International
Vision Correction
Research Centre

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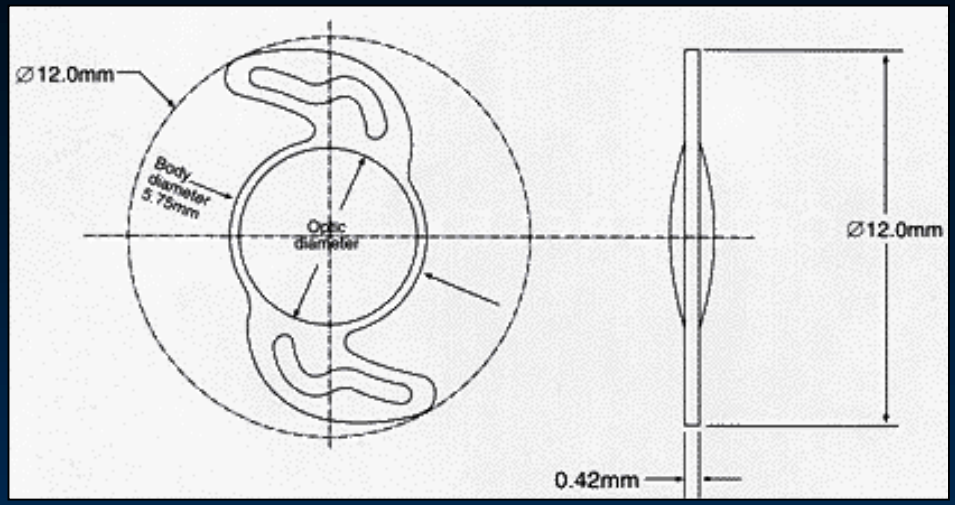
Toric Intraocular Lenses

G. U. Auffarth, MD

Dept. of Ophthalmology
University of Heidelberg, Germany
International Vision Correction Research Centre (IVCRC)

Rayner Centerflex 570H

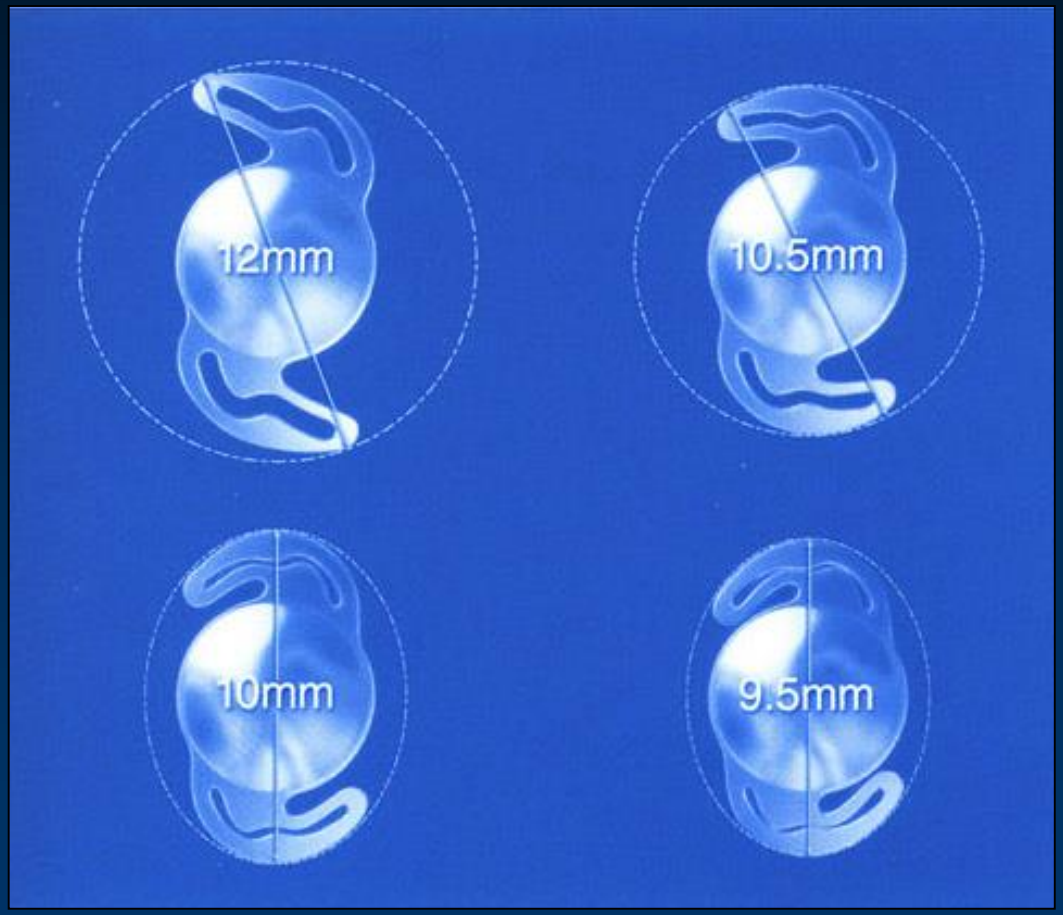


- Refractive Index: 1.46
- A-Constant: 118.0
- Watercontent: 26%
- No Haptic Angulation

- Overall-Diameter: 12.00 mm
- Optical-Diameter: 5.75 mm
- Single-piece, hydrophilic acrylic
- Square edge design

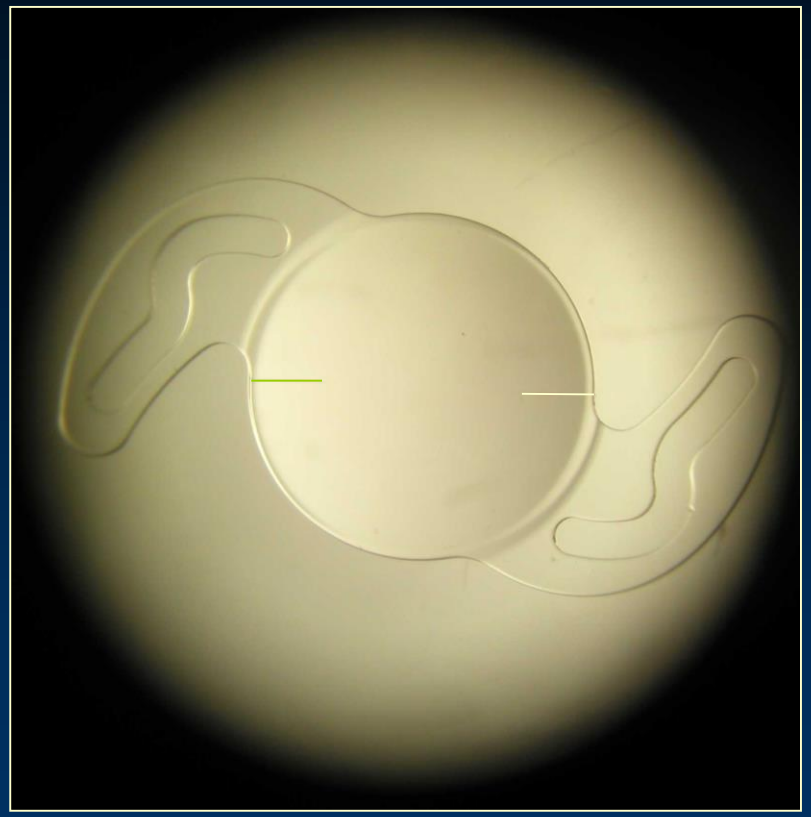
Anti-Vaulting-Haptic Technology (AHV™)

Good centration and rotational stability



Centerflex 571 T

- Single-piece hydrophilic acrylic design
- 26% water content
- 1.46 refractive index
- 5.75 mm optic. overall length 12.0 mm
- Anterior surface spherical
- Posterior toric surface



