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Presbyopia Correction With Multifocal Toric IOL Implantation



ASCRS·ASOA
SYMPOSIUM & CONGRESS
2014 APRIL 25-29
BOSTON



SZPITAL KLINICZNY CEGLANA

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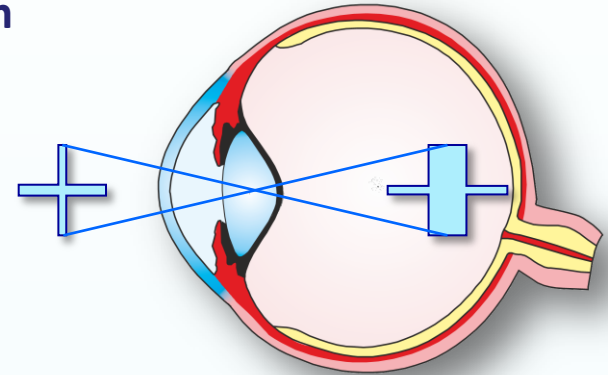
**Authors 1 and 3 of this eposter have received travel support from company Rayner, MediceM.
Authors 2 and 4 have no financial interest in the subject matter of this e-poster**

Astigmatism - most popular refractive error

35-40% of cataract patients have astigmatism
 range from **0,75** to **3,0** Dcyl

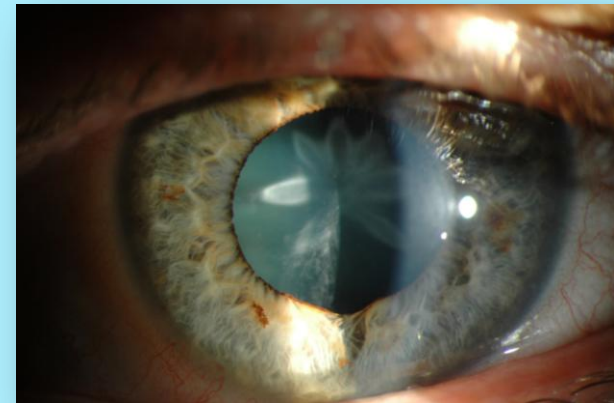
Astigmatism in cataract patients

- 18-23% corneal astigmatism **1,5 - 2,0** Dcyl
- 9-12% corneal astigmatism **2,0 - 3,0** Dcyl
- 7% corneal astigmatism more than **3** Dcyl



ASTIGMATISM CORRECTION IN CATARACT PATIENTS

- **Optical:**
 - spectacles
 - contact lenses
- **Surgical: During the cataract surgery**
 - Individual incision shape and place
 - Relaxing incisions (arcuate)
 - Primary toric PCIOL or multifocal toric implantation
- **Surgical: When is already monofocal spheric PCIOL:**
 - IOL exchange
 - Excimer laser corrections
 - Secondary IOL toric („add on”, „piggy back”)



PURPOSE

The aim of the study was the possibility assessment of the presbyopia correction, changes in the activities of everyday life and satisfaction with vision in patients with previous corneal astigmatism after bilateral cataract surgery followed by posterior chamber implantation of multifocal toric intraocular lenses M-FLEX T (Rayner, UK)

MFLEX T:

A - Constant = 118.0; Multifocal; 4-5 optic zones; monotoric = the torus implemented on the anterior surface of the optic, torus given as plus cylinder (axis marks = lowest power meridian)

Refractive, Aspheric from Rayacryl
= hydrophilic acrylic co-polymer

Amon - Apple Enhanced Square Edge
- on the posterior surface, reducing PCO;
Anti - Vaulting Haptic Technology = stability



METHODS

The patients with corneal astigmatism higher than **1.5D** motivated to reduced their dependency on glasses were qualified for presbyopia correction with multifocal toric intraocular lens implantation.

The analyzed material consisted of **30 eyes in 15 patients**, mean age **57.6**, implanted with multifocal toric IOL M-FLEX T (Rayner, UK), the addition for near vision was +4.0D. The follow up time was 12-28 months.

