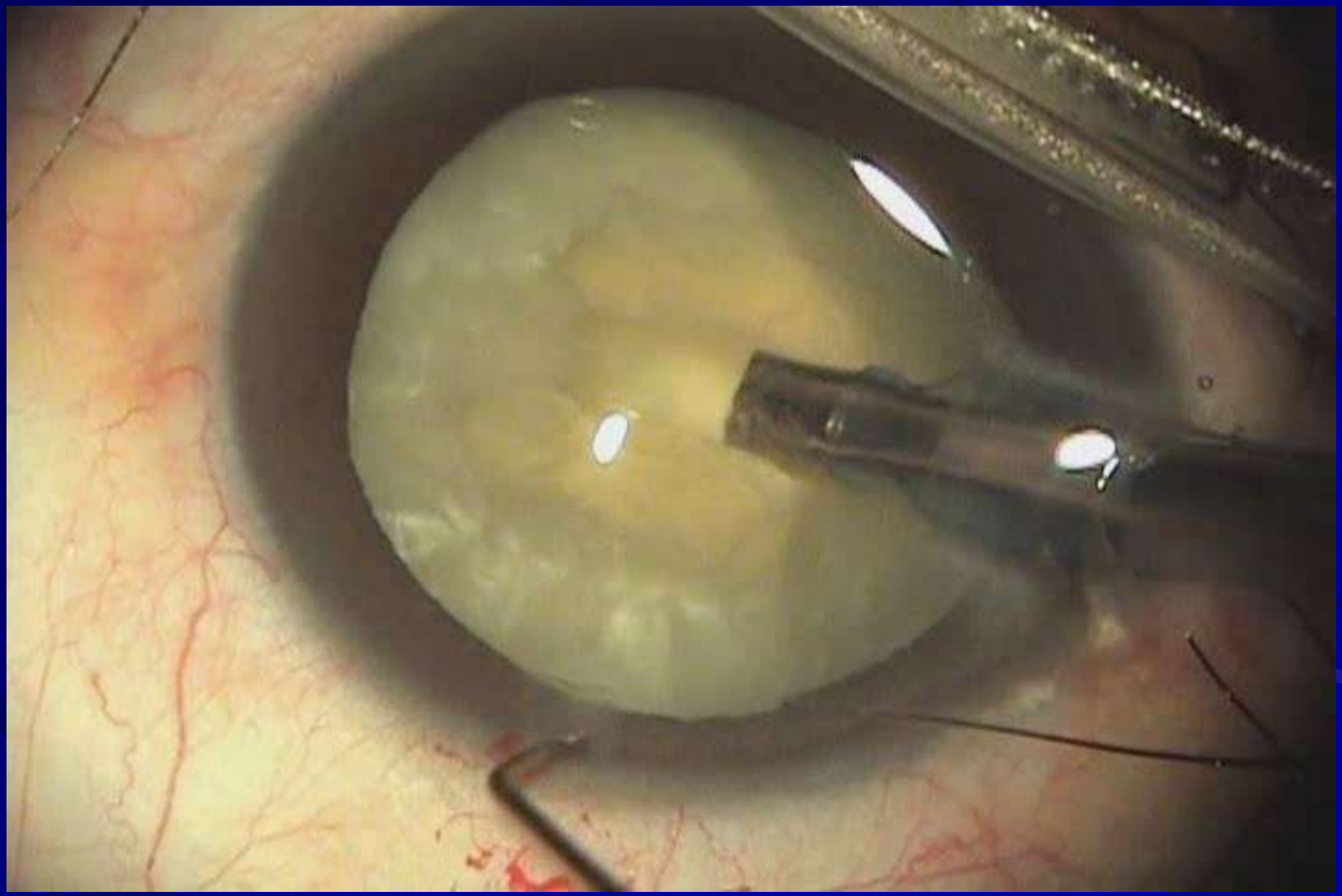


Incision with long tunnel

Equatorial misdirection

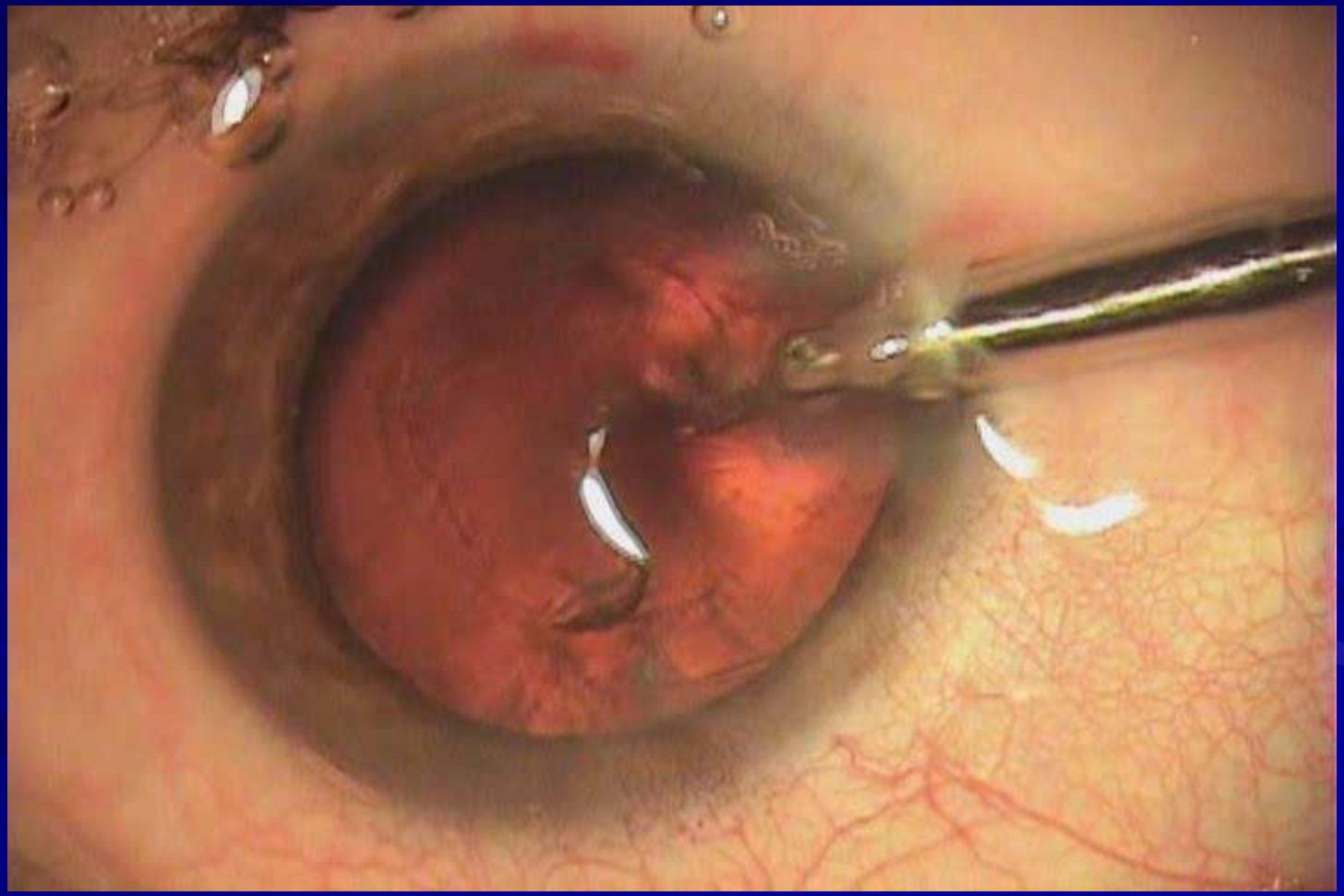


Mature cataract



Phako chop

Cortex removal



Lens capsule

•The thickness of the posterior lens capsule ranged from 4 to 9 microns and showed no significant changes with age.
•Ultimate mechanical strength of the posterior lens capsule decreased significantly with age.

Med J Malaysia. 2007 Dec;62(5):364-7.

Dropped nucleus following phacoemulsification cataract surgery. (1%)

Tajunisah I, Reddy SC.

Department of Ophthalmology, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia. tajun69@yahoo.com

Twenty two cases of dropped nucleus following 1,196 phacoemulsification procedures in cataract surgery were examined retrospectively to determine the incidence, predisposing factors and visual outcomes of this dreaded complication. All the cases underwent pars plana vitrectomy and the lens fragments were removed with phacofragmotome, vitrectomy cutter or delivered through limbus. The incidence of dropped nucleus was 1.84%.

The predisposing factors were:

hard cataracts (13.6%),
polar cataracts (9.1%), previously
vitrectomized eyes (4.5%) and
high myopia (4.5%).

The final visual outcome was > or = 6/12 in 10 eyes (45.5%); complications were seen in 5 eyes (22.7%). The interval between initial surgery and vitrectomy, the method of fragment removal and the type of lens implanted, did not influence the final visual outcome.

Ophthalmic Surg. 1992 Aug;23(8):555-6.

Extreme deepening of the anterior chamber during phacoemulsification.

Zauberman H.