Centerflex 571 T: range

	Standard	Premium
Sphere:	+16 D to +26 D (in 0.5 D increments)	+2 D to +32 D (in 0.5 D increments)
Cylinder:	+2 D to +6 D (in 1.0 D increments)	+1.5 D to +11 D (in 0.5 D increments)

Premium: custom manufactured to patient´s prescription

Clinical examination I: Rotation and decentration

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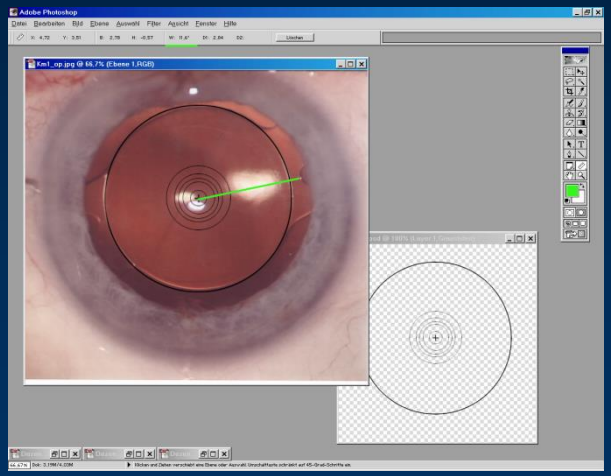
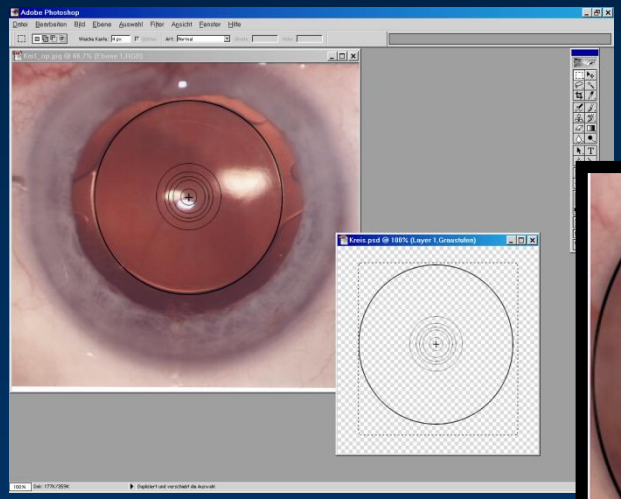
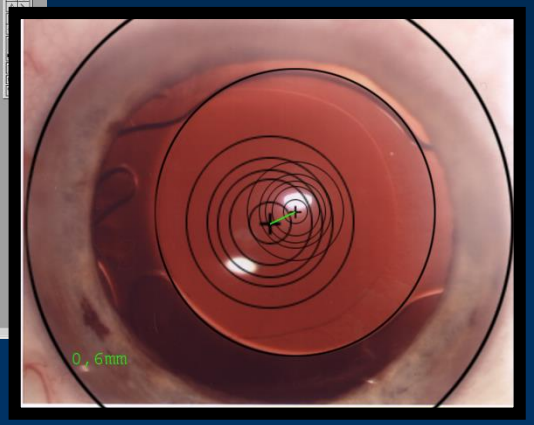
Patients & Methods

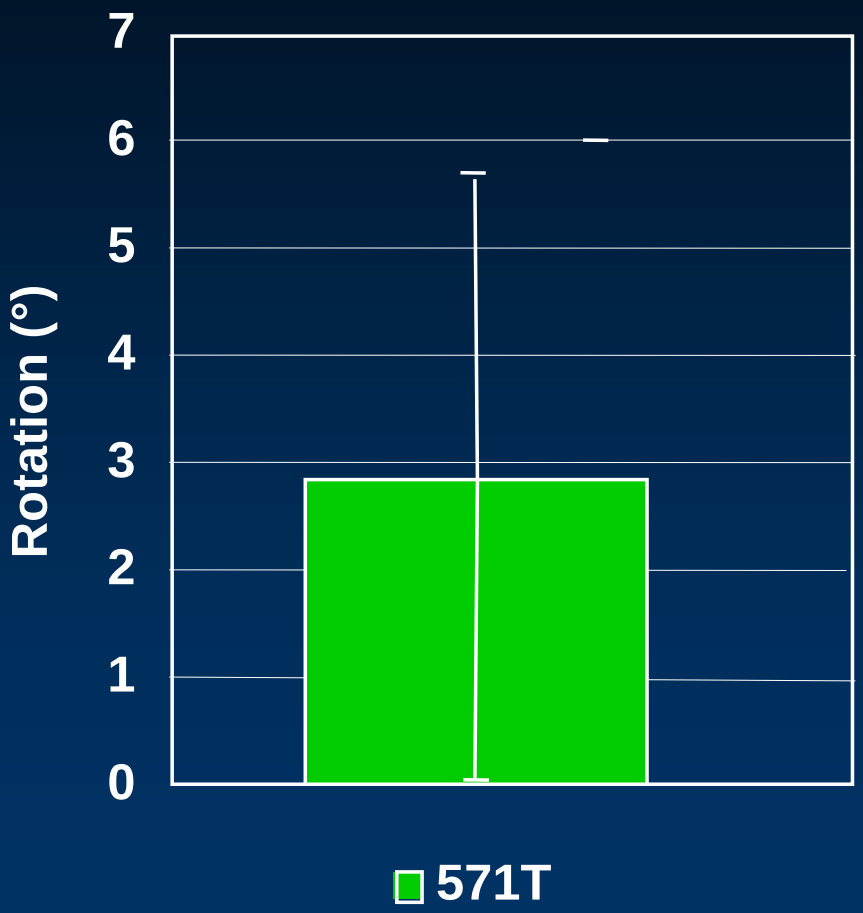
- 19 eyes Centerflex 571 T (without torus)
- Follow-up: 1 day, 1 week, 1 month
- Measurement of rotation and decentration using Adobe Photoshop

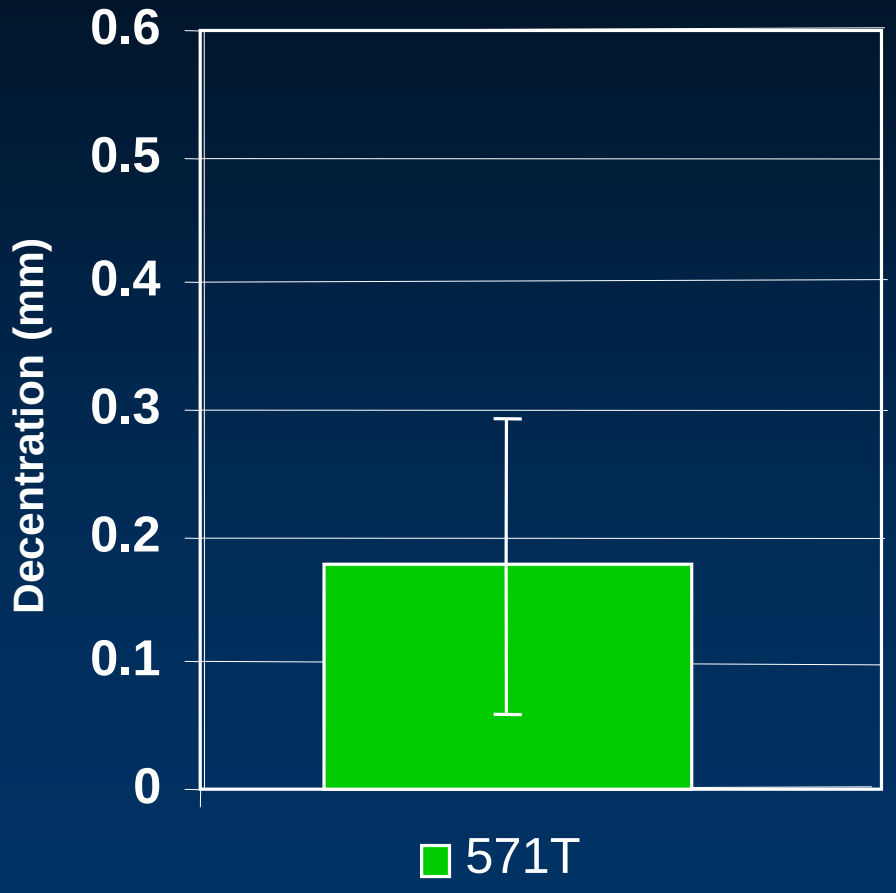






Rotation and Decentration
1 month post-op





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Clinical examination II: Functional Results Centerflex 571 T

