



Custom-Q Presbyopic LASIK

Dr. Arthur Cheng

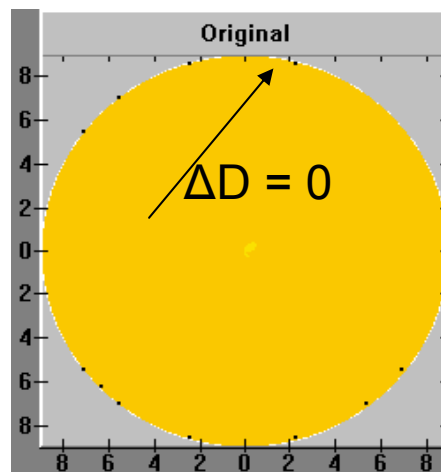
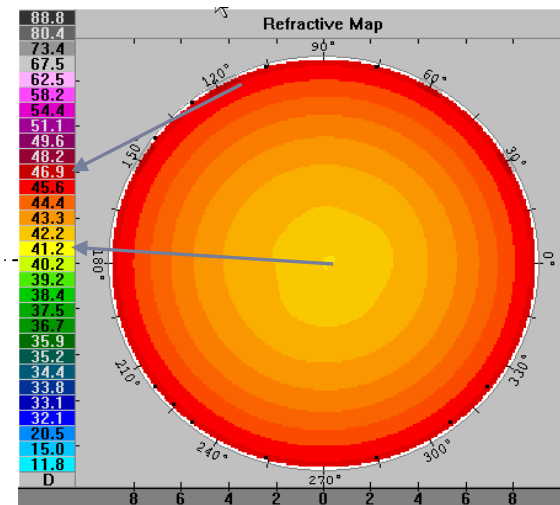
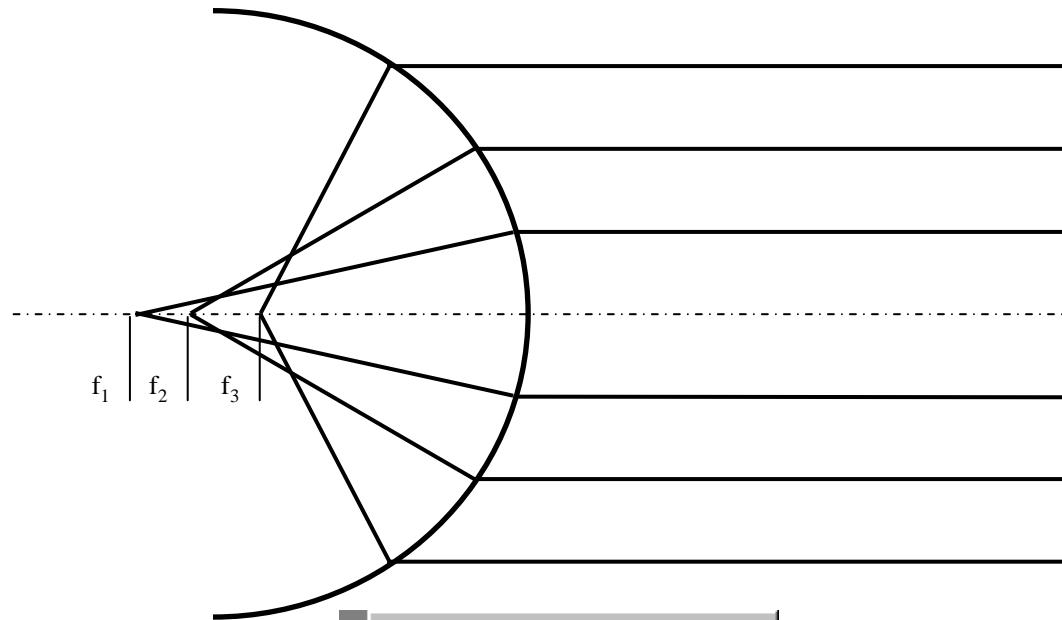
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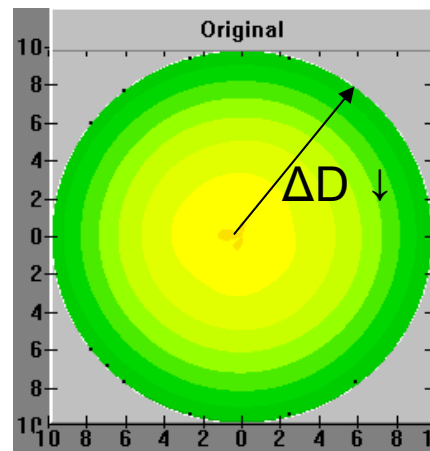
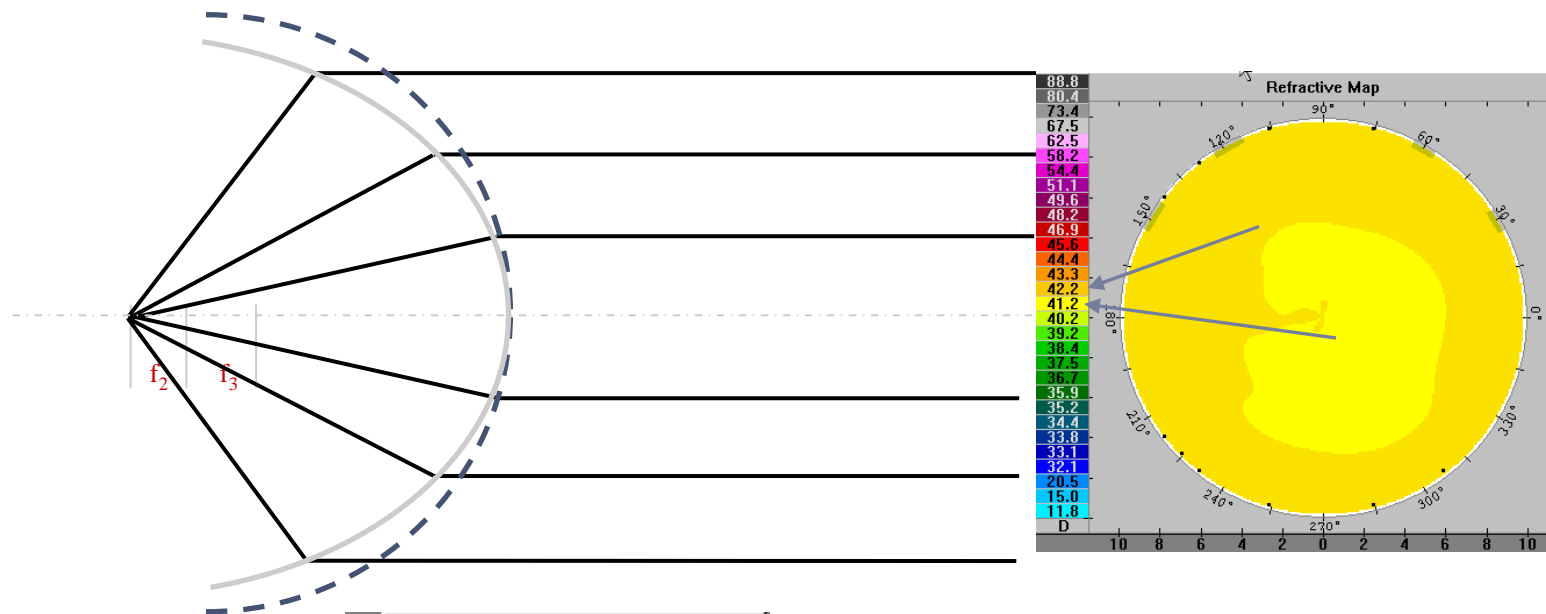


