

# AcrySof IQ Toric IOL Implantation Combined With Limbal Relaxing Incision During Cataract Surgery for Eyes With Astigmatism $> -2.50$ D

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## ABSTRACT

**PURPOSE:** To evaluate the effectiveness of toric intraocular lens (IOL) implantation combined with limbal relaxing incision (LRI) for patients with high-amplitude astigmatism.

**METHODS:** This single-center, prospective study evaluated 22 eyes of 19 patients with cataract and  $>2.50$  diopters (D) astigmatism that underwent bimanual micro-phacoemulsification cataract surgery and toric IOL implantation combined with LRI. Pre- and 6-month postoperative uncorrected and corrected distance visual acuity (UDVA and CDVA, respectively), subjective cylindrical error, refractive cylindrical error, keratometric cylinder, and corneal topography were compared. Vector analysis of change in keratometric cylinder was compared pre- and postoperatively.

**RESULTS:** Pre- and postoperative logMAR UDVA were  $0.82 \pm 0.46$  and  $0.13 \pm 0.19$ , respectively; pre- and postoperative logMAR CDVA were  $0.35 \pm 0.39$  and  $0.005 \pm 0.13$ , respectively. Mean postoperative refractive cylindrical error was  $1.07 \pm 0.60$  D. Although predicted residual astigmatism after implantation of the toric IOL was  $1.42 \pm 0.76$  D, pre- and postoperative subjective cylindrical error and keratometric cylinder changed from 3.90 D to 0.94 D and from 3.46 D to 1.80 D, respectively.

**CONCLUSIONS:** Our results show that the combined surgery of toric IOL implantation and LRI is effective in patients with high-amplitude astigmatism  $>2.50$  D. [*J Refract Surg.* 2011;xx(x):xxx-xxx.] doi:10.3928/1081597X-20110317-03

The AcrySof IQ Toric (Alcon Laboratories Inc, Ft Worth, Texas), a next-generation toric intraocular lens (IOL), has been used for correcting preexisting astigmatism during cataract surgery with good clinical results.<sup>1,2</sup> Although the AcrySof IQ Toric IOL line consists of three cylindrical models in the United States and Japan, which can be chosen depending on the degree of corneal astigmatism, the maximum correcting effect of the toric IOL is 2.06 diopters (D). However, patients with astigmatism  $>2.50$  D require a higher cylindrical power IOL.

The limbal relaxing incision (LRI) procedure is known to be useful and convenient for reducing astigmatism, and it can be performed during cataract surgery.<sup>3,4</sup> In this study, we evaluated the effectiveness of AcrySof IQ Toric IOL implantation combined with LRI for astigmatism with cylindrical error  $>2.50$  D.

## PATIENTS AND METHODS

This prospective study consisted of 22 eyes of 19 patients with  $>2.50$  D keratometric astigmatism in the healthy cornea and a corticonuclear cataract grade 2 to 4. Patient age ranged from 53 to 94 years (mean: 72.4 years). All procedures were approved by the Ethics Committee of Ouchi Eye Clinic, Kyoto, Japan. The study was conducted in accordance with the tenets of the Declaration of Helsinki. All procedures were performed by the same surgeon (M.O.).

The preoperative keratometric astigmatism, measured with an auto keratometer, of each patient was entered into the Alcon Toric Web Calculator (<http://www.acrysoftoric-calculator.com/>). Surgically induced astigmatism was con-

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