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ORDERFORM TORIC IOL

Prescription Order form and Reservation
For 571T Toric Centerflex IOL

RAYNER
Let there be light

Surgeon			Section I : To be completed by the Surgeon
First Name:	Gerd	Surname:	Auffarth
Hospital/Office-Clinic:	University of Heidelberg	Telephone:	496221566624
City:	Heidelberg	Fax:	496221568229

Patient		Subject eye (OS/OD)	OS
Patient ID:	Mrs Ledderose-Croissant	Date of Birth:	

	mm	Dioptre	Degrees
K1	7,90	42,72	
K2	7,16	47,14	61

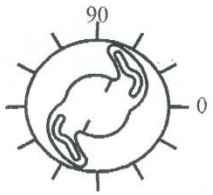
	Sphere	Cylinder	Degrees
Spectacles			
Refraction	-1	-3,5	156

Axial Length (mm)	24,77	(U/S)
ACD (mm) measurement from anterior cornea to anterior lens capsule.	3,64	

Not Corrected Visual Acuity	
Best Corrected Visual Acuity	0,63
Target spherical equivalent if required	

Proposals for standard production toric IOL's — *Section II : To be completed by Rayner*

Estimated target refraction			IOL			
Spherical Equivalent	Sphere	Cylinder	Sphere	Cylinder	No.	Price
0,4	0,4	0,0	10,5	6,0	1	0,00
0,1	0,0	0,0	11,0	6,0	2	0,00
-0,3	-0,3	0,0	11,5	6,0	3	0,00



The axis marks indicate the IOL's lowest power meridian.

Proposals for premium production toric IOL's

Estimated target refraction			IOL		No.	Price
Spherical Equivalent	Sphere	Cylinder	Sphere	Cylinder		
NO PREMIUM LENS					4	
					5	
					6	

Please enter IOL choice, from Section II.

Section III : To be completed by the Customer. Please sign and fax back to Rayner +44 (0) 1273 324623

Sphere	Cylinder	No.

MANUFACTURE WILL BEGIN ON RECEIPT OF A COMPLETED, SIGNED FORM WITH AN OFFICIAL ORDER NUMBER

Mehrwertsteuer/VAT No./TVA No.....

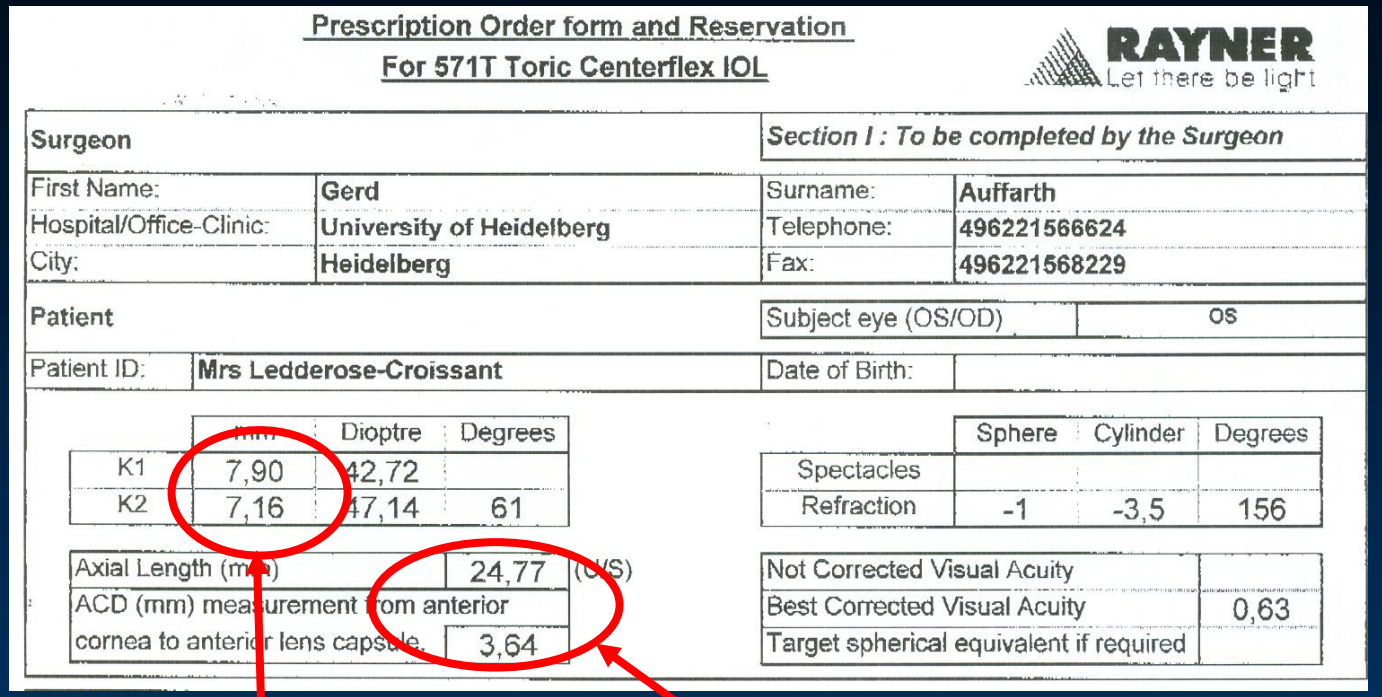
Order No..... Date..... Signed (*Customer*).....

Rayner Order Number	18341		*Section IV: For Rayner Office Use*

Rayner Intraocular Lenses ltd, 1&2 Sackville Trading Estate, Hove, East Sussex, BN3 7AN, England
Tel: +44 (0) 1273 324623 Fax: +44 (0) 1273 205 401 www.rayner.com

SOP 1429 Issue 181203-1

ORDERFORM TORIC IOL



Prescription Order form and Reservation
For 571T Toric Centerflex IOL

RAYNER
Let there be light

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Not Corrected Visual Acuity	
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Target spherical equivalent if required	

Keratometry (IOL-Master, Javal)

AXIAL LENGTH
ACD

ORDERFORM TORIC IOL

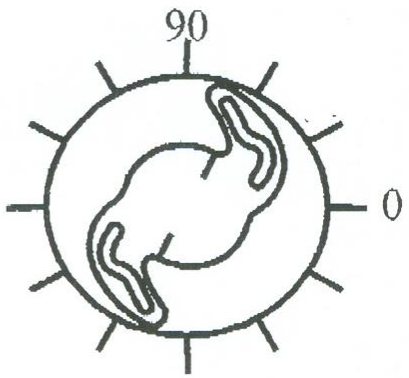
Proposals for standard production toric IOL's

Section II : To be completed by Rayner

Estimated target refraction			IOL			
Spherical Equivalent	Sphere	Cylinder	Sphere	Cylinder	No.	Price
0,4	0,4	0,0	10,5	6,0	1	0,00
0,1	0,0	0,0	11,0	6,0	2	0,00
-0,3	-0,3	0,0	11,5	6,0	3	0,00

Proposals for premium production toric IOL's

Estimated target refraction			IOL			
Spherical Equivalent	Sphere	Cylinder	Sphere	Cylinder	No.	Price
NO PREMIUM LENS					4	
					5	
					6	



The axis marks indicate the IOL's lowest power meridian.