Q - Asphericity

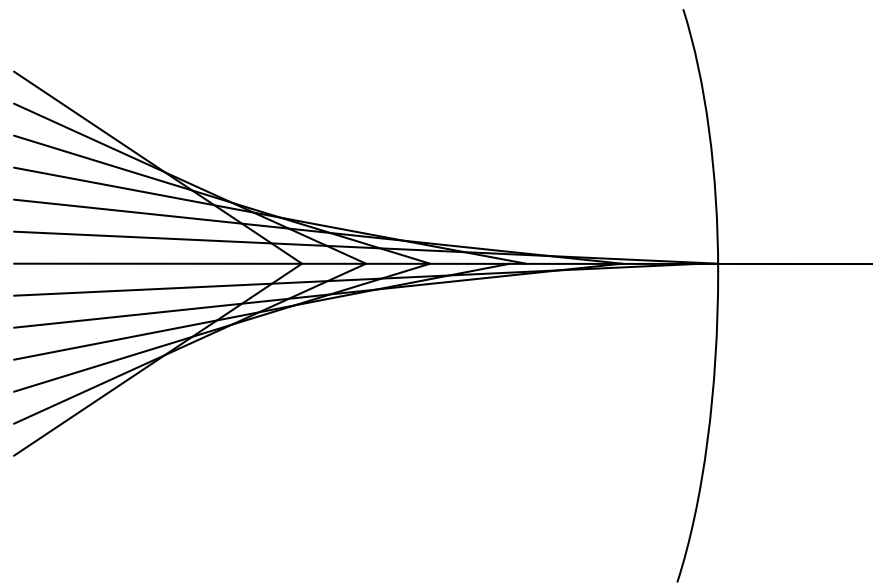


Positive Q value

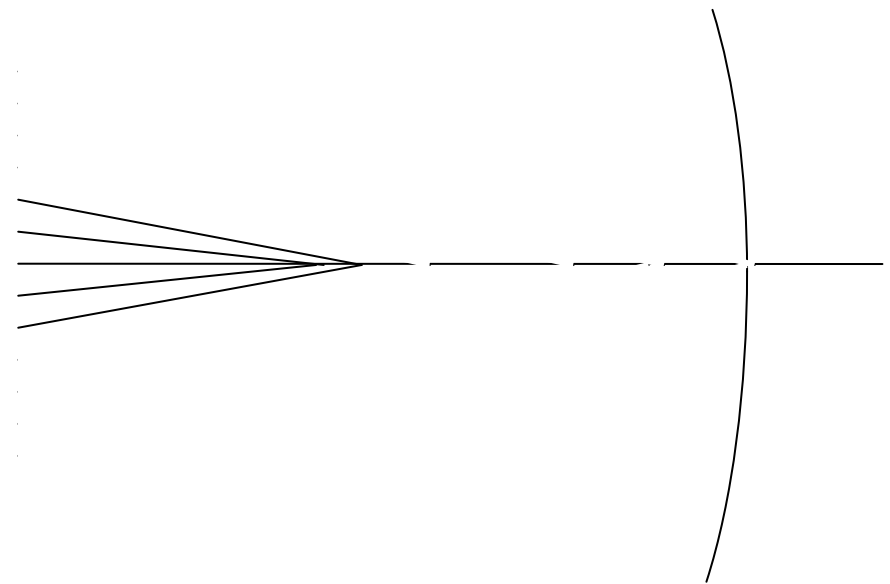
Q - Asphericity



Ideal asphericity $Q = -0.46$



+ve SA
+ve Q



-ve SA
-ve Q



- Treatment planning

Custom-Q - Presby LASIK Study



- 32 consecutive eyes of 16 presbyopic patients
- All required at least 0.5 D of near addition to see J1
- Custom-Q LASIK (F-Cat, Allegretto, ALCON Inc., Forth Worth, TX, USA)
- Target Q-value of -1
- Follow up 6 months

Methods



- Mean age was 42.38 \pm 2.78 years
- MRSE of -5.18 \pm 1.72 D (range -8.38D to -2.5D)
- Average near add 0.75 \pm 0.27 D (range 0.5 D to 1.25 D).
- Mean postoperative MRSE at 1 month, 3 months and 6 months were -0.02 \pm 0.32 D, -0.04 \pm 0.25 D, -0.03 \pm 0.23D respectively

