Outcomes and complications of a multifocal toric intraocular lens with a surface-embedded near section

Jan Venter, MD, Martina Pelouskova, MSc

PURPOSE: To evaluate the refractive outcomes and rotational stability after implantation of a multifocal toric intraocular lens (IOL) with a surface-embedded near section.

SETTING: Private center, London, United Kingdom.

DESIGN: Case series.

METHODS: This study evaluated eyes with more than 1.50 diopters (D) of preexisting corneal astigmatism. After phacoemulsification, Lentis Mplus toric IOLs were implanted in all cases. The main outcome measures were refraction, uncorrected (UDVA) and corrected (CDVA) distance visual acuities, uncorrected near visual acuity (UNVA), keratometry, and IOL position. Three-month postoperative data are presented.

RESULTS: The study enrolled 89 eyes (58 patients). The mean monocular postoperative UDVA and UNVA were 0.03 logMAR ± 0.11 (SD) and 0.17 ± 0.14 logMAR, respectively. The mean refractive cylinder decreased from 2.90 ± 1.31 D preoperatively to 0.50 ± 0.39 D postoperatively ($P<.001$). The mean difference between the planned axis of implantation and the actual axis postoperatively was 2.53 ± 2.27 degrees.

CONCLUSION: The multifocal toric IOL with a surface-embedded near section effectively corrected preexisting corneal astigmatism. The IOL was stable in the capsular bag, there were no visually significant complications, and there was no significant rotation out to 3 months postoperatively.

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Patient expectations of cataract or refractive lens exchange (RLE) have increased over time and include a desire for postoperative spectacle independence. Hence, greater emphasis is being placed on simultaneous surgical correction of keratometric astigmatism to address expectations and convenience. A significant number of patients with cataract also have preexisting corneal astigmatism.[1–3] Recent studies[2,3] report that 16% to 22% of eyes have 1.50 diopters (D) or more of corneal astigmatism.

Monofocal toric intraocular lenses (IOLs) are effective at correcting astigmatism and provide excellent visual outcomes and good rotational stability.[4–10] However, the high demand for spectacle independence at distance and near led to the development of a multifocal toric IOL.[11–14]

Recently, multifocal IOLs with rotational asymmetry were introduced into clinical practice. Early results indicate good distance, intermediate, and near visual acuity with a high level of contrast sensitivity with the nontoric multifocal Lentis Mplus IOL (LS-312 MF30, Oculentis GmbH).[15–24] To our knowledge, to date there are no peer-reviewed studies of the toric Lentis Mplus (LU-313 MFT) IOL.

The purpose of this study was to prospectively evaluate the predictability, rotational stability, and visual

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From Optical Express, London, United Kingdom.

Corresponding author: Jan Venter, MD, Optical Express, 22 Harley Street, London, United Kingdom W1G 9AP. E-mail: drjanventer@googlemail.com.

outcomes of the toric IOL in 89 consecutive cases over a 3-month period.

PATIENTS AND METHODS

This prospective study enrolled patients who were scheduled for bilateral phacoemulsification followed by implantation of the toric IOL. The study cohort comprised presbyopic ametropic patients who had cataract or were not candidates for laser vision correction. All eyes had naturally occurring keratometric cylinder greater than 1.50 D. Exclusion criteria included a history of glaucoma or retinal detachment, corneal disease, previous corneal surgery, history of ocular inflammation, neuro-ophthalmic disease, macular degeneration, and retinopathy. Informed consent was obtained from all patients.

Patient Evaluation

All patients had a preoperative examination that involved autorefraction and tonometry (Tonoref II, Nidek Co. Ltd.), corneal topography by Scheimpflug imaging (Pentacam, Oculus. Inc.), uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), uncorrected near visual acuity (UNVA), endothelial cell count (SP 2000P Specular Microscope, Topcon Europe BV), optical biometry by partial coherence interferometry (PCI) (IOLMaster, Carl Zeiss Meditec AG), subjective and cycloplegic refractions, slitlamp evaluation, and dilated fundoscopy. Distance visual acuity was measured with a Snellen visual acuity chart. Near visual acuity was measured using a handheld logarithmic near visual acuity chart (Early Treatment Diabetic Retinopathy Study) with a 40 cm cord attached to it to ensure measurement at the correct distance.

