SMILE for the Treatment of Residual Refractive Error after Cataract Surgery

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Purpose

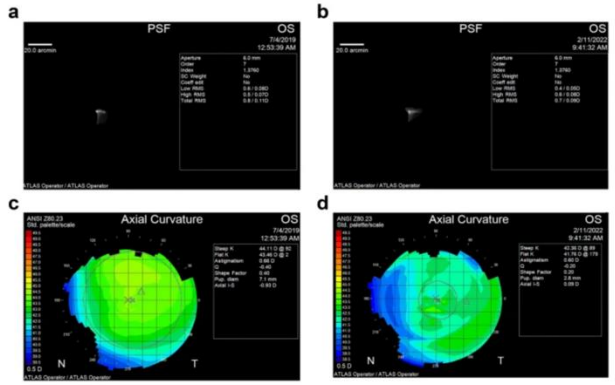
In the context of managing patients' expectations and satisfaction regarding visual acuity after cataract surgery, we aimed to investigate the improvement in visual acuity and patient satisfaction after small-incision lenticule extraction (SMILE) in pseudophakic (trifocal intraocular lens, IOL) patients with residual myopic refraction after cataract surgery.

Methods

This retrospective study included 76 patients (82 eyes) who underwent cataract surgery with Zeiss AT Lisa tri 839MP IOL implantation. Preoperative myopic refraction ranged from -1.0 to -2.75 diopters (D), and astigmatism ranged from -0.75 to -2.50 D. Following SMILE, all patients were followed for 1 year. They completed questionnaires both before and 1 year after SMILE to assess their perceptions of vision and vision difficulties.

Results

Fig. 1



Pre- and postoperative RMS and Q values. **a** Preoperative low, high, and total RMS. **b** Postoperative low, high, and total RMS. **c** Preoperative Q value. **d** Postoperative Q value

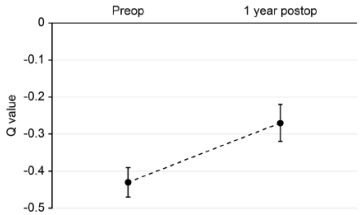


Fig. 2 *Q* value before and 1 year postoperatively after SMILE

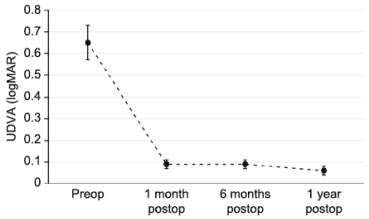


Fig. 3 UDVA (logMAR) before and 1 year postoperatively after SMILE

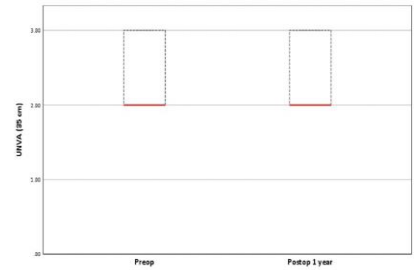


Fig. 5 Preoperative and postoperative UNVA (35 cm) J2

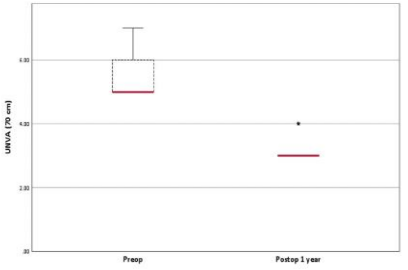


Fig. 6 Preoperative UNVA (70 cm) J5 and postoperative UNVA (70 cm) J3

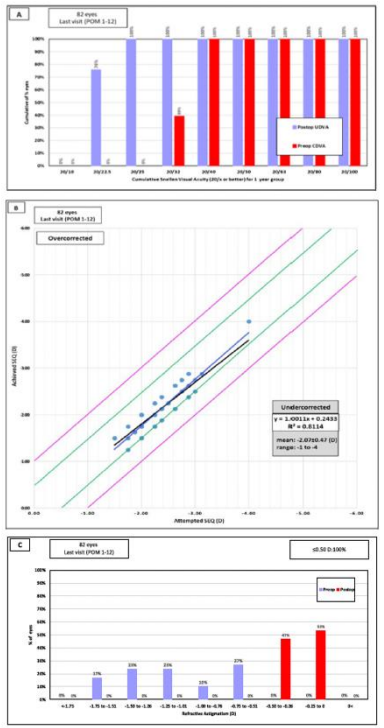


Fig. 4 Preoperative corrected distance visual acuity and postoperative uncorrected distance visual acuity

The uncorrected distance visual acuity increased from 0.66 ± 0.07 log MAR preoperatively to 0.07 ± 0.02 log MAR at 12 months postoperatively ($p < 0.001$). Patient satisfaction measures after SMILE significantly increased.

Q Value The SMILE Q value improved from - 0.43 ± 0.04 [- 0.49 to - 0.36] preoperatively to - 0.27 ± 0.05 [- 0.34 to - 0.2] 1 year postoperatively (Fig. 2). The corneal spherical aberration improved from 0.25 ± 0.02 [0.21–0.279] preoperatively to 0.23 ± 0.03 [0.174–0.279] lm postoperatively, which was not statistically significant ($p = 0.133$) (Table 1), and the total RMS improved from 0.84 ± 0.06 [0.7–0.9] preoperatively to 0.82 ± 0.08 [0.6–0.9] lm postoperatively, which was also not statistically significant ($p = 0.072$) (Table 1).

Conclusion

The study showed that using the SMILE technique can effectively address residual refraction, a common concern after trifocal IOL implantation. This treatment modality was found to be safe and successful in enhancing visual acuity for patients with pseudophakic myopic refractions.