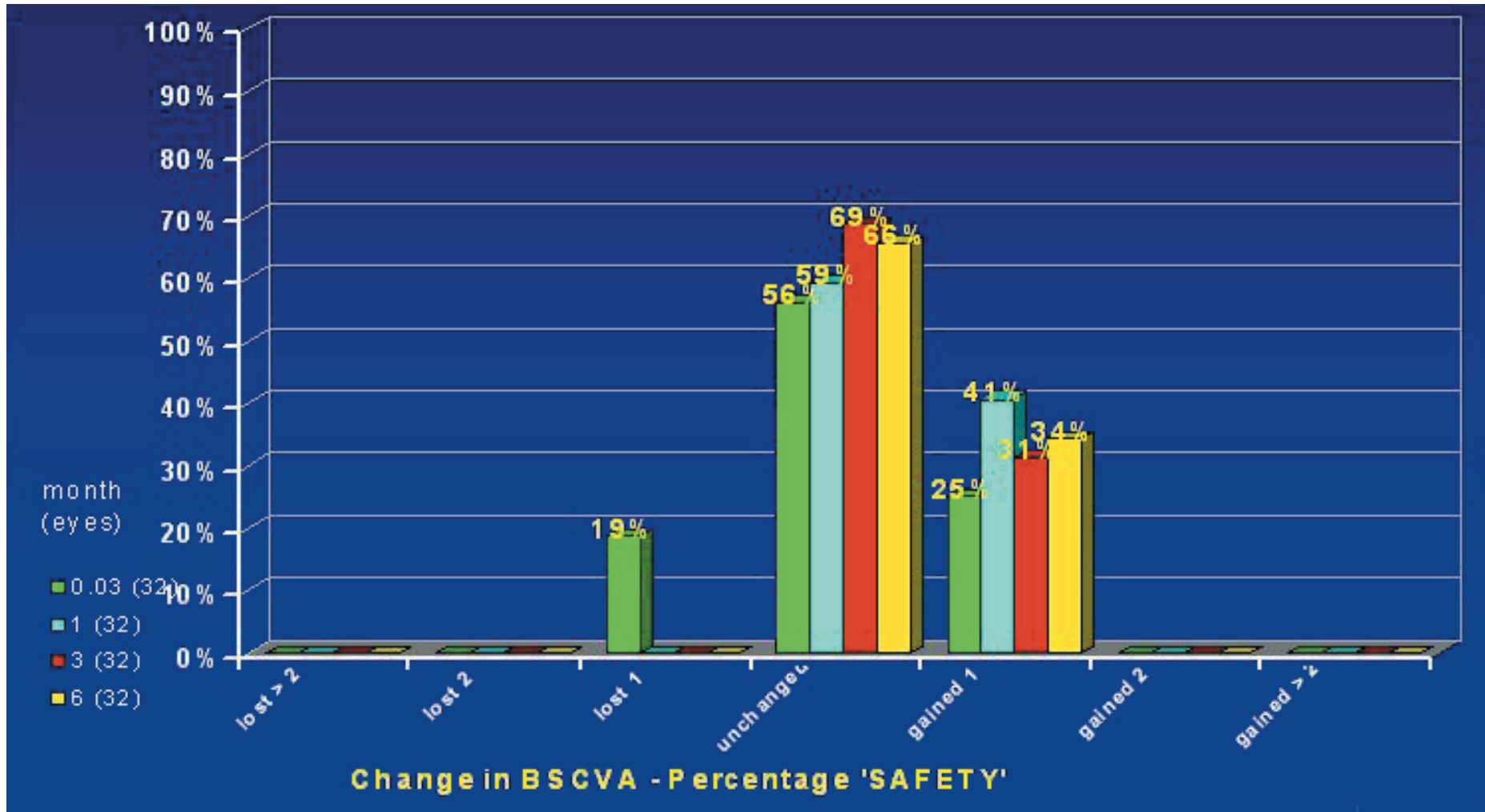


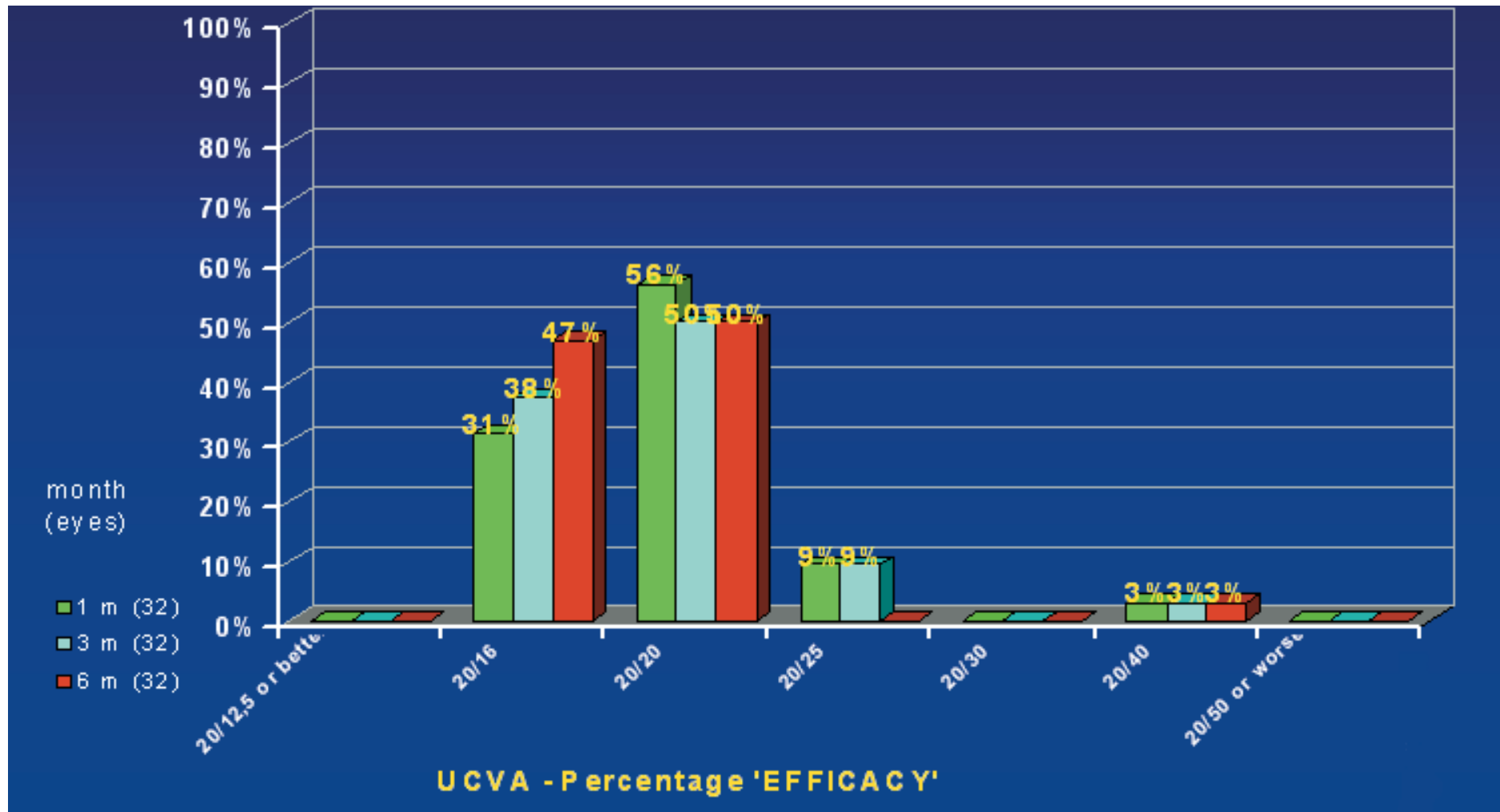
Visual Outcomes

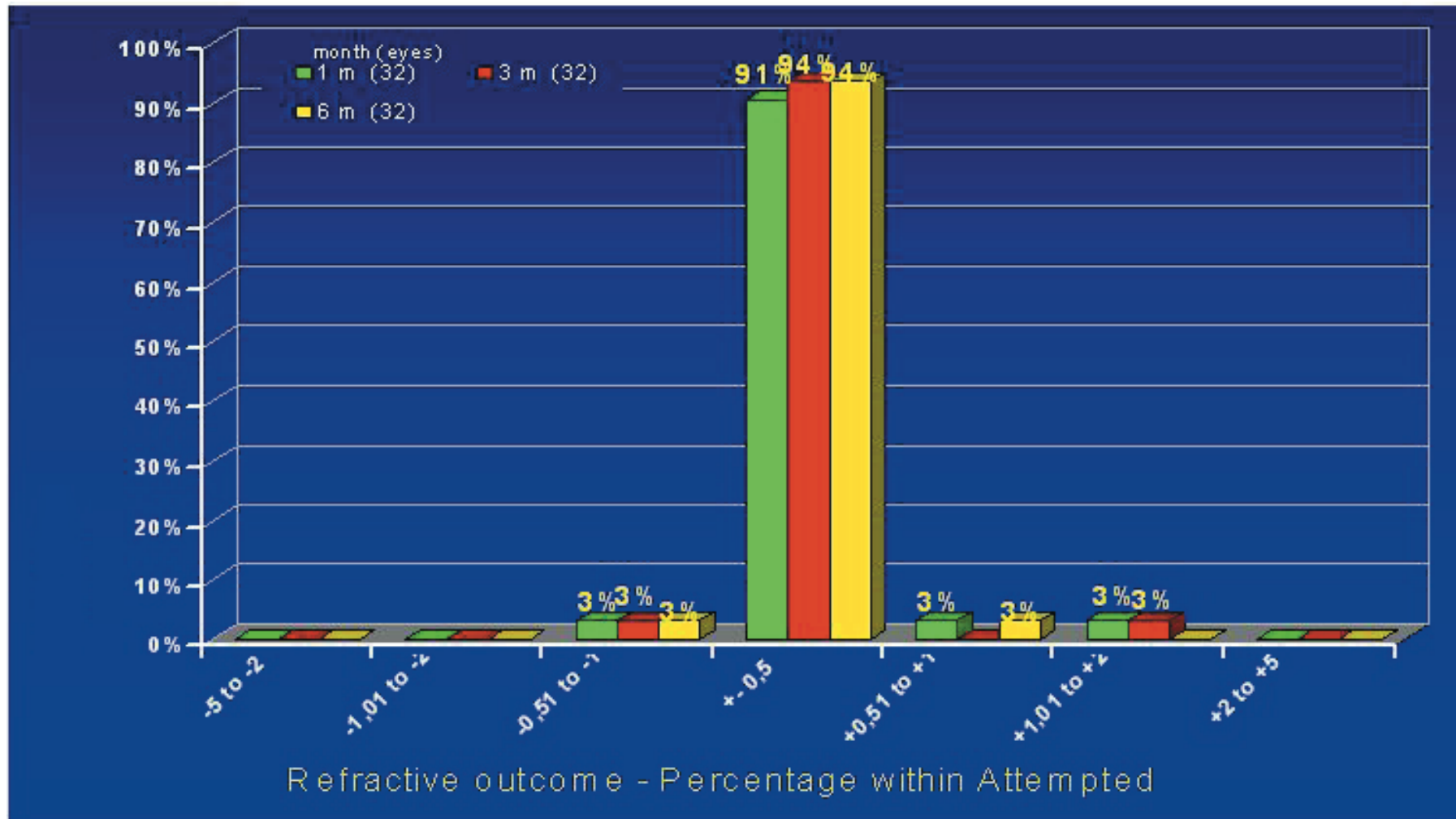


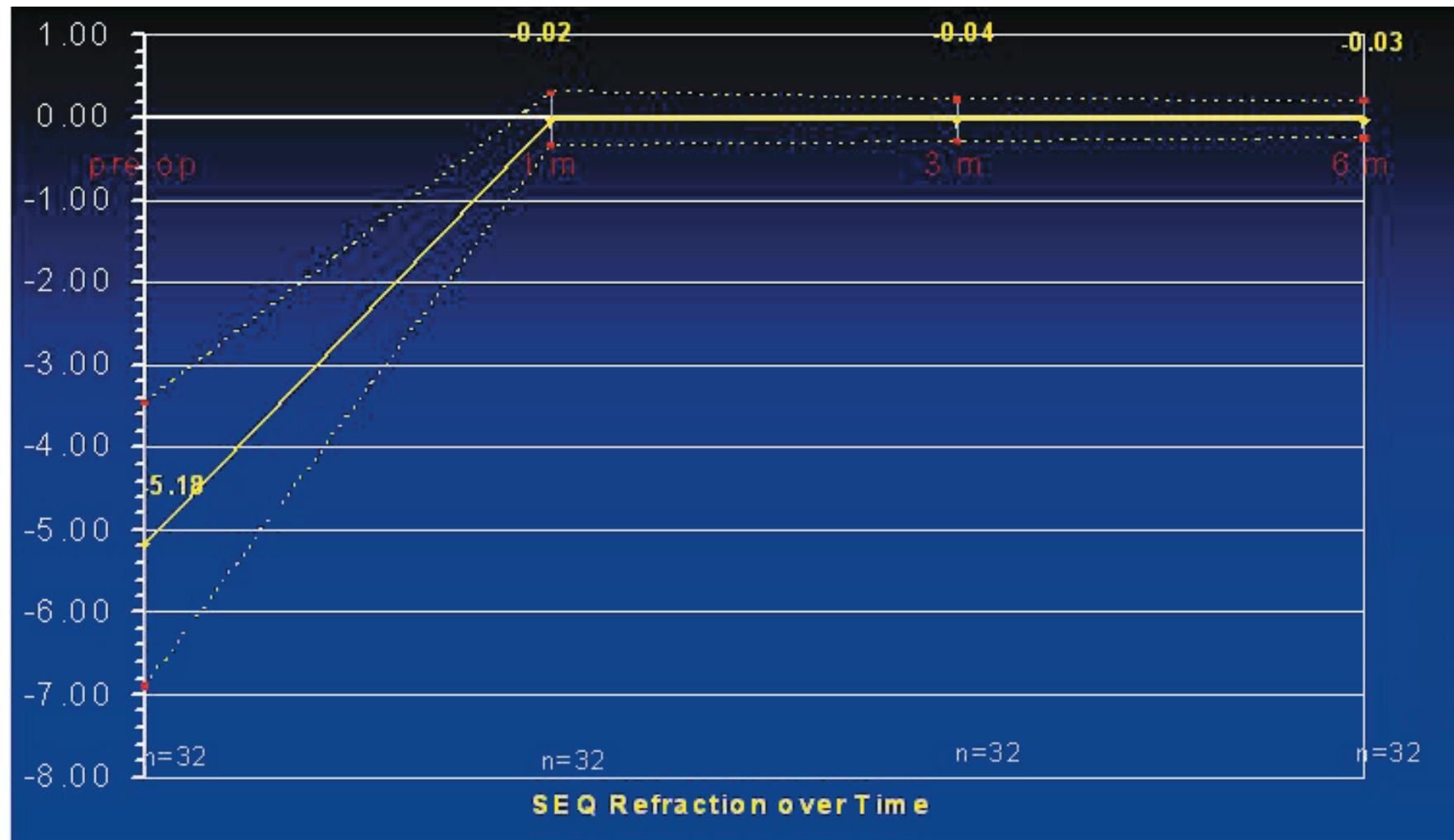


Change in BSCVA - Safety











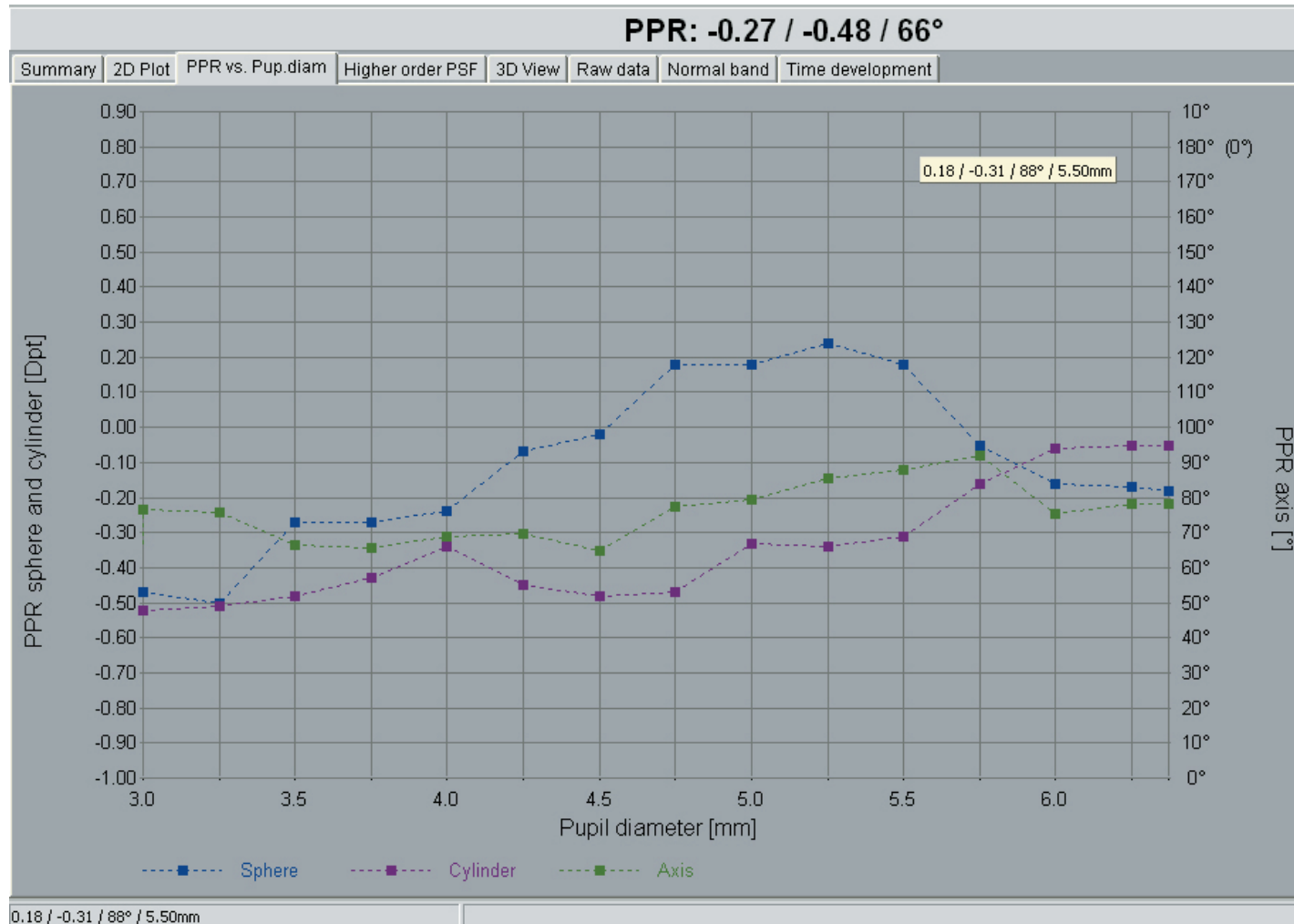
- With distance correction only, all patients achieved J1 at near during all follow-up visits