Data (axial length, anterior chamber depth [ACD], and keratometry) from the PCI device were used for IOL calculation. If the difference between keratometry from the PCI device and the Scheimpflug device or autorefraction was greater than 0.50 D, the PCI biometry was repeated; good fixation of the patient was ensured. Intraocular lens power and alignment were calculated on the manufacturer's web-based program[A] using the Haigis formula. All eyes were targeted for emmetropia.

Postoperatively, patients were evaluated at 1 day, 1 week, and 1 and 3 months. At each follow-up visit, the CDVA, UDVA, UNVA, subjective refraction, and keratometry were measured. Subjective refraction was measured by an experienced optometrist with a back vertex distance of 12.0 mm. Autorefraction was used as a reference for manifest refraction, taking into consideration that the toric IOL used in the study underestimates sphere by approximately −1.25 D on the autorefractor. In addition to the other routine measurements, the IOL axis was determined 3 months postoperatively. Intraocular lens alignment was measured at the slitlamp in 1-degree steps using an eyepiece (Carl Zeiss Meditec AG) for angle measurement through pupils dilated with tropicamide 1.0%. The mark on the IOL was aligned with the reticle on the eyepiece, and the axis was recorded. Patients were requested to complete a computer-based satisfaction questionnaire 3 months postoperatively.

Intraocular Lens

The Lentis Mplus toric LU-313 MFT is a 1-piece multifocal toric IOL with a plate-haptic design (Figure 1). It is of a hydrophilic acrylic material with a hydrophobic surface (Benz25 UV). The IOL has an aspheric and toric surface with a posterior sector-shaped near-vision segment, which provides +3.0 D of near addition (add). The optic diameter is 6.0 mm and the overall length, 11.0 mm. The IOL is custom made with available spherical correction between 0.00 D and +36.00 D in 0.01 D increments. Cylindrical correction is available between +0.25 D and +12.00 D in 0.01 D increments.

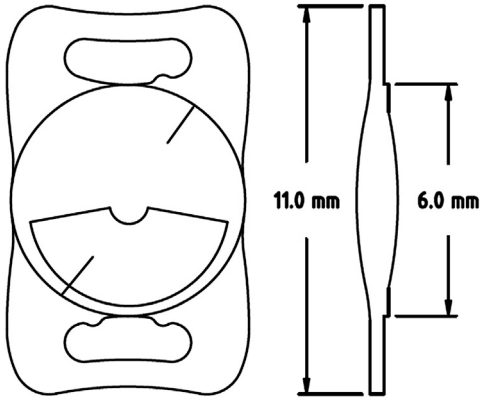

Figure 1. Multifocal toric IOL with a surface-embedded near section.

Surgical Technique

All surgeries were performed by the same surgeon (J.V.). Topical anesthesia (proxymetacaine hydrochloride 0.50%) was instilled, and the patient was seated at the slitlamp, ensuring vertical head alignment. A narrow slitlamp beam was projected in front of the eye, and the corneal limbus was marked at the 90-degree and 270-degree positions with a sterile disposable ink pen (Fine Skin Marker, Devon). A sub-Tenon anesthetic block was used in all cases, and the patient was prepared and draped for surgery.

Intraoperatively, the steep corneal meridian was marked with a Mendez gauge (Duckworth & Kent Ltd.) with the aid of the premarked reference points. After phacoemulsification, the foldable toric IOL was inserted in the capsular bag through a 2.75 mm corneal incision at 90 degrees using a Viscoject 2.2 injector (Viscoject 2.2, Cartridge-Set LP604340, Medicel AG). Slight rotation of the toric IOL was necessary to align the axis marks on the IOL with the corneo–limbal marks denoting the steep corneal meridian. Surgery in the second eye was performed 1 week later.

Postoperatively, patients were instructed to instill 1 drop of levofloxacin 0.5% (Oftaquix) 4 times daily for 2 weeks and 1 drop of dexamethasone 0.1% (Maxidex) 4 times daily for 2 weeks.