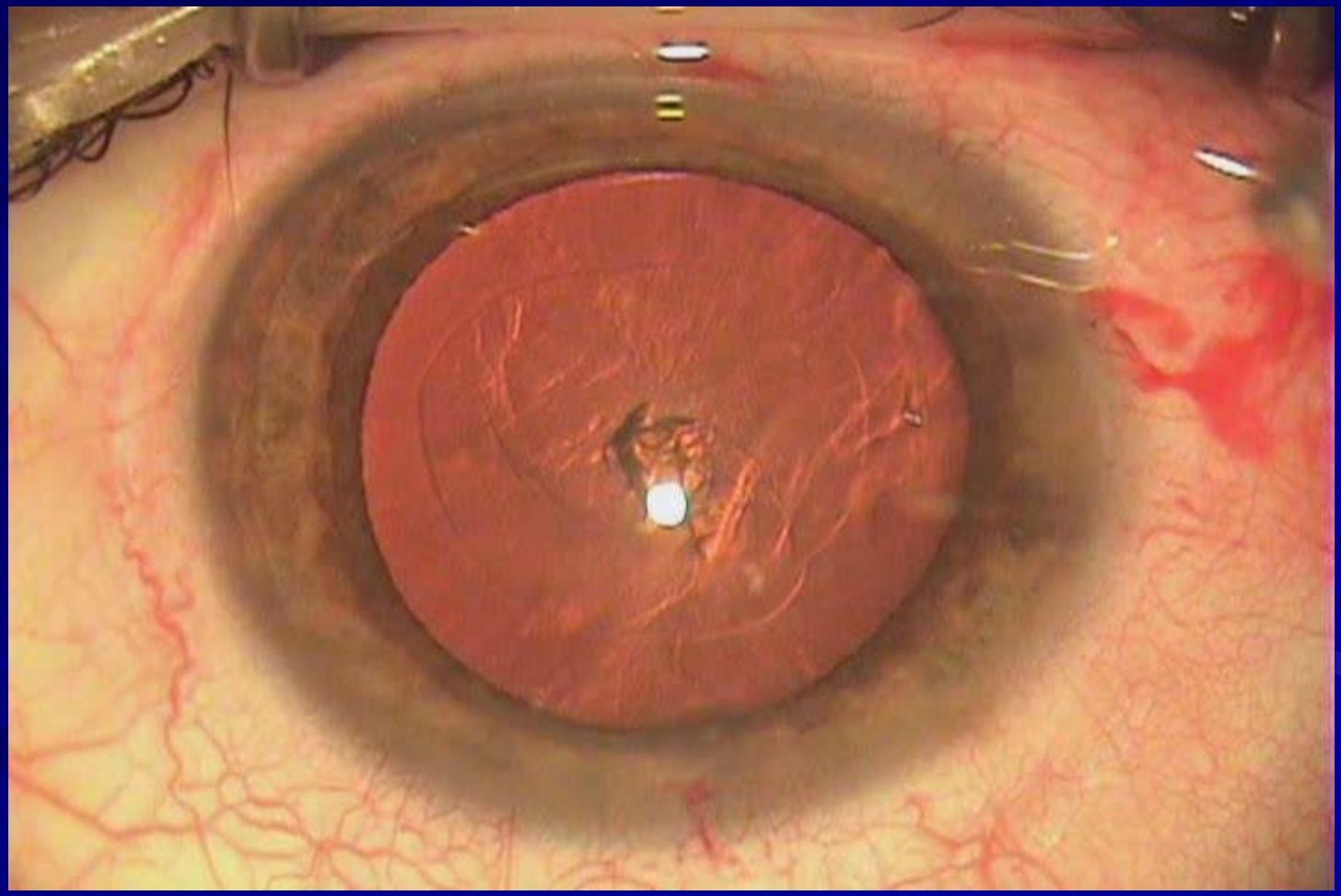
Department of Ophthalmology, Hadassah University Hospital, Jerusalem, Israel.

An unusual deepening of the anterior chamber during a phacoemulsification procedure was observed in 3 patients with cataracts:

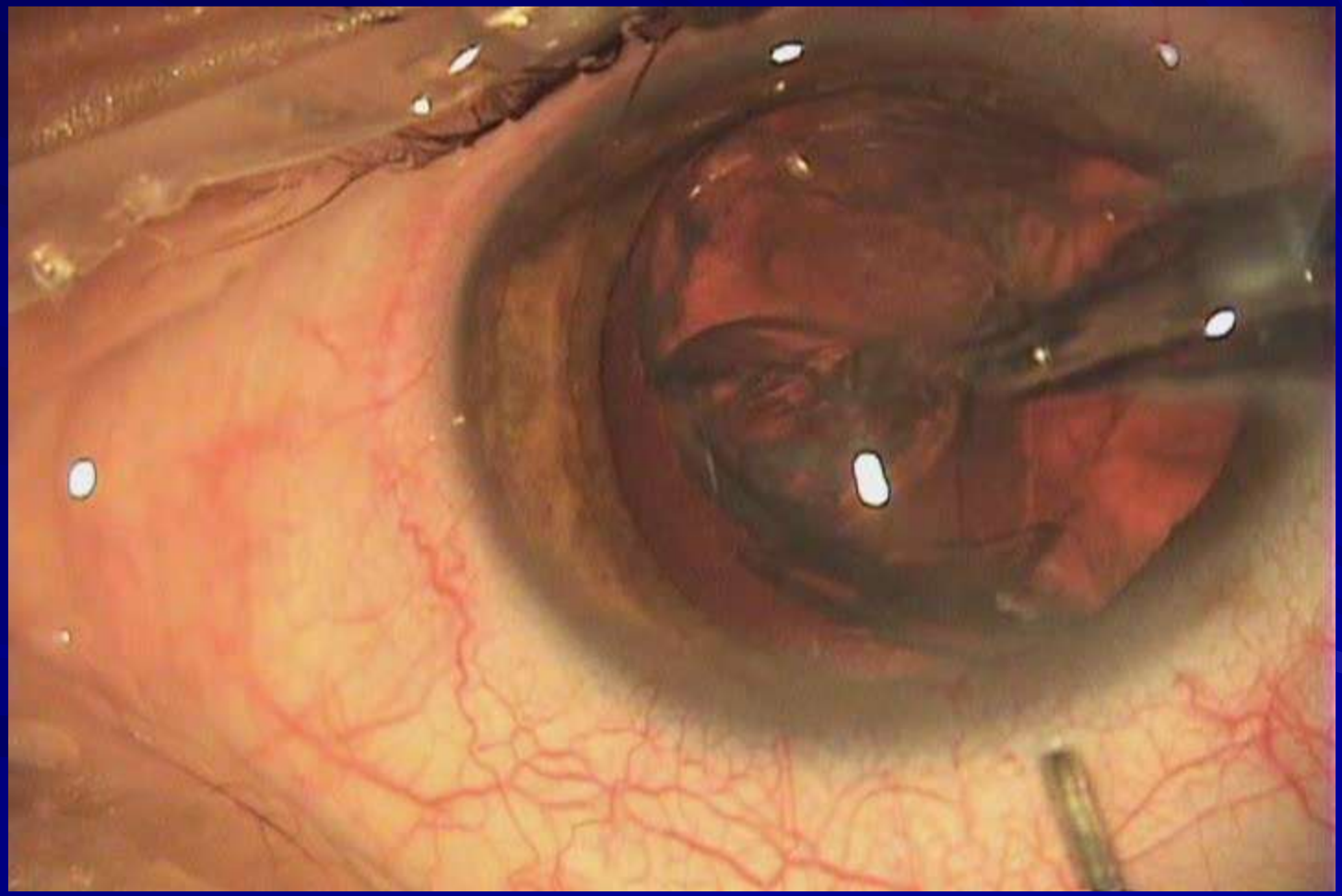
- high myopia,
- following a vitrectomy procedure,
- pseudoexfoliation syndrome.

This deepening hindered emulsification of the nucleus in the posterior chamber. Early delivery of the nucleus from the capsular bag allowed phacoemulsification to proceed at the pupillary level. The "sinking" of the lens toward the vitreous cavity appears to be related to a lack of vitreous pressure due to liquefaction, or to loosening of the zonular support in the pseudoexfoliation syndrome.

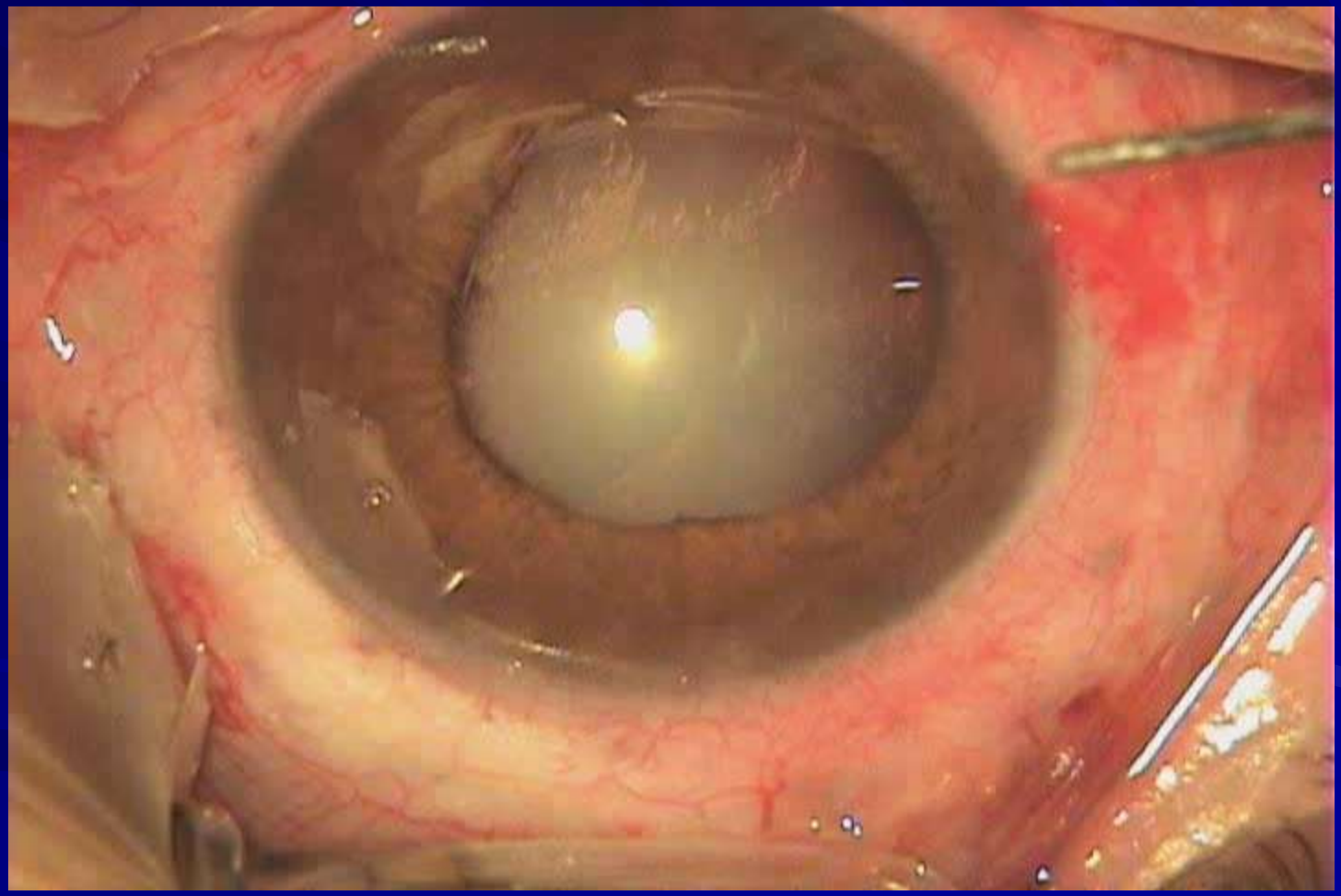
Hydro-dissection and prolapse into the anterior chamber



