

# **SURGICAL CORRECTION OF ASTIGMATISMUS BY SENIOR FLYING STAFF CLINICAL OUTCOMES AFTER IMPLANTATION OF MONOFOCAL TORIC IOL**

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## NIGHT vision MONO-focal v.s. MULTI-focal IOLs

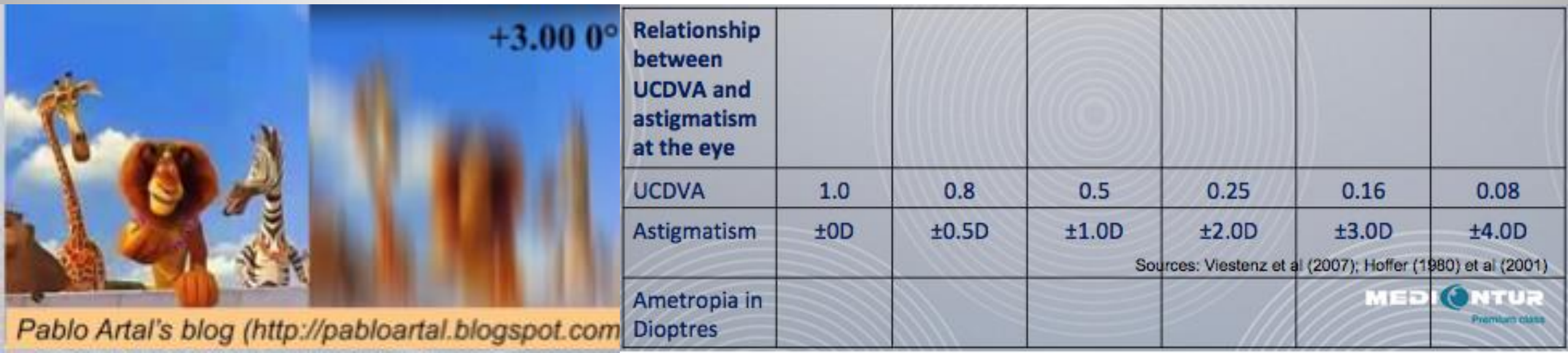


## NIGHT vision Astigmatismus



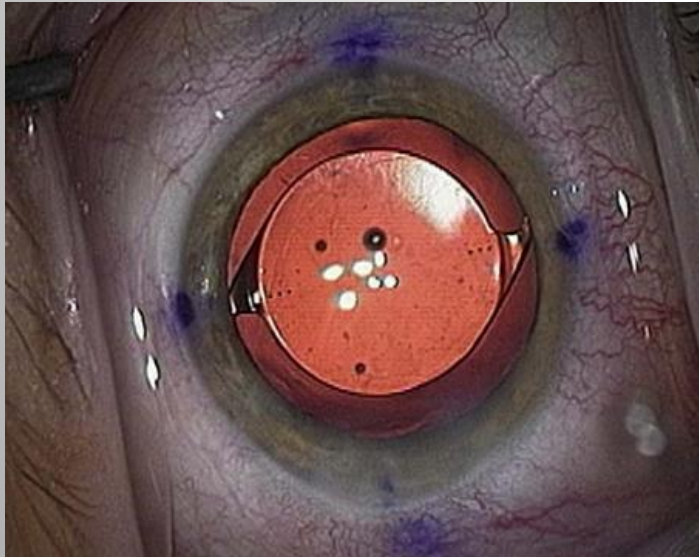
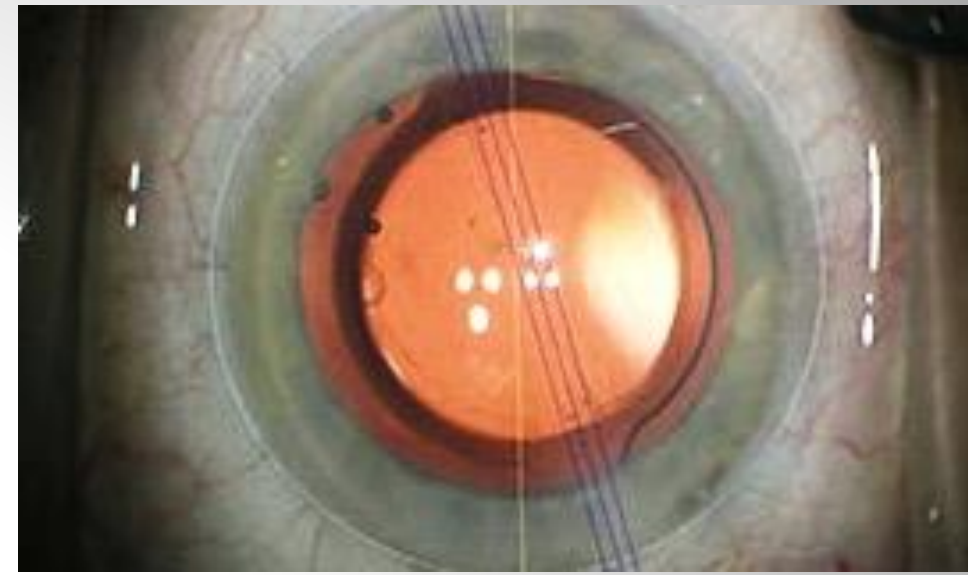
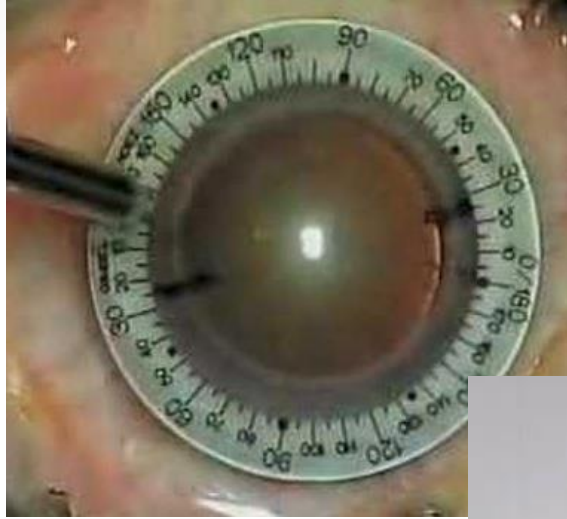
# What is astigmatism?