Statistical Analysis

Visual acuity measurements were converted to logMAR notation for statistical analysis. The Student *t* test was used to compare preoperative and postoperative refractive and keratometric outcomes. Summary statistics, such as means and standard deviations, were presented to describe the study population. Double-angle plots were used to display preoperative and postoperative refractive

astigmatism.[25,26] All data were analyzed using Microsoft Office Excel 2007 program (Microsoft Corp.) on a personal computer. A *P* value less than .05 was considered statistically significant.

RESULTS

Eighty-nine eyes of 58 patients treated between June 2010 and January 2011 were enrolled in this study. Twenty-seven patients required a toric IOL in 1 eye only; a nontoric version of Lentis Mplus LS-313 MF30 was used in the second eye. Thirty-one patients required bilateral toric IOLs. The mean age of the study cohort was 54.8 years ± 7.8 (SD) (range 42 to 73 years). Forty-eight right eyes and forty-one left eyes had surgery. The male to female ratio was 60:40. Table 1 shows the preoperative and postoperative statistics.

Visual Acuity

Three months postoperatively, 88.8% of eyes achieved a UDVA of 6/7.5 (0.10 logMAR) or better (Figure 2). Postoperatively, the mean monocular UDVA was 0.03 ± 0.11 logMAR and the mean binocular UDVA was −0.02 ± 0.10 logMAR. Figure 2 plots the postoperative UDVA compared with the preoperative CDVA.

The safety index (postoperative CDVA/preoperative CDVA) was 1.18, indicating that some patients gained CDVA postoperatively. No eye lost more than 2 lines of CDVA.

The mean monocular UNVA at 40 cm was 0.17 ± 0.14 logMAR, which is approximately Jaeger (J) 3. Binocularly, the mean UNVA was 0.13 ± 0.12 logMAR (approximately J2). Figure 3 shows the cumulative UNVA.

Table 1. Mean preoperative and postoperative axial length and refractive parameters.

Parameter	Preoperative	3 Mo Postoperative	*P* Value*
Axial length (mm)			
Mean ± SD	22.48 ± 1.83	—	—
Range	19.94, 29.5	—	—
Spherical power of implanted IOL (D)			
Mean ± SD	22.40 ± 6.59	—	—
Range	1.90, 33.23	—	—
Cylindrical power of implanted IOL (D)			
Mean ± SD	3.66 ± 1.20	—	—
Range	1.46, 7.04	—	—
Refractive sphere (D)			
Mean ± SD	3.70 ± 4.74	0.29 ± 0.43	<.001
Range	−11.00, +12.25	−0.75, 1.50	
Refractive cylinder (D)			
Mean ± SD	−2.90 ± 1.31	−0.50 ± 0.39	<.001
Range	−0.75, −6.00	0.00, −1.50	
Keratometric cylinder (D)			
Mean ± SD	3.00 ± 0.84	2.68 ± 0.97	.03
Range	1.51, 5.16	0.90, 5.02	
Mean keratometry (D)			
Mean ± SD	43.83 ± 2.28	43.49 ± 2.17	.006

*$P < .05$ statistically significant

Refraction

The mean refractive sphere and mean absolute residual refractive cylinder decreased significantly from preoperatively to postoperatively (both $P < .001$) (Table 1). Figure 4 shows the frequency of the preoperative and postoperative refractive cylinder. Fifty-eight eyes (65.2%) had a postoperative refractive

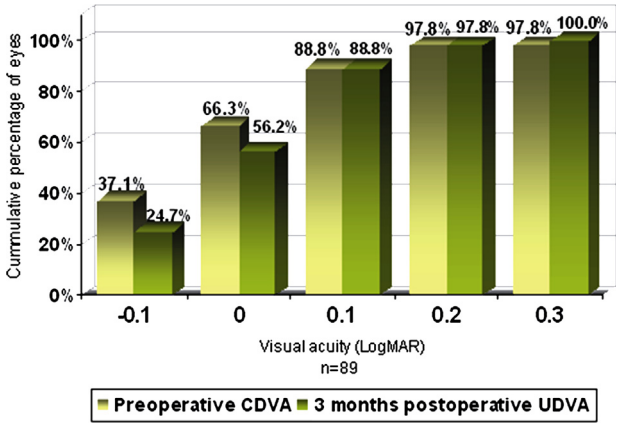

Figure 2. Cumulative preoperative CDVA versus 3-month postoperative UDVA (CDVA = corrected distance visual acuity; UDVA = uncorrected distance visual acuity).

