
SHORT COMMUNICATION

Case report

Treatment of keratoconus by toric foldable intraocular lenses

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PURPOSE. *To report on the correction of marked regular corneal astigmatism due to keratoconus by toric intraocular lenses (IOL).*

SETTING. *University eye hospital.*

METHODS. *A 66-year-old woman presented with cataract and unilateral keratoconus (keratometric readings: 50.2/41.3 diopters [D]). She underwent routine cataract surgery with implantation of a foldable posterior chamber toric IOL (refractive power: +10.0 D sphere/+12.0 D cylinder). A 68-year-old surgically aphakic woman presented with peripheral accentuated keratoconus with regular and stable corneal astigmatism (keratometric readings: 39.75/61.5 D). She underwent secondary implantation of a foldable toric IOL (refractive power: -9.0 D sphere/+30.0 D cylinder) into the ciliary sulcus.*

RESULTS. *After a follow-up period of 4 months, visual acuity increased to 0.70 with a correction of +0.75 sphere -2.5 cylinder/84° in Patient 1; after a follow-up period of 6 months, visual acuity increased to 0.60 with a correction of +1.0 -2.0/90° in Patient 2.*

CONCLUSIONS. *Foldable toric silicone IOL may be a surgical option in the management of regular marked corneal astigmatism caused by keratoconus. (Eur J Ophthalmol 2003; 13: 577-9)*

KEY WORDS. *Astigmatism, Toric intraocular lenses, Cataract surgery*

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INTRODUCTION

Marked corneal astigmatism due to keratoconus has usually been treated by penetrating allogenic keratoplasty. Keratoplasty itself, however, can lead to marked postoperative corneal astigmatism associated with a pronounced reduction in visual acuity. Other problems can arise in the preoperative and postoperative period, such as difficulties in obtaining the donor material, occurrence of postoperative suture

loosening, and development of immunologic graft reactions. In keratoconus with a marked thinning of the corneal stroma and a decentration of the corneal apex close to the inferior paralimbal region, penetrating keratoplasty may become difficult due to the paralimbal location of the corneal apex. In view of these problems, we investigated a different surgical technique to correct marked regular corneal astigmatism in eyes with keratoconus with stable refractive error.

PATIENTS AND METHODS

Patient 1

A 66-year-old woman presented with advanced cor-ticonuclear cataract and marked regular corneal astigmatism in the left eye. Keratometry of the left eye gave a reading of 50.20 diopters [D] \times 170° = 41.30 D \times 80°. The corneal astigmatism had been stable for at least 10 years. Visual acuity was 0.40 with a correction of +4.5 –6.5 \times 80°. The patient underwent routine phacoemulsification with endocapsular implantation of a foldable posterior chamber toric silicone intraocular lens (IOL) with a refractive power of +10.0 sphere/+12.0 D cylinder (MicroSil toric MS 6116 TU; Dr. Schmidt Intraocularlinsen, St. Augustin, Germany). Surgery was carried out with topical anesthesia. The diameter of the optical zone of the IOL was 6.0 mm, with 11.6 mm as total diameter of the lens.

Patient 2

A 68-year-old aphakic woman presented with marked regular astigmatism due to a peripheral accentuated keratoconus in the right eye. Keratometry was 39.75 D \times 95° = 61.50 D \times 5° in her probably amblyopic eye. Visual acuity measured 0.35 with a correction of +14.0 –24.0 \times 95° D. Pachymetry revealed a corneal thickness of 500–550 μ m in the paralimbal area, 180–220 μ m in the inferior mid periphery, and 200 μ m in the central region of the cornea. Under topical anesthesia, a foldable IOL (Dr. Schmidt Intraocularlinsen) with a refractive power of –9.0 sphere/ –30.0 D cylinder was inserted into the ciliary sulcus. Diameter of the optical part of the IOL measured 6.0 mm. Total diameter of the lens, which was especially designed for implantation into the ciliary sulcus, was 14.0 mm. A peripheral iridotomy was additionally carried out.

Prior to surgery, the axis of the steepest corneal meridian was marked at the limbus using a felt tip pen while the patient was sitting at the slit lamp.

RESULTS

In Patient 1, visual acuity increased to 0.8 with a postoperative refractive error of +0.75 –2.5 \times 84°. Af-

ter a follow-up of 4 months, the IOL has remained unchanged in its central position without rotational change of its cylindrical axis.

Visual acuity in Patient 2 increased to 0.60 with a refractive error of +1.0 –2.0 \times 90° and has remained constant during the follow-up of 6 months. For both patients, intraocular pressure measurements were in the normal range during the preoperative and postoperative period without antiglaucomatous medication. In both patients, the axis of the torus of the IOL was aligned to the limbal marks of the steepest corneal meridian.

DISCUSSION

The results suggest that implantation of a foldable toric IOL may be an alternative method to penetrating allogenic keratoplasty to correct marked regular stable corneal astigmatism due to keratoconus. Because the procedure can be performed under topical anesthesia and postoperative immunologic problems will not occur, toric IOL may show some advantages over penetrating keratoplasty if cataract is present and if the corneal astigmatism is regular and has been constant over time. The astigmatic power of the IOL has to be higher than the keratometric astigmatic readings because the IOL compared with the cornea is closer to the principal planes of the eye. Even a corneal astigmatism of 30.0 D in the eye with peripheral keratoconus can be corrected. The findings may have clinical importance because penetrating allogenic keratoplasty as treatment of keratoconus can lead to postoperative problems if there is a paralimbal location of the corneal apex and marked thinning of the peripheral cornea.

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