- 15% to 29% of patients with cataract have more than 1.5 dioptres of refractive astigmatism
- prevalence of astigmatism increases with age
- strongly affects visual acuity
- Intraocular toric lenses were first introduced in 1992





## Manual mark v.s. Calisto navigation ZEISS system



### Cyclotorsion -

- 6D movement
- Purkynje



## Rotation Stability – KEY FACTOR

**one degree** off-axis rotation

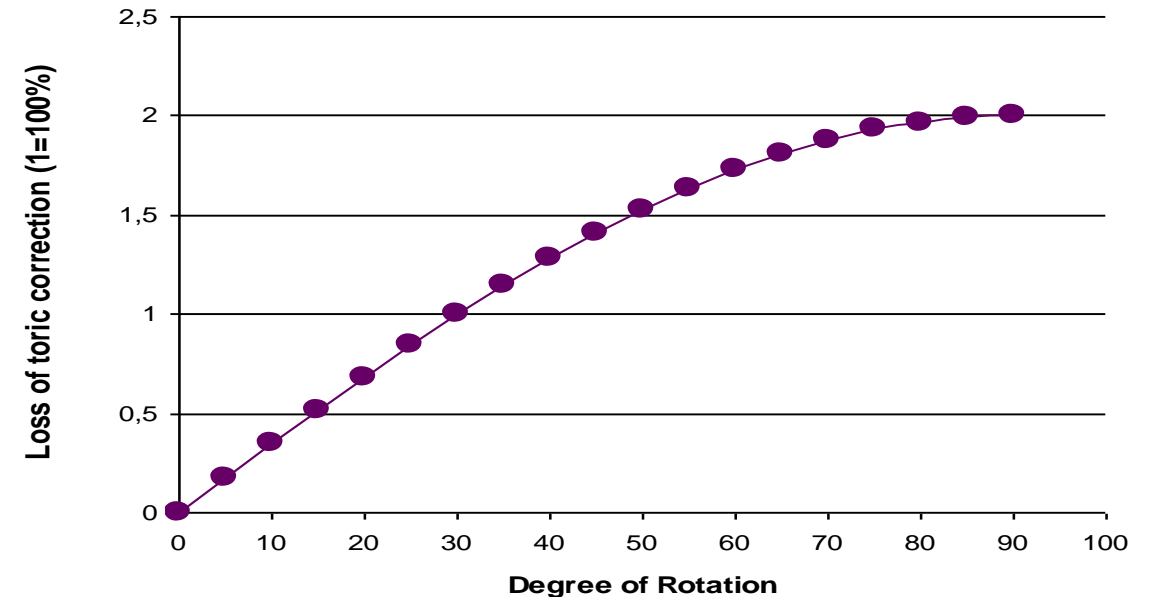
•= **3.3%** of the lens astigmatic power is lost

•A deviation of **10 degrees** minimizes the potential correction by **33 %**

•at **30 degrees** of rotation the cylindrical power is **ZERO**

•One mm circumference at the limbus equates to **10°**

Association of rotation of toric IOL and the loss of the cylindric correction  
(1=100%)



## **Study:**

- prospective, interventional case series study
- 20 cases >> 10 cataract patients
- Follow-up: 3 months (Day1, Day7, Month 1,2,3)