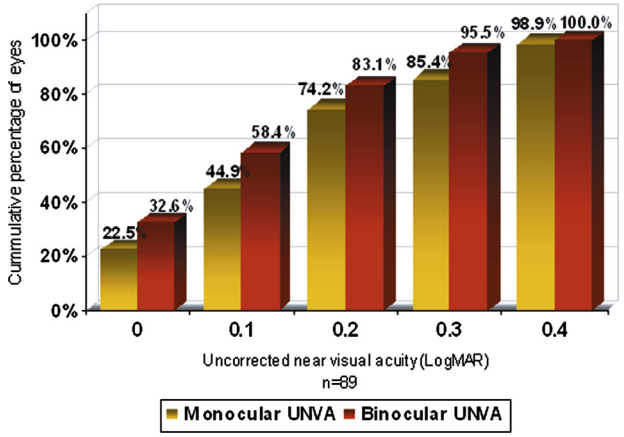

Figure 3. Cumulative monocular and binocular UNVA (UNVA = uncorrected near visual acuity).

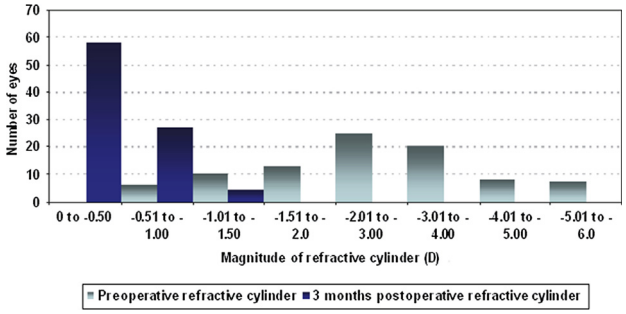

Figure 4. Magnitude of preoperative and postoperative refractive cylinder.

cylinder of 0.50 D or less. At 3 months, 75 eyes (84.3%) were within ±0.50 D and 87 eyes (97.7%) were within ±1.00 D of the spherical equivalent.

The mean keratometric astigmatism decreased significantly from preoperatively to postoperatively ($P = .03$). The double-angle plot of refractive cylinder showed a very tight grouping, with all points within the −2.00 D ring and the refractive centroid at −0.27 × 89.2 degrees (Figure 5).

Rotational Stability

No IOL required secondary repositioning due to excessive rotation 3 months postoperatively. The mean difference between the planned intraoperative toric IOL axis and actual axis alignment at 3 months was 2.53 ± 2.27 degrees. All eyes were within ±10 degrees of the intended axis, and 80 eyes (89.9%) were within ±5 degrees.

Complications

There were no intraoperative complications. Postoperative complications included 2 cases of late iritis, which resolved with the use of topical steroids. There was no significant posterior capsule opacification that required neodymium:YAG laser capsulotomy within the first 3 months after surgery. Four patients elected to have further surgery (laser in situ keratomileusis or astigmatic keratotomy) to correct remaining refractive error.

Patient Satisfaction

Figure 6 shows the results of the patient satisfaction questionnaire. Moderate difficulty and a lot of difficulty with each task were evaluated. As expected with any multifocal IOL design, a percentage of patients experienced difficulty with glare, driving at night, starburst and halo. A small number of patients also reported ghosting and doubling. Intermediate vision (computer, dashboard) seemed to be less of an issue than reading small print (medicine bottles, telephone books, newspaper).