Lens “rolled” into the anterior chamber



S/P Vitrectomy with PERFLUORON™* Perfluoro-n-octane liquid



Cook’s Bay , Mo’orea 2010

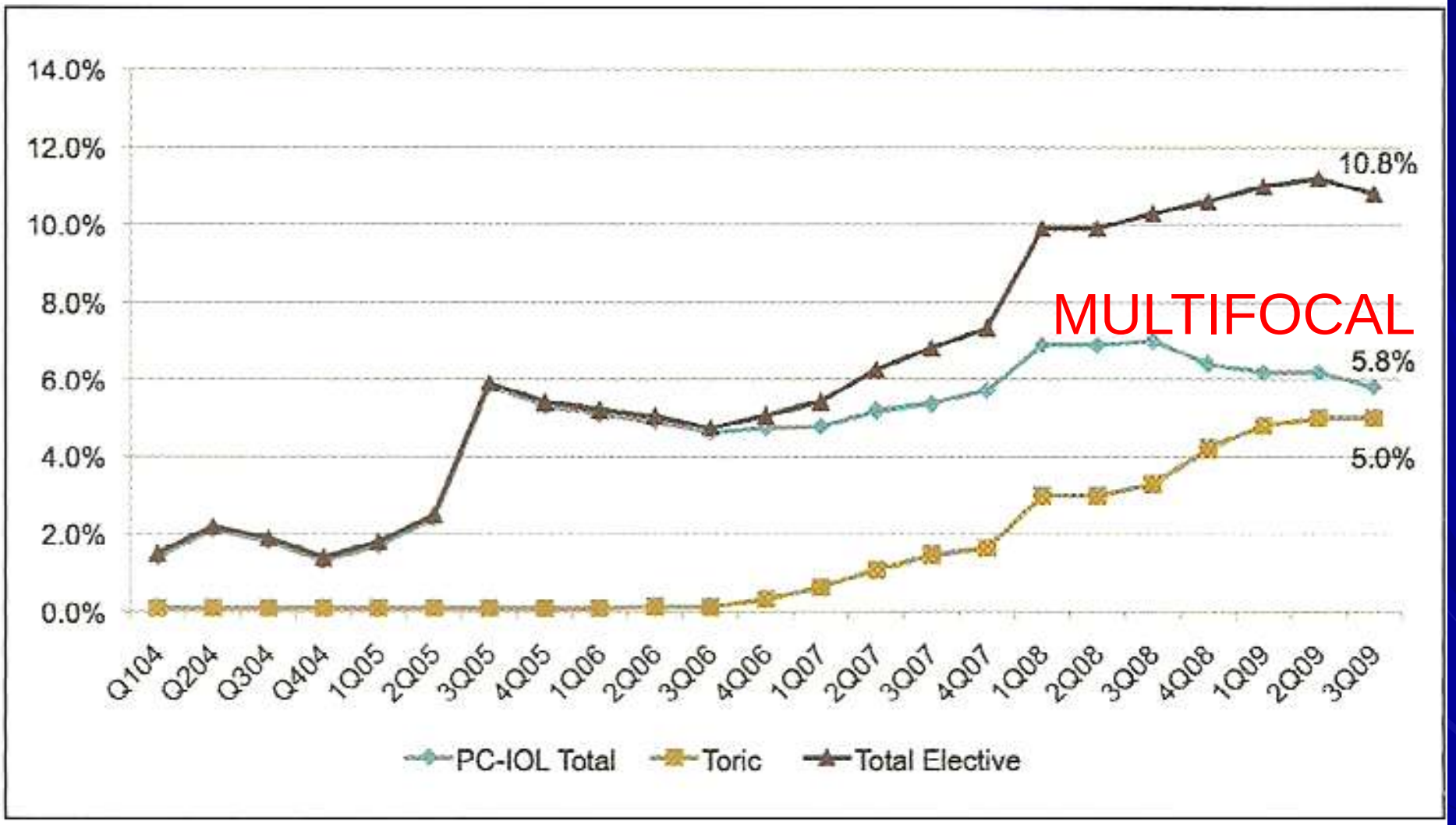


Figure 2. Quarterly elective IOL market share in the United States, from Q1 2004 through Q3 2009. *

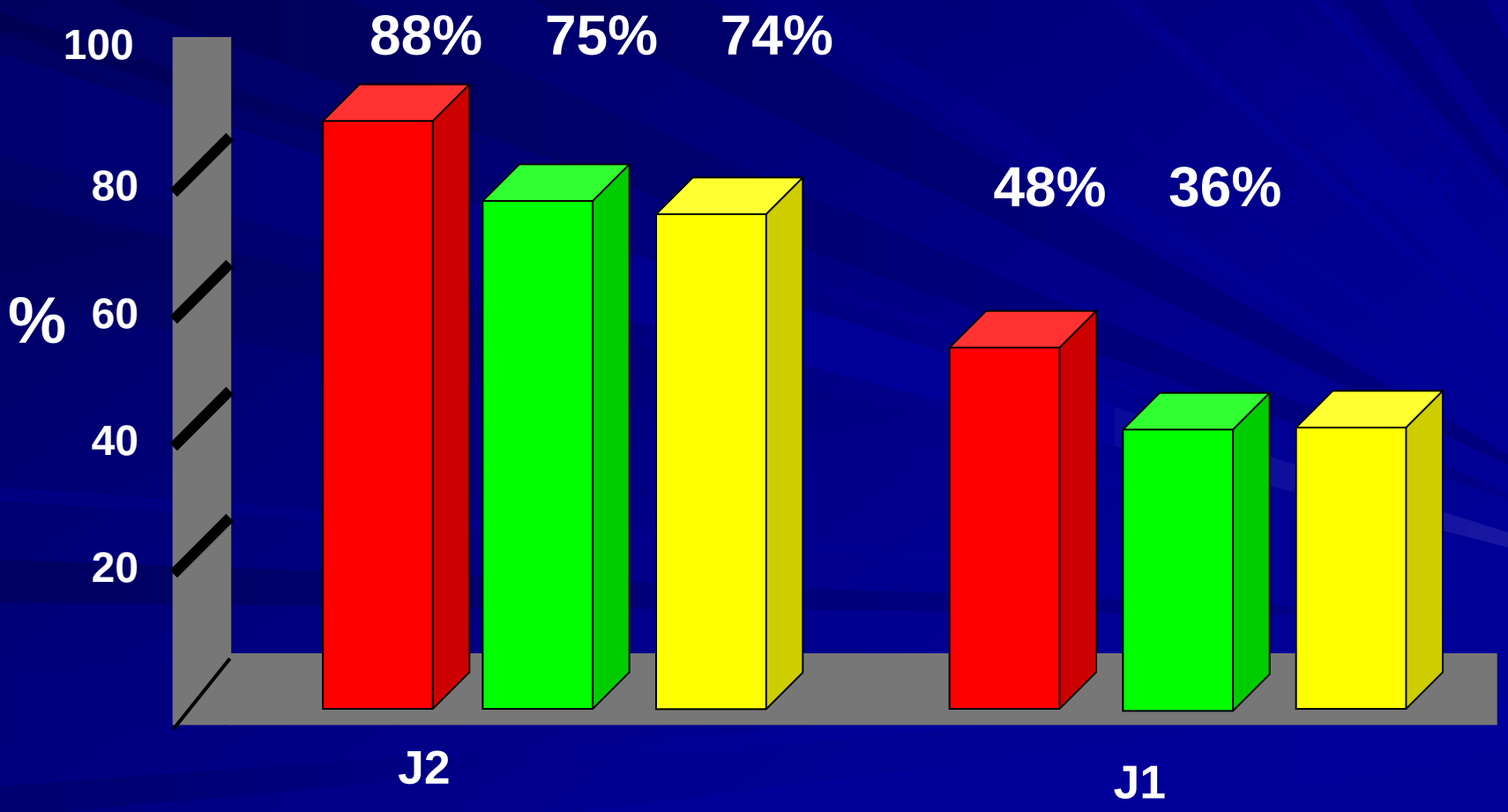
2004
J Cataract Refract Surg. Apr;30(4):769-74.