Objective Assessments



Wavefront Multifocality Assessment



Wavefront Multifocality Assessment



- The mean achieved multifocality was 0.68D
0.13D (range 0.32D to 0.94D) across the pupil from
3mm to 6mm pupil

Effect on **Corneal** Spherical Aberrations



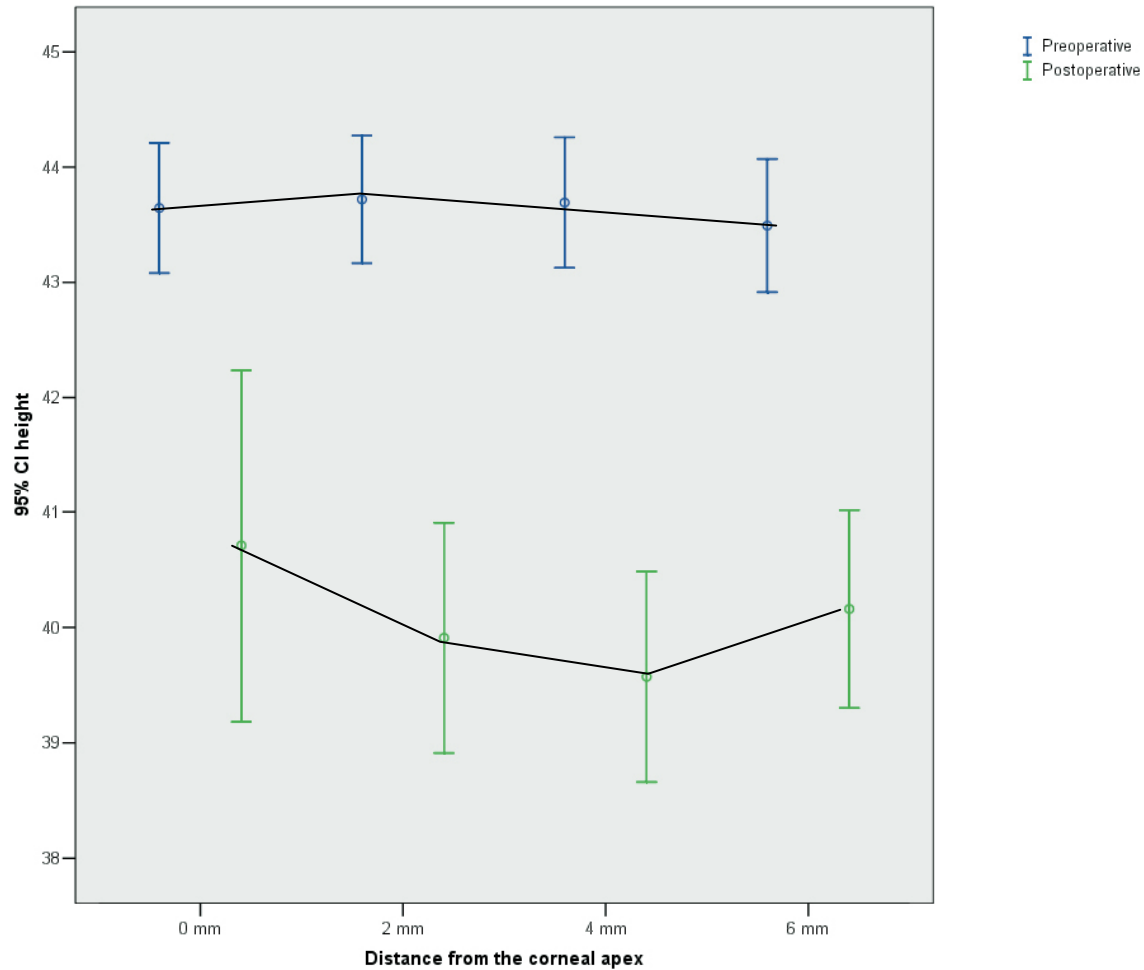
	3 mm zone /um	4 mm zone /um	5 mm zone /um	6 mm zone /um
Preop corneal SA	0.078 +/- 0.030	0.187 +/- 0.054	0.353 +/- 0.090	0.584 +/- 0.125
Postop corneal SA	-0.001 +/- 0.054	0.045 +/- 0.110	0.188 +/- 0.171	0.530 +/- 0.219
Mean difference	0.079 +/- 0.054	0.141 +/- 0.114	0.164 +/- 0.178	0.054 +/- 0.218
Postop total SA	N/A	N/A	N/A	-0.190 +/- 0.075