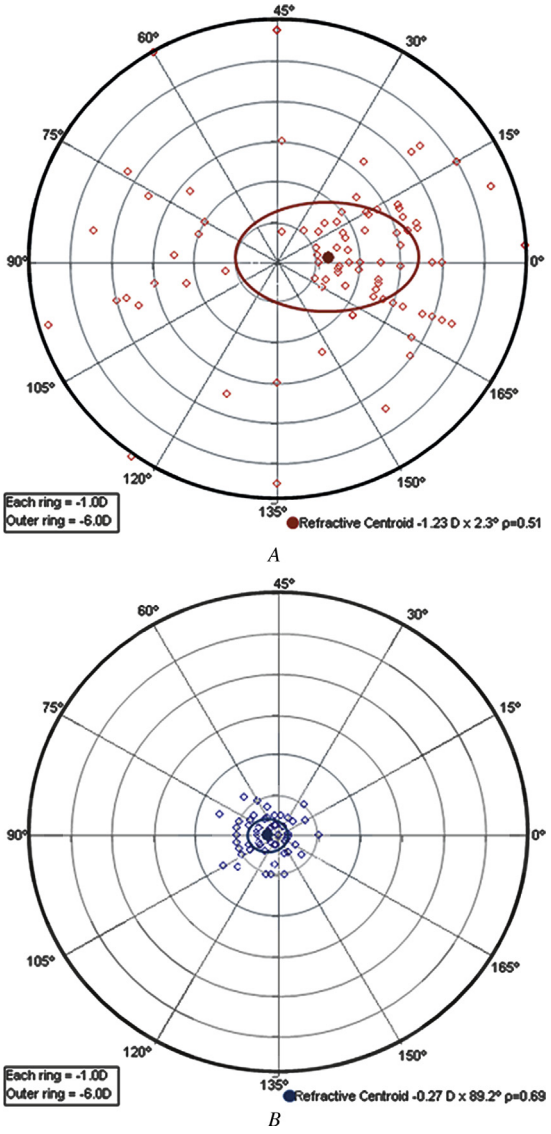

Figure 5. Doubled-angle minus cylinder power plots of preoperative (*A*) and postoperative (*B*) refractive cylinder.

DISCUSSION

The key factor for effective correction with a multifocal toric IOL is the magnitude of residual error—the closer to emmetropia, the better. Studies show that approximately one third of the correction is lost if the toric IOL is misaligned by 10 degrees.[27,28] A misalignment of approximately 30 degrees negates the effectiveness of the astigmatic correction, and rotation of more than 30 degrees may induce additional astigmatism. Toric IOLs lose approximately 3.3% of cylindrical correction for every degree of misalignment.

Both the spherical and cylindrical components of the Lentis Mplus toric IOL are provided in 0.01 D

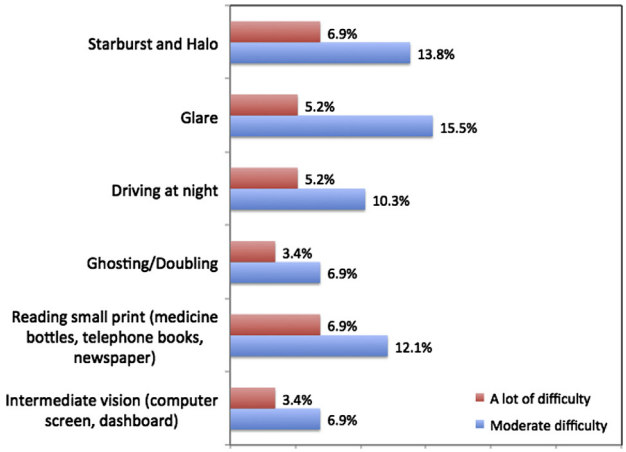

Figure 6. Patient satisfaction questionnaire 3 months postoperatively.

increments. However, accurate preoperative measurement of corneal cylinder is necessary for the IOL calculation. We measured keratometry using PCI optical biometry, corneal topography, and autorefractometry. To ensure accuracy of measurements, we required comparable results from the 3 instruments used in this study. If there was a difference of 0.50 D or more between any of the 3 instruments, the measurements were repeated to ensure consistency. The keratometry from the IOLMaster was used for IOL calculation. Accurate measurement of ACD was also required because the Haigis formula was used in all cases. The ACD from the IOLMaster device (measured from the corneal epithelium) was compared with the ACD from the Pentacam device (measured from the corneal endothelium) (ACD from Pentacam + corneal thickness approximates the ACD from the IOLMaster).