Ocular dominance and patient satisfaction after MONOVISION induced by intraocular lens implantation.

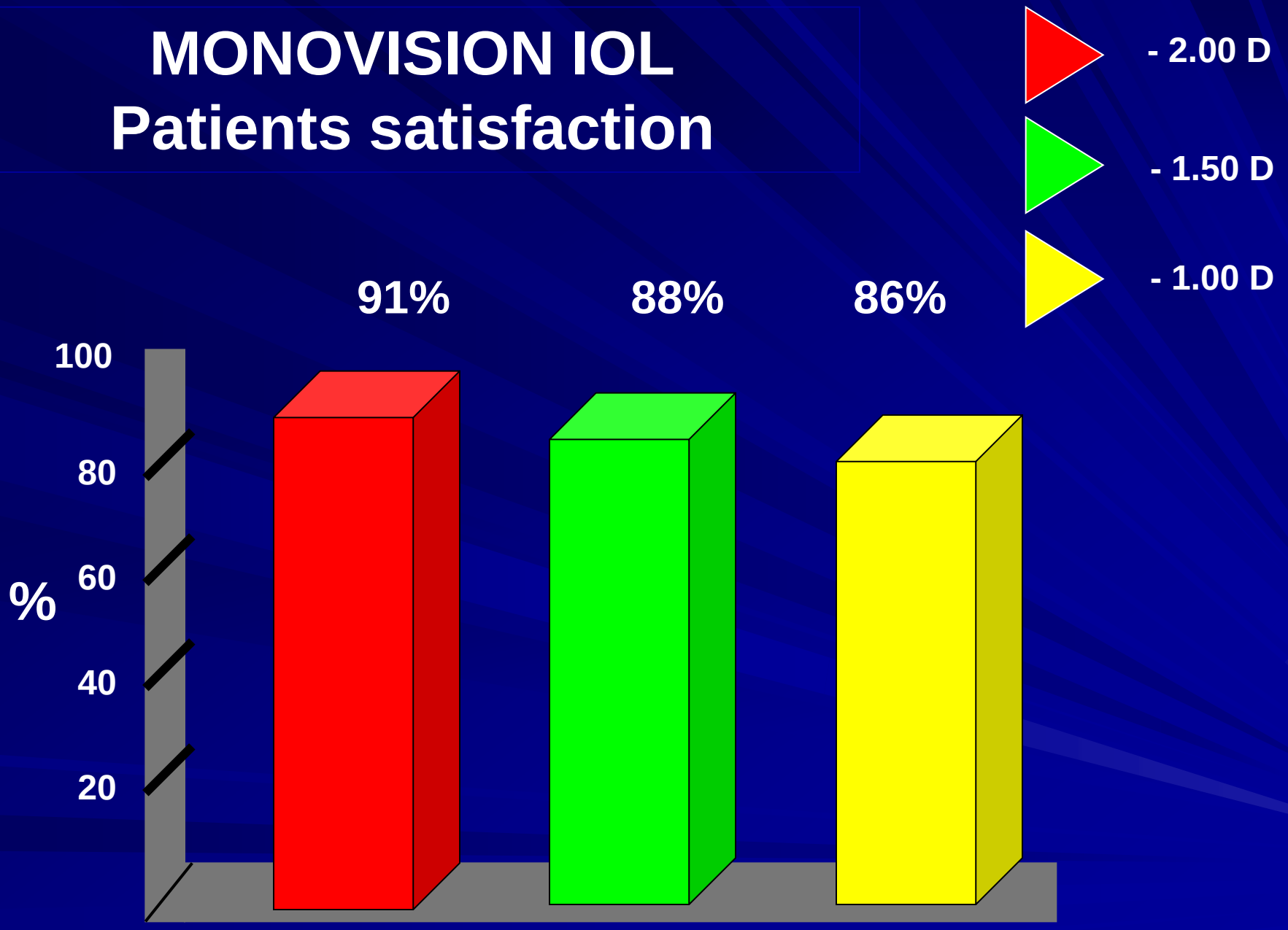
Handa T, Mukuno K, Uozato H, Niida T, Shoji N, Minei R, Nitta M, Shimizu K.
Doctor's Program of Medical Science, Kitasato University Graduate School, 1-15-1 Kitasato, Sagamihara-shi 228-8555, Japan. tomoya.handa@nifty.com
PURPOSE: To elucidate the relationship between ocular dominance and patient satisfaction with monovision induced by intraocular lens implantation. SETTING: Eye Clinic, Kitasato University School of Medicine Hospital, Sagamihara, Kanagawa, Japan. METHODS: The durations of exclusive visibility of dominant- and nondominant-eye targets were measured in 16 patients with successful monovision and 4 patients with unsuccessful monovision to determine the characteristics of ocular dominance. The dominant eye was determined using the hole-in-card test (sighting dominance). The contrast of target in nondominant eye was fixed at 100%; the contrast of target in the dominant eye varied (ie, 100% to 80% to 60% to 40% to 20%) using rectangular gratings of 2 cycles per degree that were 4 degrees in size. RESULTS: In the successful monovision group, the reversal thresholds (ie, exclusive visibility of the nondominant eye crosses over that of the dominant eye) were displayed only at low decreasing contrast (80% and 60%). However, in the unsuccessful monovision group, the reversal thresholds were at high decreasing contrast (20%) or not at all. The reversal thresholds in patients with unsuccessful monovision were at a significantly lower contrast than in patients with successful monovision (P<.05). CONCLUSIONS: Success and patient satisfaction in monovision patients were significantly influenced by the magnitude of ocular dominance. The balance technique seems to be a good method to evaluate the quantity of ocular dominance and prospectively evaluate the monovision technique.

