Comparing several different methods for toric IOL alignment.

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COMPARISON OF VISUAL OUTCOMES, ALIGNMENT ACCURACY, AND SURGICAL TIME BETWEEN 2 METHODS OF CORNEAL MARKING FOR TORIC INTRAOCULAR LENS IMPLANTATION

Mayer WJ, Kreuzer T, Dirisamer M, et al

Industry support: No

ABSTRACT SUMMARY

This prospective randomized study included 57 eyes of 29 patients who underwent cataract surgery and toric IOL implantation. Toric IOL power calculations were performed with the Z-calc software (Carl Zeiss Meditec) and simulated keratometry. Scheimpflug topography values for the central 4.0 mm were used to determine the corneal astigmatism. All patients received the AT Torbi 709M (Carl Zeiss Meditec, not available in the United States). In group 1, manual marking was performed with a bubble marker instrument (Nuijts-Lane marker, ASICO) while the patient was seated upright. In group 2, digital marking was performed with the Forum Cataract Workplace platform (Carl Zeiss Meditec); a reference image was displayed as an overlay seen through the microscope.

No significant difference was found between the two groups in terms of preoperative spherical equivalent, cylinder, uncorrected distance visual acuity, or corrected distance visual acuity. Rotational stability was excellent in both groups; mean postoperative IOL misalignment was slight (2.00° ± 1.86° and 3.40° ±2.37° in the digital and manual groups, respectively, \( P = .026 \)). The target induced astigmatism was significantly lower in the digital group than in the manual group (\( P = .008 \)). The difference in postoperative cylindrical power between the two groups was not statistically significant (\( P = .063 \)). The time required to perform various steps of the surgery was significantly shorter both intra- and postoperatively in the digital group (\( P = .001 \), for each comparison).

DISCUSSION

In current practice, a main goal of the cataract surgeon is to provide spectacle independence to patients after cataract surgery. Toric IOLs can provide greater spectacle independence and lower postoperative residual astigmatism than nontoric IOLs.\(^2\) For the best results, the axis of the toric IOL must be aligned exactly with the axis of corneal cylinder, which requires exact corneal marking. Although the accuracy of manual marking methods is high, computer-guided methods have been developed to overcome the limitations of manual methods.\(^3,4\)

Mayer et al evaluated the efficacy of a computer-assisted marking system for toric IOLs, the Callisto eye system (Carl Zeiss Meditec), and compared the results with those achieved using a manual marking technique.\(^1\) The investigators found better toric IOL alignment and lower deviation from the target induced astigmatism in the
digital marking group compared to the manual marking group. They also found the preoperative procedure and toric IOL alignment to be faster in the digital group, translating to shorter overall surgical time.

**COMPARISON OF TORIC INTRAOCULAR LENS ALIGNMENT ERROR WITH DIFFERENT TORIC MARKERS**

Lipsky L, Barrett G

Industry support: No

**ABSTRACT SUMMARY**

For this retrospective cohort study, investigators compared errors in toric IOL alignment using two toric markers. The study included 72 eyes of 56 patients from two centers who underwent surgery by the same ophthalmologist and received a hydrophobic IOL (AcrySof IQ Toric IOL, model SN6AT2, versions T2–T8, Alcon). For all eyes, the reference meridian was determined with a mobile phone app, toriCAM, developed by Graham D. Barrett, MD. The desired implantation meridian was marked with a Barrett Dual Axis Toric Marker (Duckworth & Kent) in group 1 and with a Mendez degree gauge (Bausch + Lomb Storz Ophthalmic Instruments) in group 2.

The data on degree of preoperative astigmatism (with- or against-the-rule), cylinder and type of corneal group 2. Storz Ophthalmic Instruments) in degree gauge (Bausch + Lomb Kent) in group 1 and with a Mendez Axis Toric Marker (Duckworth & Kent) was marked with a Barrett Dual Axis Toric Marker (Duckworth & Kent) in group 1 and with a Mendez degree gauge (Bausch + Lomb Storz Ophthalmic Instruments) in group 2.

The desired implantation meridian was determined using two toric marking methods and the novel toriCAM application for toric intraocular lens implantation in cataract and refractive surgery.

**STUDY IN BRIEF**

This retrospective cohort study compared errors in toric IOL alignment using two toric markers and found that mean absolute toric IOL alignment error was significantly lower with one of the instruments, such that a higher percentage of eyes in that group achieved a manifest refraction astigmatism of 0.50 D or less after surgery.

**WHY IT MATTERS**

Accurately aligning toric IOLs is of the utmost importance to achieve effective astigmatic correction.