Surgically induced astigmatism (SIA) and shift in the keratometric axis due to clear corneal incisions are important factors to address during toric IOL calculations.[29] In our study, all incisions were placed at 90 degrees and 0.50 D of SIA was accounted for when calculating the IOL power. A superior incision enabled the implantation of the IOL directly into position, and no significant rotation was necessary once the IOL was in the capsular bag. The mean postoperative IOL misalignment was 2.53 ± 2.27 degrees, with all eyes within ±10 degrees of the intended axis. These outcomes are similar to those in recent studies of toric monofocal IOLs[10] and multifocal IOLs.[11,13,14] For example, a study of 67 eyes with somewhat higher preoperative refractive cylinder (−4.02 D versus −2.90 D in our study) reported a mean misalignment of 3.20 ± 2.80 degrees with a C-loop toric monofocal IOL (Acrysof toric, Alcon Laboratories, Inc.).[10] Studies of multifocal toric plate IOLs (AT Lisa 909 M, Carl Zeiss Meditec AG) with a similar amount of preoperative refractive cylinder (range −2.25 to −3.41 D) report a mean IOL misalignment ranging from 1.33 ± 2.42 degrees to 5.33 ± 4.60 degrees 3 months postoperatively.[11,13,14]

Excellent refractive outcomes were achieved with this new multifocal toric IOL. For example, the mean postoperative absolute value of refractive cylinder was 0.50 ± 0.39 D and the mean postoperative refractive sphere, +0.29 ± 0.43 D. A postoperative refractive cylinder of 0.50 D or less was achieved in 65% of eyes, with a well-grouped range of cylinder postoperatively. These outcomes are equivalent to those in previous studies of toric multifocal (diffractive) IOL implantation for similar preoperative cylinder. Visser et al.[14] found a mean cylinder of 0.71 ± 0.42 D 3 months postoperatively. Alió et al.[13] report a mean cylinder of −0.80 ± 0.42 D and a mean sphere of 0.23 ± 0.55 D at 3 months. Although the safety index was high, long-term data and rigorous analyses are required to determine the safety of any refractive procedure.

Apart from the ability of the IOL to correct a high magnitude of preoperative ametropia, one of the main advantages of the Lentis Mplus toric IOL is the multifocal add, which is based on the concept of refractive rotational asymmetry. Multifocal IOLs available over the past 2 decades are rotationally symmetric with 2 main designs—refractive and diffractive.[30–32] Although they provide good near visual acuity with distance correction simultaneously, they are associated with optical side effects such as glare, halos, and loss of contrast sensitivity.[33–35] Despite an ongoing effort to develop the best possible multifocal IOL, no multifocal IOL is without night-vision phenomena. In our study, 6.9% of patients experienced severe and 13.8% experienced moderate starburst and halo at night. Severe glare was reported by 5.2% of patients and moderate by 15.2% patients. A lot of difficulty driving at night was reported by 5.2% of patients. To our knowledge, the only study reporting patient satisfaction with a toric multifocal IOL design is a prospective one by Visser et al.,[14] who evaluated the AT Lisa 909 M diffractive IOL. In Visser et al.'s study, approximately one half of patients reported moderate glare, halo, and starburst symptoms. Our starburst, halo, and glare results are better than those with the diffractive multifocal toric IOL; however, more studies evaluating patient satisfaction are necessary to determine whether this new multifocal toric design is better in terms of night-vision phenomena.

In the current study, postoperative near vision and distance vision were well within the range required for daily activities. Postoperatively, 66.3% of eyes had 0 logMAR (6/6) UDVA and 12.4% of eyes had a better postoperative UDVA than the

CDVA of −0.1 logMAR (6/4.8). The mean UNVA (at 40 cm) was 0.17 ± 0.14 logMAR monocularly (approximately J3) and 0.13 ± 0.12 logMAR binocularly (approximately J2), which is more than adequate for activities such as reading (newspaper-sized print).