Functional results and clinical state of the operated eyes during entire postoperative period was evaluated.

We compared:

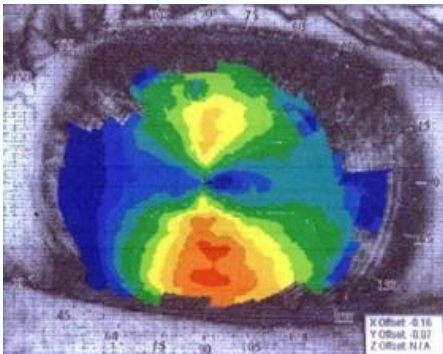
**pre- and postoperative UCDVA, BCDVA, UCNVA,
changes of the postoperative objective refraction,
contrast sensitivity,
changes in the activities of everyday life,
patients subjective satisfaction.**



METHODS OF M-FLEX T IOL CALCULATION

Raytrace Toric On-line Ordering System

PATIENT QUALIFICATION

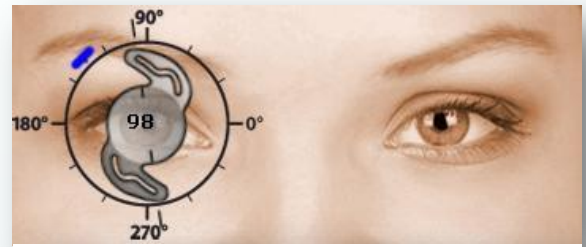


AL: 21.56 mm (SNR = 245.4)
 K1: 40.81 D / 8.27 mm @ 176°
 K2: 43.49 D / 7.76 mm @ 86°
 R / SE: 8.02 mm (SD = 42.15 mm)
 Cyl.: -2.68 D @ 176°
 opt. ACD: 2.55 mm

OS
left

Eye Status: phakic

Corneal Quatrix		Rayner Superflex 620H	
pACD Const:	6.04	pACD Const:	5.39
IOL (D)	REF (D)	IOL (D)	REF (D)
33.5	-1.2	31.5	-1.2
33.0	-0.8	31.0	-0.9
32.5	-0.5	30.5	-0.5
32.0	-0.1	30.0	-0.1
31.5	0.2	29.5	0.2
31.0	0.5	29.0	0.6
30.5	0.9	28.5	1.0

