



UniversityHospital Heidelberg

[Ramin.Khoramnia@med.uni-heidelberg.de](mailto:Ramin.Khoramnia@med.uni-heidelberg.de) [www.ivcrc.com](http://www.ivcrc.com) [www.djapplelab.com](http://www.djapplelab.com)

# Results After Implantation of Aspheric Toric IOL

**Khoramnia R, Fitting A, Auffarth GU, Holzer MP**

International Vision Correction Research Centre (IVCRC),  
David J Apple International Laboratory of Ophthalmic Pathology  
Dept. of Ophthalmology, Univ. of Heidelberg, Germany  
Chairman: G.U. Auffarth, MD, PhD, FEBO

# IVCRC / DJ Apple Laboratory were supported by ...

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Alcon<sup>1,2,3</sup>

Allergan<sup>1,4</sup>

AMO<sup>1,2,3,4</sup>

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Bayer<sup>2</sup>

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Geuder<sup>2</sup>

Novartis<sup>1,2</sup>

Oculentis<sup>1,2,3</sup>

Ophtec<sup>2</sup>

Physiol<sup>1,2</sup>

Powervision<sup>1</sup>

Rayner<sup>1,2,3</sup>



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# Purpose & Methods

	573T	623T
∅ Optic	5.75 mm	6.25 mm
∅ Total	12.00 mm	12.50 mm
Material	Hydrophilic Acrylate	
Delivery range (Standard)	Sphere: +6.00 D to +30.00 D (0.50 D increments)	
	Cylinder: +1.00 D to +6.00 D (0.50 D increments)	
Delivery range (Special)	Sphere: -10.00 D to +35.00 D (0.50 D increments)	
	Cylinder: +1.00 D to +11.00 D (0.25 D increments)	



**T-flex**  
**Rayner Surgical GmbH**

Bestellungsfrage für:  Torische IOL T-flex  
 Multifokal-Torische IOL M-flex T

Operator: **Abschnitt 1: Vom Operateur auszufüllen**

Vorname: Max Nachname: Dr. med. Muster  
Praxis/Klinik: Musterstr. 1 Telefon: 01234/1234  
Ort: 12345 Musterhausen Fax: 01234/1234

Patient: Hermine Müller Auge(OS/OD): OS

Patienten-ID: Geb.-Datum: 11.11.1911

IOL-Master/Ultraschall? IOL-Master Weiß-zu-Weiß: 12,1

	mm	Dioptrien	Grad	Sphäre	Zylinder	Grad
K1	7,67	44,00	168			
K2	7,21	46,81	78			

Brille Refraktion: 3,00 -1,25 157

Visus sc: Visus cc: Zielrefraktion: Zustand nach Keratoplastik? 0 nein

ACD (mm) Messung von der anterioren Cornea zur anterioren phaken Linse (C-Vorderkammermetrie): 2,57

Vorschläge für Standard-Torische IOL **Abschnitt 2: Von Rayner auszufüllen**

Zielfraktion	Sphäre	Zylinder	Sphäre	Zylinder	Nr.	Preis in € (zzgl. 7 % MwSt)
0,4	0,6	-0,4	21,0	3,0	1	
0,0	0,2	-0,4	21,5	3,0	2	
-0,3	-0,1	-0,4	22,0	3,0	3	

78°

Vorschläge für Spezial-Torische IOL

Zielfraktion	Sphäre	Zylinder	Sphäre	Zylinder	Nr.	Preis in € (zzgl. 7 % MwSt)
0,2	0,2	0,0	21,0	3,5	4	
-0,2	-0,1	0,0	21,5	3,5	5	
-0,5	-0,5	0,0	22,0	3,5	6	

Die Achsenmarkierung zeigt den schwächsten Meridian der IOL

Bitte Bestell-IOL aus Abschnitt 2 angeben **Abschnitt 3: Vom Kunden auszufüllen. Bitte unterschreiben und Fax an Rayner +49 (0) 951 7000 933**

geplanter OP-Termin: Sphäre Zylinder Nr.: 22,0 3,0 3

Bitte mit Achslage der IOL erwünscht?

Die PRODUKTION STARTET MIT ERHALT EINER UNTERSCHRIEBENEN ANFORDERUNG MIT OFFIZIELLER BESTELL-NR.