At present, 4 toric multifocal IOL models are available: the diffractive AT Lisa 909 M IOL with a +3.75 D add, the diffractive Restore IQ toric IOL (Alcon Laboratories, Inc.) with a +3.00 D add, the refractive M-flex T IOL (Rayner Intraocular Lenses Ltd.) with an add power of +3.00 or +4.00 D, and the Lentis Mplus LU-313 MFT toric IOL with a +3.00 D sector-shaped near vision segment. To our knowledge, no studies of the refractive outcomes with the Lentis Mplus LU-313 MFT, Restore IQ toric, or M-flex T IOL have been published. There are 4 studies of the AT Lisa 909 M diffractive toric IOL.[11–14] Table 2 shows a direct comparison of results in these studies with our outcomes. All studies had a comparable amount of preoperative cylinder and a similar reduction in refractive cylinder postoperatively. The postoperative UNVA with AT Lisa IOLs ranged from 0.10 logMAR to 0.22 logMAR, which is comparable to our outcome of 0.17 logMAR. We would perhaps expect slightly better near visual acuity with the AT Lisa IOL than with the Lentis Mplus toric IOL because of the stronger reading add of the AT Lisa IOL; however, a variation in postoperative UNVA between the 4 studies might be the result of differing inclusion criteria. The UDVA was slightly better with the Lentis Mplus toric IOL, which could possibly be due to less light scattering with this new design than with a diffractive IOL; however, this would have to be evaluated in studies of contrast sensitivity with the 2 multifocal toric IOLs. Another theoretical potential advantage of the Lentis Mplus toric IOL over the diffractive toric IOL could be better intermediate visual acuity. Intermediate vision was not numerically evaluated in this study; however, from the results of our questionnaire, only 6.9% of patients experienced moderate and 3.4% experienced a lot of difficulty with intermediate vision (computer screen, dashboard).

Nontoric Lentis Mplus LS-312 MF30 multifocal IOL implantation has been evaluated in several studies.[15–24] This IOL has the same platform as the Lentis Mplus toric IOL. These studies showed postoperative monocular UDVA ranging from 0.00 to 0.26 logMAR (Table 3). The postoperative UDVA in our study was 0.03 logMAR, which is comparable to or better than results in published studies of the nontoric version of Lentis Mplus (Table 3). The achieved postoperative CDVA with the Lentis Mplus toric IOL was −0.02 logMAR, which is equal to or slightly better than the reported range of −0.02 to 0.13 logMAR with the nontoric Lentis Mplus (Table 3). We achieved excellent postoperative UDVA and CDVA with the Lentis Mplus toric IOL compared with the nontoric version, considering there was a wider range of spherical power of implanted IOLs in our study than in previous studies (Table 3). However, there might be a slight bias in results because a significant portion of our patients had implantation of IOLs as a refractive, rather than a cataract, procedure (88.8% of eyes had preoperative CDVA or 0.10 logMAR or better); therefore, a good level of postoperative CDVA and UDVA was expected. Uncorrected near visual acuity in our study (0.17 logMAR) was also comparable to the reported range with the nontoric Lentis Mplus (0.11 to 0.30 logMAR) (Table 3). In conclusion, the added toricity of the Lentis Mplus LU-313 MFT did not worsen the visual acuity outcomes over those with the nontoric version of the same IOL. However, it would be interesting to evaluate whether the added toricity of this rotationally asymmetric multifocal IOL has an effect on contrast sensitivity, which was not the aim of this study.

Table 2. Comparison of current study with previous studies of the multifocal toric IOLs.