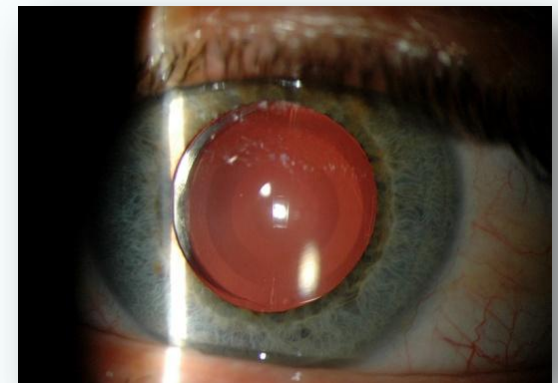


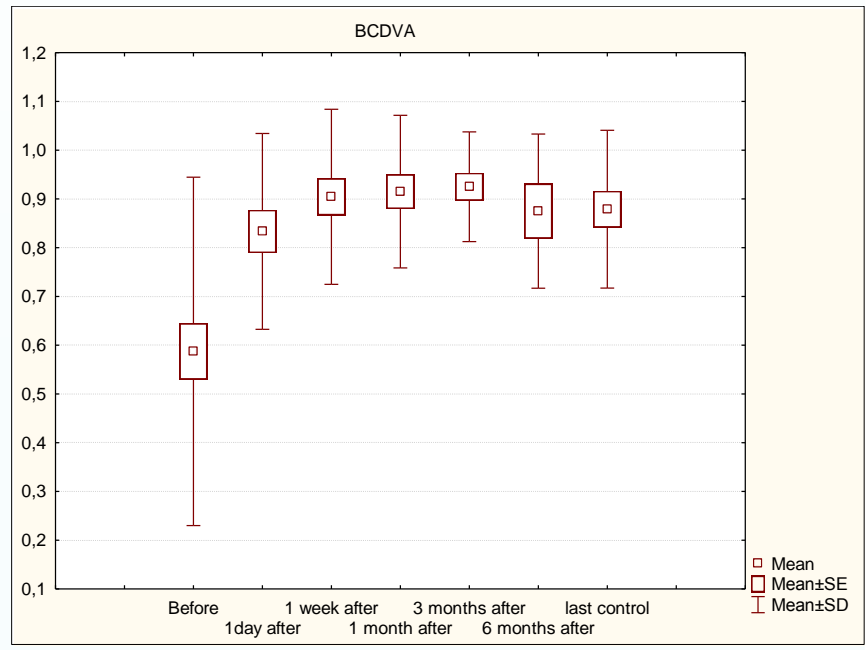
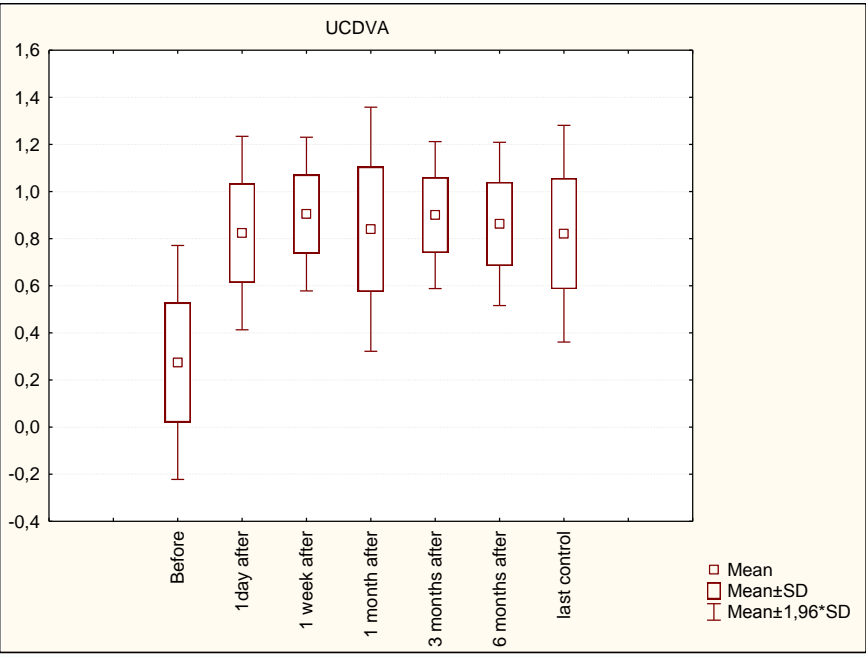
Estimated post-op refraction			Ordered IOL			
Sph Equiv (D)	Sphere (D)	Cylinder (D)	Sph Equiv (D)	Sphere (D)	Cylinder (D)	model / range
-0.1	0	-0.1	14.5	12	5	623T STD

Surgeon		Patient data	
katarzyna BUCZAK-GAS		Axial length measurement method: Optical	
Hospital: Ediro		Axial Length (mm): 25.74	
Patient number: 3298		ACD (mm): 3.32	
ID: 60112901659		K1: 8.11 mm, 41.62 D, 10 degrees	
Date of birth: 29/11/1960		K2: 7.43 mm, 45.42 D, 100 degrees	
Subject Eye: OD(right)		K index: 1.3375	
Target Refraction: 0.00		SIA (D): 0.25	
Pre-Operative Refraction		Incision location (deg): 135	
Sphere	Cylinder	Degree	
-2.75	-5.25	2	