TARGET REFRACTION

TORIC IOL

ORDERFORM TORIC IOL

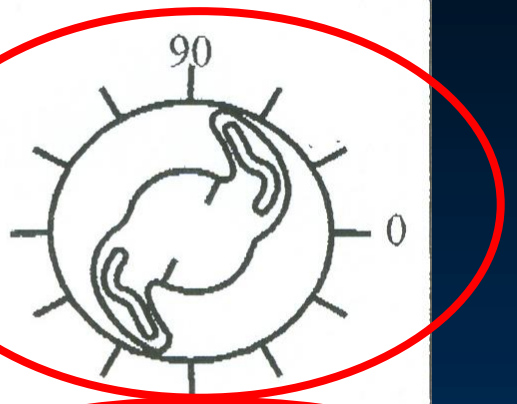
Proposals for standard production toric IOL's

Section II : To be completed by Rayner

Estimated target refraction			IOL			
Spherical Equivalent	Sphere	Cylinder	Sphere	Cylinder	No.	Price
0,4	0,4	0,0	10,5	6,0	1	0,00
0,1	0,0	0,0	11,0	6,0	2	0,00
-0,3	-0,3	0,0	11,5	6,0	3	0,00

Proposals for premium production toric IOL's

Estimated target refraction			IOL			
Spherical Equivalent	Sphere	Cylinder	Sphere	Cylinder	No.	Price
NO PREMIUM LENS					4	
					5	
					6	



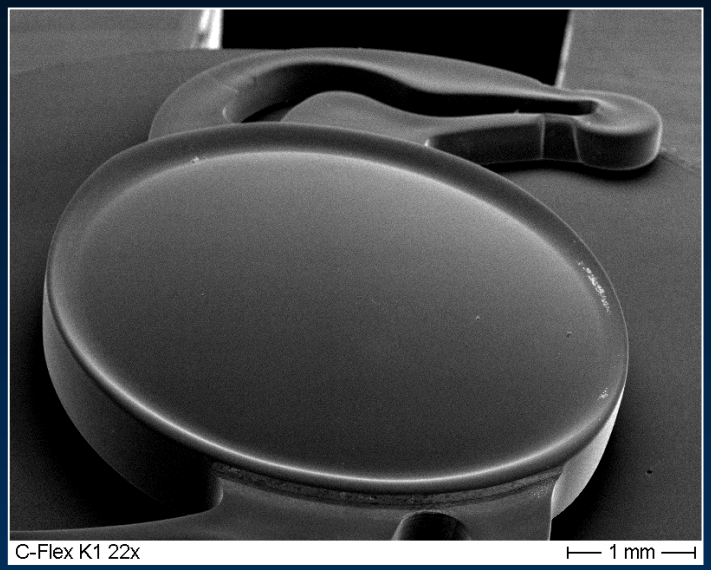
The axis marks indicate the IOL's lowest power meridian.

Toric IOL Fixation

Attention !

Marking of Axis

Centerflex - C-Flex



Centerflex → **C-Flex**

Enhanced 360º sharp optic edge

Patients

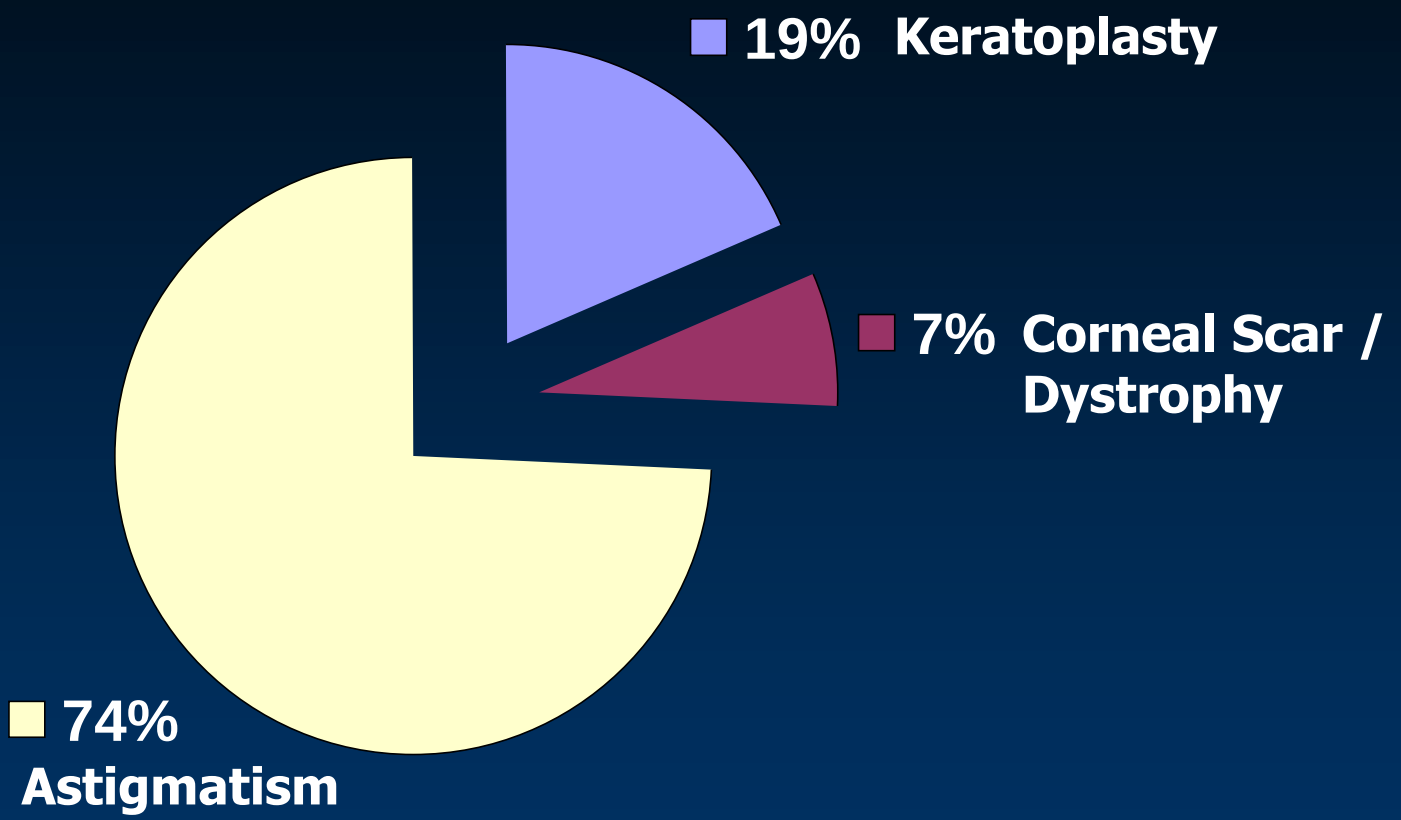
- 27 eyes of 18 patients
- Mean age: 59.9 ± 12.2 years (40 to 77 years)
- Mean astigmatism preop: -5.1 +/- 2.9 D

Toric IOLs:

Sphere: 14.4+/-5.4 D (Range: 5 – 21.5 D)