Mehrwertsteuer/VAT No./TVA No.: Unterschrift (Kunde):

Bestell-Nr.: Datum: Unterschrift (Kunde):

Rayner Bestell-Nr.: 12345a **Abschnitt 4: Nur zur Verwendung von Rayner**

- Necessary data for IOL power calculation at Rayner Surgical GmbH
  - axial length
  - anterior chamber depth
  - keratometry
  - target refraction
- Consideration of a surgically induced astigmatism of 0.5 D at 90°
- Marking of the axis in the sitting patient preoperatively
- Incision size 2.9-3.5 mm at 90°



# Purpose & Methods

- Clinical retro- and prospective study, approved by the ethics committee of the University of Heidelberg
  - 12 eyes of 8 patients, median age 49.50 years (45 to 73 years)
  - CLE (n=4) / Cataract surgery (n=8) between Feb. 2012 and March 2013 (Surgeons: GUA, MPH)
- Implantation of a monofocal-toric **T-flex 623T/573T** (Rayner Surgical GmbH)

Preoperatively	Sphere Median (Min/Max)	Cylinder Median (Min/Max)
Subj. Refraction	2.38 D (-8.25 / 7.25 D)	-2.25 D (-6.50 / -0.25 D)
IOL-Power	19.25 D (8.50 / 28.00 D)	2.75 D (1.50 / 7.00 D)

## Follow-up examination after 2-4 months:

- Keratometry (IOL-Master, C. Zeiss Meditec)
- Calculation of the surgically induced astigmatism (Warren Hill)
- Determination of the axis by means of a photo of the anterior segment
- subjective refraction, visual acuity
- Patients' satisfaction by means of a questionnaire

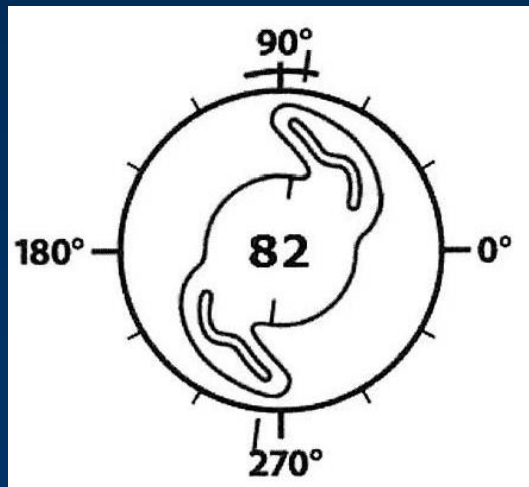


*IOL Master*

# Results – Keratometry, determination of the axis

Median (Min/Max)	preoperatively	postoperatively
K1 [D]	41.87 (44.10/44.33)	41.97 (40.00/44.68)
K2 [D]	44.84 (42.40/46.43)	45.23 (42.56/46.37)
$\Delta$ K [D]	-2.13 (-5.89/-1.41)	-2.36 (-5.93/-0.66)
P-Value (Wilcoxon Test)	0.79	

- Calculation of the surgically induced astigmatism (Warren Hill: [http://www.doctor-hill.com/physicians/sia\\_calculator.htm](http://www.doctor-hill.com/physicians/sia_calculator.htm)): Median **0.56 D (0.06/1.68 D)**
- Median deviation of the axis postoperatively: **4.00° (0.00°/18.00°)**
- Two eyes with a deviation of 16° and 18° respectively → subjective cylinder of -0.5 D and -1.25 D postoperatively



Calculated axis



T-flex

2-4 months postoperatively

# Results – Achieved vs. target refraction

SE (D)	Median (Min/Max)
Postop	-0.38 (-2.25/0.00)
Target	-0.20 (-1.60/-0.10)
$\Delta$ Achieved – Target	-0.18 (-1.25/0.23)
P-Value (Wilcoxon Test)	0.021

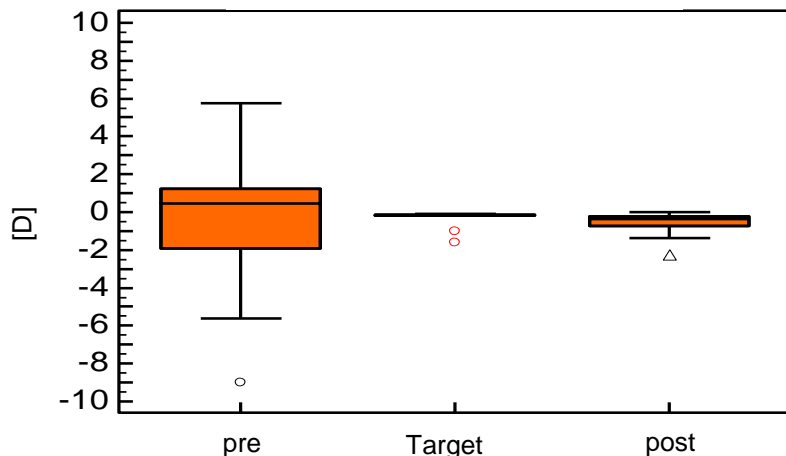
Cylinder (APV, D)	Median (Min/Max)
Postop	0.25 (0.00/0.63)
Target	0.05 (0.00/0.10)
$\Delta$ Achieved – Target	0.28 (-0.10/0.58)
P-Value (Wilcoxon Test)	0.002

	preop CDVA [logMAR]	postop UDVA [logMAR]	postop CDVA [logMAR]
Median (Min/Max)	0.20 (0.02/0.44)	0.06 * (-0.18/0.20)	-0.10 (-0.26/0.16)

