Lens Results Promising for Astigmatism Reduction

The MS 6116 TU toric IOL also increases unaided visual acuity.

BY PETER D. FOX, FRCS, FRCOPHTH

My interest in astigmatism management first came in the form of limbal relaxing incisions, and more recently, it has been with toric lens implants. Small incision cataract surgery provides us with an effective technique for inducing little astigmatism, however, corneal astigmatism is still a limiting factor in unaided vision after cataract surgery. It is for this reason that I was impressed to find a significant reduction of astigmatism and excellent UCVA with the MS 6116 TU toric IOL (HumanOptics AG, Erlangen Germany).

STUDY

We conducted a clinical evaluation of 36 eyes (27 patients) implanted with the MS 6116 TU toric lens between 2004 and 2007. All eyes had at least 1.70 D of preexisting corneal astigmatism and underwent routine phacoemulsification cataract surgery at Chichester Nuffield Hospital or Goring Hall Hospital, in the United Kingdom.

Mean patient age was 78.31 years, (range, 57–89 years). The mean axial length was 23.94 ±1.80 mm (range, 20.76–28.01 mm), and the anterior chamber depth was 3.06 ±0.44 mm (range, 2.24–3.73 mm).

Mean preexisting corneal astigmatism was 2.95 ±1.05 D standard deviation (range, 1.70–5.84 D), with the flattest and steepest keratometry values measuring 39.75 D and 55.33 D, respectively. The mean cylindrical value of refraction was -2.57 ±1.22 D (range, 0.50–6.00 D) preoperatively, and the spherical equivalent ranged from -14.75 D to 5.10 D. Mean preoperative BCVA was 0.45 ±0.13 (range, 0.20–0.67).

The spherical equivalent of IOLs implanted ranged from 7.50 D to 29.00 D, and cylindrical powers ranged from 2.00 D to 8.00 D.

Patients' keratometry readings, axial length, anterior chamber depth, refraction, and desired target refraction were sent to the manufacturer. The manufacturer's calculation service provided power calculations for the MS 6116 TU, which is based on special ray-tracing software. In return, the surgeon was given three lens proposals with corresponding target refractions.

LENS IN SURGERY

The MS 6116 TU comes in an easy-to-fold container (Figure 1); it may be removed and folded with forceps in one step. A 3-mm temporal incision was created to minimize surgically induced astigmatism. The incision was enlarged to 4 mm for lens implantation, which took 30 minutes or less, as there are a few additional steps compared with standard cataract procedure. To prevent globe torsion, corneal marking of the reference axis (horizontal or vertical) was performed preoperatively in an upright position on the slit lamp. The suggested implantation axis was marked as soon as the patient was located on the operation table, and after the lens was inserted, it was dialed clockwise to ensure alignment.

Figure 1. The MS 6116 TU, in its easy-to-fold container.

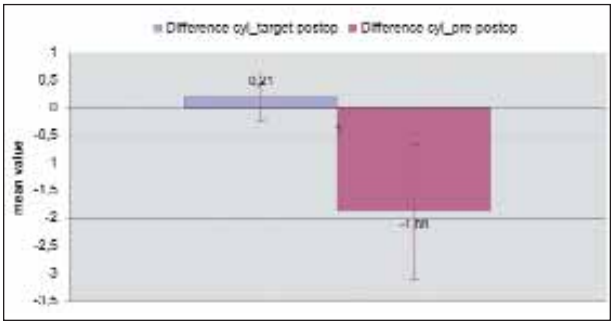

Figure 2. The graph shows the difference in cylindrical value between the target and postoperative measurements and between pre- and postoperative measurements.

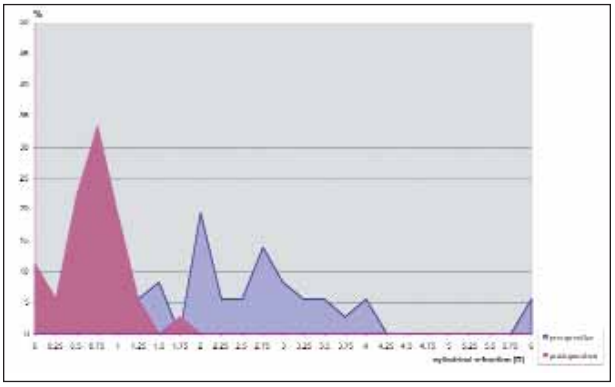

Figure 3. The pre- and postoperative cylindrical refraction.

RESULTS

At 9.08 weeks mean follow-up, the average postoperative refractive cylinder was -0.69 ±0.38 D (range, 0.00 to -1.75 D), and spherical equivalent was -0.44 ±0.34 D (range, 0.25 to -1.25 D), respectively. Postoperative UCVA was 0.77 ±0.21 (range, 0.33–1.2), and BCVA was 0.94 ±0.15 (range, 0.5–1.2). Phacoemulsification was uneventful in all cases, however, two eyes experienced zonular dehiscence due to uncontrolled haptic maneuver in the sulcus. Lens position was stable with no major axial shifts after implantation in all but one case, which was 7° off axis. A second operation was not needed to correct the axis change. Furthermore, there has been no appearance of significant posterior capsule opacification at this point in the study.

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The difference between the targeted postoperative refraction and the effectively measured refraction in spherical equivalent averaged 0.07 ±0.3 D (range, -0.85–0.70 D). Cylindrical refraction differed between the targeted and measured amounts by a mean of 0.21 ±0.43 D.

Mean reduction of cylindrical refraction was 1.88 ±1.22 D (range, 0.00–5.25 D) (Figure 2), relating to a 73% reduction of astigmatism (Figure 3). In 86% of cases, the cylinder in the postoperative refraction was 0.75 D or less. A postoperative UCVA of 0.67 or better was found in 83% of patients, and the BCVA improved to 0.94 (Figure 4). Mean UCVA was 0.77, although one eye in the study was considered amblyopic.

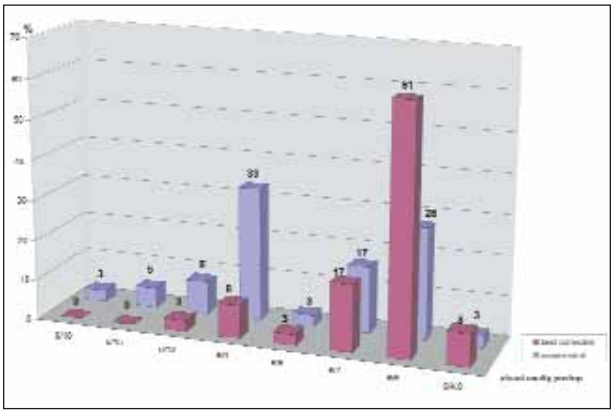

Figure 4. The postoperative BCVA and UVCA.

CONCLUSION

Lens implantation is more challenging with the MS 6116 TU, so careful attention must be paid during implantation to the extended Z-haptics of the toric lens. I have found that creating an oval-shaped capsulorrhexis helps to prevent complications. The undulated design of the Z-haptics ensures reliable centration and stabilization, which is essential when dealing with astigmatism. I believe that the good results and high patient satisfaction compensate for any additional effort needed during implantation.

Still, I would advise surgeons embarking on toric lens implantation for the first time to watch live surgery and speak with an experienced surgeon before performing this procedure. ■

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