Monovison IOL:
Visual acuity

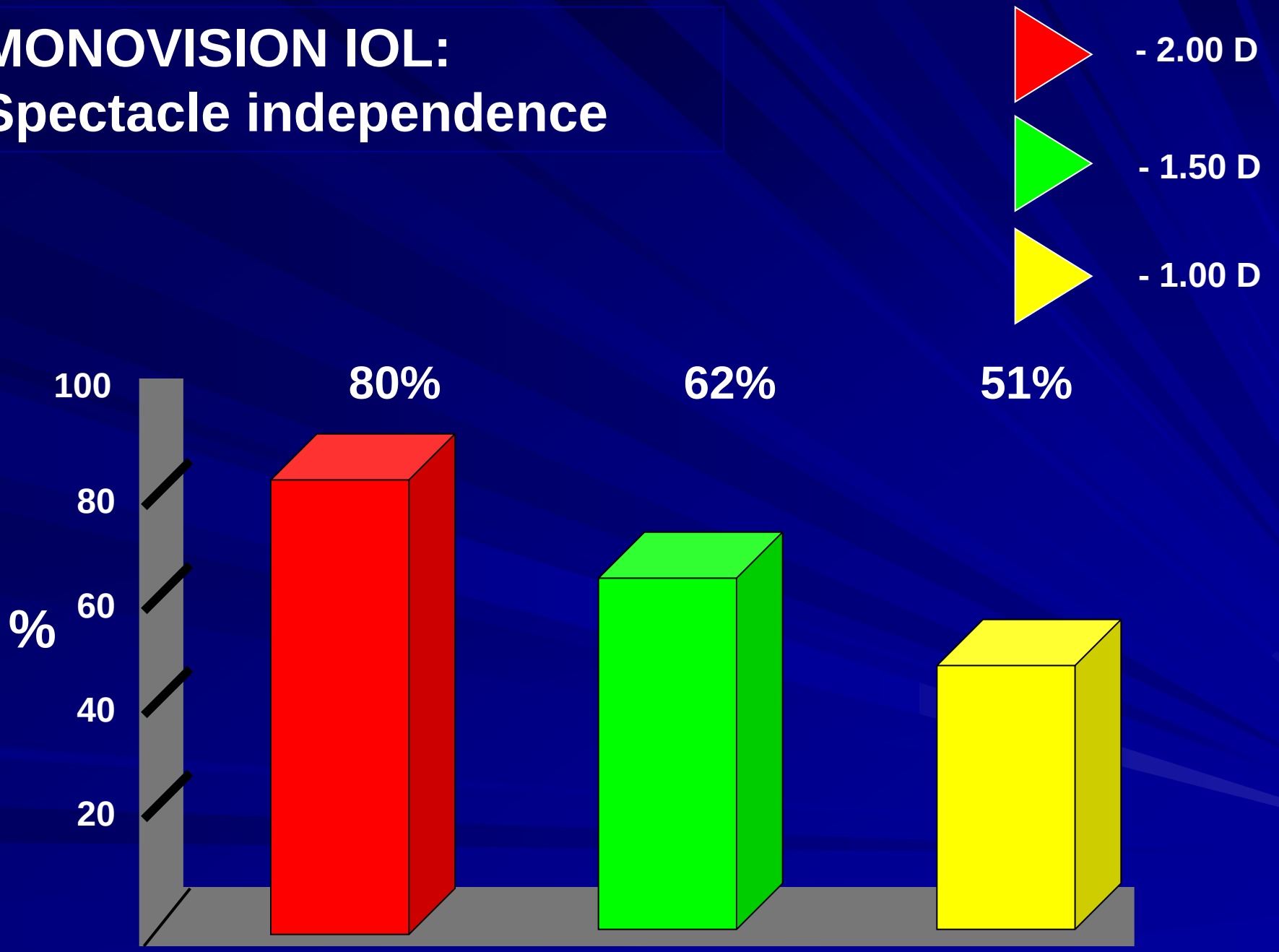
Binocular near UCVA



MONOVISION IOL
Patients satisfaction



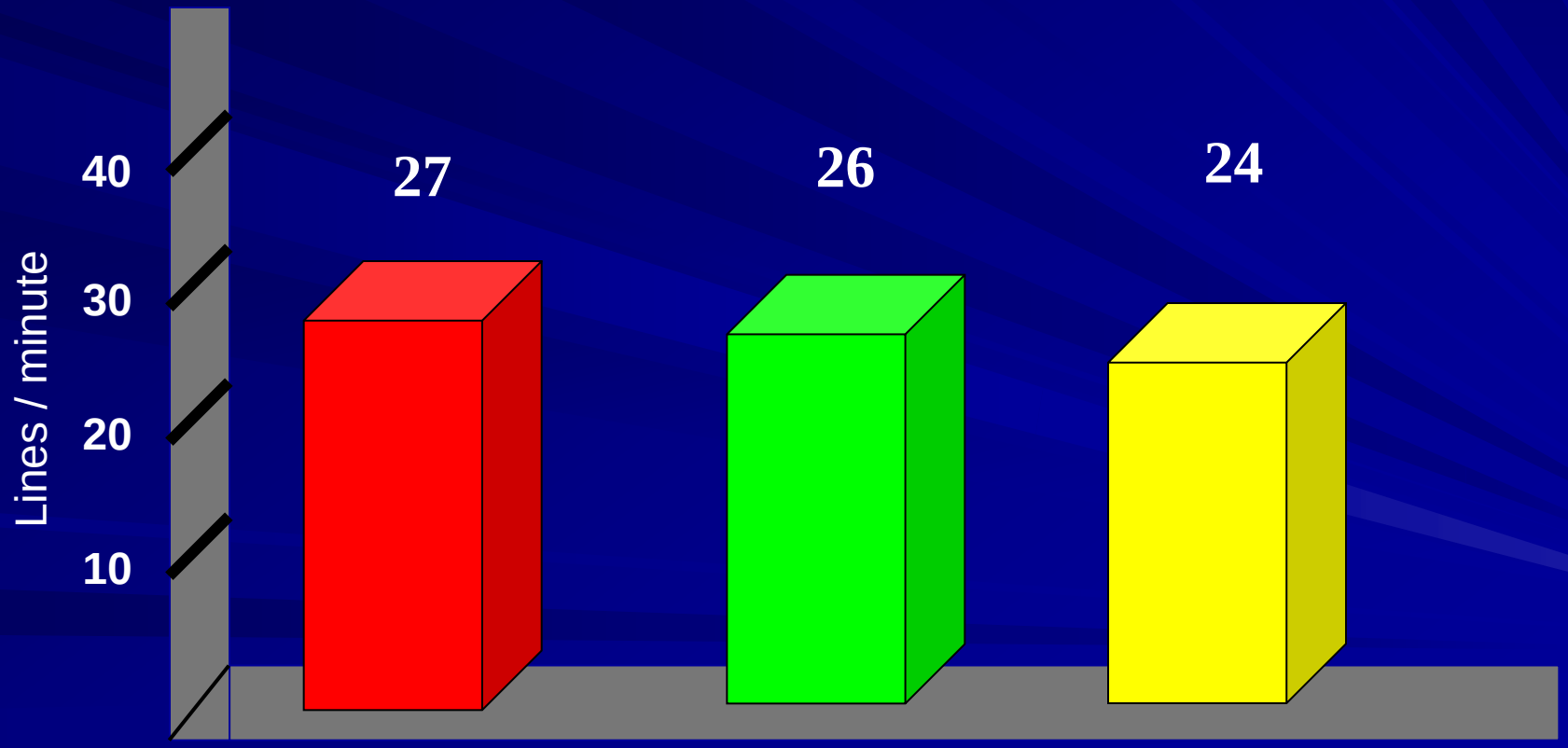
MONOVISION IOL:
Spectacle independence



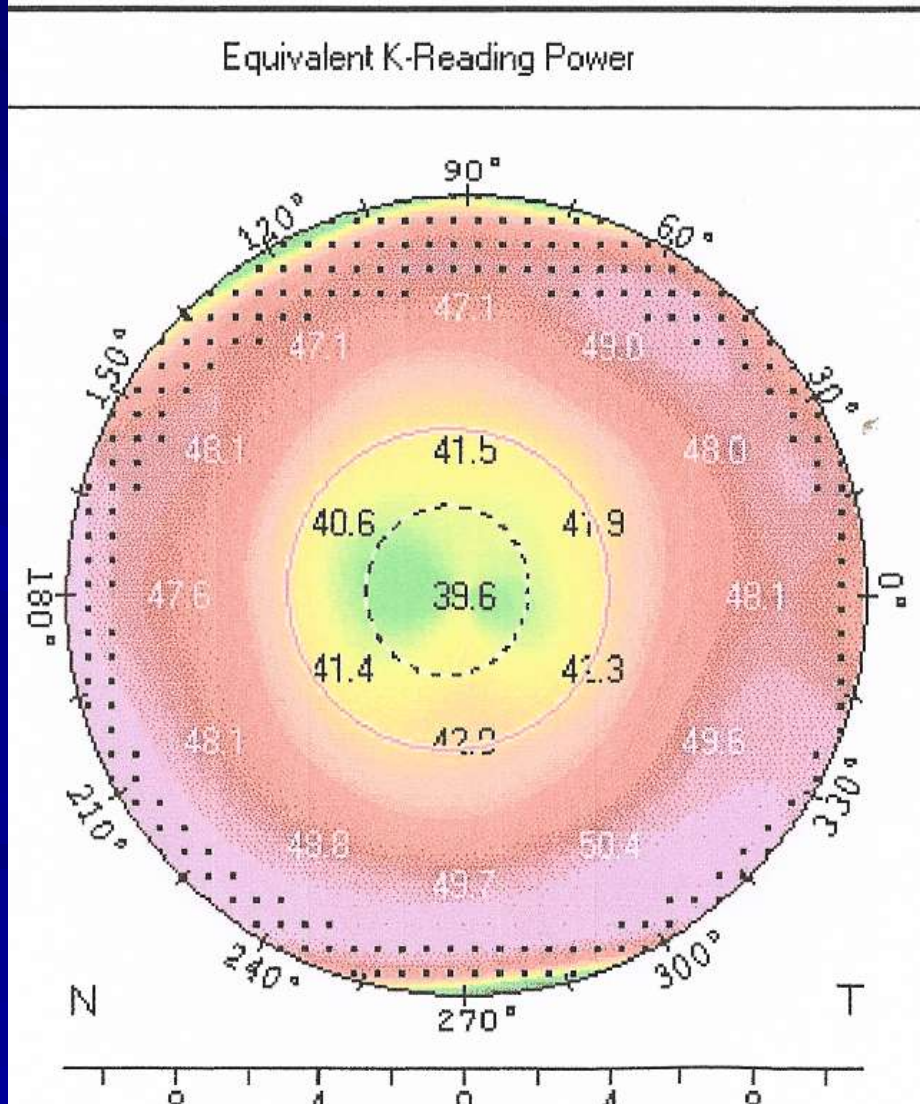
MONOVISION IOL: Reading Speed

- 2.00 D
- 1.50 D
- 1.00 D

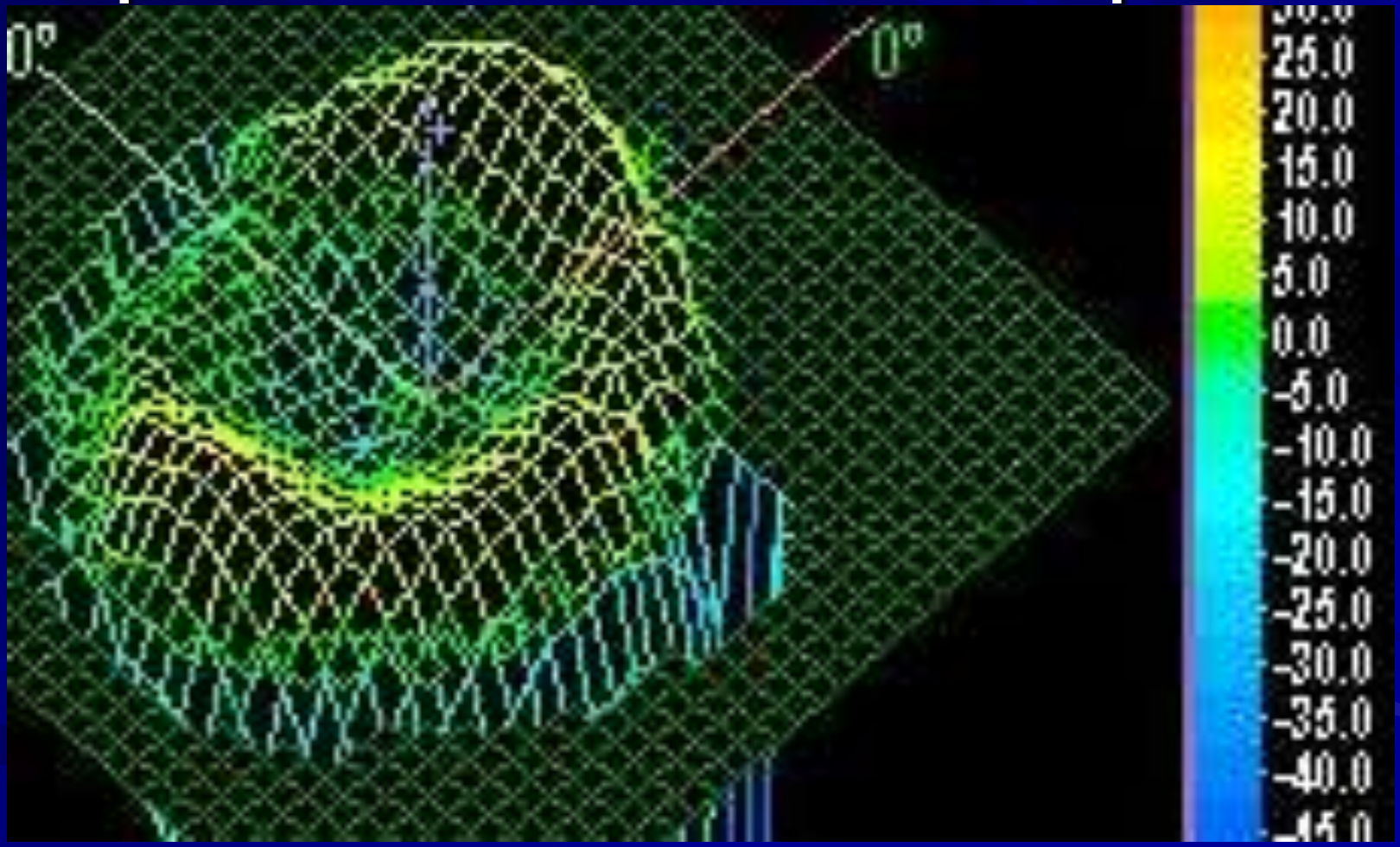
Slow-fast reading test
(Dr Giardini)