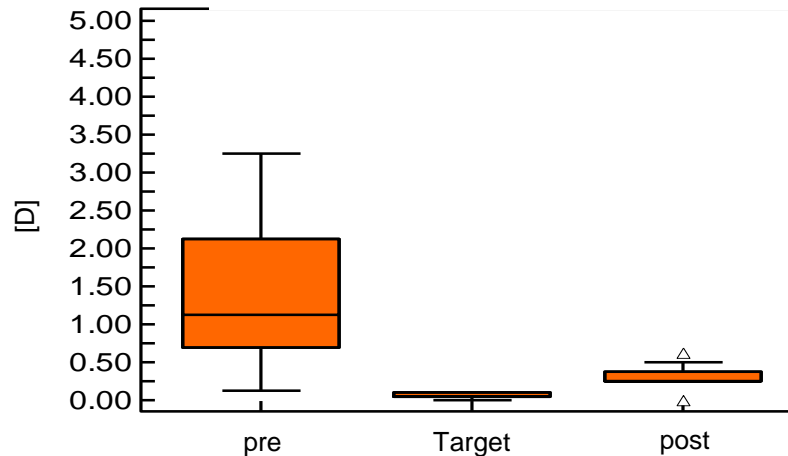
\* n=10, target refraction >-1.00 D excluded

Diff. achieved - target	$\pm 0.25$ D	$\pm 0.50$ D	$\pm 0.75$ D	$\pm 1.00$ D	$\pm 1.25$ D
SE	58.33 %	83.33 %	83.33 %	91.67 %	100.00 %
Cylinder (Power Vector Analysis)	58.33 %	91.67 %	100.00 %	100.00 %	100.00 %

Spherical Equivalent (SE)



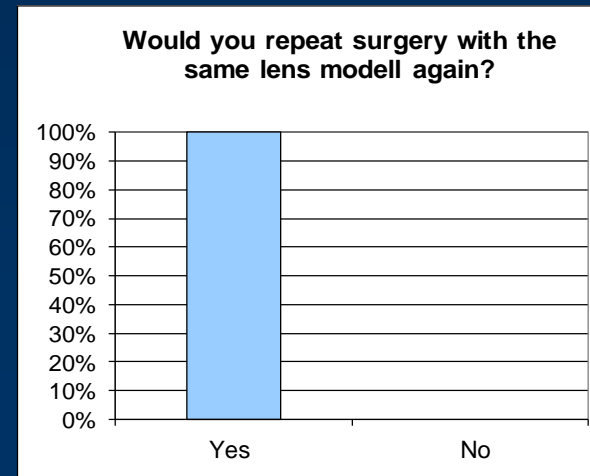
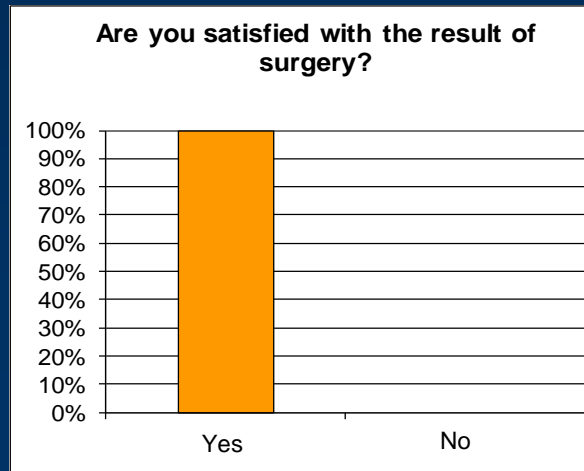
Cylinder (Power Vector Analysis)



# Conclusions



- Median induced astigmatism: 0.56 D (0.06/1.68 D)  
→ values may vary, however
- Postoperative axis was predictable most of the times
- Slight, but statistically significant difference regarding target vs. achieved refraction (SE, cylinder)
- High patients' satisfaction







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## G.U. Auffarth, MD, PhD, FEBO

M.P. Holzer, MD, FEBO  
F.T.A. Kretz, MD, FEBO  
K. Linz, MD

T.M. Rabsilber, MD  
F.N. Auerbach, MD  
A. Fitting, MSc

R. Khoramnia, MD, FEBO  
M. Safwat Attia, MD  
R. Willrich Amroussi, MA