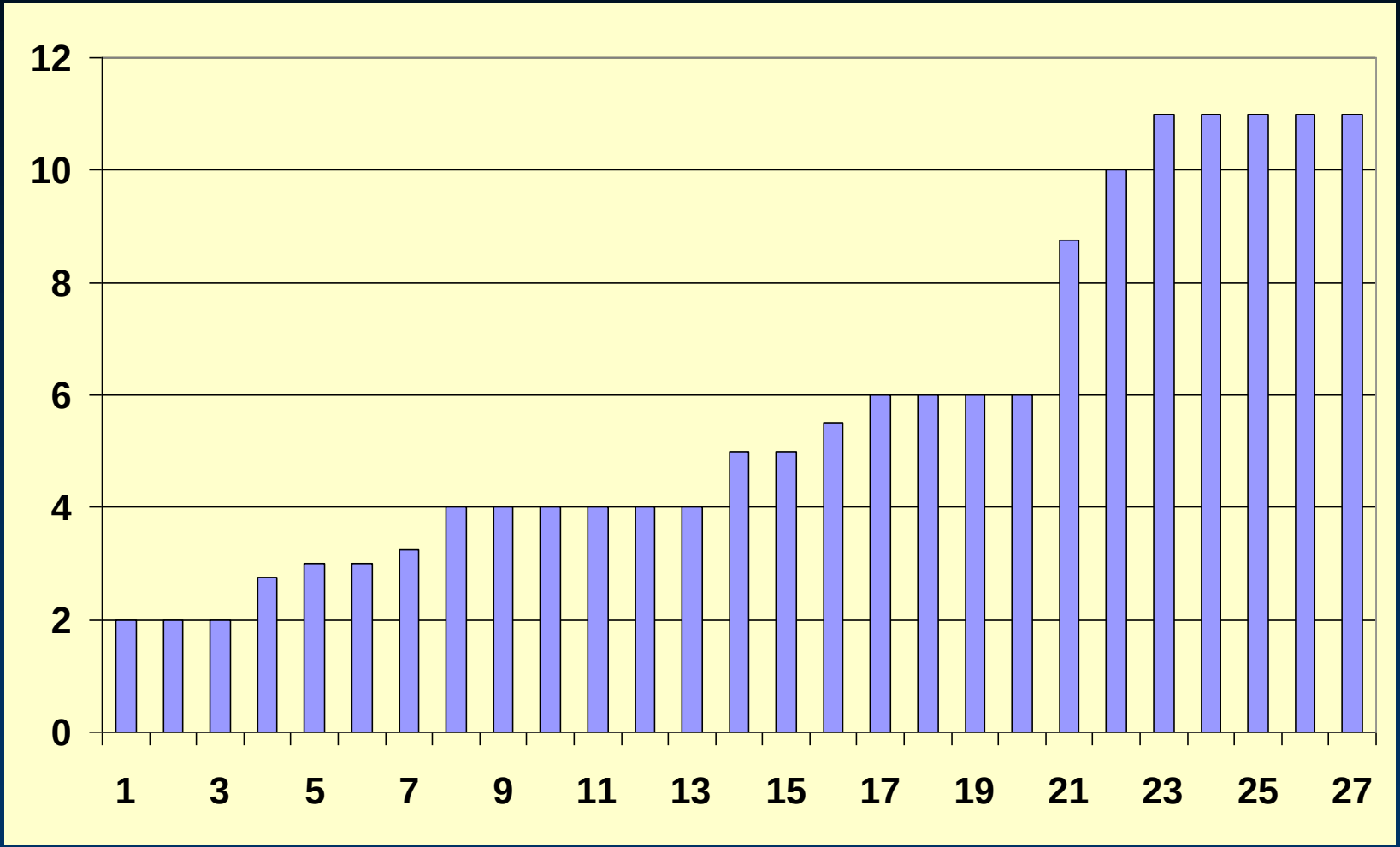
Torus: 6.4+/-3.3 D (Range: 2 – 11 D)

Reasons for toric IOL implantation

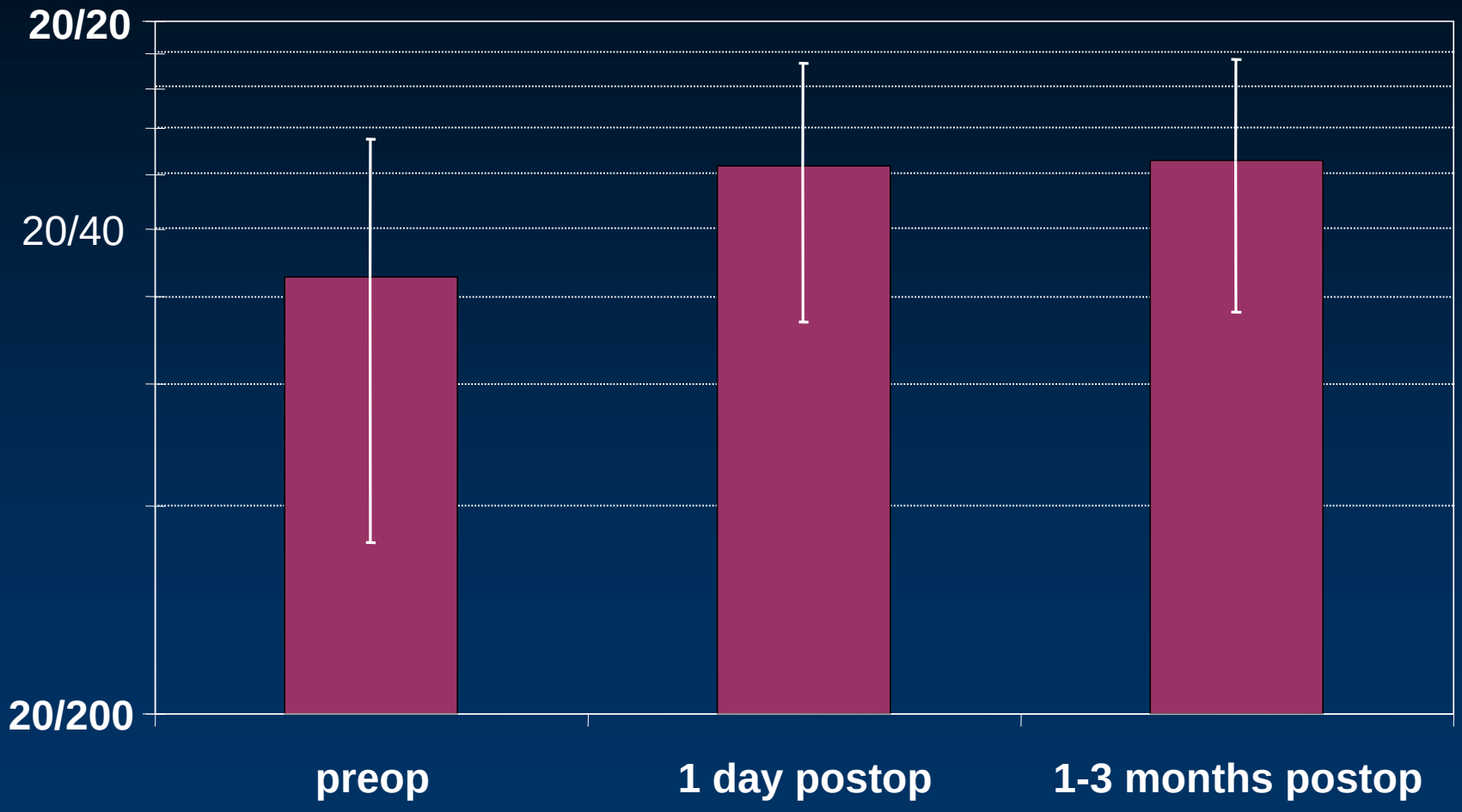


IOL-Torus-Power-Values

Rayner 571T Toric IOL (n=27)