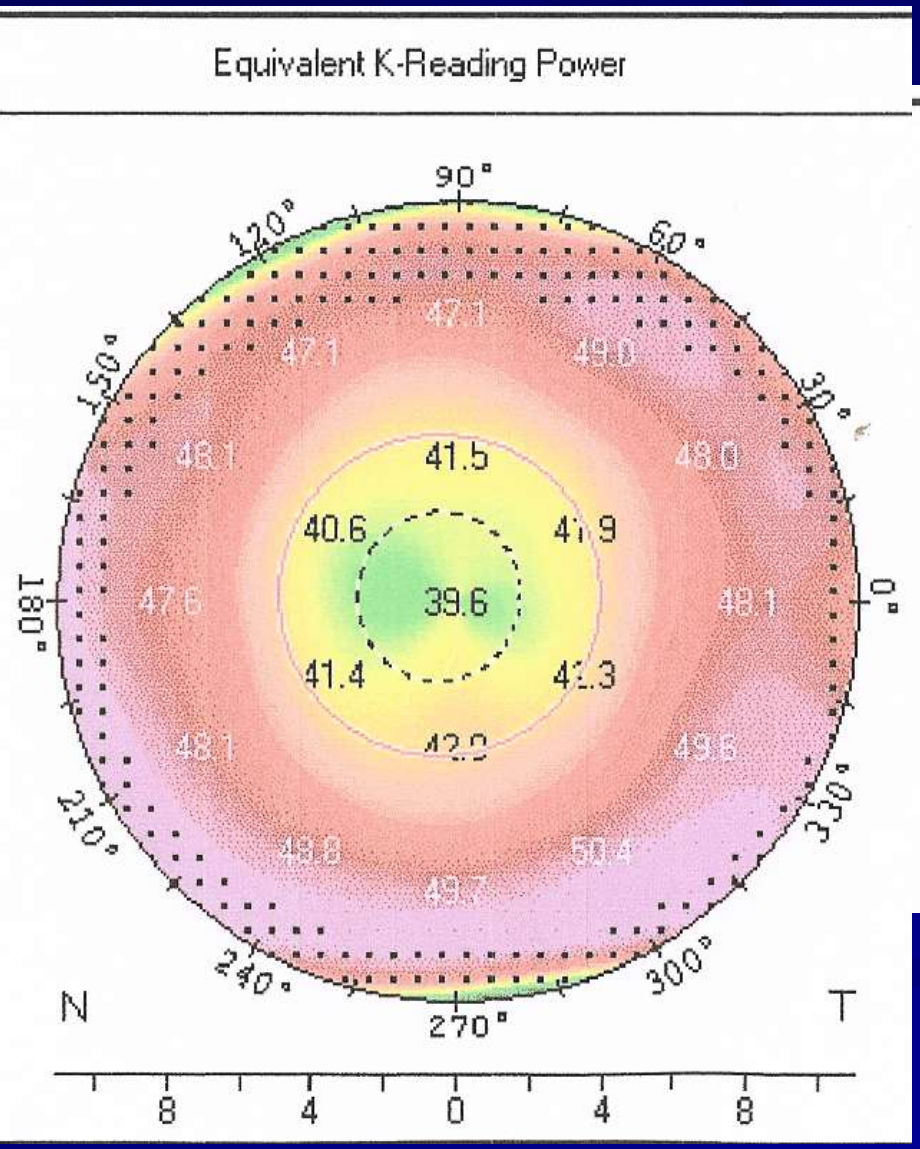


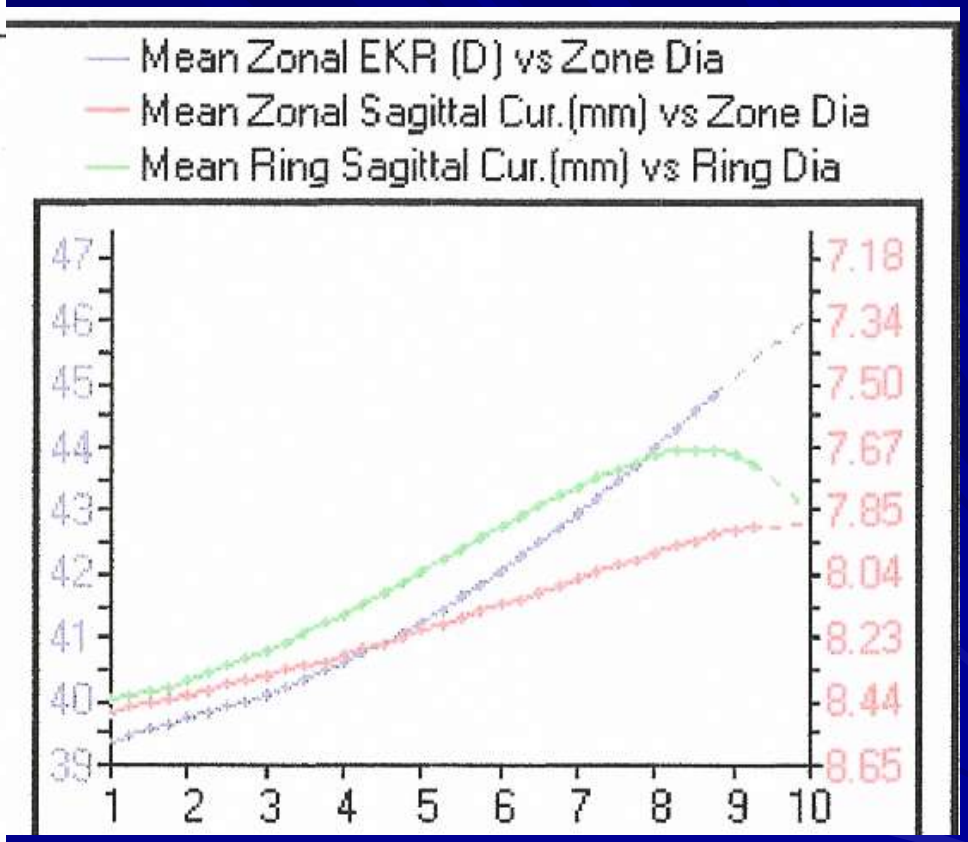
OCULUS Pentacam: Rotating Scheimpflug Camera