SURGICAL TECHNIQUE

- Marking the axis:
horizontal marks 0 i 180 degrees
orientation of IOL
- Topical anesthesia: 4% *lignocainum* gel
+ 2% *lignocainum* to anterior chamber
- Corneal incision: 2,6 mm, ax = 135 °
- Standard phacoemulsification
- Multifocal Toric lens implantation
- Positioning IOL MFLEX T IOL
in correct angle
- Postoperative treatment consistent
with PTO and ESCRS recommendation



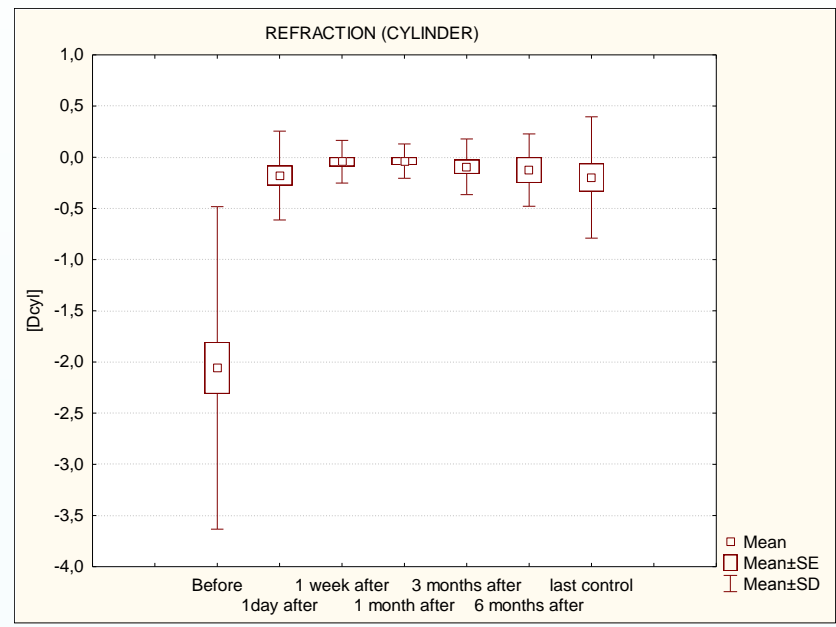
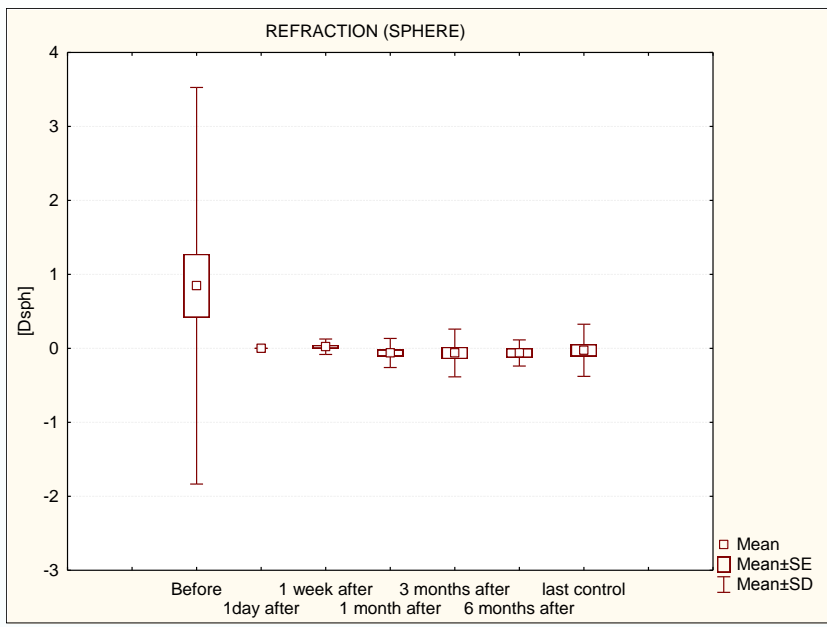