Development of BCDVA
Rayner 571T toric IOL



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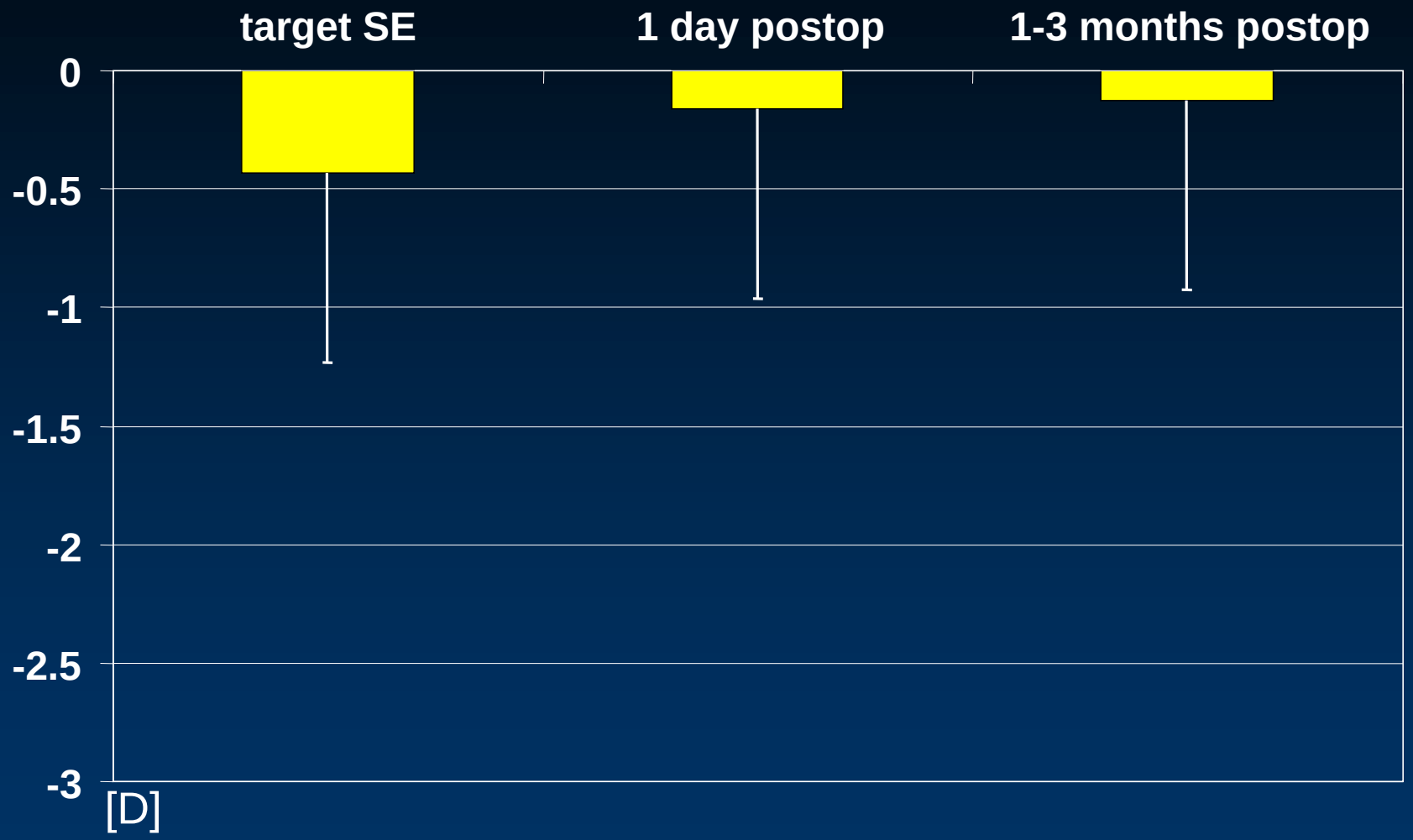
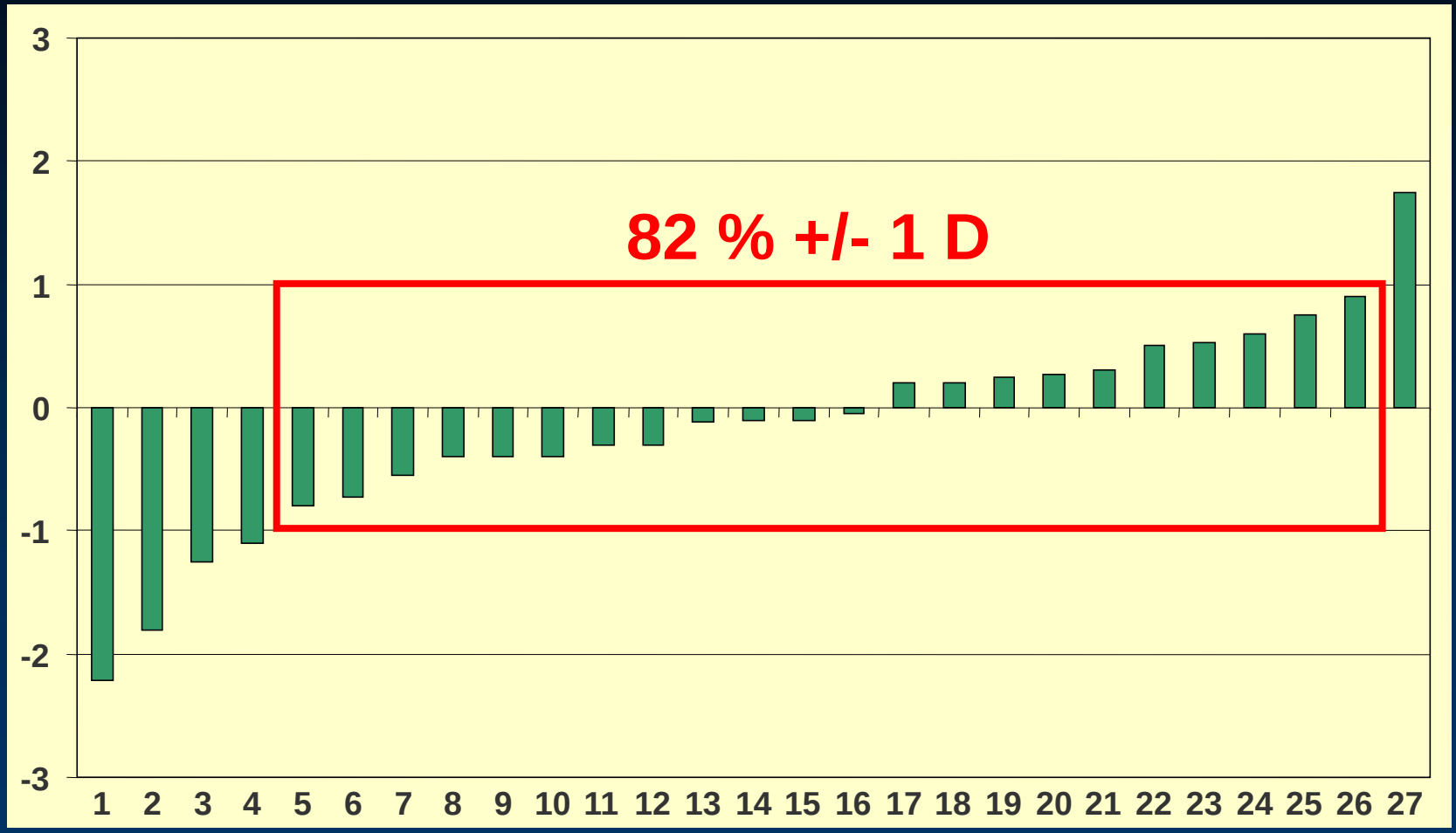
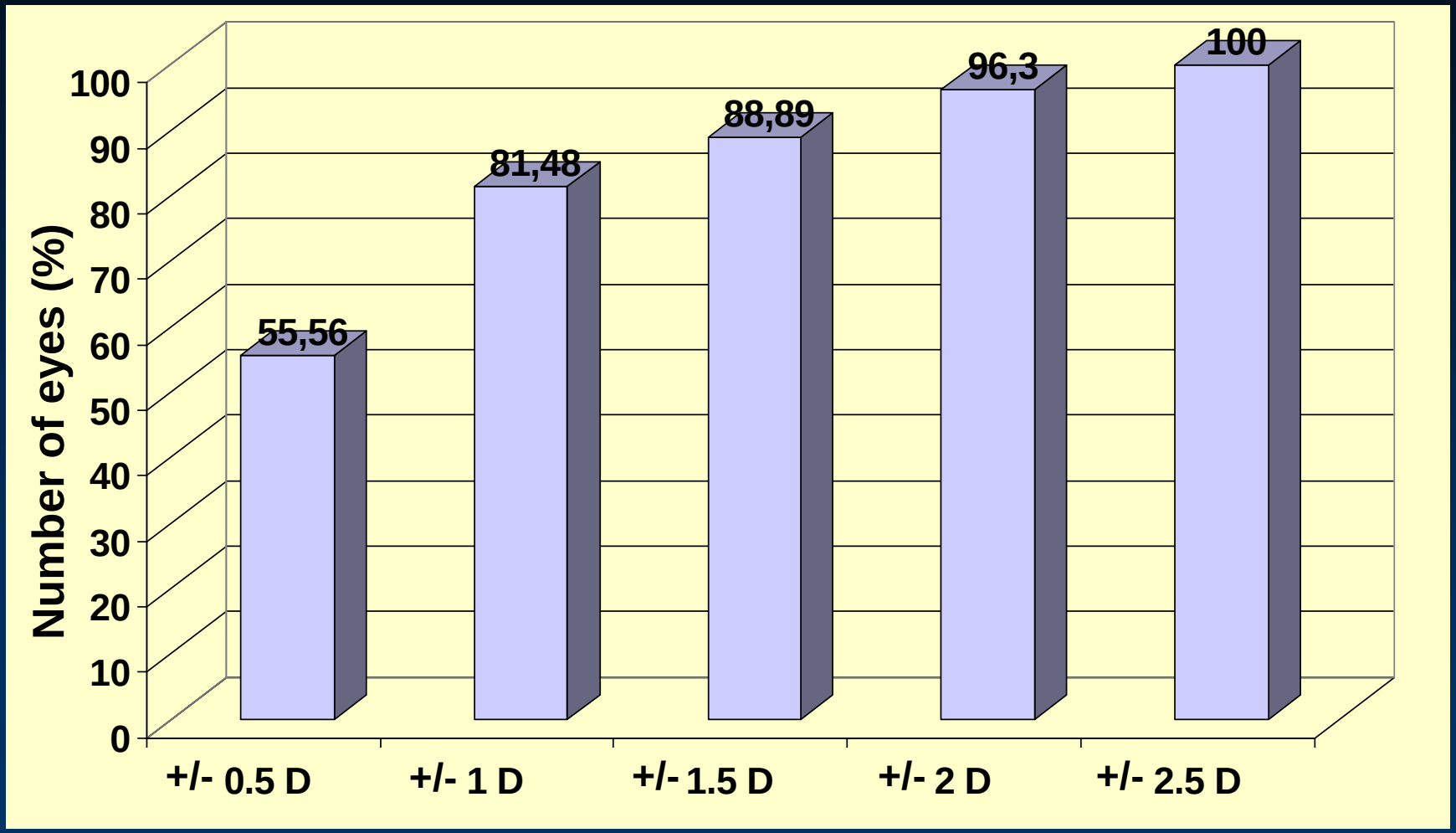
Development of spherical equivalent (SE)