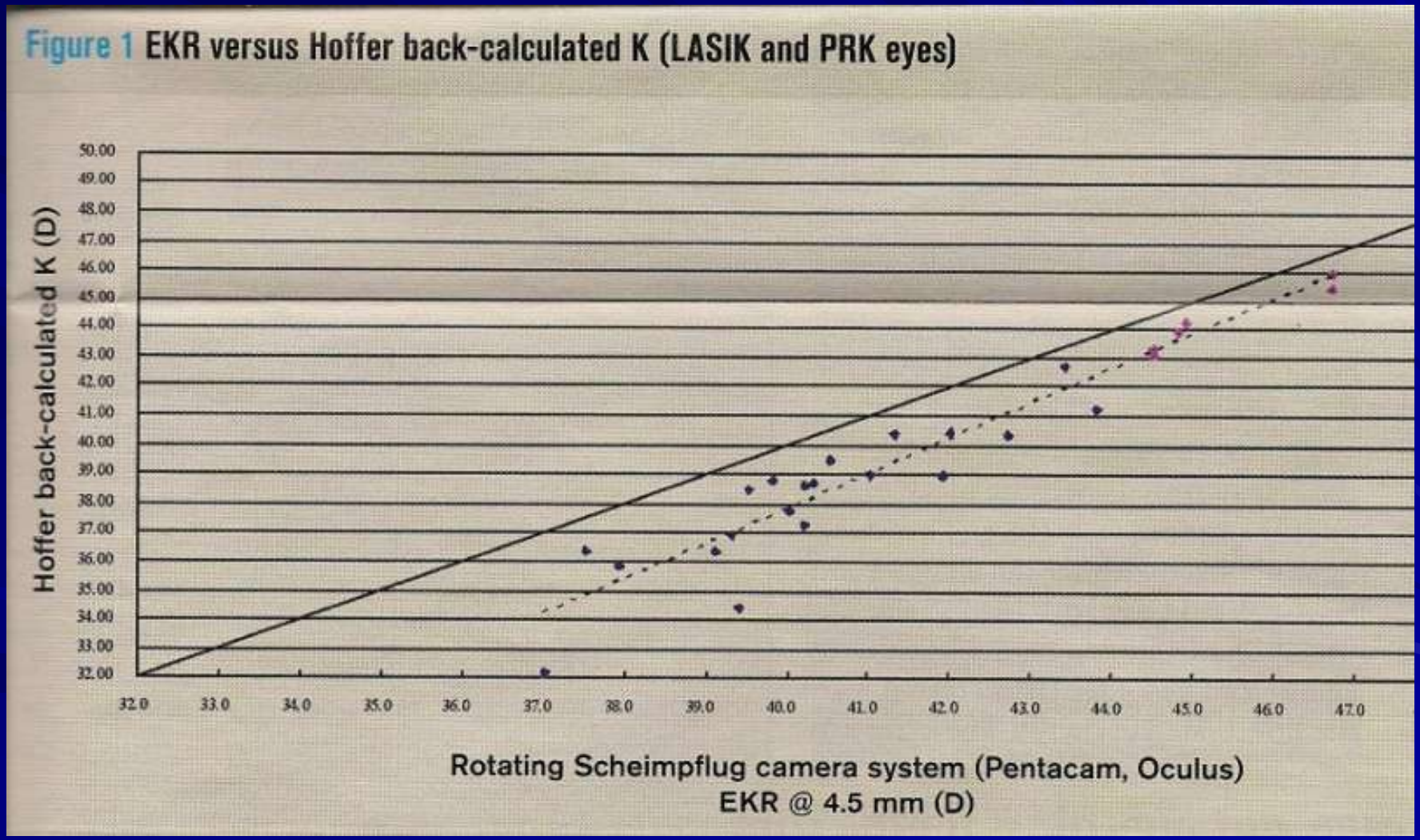
Elevation map after LASIK compared to a reference sphere




Equivalent K-Reading Power
90°
120°
60°
150°
30°
180°
0°
210°
330°
240°
300°
270°
N
T
47.1
47.1
49.0
48.1
48.0
41.5
40.6
41.9
47.6
39.6
48.1
41.4
42.3
48.1
42.2
49.6
48.8
50.4
49.7
8
4
0
4
8

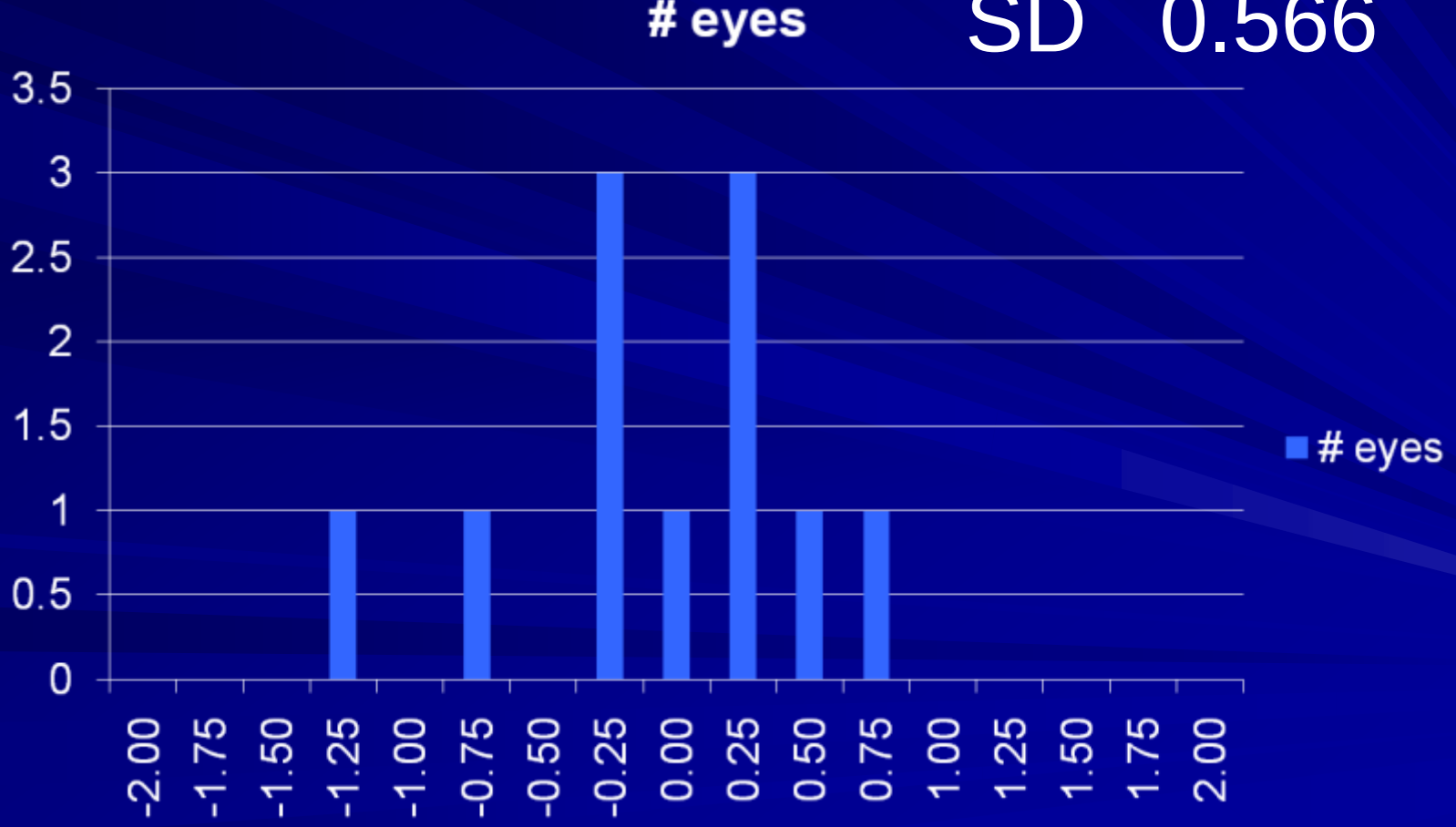

Mean Zonal EKR (D) vs Zone Dia
Mean Zonal Sagittal Cur.(mm) vs Zone Dia
Mean Ring Sagittal Cur.(mm) vs Ring Dia
47
46
45
44
43
42
41
40
39
7.18
7.34
7.50
7.67
7.85
8.04
8.23
8.44
8.65
1
2
3
4
5
6
7
8
9
10

Back calculated K's compared to average central Ks post LASIK



Lasik: Prediction error in SE using the Pentacam 3.0 mm equivalent K's

AV -0.069
SD 0.566



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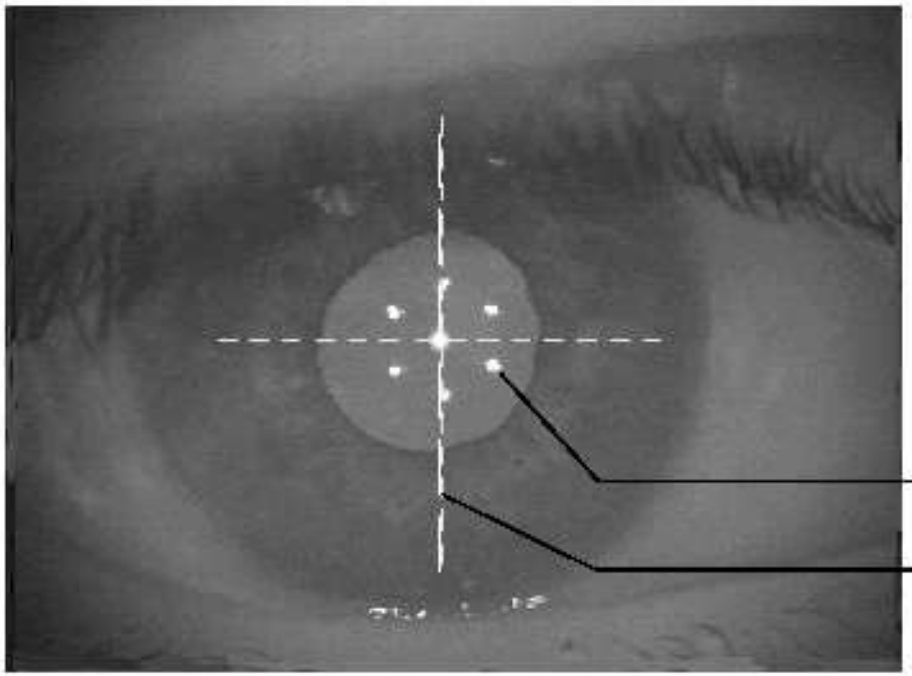