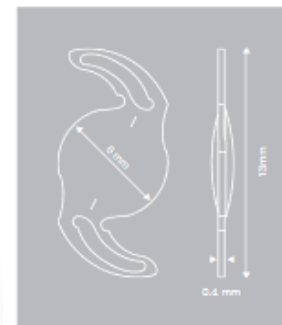
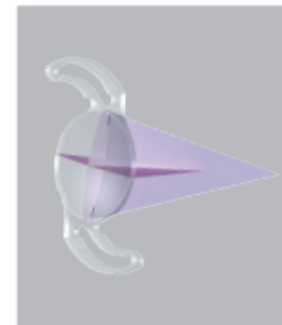
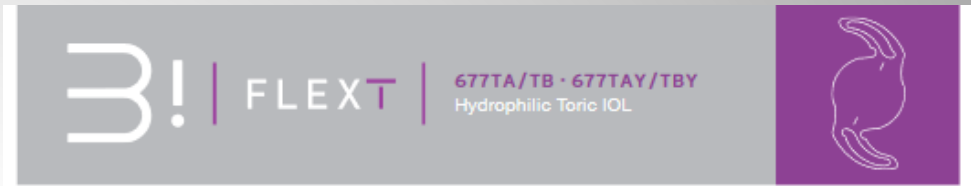
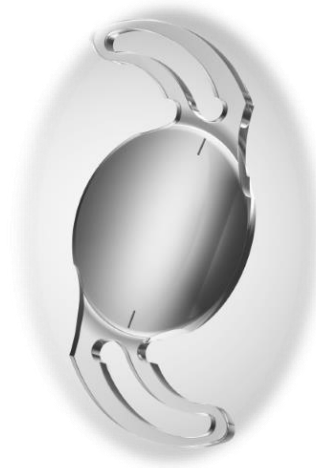
**Purpose:** to evaluate clinical outcomes, rotational and refractive stability after the implantation of monofocal toric IOL: Bi-Flex 677TAY (Medicontur).

# Medicontur Bi-Flex 677TAY toric lenses

- Single piece, hydrophilic
- Toric posterior optic
- Double loop haptic
- Convex-concave technology
  - Widest cylindrical choice – up to 27 cyl

Medicontur provides a user-friendly online calculator for choosing the optimal toric lens supported with

**ABULAFIA – KOCH regression formula**



Technical specification	
Type	Single-piece Aspheric Hydrophilic Toric
	Intraocular Lens for implantation into the capsular bag
Optic	
• 677TA / TAY	Toric – Aspheric
• 677TB / TBY	Bitoric – Aspheric
PCO protection	360° Special Square Edge (patented)
Estimated incision size	from 2.2 to 2.4 mm
Powers available *	-10.0 D → -1.0 D · (increment: 1.0 D)
	0.0 D → +30.0 D · (increment: 0.5 D)
	+31.0 D → +35.0 D · (increment: 1.0 D)
Cylinders available	
• 677TA / TAY	1.0; 1.5 D → 9.0 D · (increment: 0.75 D); 10.0 D
• 677TB / TBY	+11.0 D → +24.0 D · (increment: 1.0 D)
A-constant**	118.9 (SRK/T)
Sterilization	Steam
Material	
• 677TA / TB	Copolymer of Hydrophilic and Hydrophobic Acrylic,
	25 % water content with UV absorber
• 677TAY / TBY	+ blue light filter
Refractive index	1.46
ABBE number	58
Geometry	
Optic design	Biconvex
Overall length	13.0 mm
Optic diameter	6.0 mm
Haptic thickness	0.40 mm
Haptic angulation	0° – asymmetrical design with posterior vaulting
Storage	
Temperature	+15 – +35°C
Humidity	15% – 50%
Shelf life	5 years (from sterilization)

\* Other powers upon request  
 \*\* It is recommended that surgeons personalize the constants they use. Please find more information about IOL constants on ULIS.  
<http://www.cousoft.de/ulis/c1.html>

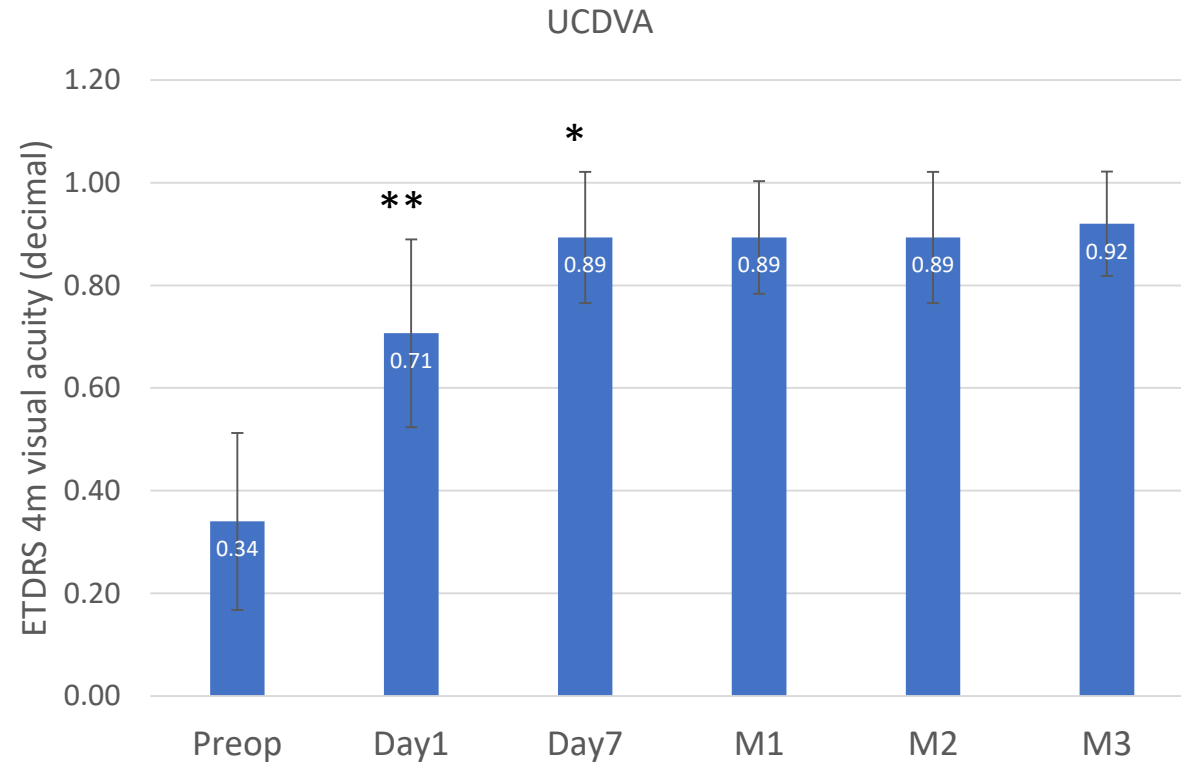
## Patient characteristic and preoperative data