Difference:
Pre-op target SE versus post-op SE



Difference:
Pre-op target SE versus post-op SE



Example: Refractive Lens Exchange

57-year old patient, female: left eye

	Sph.	Cyl.	°	SE	BCDVA
preoperative	0.5	-3.5	180	-1.25	0.9
571 T	18.5	+3		-0.2	
postoperative	0.25	-0.5	60	0	0.9

Example: Cataract

77-year old patient, male: right eye

	Sph.	Cyl.	°	SE	BCDVA
preoperative	2.75	-8.0	90	-1.25	0.5
571 T	12.5	+8.75		-0.5	
postoperative	0	0		0	0.8

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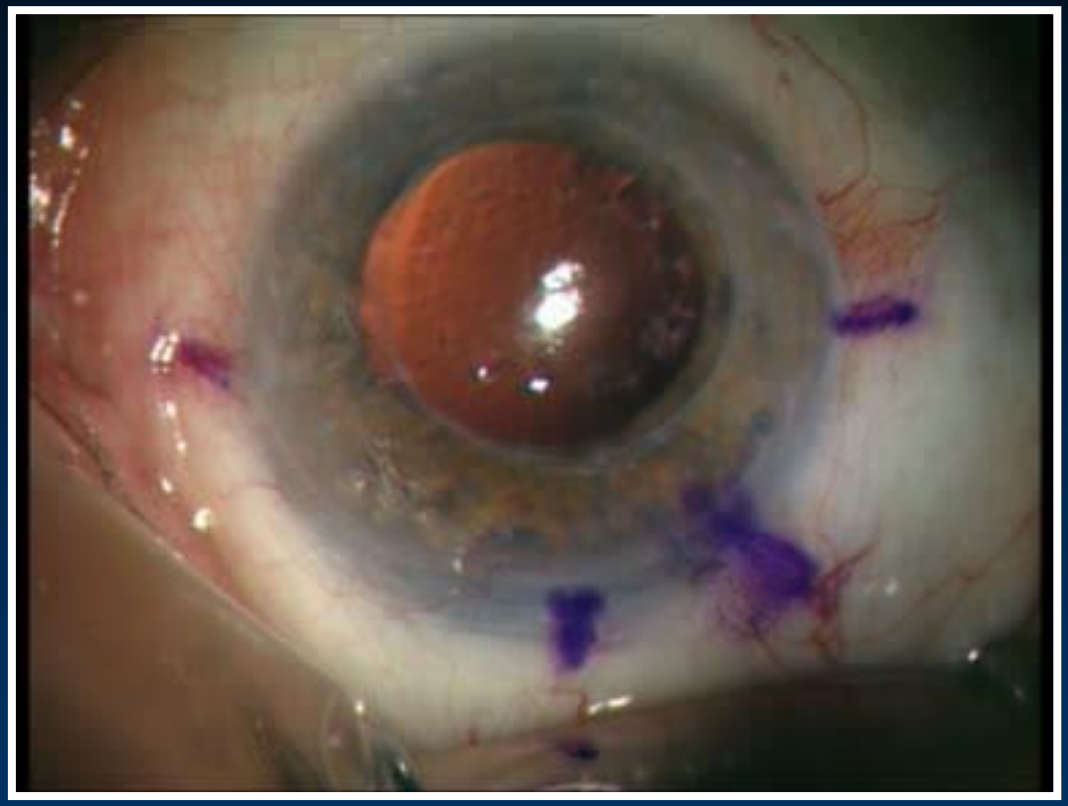
Example: Keratoplasty

40-year old patient, male: right eye

	Sph.	Cyl.	°	SE	BCDVA
preoperative	5.0	-9.0	35	0.5	0.4
571 T	19	+11		-0.3	
postoperative	1.0	-2.0	70	0	0.63