1 Circle of light spots for focusing
2 Cross hairs

Video image of the eye with correctly aligned instrument

Haagis L nomogram

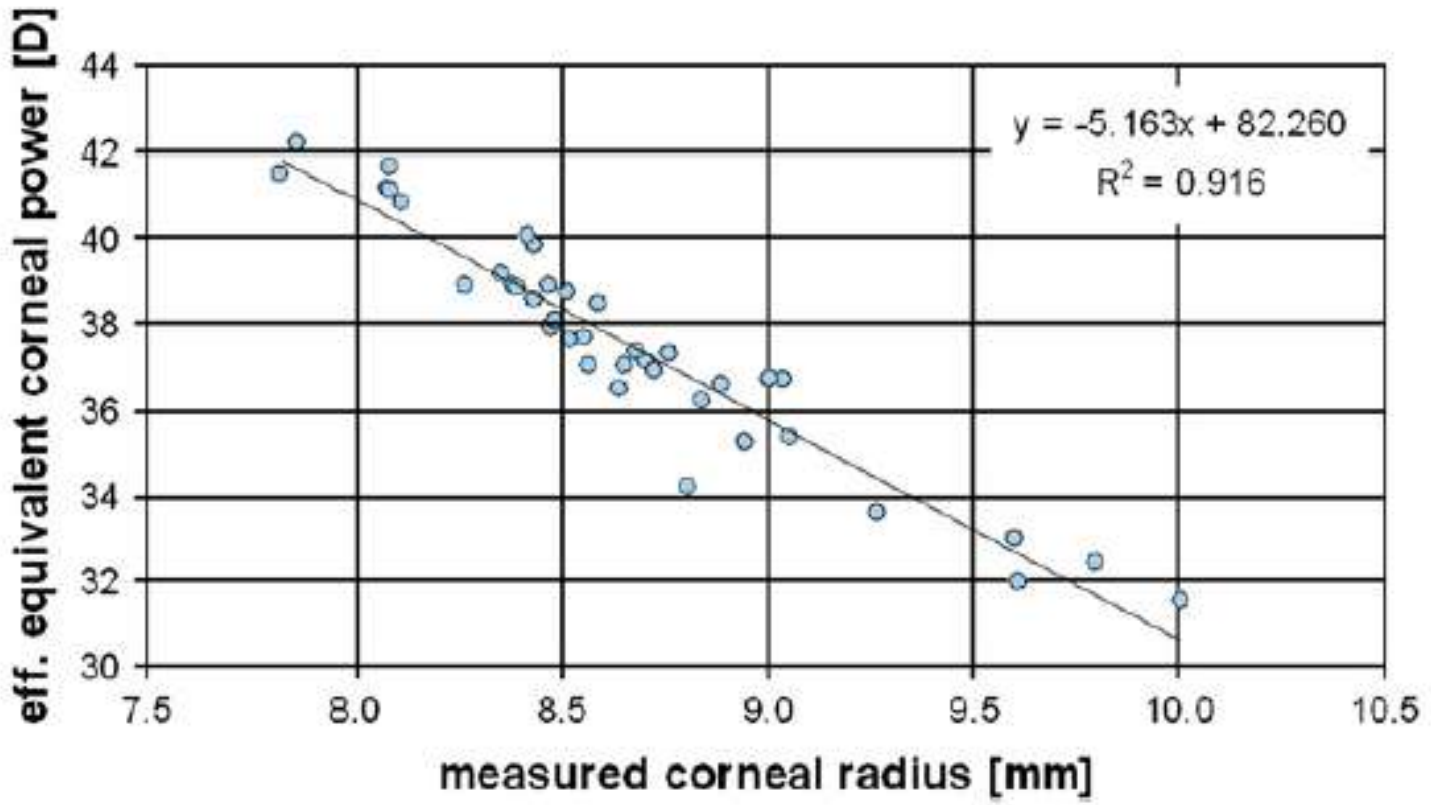
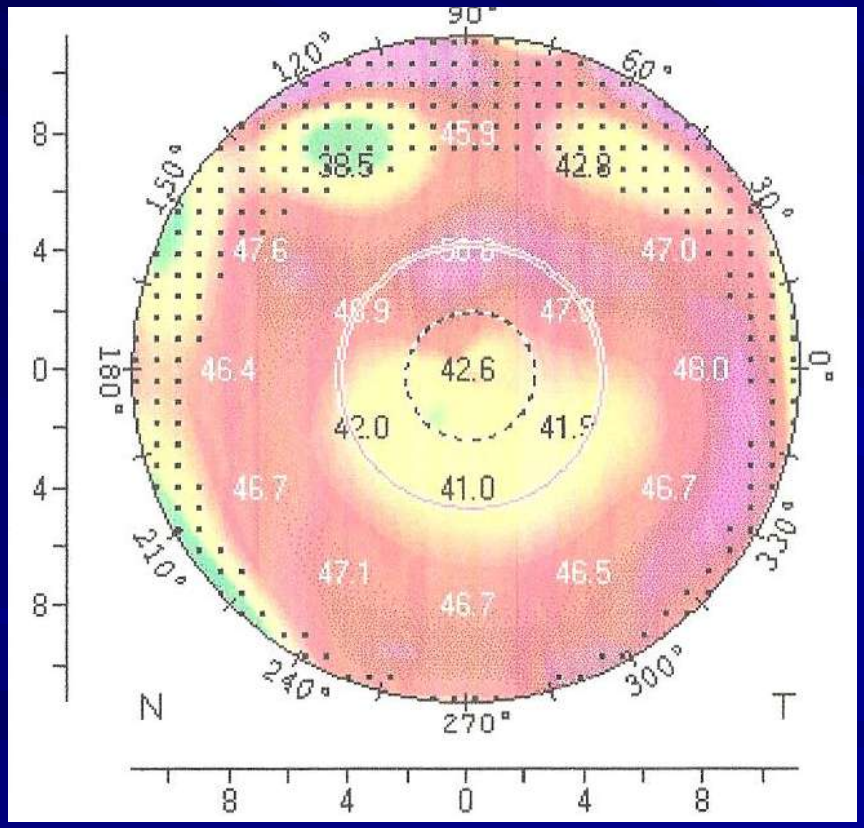


Figure 1. Effective (equivalent) corneal power from the refractive history method as a function of corneal radius measured with the IOLMaster in 40 eyes after LASIK for myopia performed with a Schwind keratome (eff. = effective).

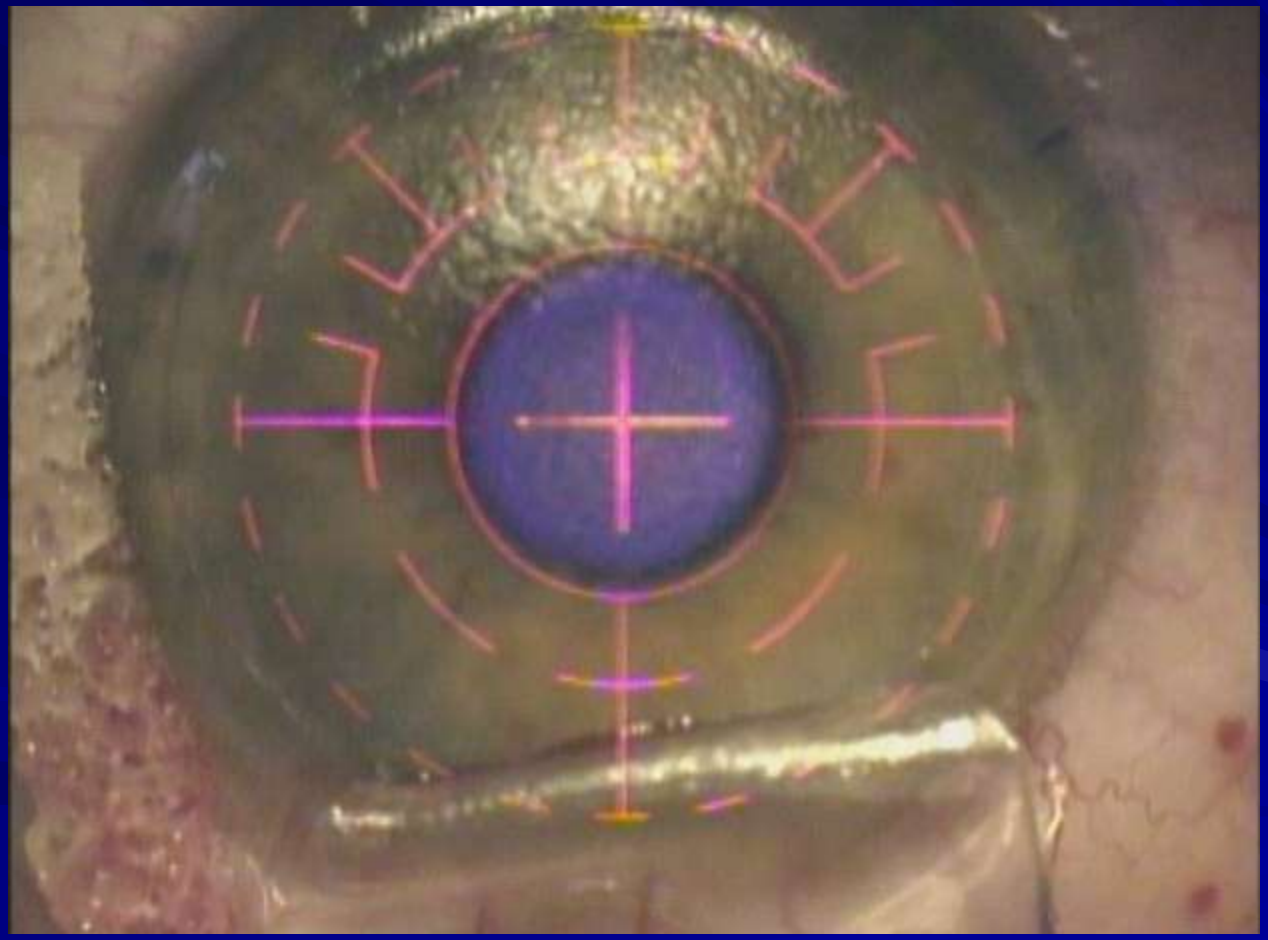
Basement Membrane Dystrophy

Pentacam



Nidek

Excimer:
Rarely for PTK or enhancements in cataract patients



Ta’ha’a Motu 2010