UCDVA	BEFORE	1 DAY AFTER	1 WEEK AFTER	1 MONTH AFTER	3 MONTHS AFTER	6 MONTHS AFTER	LAST CONTROL
Średnia	0,27	0,82	0,90	0,84	0,90	0,86	0,82
Odch.Std	0,25	0,21	0,17	0,26	0,16	0,18	0,23
min	0,00	0,40	0,40	0,00	0,60	0,60	0,20
max	1,00	1,00	1,00	1,00	1,00	1,00	1,00
p		<0,05	<0,05	<0,05	<0,05	<0,05	<0,05

BCDVA	BEFORE	1 DAY AFTER	1 WEEK AFTER	1 MONTH AFTER	3 MONTHS AFTER	6 MONTHS AFTER	LAST CONTROL
Średnia	0,59	0,83	0,90	0,92	0,93	0,88	0,88
Odch.Std	0,36	0,20	0,18	0,16	0,11	0,16	0,16
min	0,00	0,40	0,40	0,50	0,70	0,60	0,40
max	1,00	1,00	1,00	1,00	1,00	1,00	1,00
p		0,005	<0,05	<0,05	<0,05	0,003	<0,05



RESULTS – CHANGES IN TOTAL REFRACTION



SPHERE	BEFORE	1 DAY AFTER	1 WEEK AFTER	1 MONTH AFTER	3 MONTHS AFTER	6 MONTHS AFTER	LAST CONTROL
MEAN	0,85	0,00	0,02	-0,06	-0,06	-0,06	-0,03
ST DEV	2,68	0,00	0,10	0,20	0,32	0,18	0,35
min	-6,00	0,00	0,00	-0,75	-1,25	-0,50	-1,00
max	6,75	0,00	0,50	0,00	0,25	0,00	1,00
p		0,155	0,146	0,137	0,184	0,347	0,165

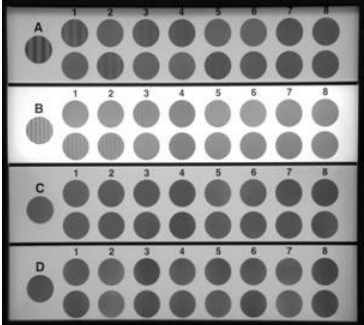
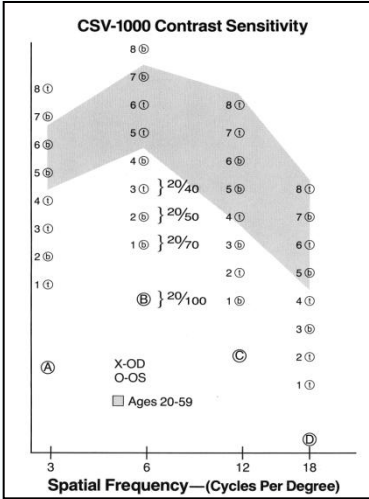
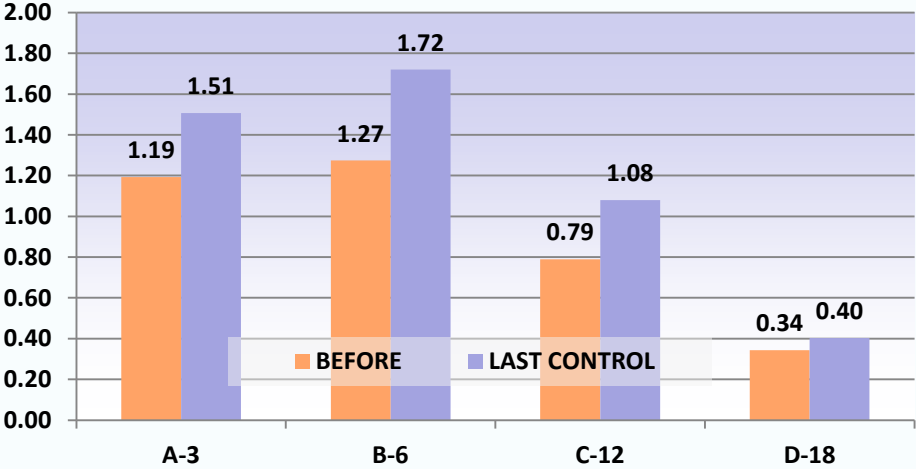
CYLINDER	BEFORE	1 DAY AFTER	1 WEEK AFTER	1 MONTH AFTER	3 MONTHS AFTER	6 MONTHS AFTER	LAST CONTROL
MEAN	-2,06	-0,18	-0,04	-0,04	-0,09	-0,13	-0,20
ST DEV	1,58	0,43	0,21	0,17	0,27	0,35	0,59
min	-6,50	-1,50	-1,00	-0,75	-1,00	-1,00	-2,50
max	0,00	0,00	0,00	0,00	0,00	0,00	0,00
p		<0,05	<0,05	<0,05	<0,05	0,001	<0,05