Transcleral Fixation of a Rayner 571T Toric IOL



Pre-OP: +20/-11/25º =0.3 **Post-OP: +1/-2/15º =0.3**

IOL: Rayner 571 T: +20 Sphere +11 Torus

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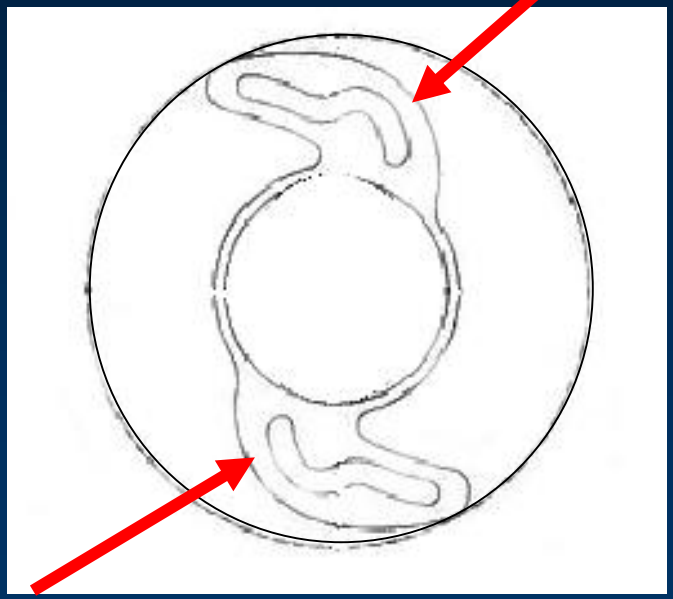
Surgical technique

Transscleral fixation of Center/C-/Superflex

Suture fixation



Suture fixation

Introduction of a new IOL type

Combination of 2

optical principles.

Combining Optical Features

First Implantation of a toric, multifocal IOL

Model Rayner 588F C-Flex

Patient T.A., female, 45years, RLE procedure

Pre-OP data:

BCDVA: OD: +8.0/-2.25/170º= 0.8

OS: +10.25/-3.25/5º = 0.8

IOL: OD: +33.5 / +3 Near Add/ -3.5 Torus

OD: +36.5 / +3 Near Add/ -4.5 Torus

First Implantation of a toric, multifocal IOL

Model Rayner 588F C-Flex: 28.06.2006

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First Implantation of a toric, multifocal IOL

Model Rayner 588F C-Flex

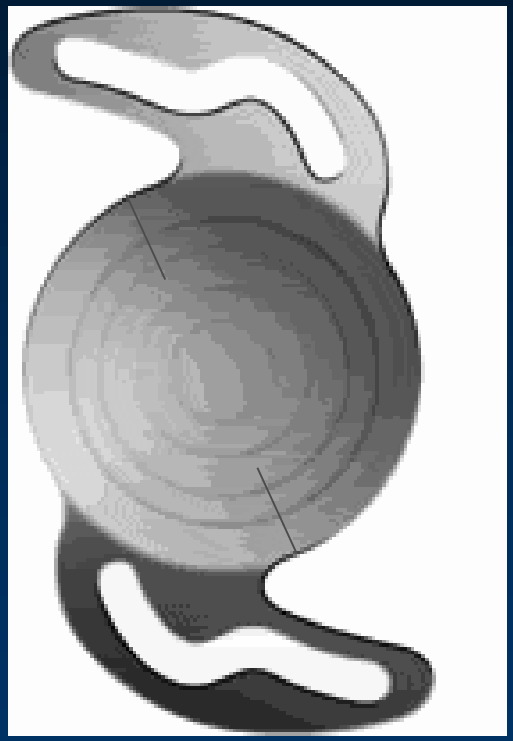
Post-OP data:

UCDVA: OD = 0.9

OS = 0.6

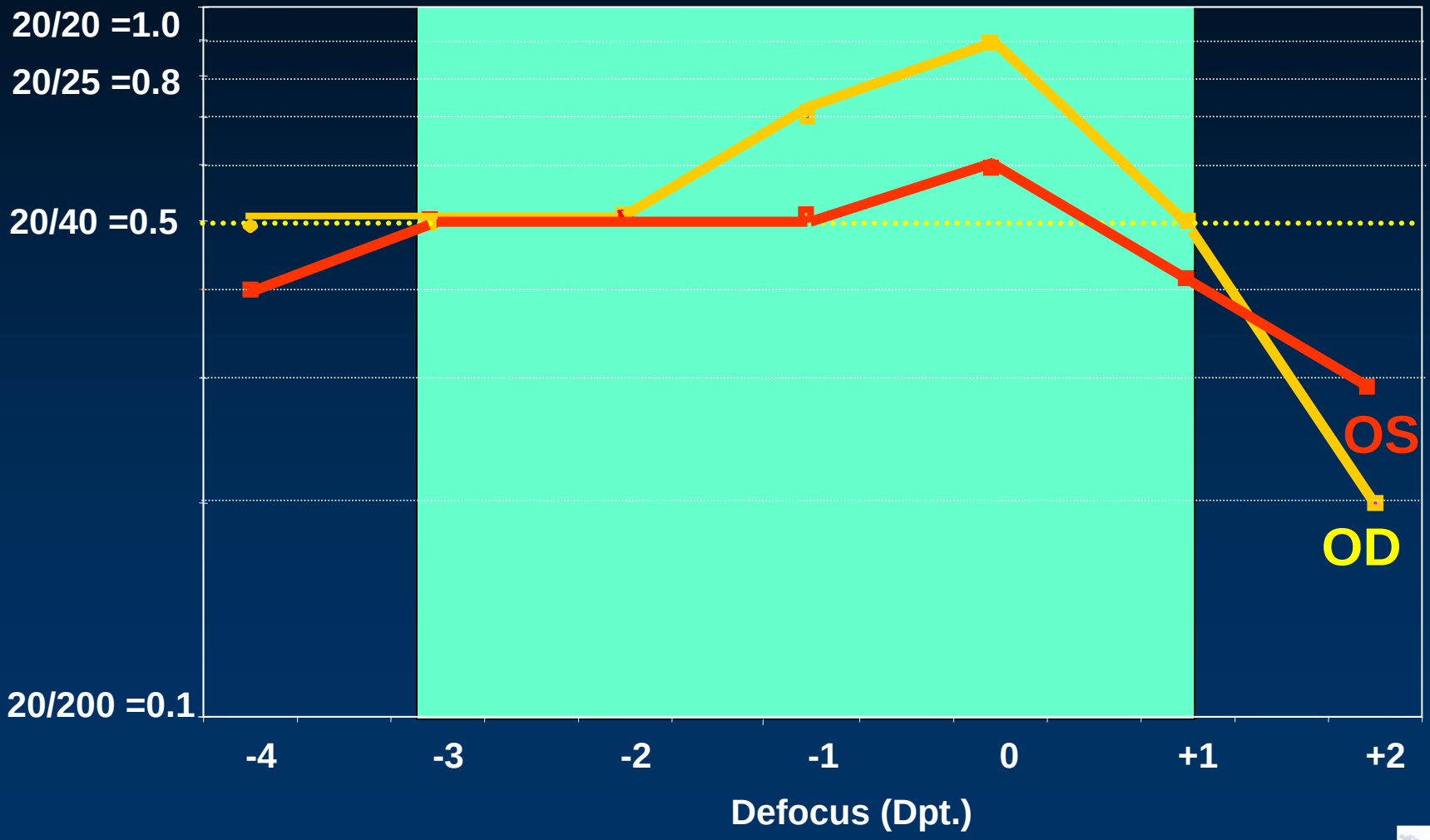
UCNVA: OD = 0.5

OS = 0.5



Defocus Curve

Rayner Toric, multifocal IOL 588F



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Conclusions: Toric IOLs

- excellent centration and minimal rotation
- difference between target and achieved spherical equivalent -0.16 +/- 0.83 D
- 80% of eyes +/- 1.0 D
- correction of higher astigmatism up to 11 D torus possible
- transscleral fixation possible

Conclusions: Toric IOLs

- **The Rayner toric IOL provides excellent results**
  - **in cataract surgery**
  - **in refractive surgery**
  - **after keratoplasty**

Certified for DIN EN ISO 9001:2000

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