

Prospective Randomized Trial of Limbal Relaxing Incisions Combined With Microincision Cataract Surgery

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ABSTRACT

PURPOSE: To evaluate clinical outcomes of the limbal relaxing incision (LRI) combined with bimanual phacoemulsification and insertion of an intraocular lens (IOL) developed for bimanual microincision cataract surgery (MICS).

METHODS: In a prospective, single-center study, eyes with ≥ 0.75 diopters (D) of keratometric astigmatism were randomly assigned to two surgical techniques: 1) bimanual MICS (non-LRI group) or 2) LRI combined with bimanual MICS (LRI group). Postoperative uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), postoperative refractive error, corneal topography, and vector analysis of keratometric change between pre- and postoperative eyes were compared.

RESULTS: In all cases of astigmatism in the LRI group, incisions for phacoemulsification and IOL insertion did not overlap or affect the LRIs. Uncorrected distance visual acuity was significantly higher in the LRI group (mean: 0.94), than in the non-LRI group (mean: 0.71, $P=.009$), although no difference was seen in CDVA in either group. Postoperative cylindrical error was significantly lower in the LRI group than in the non-LRI group (0.56 D and 1.51 D, respectively, $P=.0004$). Cray analysis showed that the vector change in cylinder was 1.44 D in the LRI group and 0.18 D in the non-LRI group ($P=.0007$).

CONCLUSIONS: Limbal relaxing incision with bimanual MICS is an easy-to-follow combined surgery to correct preexisting astigmatism with predictable accuracy. [*J Refract Surg.* 2009;xx:xx-xxx.] doi:10.3928/1081597X-

The limbal relaxing incision (LRI) is known to be a useful and convenient procedure for reducing astigmatism, especially after cataract surgery.^{1,2} In this procedure, a pair of arc-shaped corneal incisions, 400 to 550 μm in depth, are made in the steep axis inside the surgical limbus, with the incision angle determined by the degree of astigmatism.³ The LRI flattens the corneal sphere in the steep axis to decrease corneal refractive power. This procedure does not require an extensive amount of equipment capital investment and it can also be performed during cataract surgery to correct preexisting astigmatism,² thus resulting in an enhanced outcome for cataract surgery. However, conventional cataract removal and intraocular lens (IOL) implantation create astigmatism at various degrees and reduce the accuracy of astigmatism correction. Moreover, the phacoemulsification incision and LRI sometimes mutually interfere, depending on the astigmatism angle, because LRI involves one pair of 40° to 120° arc-shaped incisions at various angles, which can make combined surgery more technically difficult due to a reduction in corneal rigidity.

On the other hand, bimanual microincision cataract surgery (MICS) can be performed through a 0.9-mm incision using a 22-gauge phacoemulsification needle and a 22-gauge irrigating chopper,⁴ and the newly developed Y-60H MICS IOL (Hoya Corp, Tokyo, Japan) can be inserted through a 1.6-mm incision.⁵ We report the clinical results of LRI combined with a 0.9-mm incision bimanual phacoemulsification and implantation of the Hoya Y-60H MICS IOL.

PATIENTS AND METHODS

A prospective study was conducted in a single center between September 2007 and July 2008. Patients were ran-

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