	Mean $\pm$ SD	Min	Max
Age (years)	66.8 $\pm$ 5.5	58	70
UCDVA (decimal)	0.34 $\pm$ 0.17	0.1	0.6
BCDVA (decimal)	0.66 $\pm$ 0.13	0.4	0.8
Mean refractive spherical equivalent(D) <sup>#</sup>	1.46 $\pm$ 1.38 (abs. value)	-5.75	1.875
Refractive astigmatism (D) <sup>#</sup>	-1.76 $\pm$ 1.47	-4.5	-0.25
Topographic astigmatism (D)	-1.71 $\pm$ 1.85	-4.71	2.3
SEQ of implanted IOL (D)	21.06 $\pm$ 2.61	16	25
Cyl of the implanted IOL (D)	2.01 $\pm$ 1.11	1	3.75

<sup>#</sup> obtained by subjective refraction

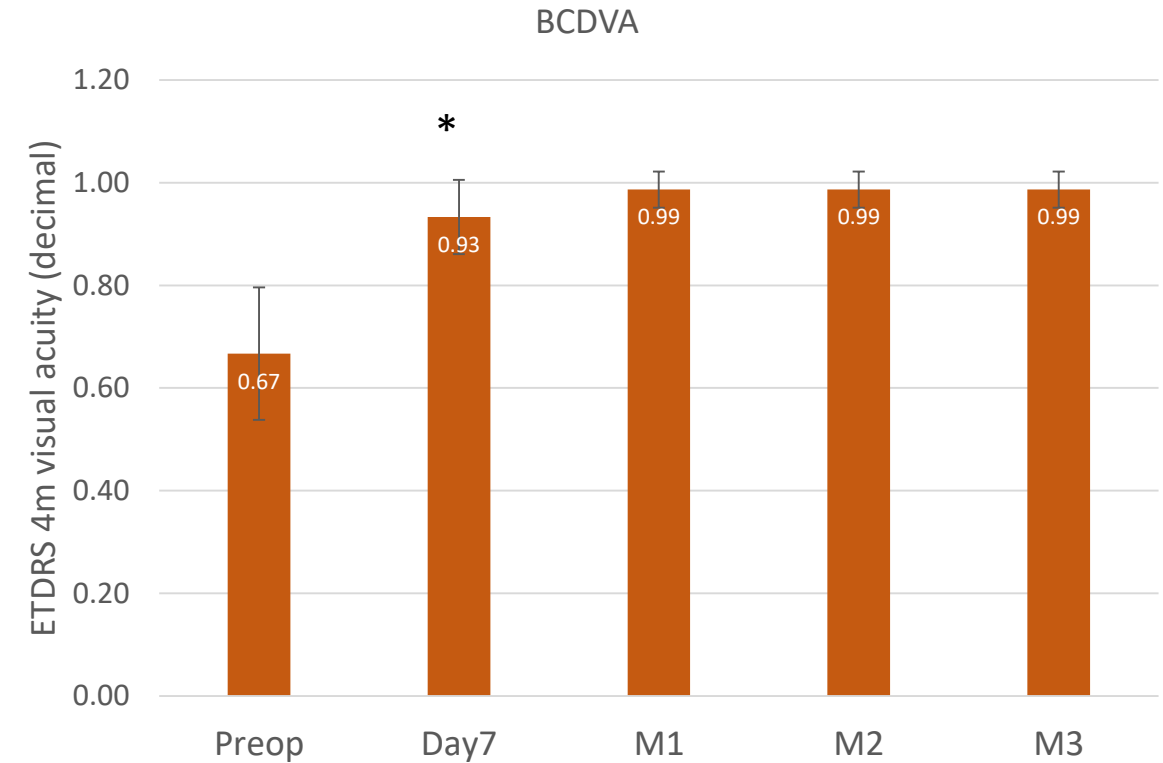


# Visual outcome - Non-corrected and corrected monocular far visual acuity



**\*\***  $p < 0.0001$  preop vs. Day1 (paired Student's  $t$  test)

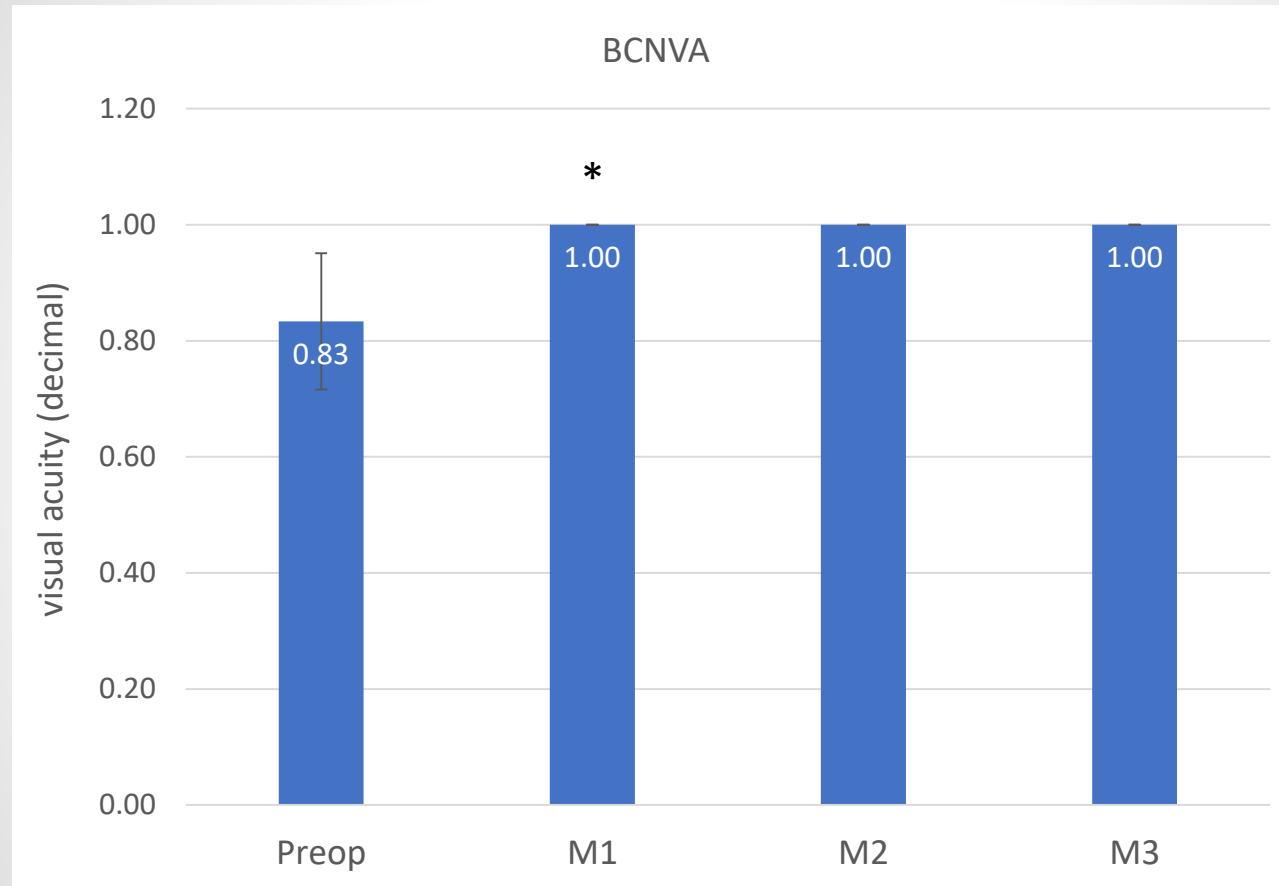
**\***  $p < 0.001$  preop vs. Day7 (paired Student's  $t$  test)