No statistically significant difference in pre- and postoperative **corneal astigmatism** was reported

RESULTS – CONTRAST SENSITIVITY

CONTRAST	BEFORE A-3	LAST CONTROL A-3	BEFORE B-6	LAST CONTROL B-6	BEFORE C-12	LAST CONTROL C-12	BEFORE D-18	LAST CONTROL D-18
MEAN	1,19	1,51	1,27	1,72	0,79	1,08	0,34	0,40
ST.DEV	0,38	0,24	0,34	0,28	0,24	0,34	0,24	0,32
min	0,70	1,00	0,91	1,21	0,61	0,61	0,17	0,17
max	1,93	1,93	1,84	2,29	1,25	1,69	1,08	0,96
p	<0,05		<0,05		0,02		0,50	

MEAN CONTRAST SENSITIVITY

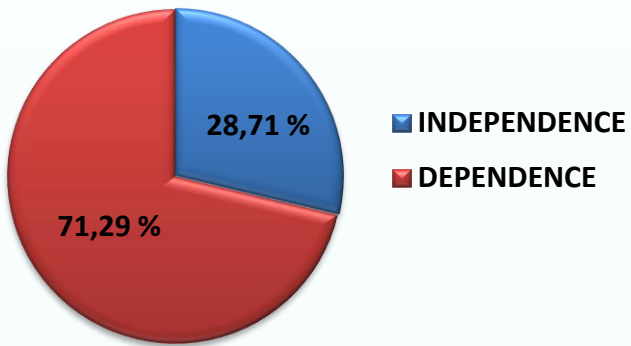


Test CSV-1000E

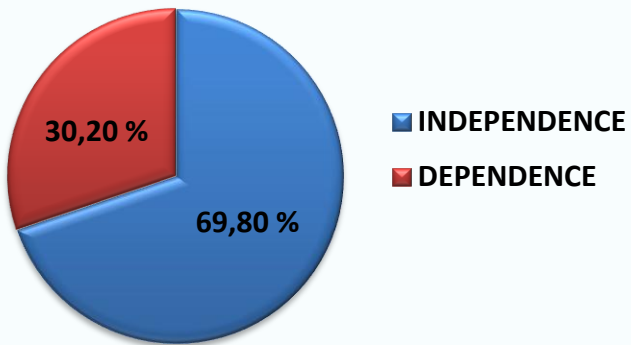
The mean contrast sensitivity improved postoperatively in all spatial frequencies (from 1.19, 1.27, 0.79, 0.34 pre-op to 1.51, 1.72, 1.08, 0.40 post-op respectively).