SA denotes spherical aberrations

Preop denotes preoperative

Postop denotes postoperative

Change of corneal curvature from apex outwards

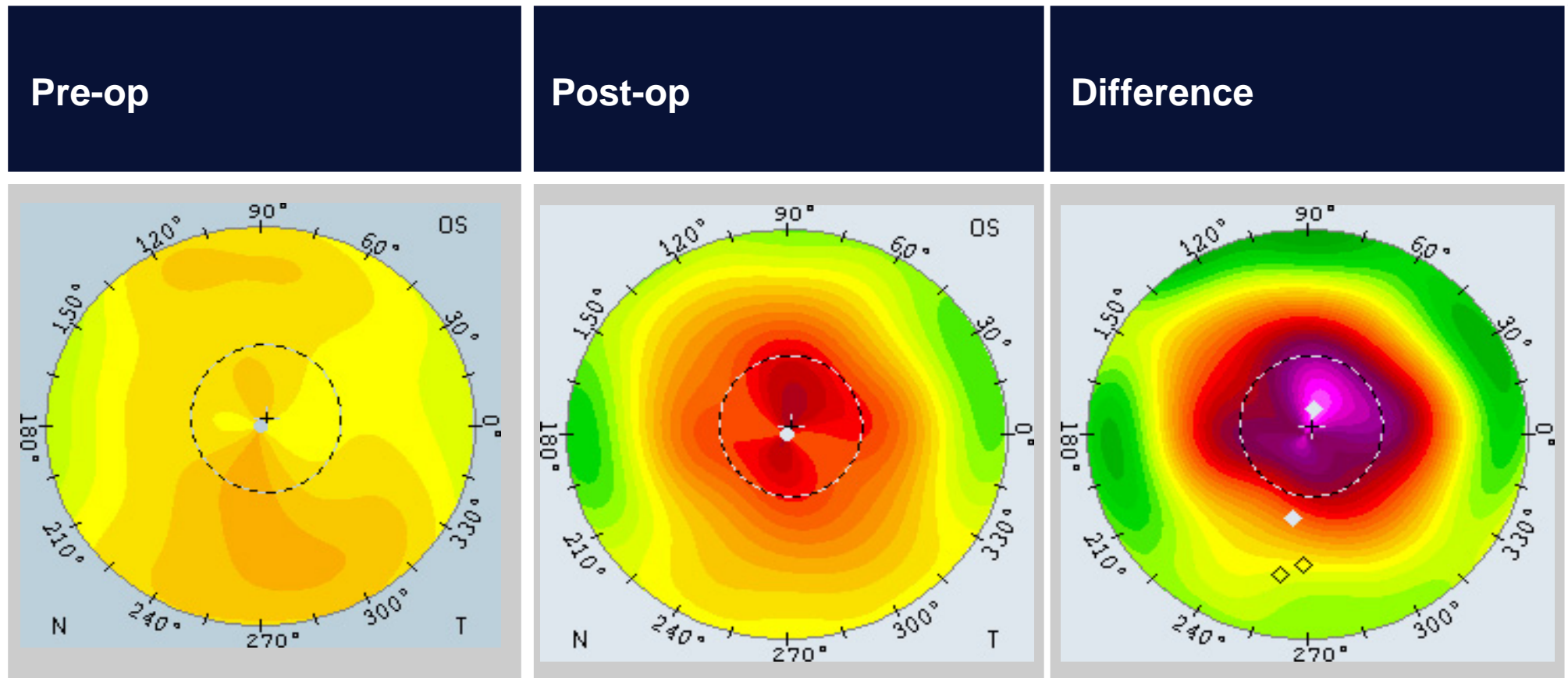




Clinical Case – Treatment Results



Corneal topography pre- and post-op



Contrast Sensitivity



	3 cyc/deg	6 cyc/deg	12 cyc/deg	18 cyc/deg
Preoperative	5.31 +/- 1.30	5.13 +/- 1.82	5.13 +/- 1.93	4.50 +/- 1.51
Postoperative	5.63 +/- 1.36	5.69 +/- 1.08	4.50 +/- 1.63	4.44 +/- 1.46
Diff	-0.31 +/- 1.74	-0.56 +/- 1.46	0.63 +/- 1.93	0.06 +/- 1.61
p	0.48	0.14	0.21	0.88

Diff denotes difference

cyc/deg denotes spatial frequency measured in cycles per degree

p denotes statistical significance, a $p < 0.05$ is statistically significant.



Subjective Assessments

Subjective Score



- 94.4% spectacle independence
- 100% found it more convenient than before surgery
- 100% would recommend the surgery to their friends
- Overall satisfaction rate was 2.62 \pm 0.52 at 1 month
- improved to 2.42 \pm 0.76 at 6 months



- Halos improved from 1.75 □ 1.16 to 1.5 □ 0.86
- Glare improved from 2.00 □ 1.31 to 1.5 □ 0.76
- Haze improved from 2.12 □ 1.25 to 1.36 □ 0.84

	5	4	3	2	1
How satisfy you are with your current vision?	Extremely disappointed		Satisfy		Extremely Satisfy
How do you find your current vision compared to before surgery with spectacles or contact lens?	Much worse		same		Much better
Do you still need to wear spectacles?	100%		50%		0%
Halos	Severe		Some		No
Glare	Severe		Some		No
Foggy	Severe		Some		No

Summary



- we have demonstrated that Custom-Q presbyopic LASIK can safely and effectively treat early presbyopia up to 1.25 D

Patient selection



■ Who are the best patients—

- Large scotopic pupil and small photopic pupil ($7\text{mm} > 4\text{mm}$)
- MRSE $< -5\text{D}$
- Early presbyope (limited by the max target Q), high presbyope need modified monovision

Examination Data

OD

Test, Test; 12-12-1965

Pupil

Diameter: 7.00 mm

Pachymetry

Central thickness: 550 痠

Applied drugs:

Pachymeter:

Clinical Refraction

Sph: -4.00 D

Cyl: 0.00 D

Axis: 0

VD: 12.0 mm

Keratometry

K1: 44.00 D

@: 44

ϵ 1: -0.08

Q1: 0.01

K2: 44.00 D

@: 134

ϵ 2: -0.08

Q2: 0.01

Notes

Empty text box for notes.

Entry made by: A Cheng

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Patient [F3]

Examination [F4]

Treatment [F5]

Summary [F6]

Laser [F7]

Print [F8]

Exit [Esc]

Treatment Plan

Standard

OD

Test, Test; 12-12-1965

Planned [F2]

Treatment type : Standard

Nomogram : S 001

Clinical : Sph : -4.00 D Cyl : 0.00 D Axis : 0 VD : 12.0 mm

Target : Sph : 0.00 D Cyl : 0.00 D Axis : 0

Correction : Sph : -4.00 D Cyl : 0.00 D Axis : 0

Patient [F3]

Examination [F4]

Correction Type : Myopia

Ablation Depth dyn.