**\***  $p < 0.001$  preop vs. Day7 (paired Student's  $t$  test)

† All data are presented as mean  $\pm$  SD

## Visual outcome - corrected monocular near visual acuity

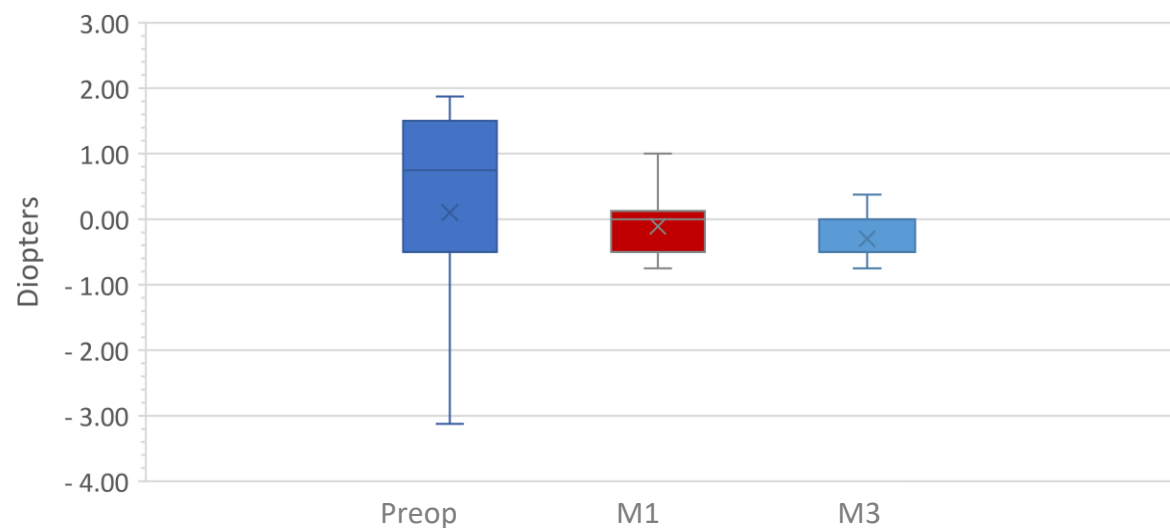


\*  $p < 0.001$  preop vs. M1 (paired Student's t-test)

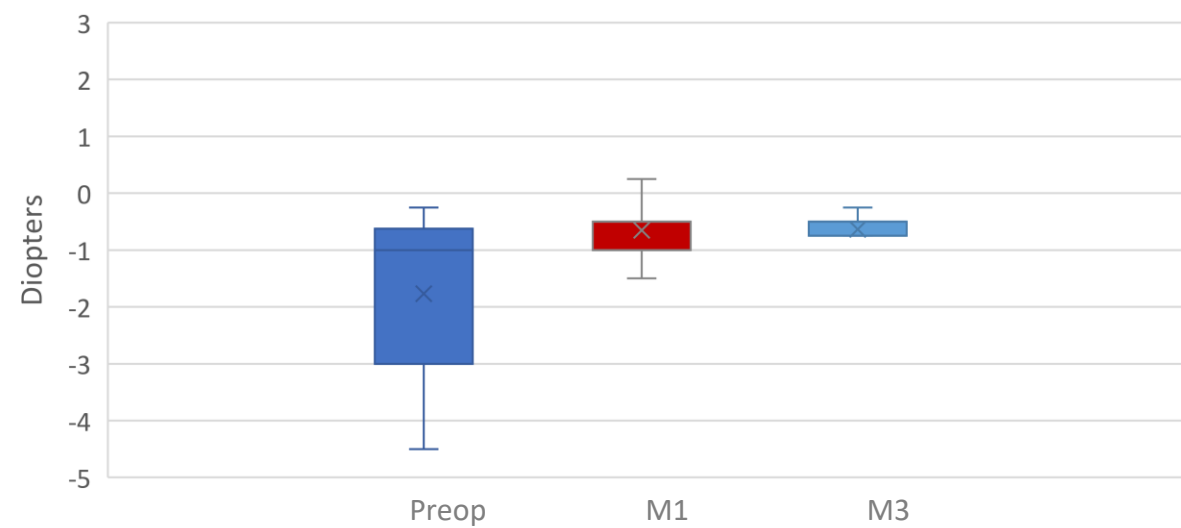
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# Stability of the spherical equivalent and refractive astigmatism in the follow-up period after implantation of toric IOL