			Mean ± SD						
				Refractive Cylinder [D]				IOL Misalignment (°)	
Study*	Eyes (n)	IOL Type	IOL Cylinder Power (D)	Preoperative	Postoperative	UDVA (LogMAR)	UNVA (LogMAR)	3 Months	6 Months
Mojzis[11]	51	AT Lisa 909 M	3.01 ± 1.50	2.25 ± 1.70	0.40 ± 0.25	0.12 ± 0.13	0.10 ± 0.09	5.33 ± 4.60	5.98 ± 4.76
Mojzis[12]	64	AT Lisa 909 M	3.16 ± 1.63	2.82 ± 1.32	1.03 ± 0.70	0.14 ± 0.11	0.15 ± 0.13	—	—
Alió[13]	23	AT Lisa 909 M	3.30 ± 1.66	3.41 ± 1.17	0.80 ± 0.42	0.12 ± 0.11	0.22 ± 0.11	1.33 ± 2.42	3.10 ± 5.44°
Visser[14]	45	AT Lisa 909 M	3.22 ± 1.60	2.36 ± 1.41	0.71 ± 0.42	0.04 ± 0.15	0.20 ± 0.16	2.3 ± 2.0	—
Current	89	Lentis Mplus LU-313 MFT	3.66 ± 1.20	2.90 ± 1.31	0.50 ± 0.39	0.03 ± 0.11	0.17 ± 0.14	2.53 ± 2.27	—

IOL = intraocular lens; UDVA = uncorrected distance visual acuity, UNVA = uncorrected near visual acuity
*First author

Table 3. Comparison of the Lentis Mplus LU-313 MFT toric lens with previous studies of the nontoric Lentis Mplus LS-312 MF30.

			Spherical Power of Implanted IOL (D)		Mean Postoperative (LogMAR) ± SD		
Study*	Eyes (n)	IOL Model	Mean ± SD	Range	CDVA	UDVA	UNVA
Alió[15]	24	Nontoric	20.21 ± 1.84	16.50, 22.50	0.09 ± 0.18	0.25 ± 0.33	0.30 ± 0.21
Ramón[17]	26	Nontoric	19.42 ± 2.91	10.50, 23.50	0.13 ± 0.13	0.20 ± 0.17	0.19 ± 0.12
Alió[18]	21	Nontoric	21.00 ± 1.64	18.00, 25.00	0.06 ± 0.07	0.14 ± 0.11	0.21 ± 0.10
van der Linden[19]	90	Nontoric	—	—	—	0.04 ± 0.15	0.16 ± 0.21
Muñoz[20]	40	Nontoric	—	—	−0.02 ± 0.05	0.00 ± 0.08	0.08 ± 0.07
Muñoz[21]	64	Nontoric	—	—	−0.02 ± 0.05	0.05 ± 0.10	0.11 ± 0.13
Alfonzo[22]	40	Toric	20.74 ± 2.51	—	0.02 ± 0.06	0.03 ± 0.09	0.11 ± 0.10
Alio[23]	45	Nontoric	21.38 ± 2.83	13.50, 26.50	0.03 ± 0.07	0.13 ± 0.20	0.21 ± 0.16
Alió[24]	39	Nontoric	21.45 ± 2.61	16.50, 26.50	0.06 ± 0.13	0.26 ± 0.51	0.21 ± 0.17
Current	89	Toric	22.40 ± 6.59	1.90, 33.29	−0.02 ± 0.10	0.03 ± 0.11	0.17 ± 0.14

CDVA = corrected distance visual acuity; IOL = intraocular lens; UDVA = uncorrected distance visual acuity; UNVA = uncorrected near visual acuity
*First author

In conclusion, we found excellent functional distance and near visual acuities, refractive outcomes, and IOL stability with implantation of the Lentis Mplus toric IOL. No complications related to this new IOL were observed in this study. The Lentis Mplus toric IOL was a predictable method of managing corneal astigmatism and achieving spectacle independence after cataract surgery or RLE.

WHAT WAS KNOWN

- The peer-reviewed literature contains 10 publications evaluating the nontoric Lentis Mplus. All publications indicate excellent uncorrected distance, intermediate, and near vision.

WHAT THIS PAPER ADDS

- This study is the first to evaluate the clinical outcomes after toric Lentis Mplus implantation in patients with cataract and corneal astigmatism. Distance, intermediate, and near visual acuities, residual astigmatism, lens stability, and patient satisfaction were excellent.

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First author:
Jan Venter, MD

Private center, London, United Kingdom