Optical zone : 6.50 mm

Ablation zone : 7.1 mm

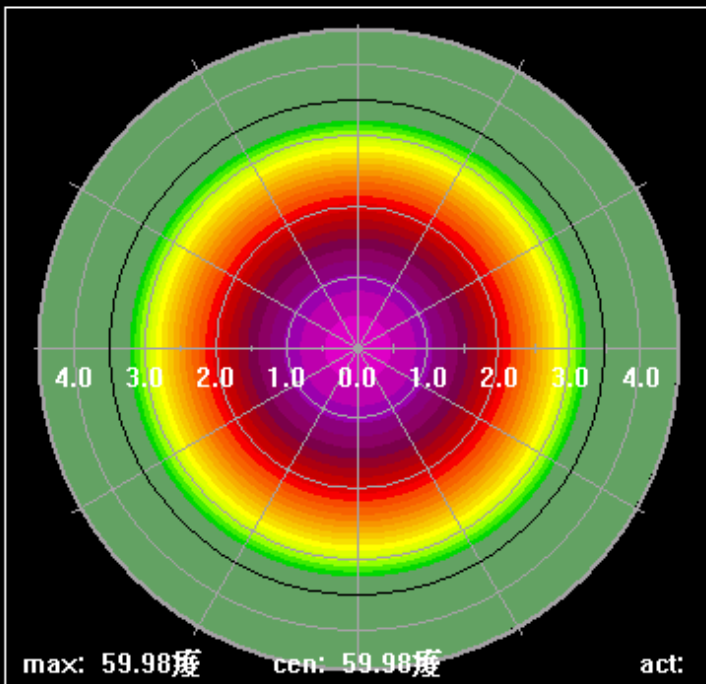
Flap thickness : 100 痠

Corneal thickness : 550 痠

Stroma : 390 痠

Treatment [F5]

Summary [F6]



- 60.0
- 57.5
- 55.0
- 52.5
- 50.0
- 47.5
- 45.0
- 42.5
- 40.0
- 37.5
- 35.0
- 32.5
- 30.0
- 27.5
- 25.0
- 22.5
- 20.0
- 17.5
- 15.0
- 12.5
- 10.0
- 7.5
- 5.0
- 2.5
- 0.0

Warnings and Messages :

[Empty box for warnings and messages]

Laser [F7]

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Treatment Plan

F-CAT

OD

Test, Test; 12-12-1965

Planned [F2]

Treatment type : F-CAT

Nomogram : S 301

Clinical : Sph : -4.00 D Cyl : 0.00 D Axis : 0 VD : 12.0 mm

Target : Sph : 0.00 D Cyl : 0.00 D Axis : 0 Q : 0.00

Correction : Sph : -4.00 D Cyl : 0.00 D Axis : 0

Patient [F3]

Correction Type : Myopia

Zernike / RMS

Ablation Depth dyn.

Optical zone : 6.50 mm

Transition zone : 1.25 mm

Flap thickness : 100 痠

Corneal thickness : 550 痠

Stroma : 388 痠

Examination [F4]

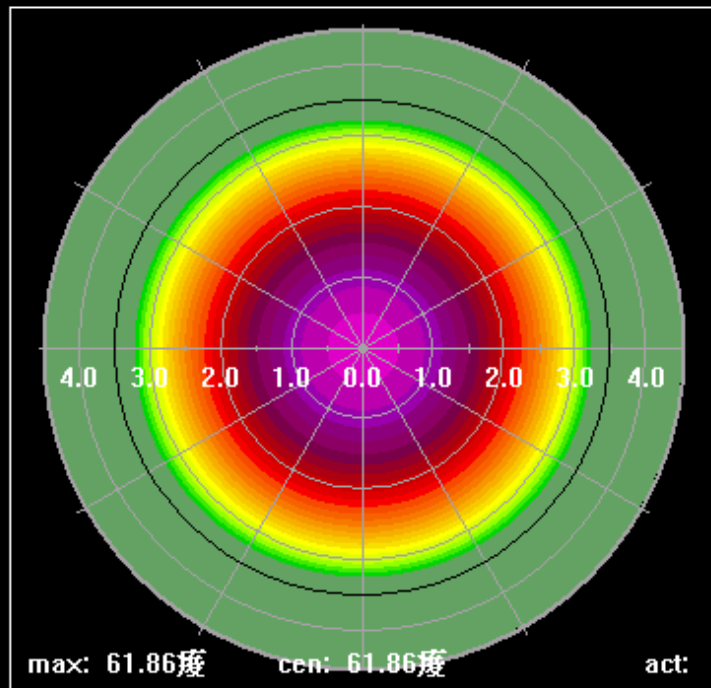
Treatment [F5]

Summary [F6]

Laser [F7]

Print [F8]

Exit [Esc]



- 61.9
- 59.3
- 56.7
- 54.1
- 51.5
- 49.0
- 46.4
- 43.8
- 41.2
- 38.7
- 36.1
- 33.5
- 30.9
- 28.4
- 25.8
- 23.2
- 20.6
- 18.0
- 15.5
- 12.9
- 10.3
- 7.7
- 5.2
- 2.6
- 0.0

Warnings and Messages :

[Empty box for warnings and messages]

2D Grid 3D ani

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Treatment Plan

F-CAT

OD

Test, Test; 12-12-1965

Treatment type :

Nomogram : S 301

Clinical : Sph : D Cyl : D Axis : VD : mm

Target : Sph : D Cyl : D Axis : Q :

Correction : Sph : D Cyl : D Axis :

Correction Type : Myopia

Zernike / RMS

Ablation Depth

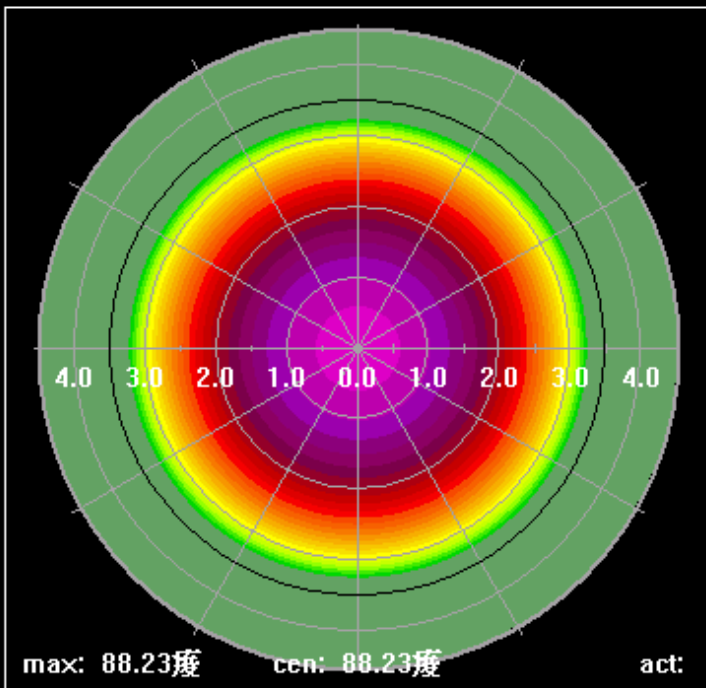
Optical zone : mm

Transition zone : mm

Flap thickness : 痠

Corneal thickness : 痠

Stroma : 痠



- 88.2
- 84.6
- 80.9
- 77.2
- 73.5
- 69.8
- 66.2
- 62.5
- 58.8
- 55.1
- 51.5
- 47.8
- 44.1
- 40.4
- 36.8
- 33.1
- 29.4
- 25.7
- 22.1
- 18.4
- 14.7
- 11.0
- 7.4
- 3.7
- 0.0