Refractive Spherical Equivalent

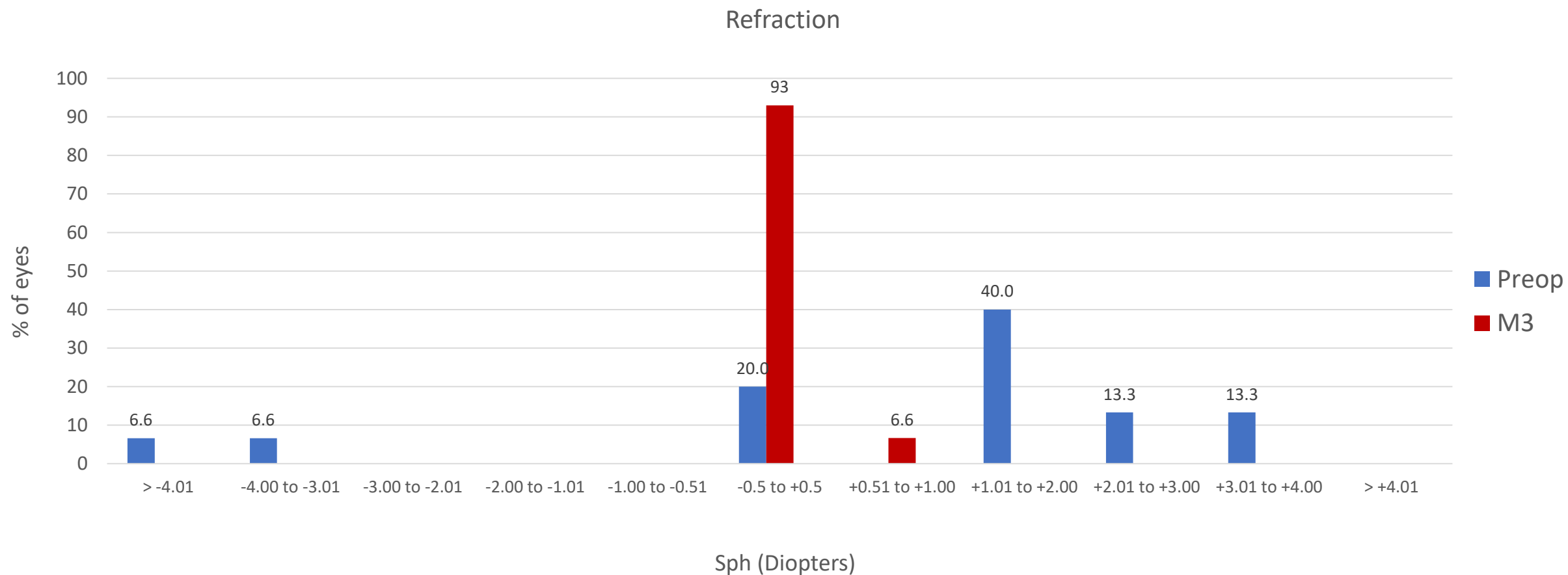


Refractive astigmatism



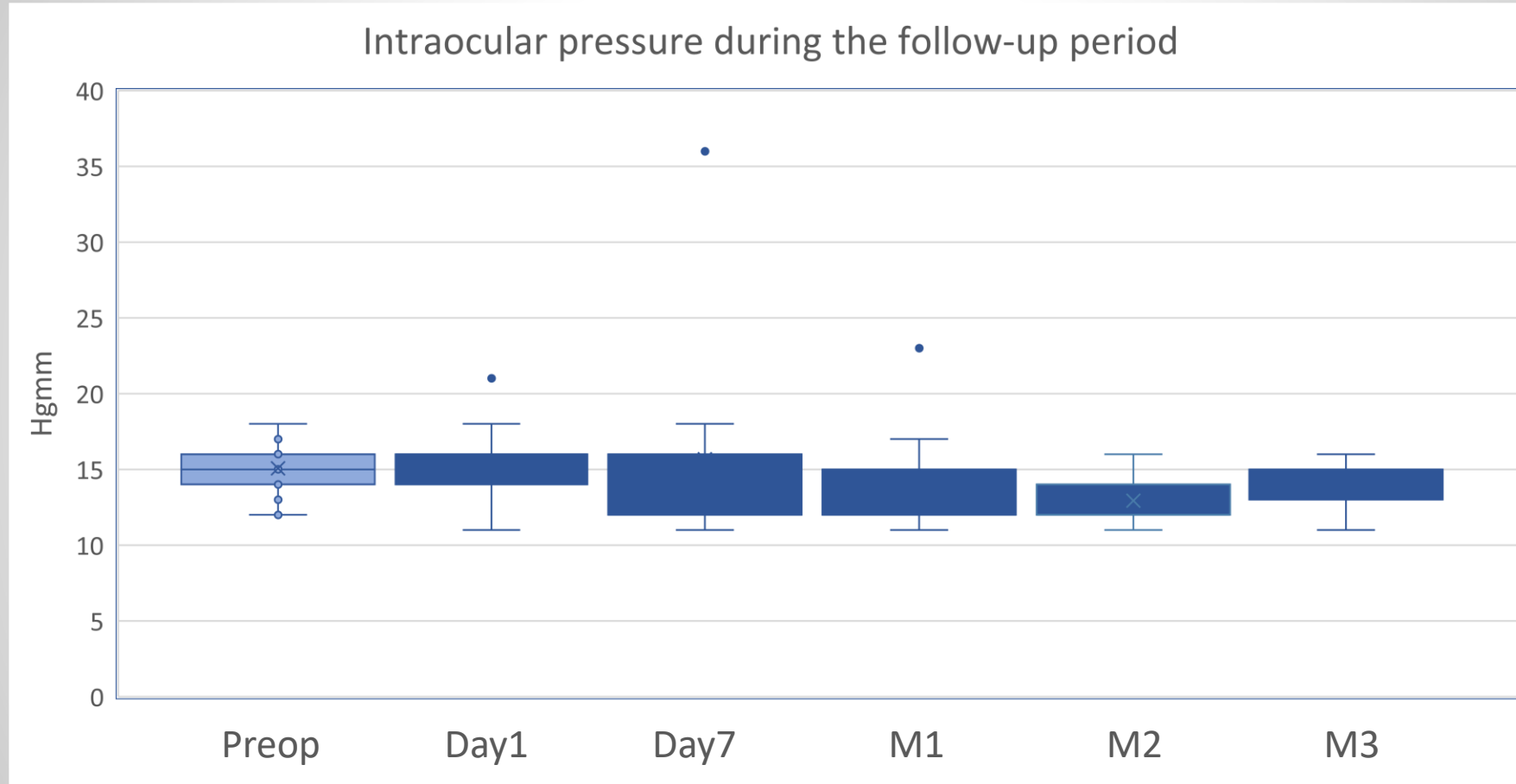
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# Preoperative and postoperative refraction



