

Commentary: Modulation of the incision size for the correction of astigmatism in manual small-incision cataract surgery

Patients who have cataracts as well as preexisting corneal astigmatism are now able to attain the best uncorrected distant visual acuity possible after surgery, even without the need for glasses or contact lenses owing to the improvements in the field

of cataract surgery. The various surgical options available for the same include placement of the incision on the steep axis of the cornea, placing relaxing incisions at the corneal periphery, and implantation of toric intraocular lenses.^[1] The other factors noted to influence postoperative astigmatism include the depth of sclerocorneal incision in manual small-incision cataract surgery (MSICS),^[2] sites of incision with respect to clear corneal versus sclerocorneal,^[3] and temporal versus superior incisions,^[4] shape of incision, cauterization, presence and types of suture, and healing of the surgical incision.^[5,6] The most commonly performed cataract surgery in the developing

world is MSICS, in which the surgeon makes a scleral incision for surgical manipulation.^[7] Modulating the size of the incision to treat postoperative astigmatism is an astute surgical procedure in this situation. It is prudent to place the incision on the steeper corneal meridian based on the preoperative keratometric readings. The corneal curvature flattens in the meridian where the incision is made, with a corresponding steepening to the same degree in the orthogonal meridian. Postoperatively, the disparity in corneal powers between the flattened steeper meridian and the steepened flatter meridian will be decreased, resulting in low postoperative corneal astigmatism.

We commend the work of the authors of the recent article for successfully managing preexisting corneal astigmatism of less than 3.00 D by adjusting the on-axis external incision size in MSICS.^[8] The findings demonstrate that all of the groups saw an increase in the patients' uncorrected visual acuity (UCVA) as well as a reduction in their pre-op astigmatism. The prospective nature of the study adds value to the results and interpretations. Also, the authors have excluded the cases with any preexisting ocular conditions that may influence corneal astigmatism, which avoids confounding factors and reduces bias.

The following are some lacunae in the research that need to be addressed: 1) It is necessary to increase the sample size since the current sample size is too small to accurately evaluate the prevalence of postoperative surgically induced astigmatism (SIA) in each of the classes and subgroups. 2) A longer duration of follow-up will be helpful. 3) The manipulation of astigmatism using several forms of incisions, such as straight, smile, frown or chevron, among others, and the comparison of these types of incisions may provide additional valuable information that is necessary for the completion of the study. 4) Because harder cataracts are more difficult to deliver out and demand larger incisions, the necessity to adjust the size of the incision will change based on the grade of the cataract. Hence, a comparison of the sizes of the incisions required to deliver the various grades of cataracts may need to be reviewed distinctly.

Future studies focusing on the following aspects will be helpful in this regard: 1) The measurement of the depths of the incision with the help of anterior segment optical coherence tomography (ASOCT). 2) Utilization of a marker to ensure consistency in incision size and location. 3) Standardization of the type of instruments used for making the sclerocorneal incision and entry into the anterior chamber. A myriad of instruments are currently being used for tunnel construction in MSICS. Current studies have shown that the postoperative astigmatism is influenced by the type of instruments used.^[9] 4) Loops have been implemented as a means of partitioning the nucleus into separate pieces before delivering them out individually. This maneuver will assist in delivering nuclei of varying densities through an incision of a predetermined size, which, in turn, may be helpful in standardizing the SIA. 5) Also, it will be of added benefit to do a comparative study of the effects of the astigmatism correction with the modulation of the incision size compared to any other known surgical methods for the same.

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Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_2122_22

Cite this article as: Shekhar M, Mishra C, Prasad S, Koshy TA. Commentary: Modulation of the incision size for the correction of astigmatism in manual small-incision cataract surgery. *Indian J Ophthalmol* 2022;70:3863-4.