

Femtosecond laser-assisted arcuate keratotomy at the time of cataract surgery for the management of preexisting astigmatism

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PURPOSE

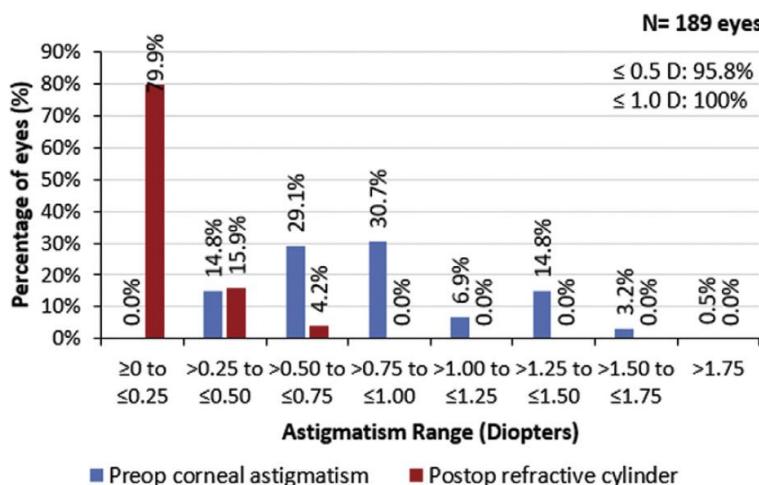
To evaluate safety and effectiveness of femtosecond laser-assisted arcuate keratotomy (FLAK) during cataract surgery with low to moderate corneal astigmatism.

METHOD

This retrospective analysis included case records of patients with preexisting corneal astigmatism ranging from 0.5 – 2.0 diopter (D). Study parameters included corneal astigmatism, refractive astigmatism, and uncorrected (UDVA) and corrected (CDVA) distance visual acuities. The results which were analyzed at 3 months postoperatively, included frequency distribution histograms, vector analysis, and single-angle polar plots.

RESULTS

The study comprised case records of 189 eyes of 143 patients. The postoperative refractive astigmatism was reduced significantly compared with preoperative corneal astigmatism to $0.14 \text{ D} \pm 0.23$ (SD) from 0.92 ± 0.34 D ($P < .001$). One hundred eighty-one eyes (95.8%) demonstrated postoperative refractive astigmatism of 0.5 D or less. The mean surgically induced change along the preoperative steep axis was -0.59 ± 0.56 D, and the change along the orthogonal axis was ± 0.35 D. Postoperatively, 171 eyes (90.5%) had astigmatism angle of error of 15 degrees or less. The postoperative mean UDVA and CDVA were 0.09 ± 0.16 logarithm of the minimum angle of resolution (logMAR) and ± 0.05 logMAR, respectively. One hundred seventy eyes (90%) had a postoperative UDVA of 20/30 or better.



Distribution of preoperative corneal versus postoperative refractive astigmatism for the full cohort, showing effective astigmatism reduction with 95.8% of eyes achieving ≤0.50 D residual refractive astigmatism.

CONCLUSION

Femtosecond laser-assisted arcuate keratotomy performed during cataract surgery was safe and effective for correcting low-to-moderate astigmatism, with stable outcomes through 12 months. The use of Cassini color-LED corneal topography for preoperative astigmatism assessment and iris registration supported accurate incision alignment and contributed to predictable refractive results.