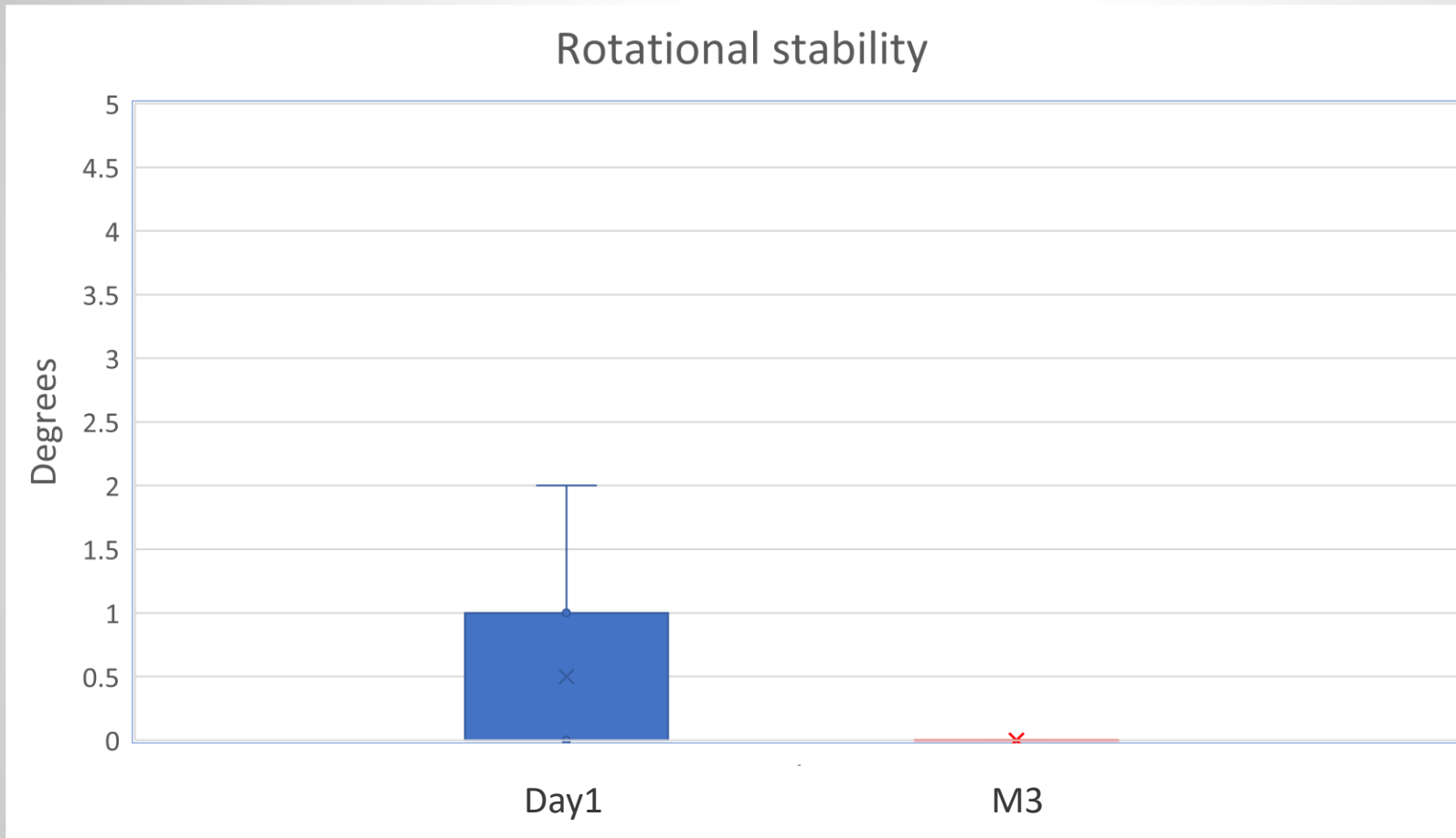


# Intraocular pressure



† All data are presented as mean  $\pm$  SD

## Rotational stability



Lens rotation:  
intraop vs. Day1  
and Day1 vs. M3

*† All data are presented as mean  $\pm$  SD*

## Conclusions

- The implanted toric IOLs provides safe and effective correction of pre-existing regular corneal astigmatism in patients after cataract surgery
- This method is good enough to restore excellent vision and brings glasses independency for distance
- Medicontur Bi-Flex 677TAY lenses exhibit excellent refractive precision and refractive & rotational stability