RESULTS - VF-14 QUESTIONNAIRE

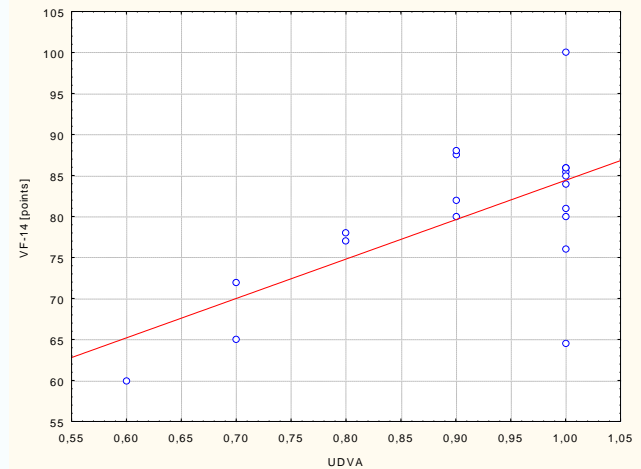
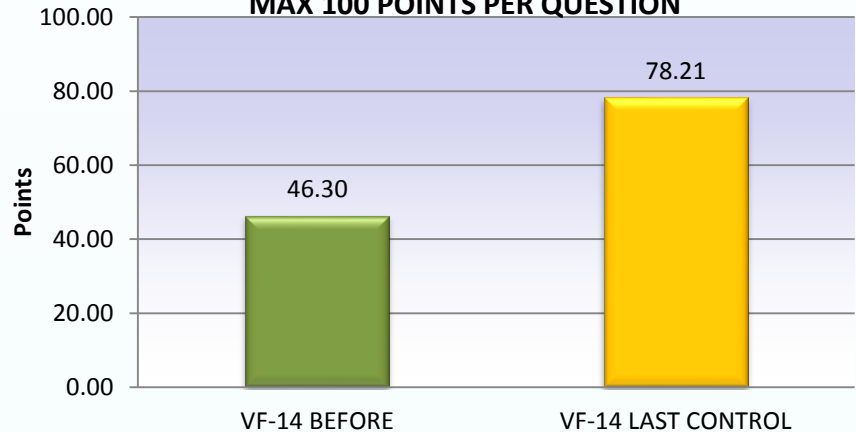
**VF-14 QUESTIONNAIRE
- DEPENDENCE ON SPECTACLE CORRECTION
BEFORE TREATMENT**



**VF-14 QUESTIONNAIRE
- DEPENDENCE ON SPECTACLE CORRECTION
AT LAST CONTROL**



**VF-14 QUESTIONNAIRE
- PATIENT'S SATISFACTION
MAX 100 POINTS PER QUESTION**

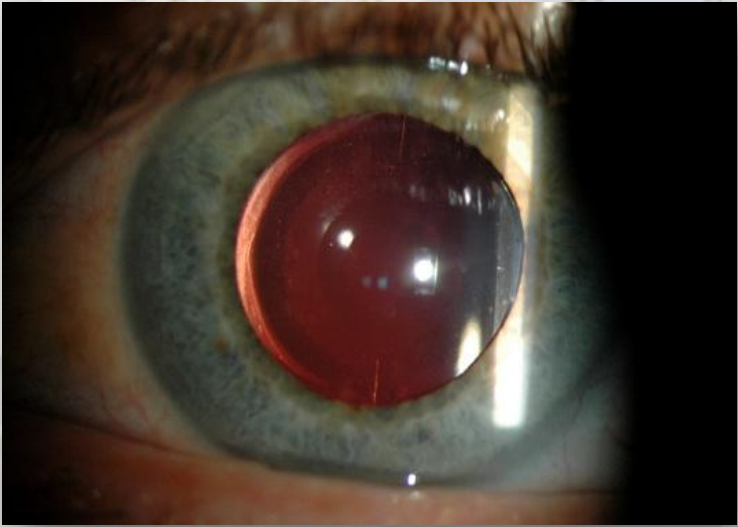


Correlation coefficient $r=0.6$ $p=0.003$

There is no coincidence between changes of the distance visual acuity and measures of the quality of life with the VF-14 index

CONCLUSIONS

The greatest advantage of the multifocal toric M-FLEX T IOL implantation is that it can provide good uncorrected distance and near visual acuities reducing the dependence on spectacles. Procedure is reasonable refractive surgery option for middle-aged patients.



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Thank for your attention