Warnings and Messages :

2D Grid 3D ani

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Summary [F6]

Laser [F7]

Print [F8]

Exit [Esc]

Treatment Plan

F-CAT

OD

Test, Test; 12-12-1965

Treatment type :

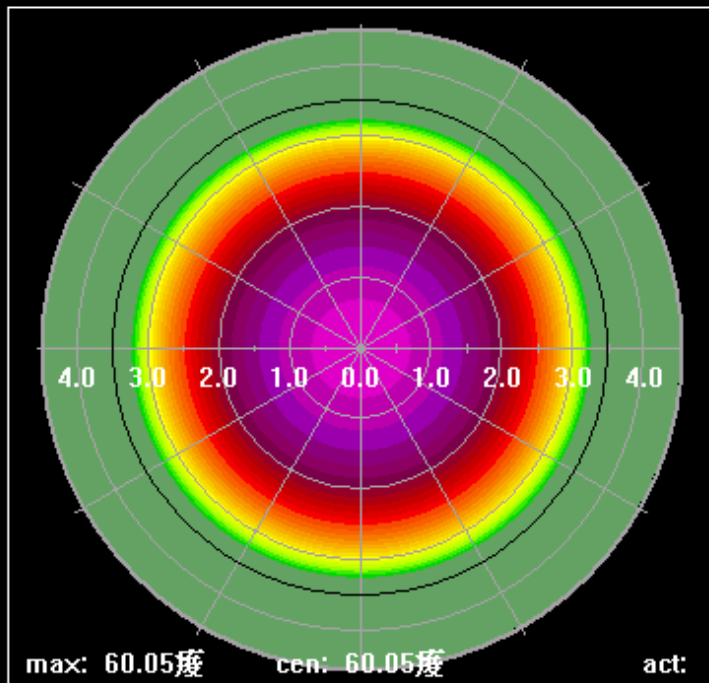
Nomogram : S 301

Clinical : Sph : D Cyl : D Axis : VD : mm
Target : Sph : D Cyl : D Axis : Q : D
Correction : Sph : D Cyl : D Axis :

Correction Type : Myopia

Zernike / RMS

Ablation Depth



- 60.1
- 57.6
- 55.1
- 52.5
- 50.0
- 47.5
- 45.0
- 42.5
- 40.0
- 37.5
- 35.0
- 32.5
- 30.0
- 27.5
- 25.0
- 22.5
- 20.0
- 17.5
- 15.0
- 12.5
- 10.0
- 7.5
- 5.0
- 2.5
- 0.0

Optical zone : mm

Transition zone : mm

Flap thickness : µ

Corneal thickness : µ

Stroma : µ

Warnings and Messages :

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Planned [F2]

Patient [F3]

Examination [F4]

Treatment [F5]

Summary [F6]

Laser [F7]

Print [F8]

Exit [Esc]

Treatment type : Standard

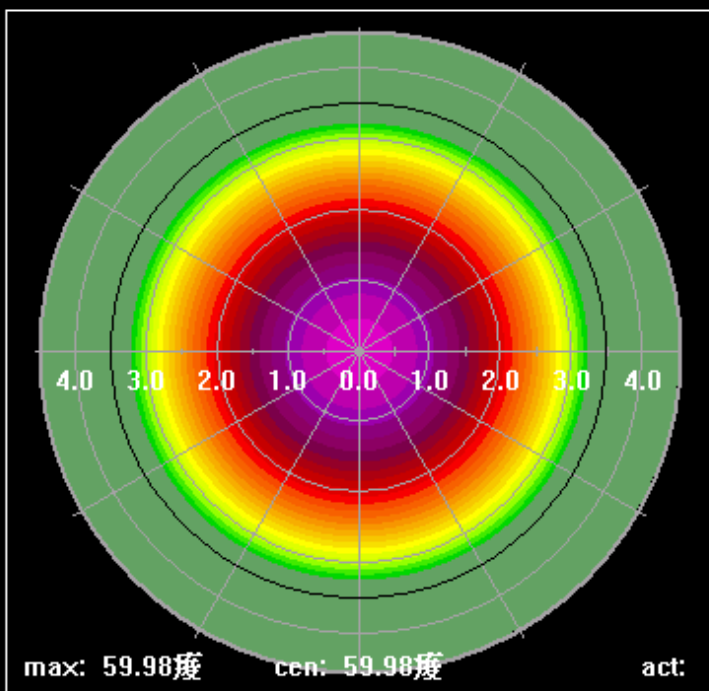
Clinical : Sph : -4.00 D Cyl : 0.00 D

Target : Sph : 0.00 D Cyl : 0.00 D

Correction : Sph : -4.00 D Cyl : 0.00 D

Correction Type : Myopia

Ablation Depth dyn.



2D Grid 3D ani

Warnings

Treatment type : F-CAT

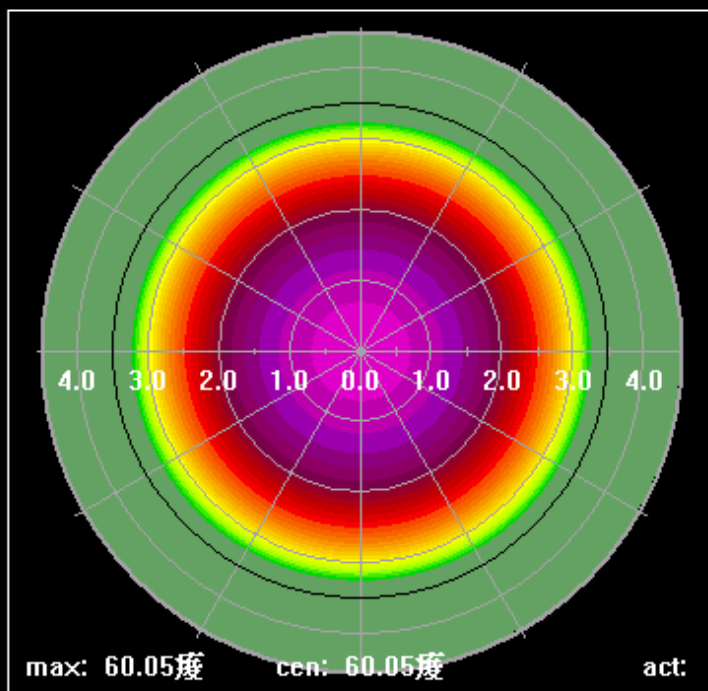
Clinical : Sph : -4.00 D Cyl : 0.00 D

Target : Sph : -2.14 D Cyl : 0.00 D

Correction : Sph : -1.86 D Cyl : 0.00 D

Correction Type : Myopia

Ablation Depth dyn.



2D Grid 3D ani

Zernike RMS

Warnings



Thankyou!

