Improving toric intraocular lens alignment skills of ophthalmology residents

Dear Editor,
COVID-19 pandemic has significantly affected surgical training of residents, especially for nonemergency surgeries.[1] Cataract surgeries are one of them. Also, patients eligible and willing for astigmatism correcting surgeries with toric intraocular lenses (IOL) form a minor chunk of cataract surgery eligible patients on which a trainee/resident rarely gets a hand on, more so during current COVID-19 times.

We propose that even normal cataract surgery (nontoric) can be a training tool for toric IOL implantation with our method as described below. The surgeon can mark 0, 180, and 270 degrees axes on the cornea (in standing position) before taking the patient on operating table. The marks are to be verified on table [Fig. 1a] in supine position (keeping cyclotorsion of the eye in supine position in mind). A random axis can be marked on the cornea [here 30 degrees from vertical, Fig. 1b]. The normal steps of phacoemulsification and foldable IOL implantation[2] have to be followed [Fig. 1c]. The surgeon’s aims should be to align the haptic–optic junction [Fig. 1d, arrow] with the 30-degree mark [Fig. 1e, star] at the end of the surgery [Fig. 1f]. Here, we are taking the haptic–optic junction of nontoric IOL as equivalent to toric mark on the toric IOL. All patients with a good dilating pupil and corneal clarity are eligible for such surgery.

The advantage is that during early learning curve, where malalignment/rotations of the IOL are likely, our technique will theoretically eliminate any cylindrical refractive error (our IOL being nontoric) that can occur with malalignment/rotation of an actual toric IOL. A resident/trainee can practice enough to improve his surgical skills before shifting on toric cases. To conclude, we propose using haptic–optic junction of nontoric IOL as alignment reference to practice for toric IOL surgeries.

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Conflicts of interest
There are no conflicts of interest.

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Figure 1: (a) Axis marking on table; (b) axis marked 30 degrees from vertical (star); (c) foldable nontoric IOL implantation; (d) haptic–optic junction is marked with arrow; (e) surgeon trying to rotate and align arrow (haptic–optic junction) with star (30-degree axis); and (f) alignment done and surgery completed.
Dear Editor,

In the absence of more definite signs, an increase in vertical cup-disc ratio (VCDR) by artificial intelligence (AI) can be a solution to this problem. Of VCDR by artificial intelligence (AI) can be a solution to this problem.

In this study, we aimed to determine the efficacy of a smartphone-based fundus measurement integrated into the device. While there are software and algorithms for VCDR assessment to be more accurate and showed a good agreement method. In contrast, we found the AI-mediated VCDR atrophy, the disc margins were overestimated by the automated estimations of the VCDR were on an average higher by a tenth seconds. The resolution of images (3024×4032 pixels) obtained was higher than the currently used handheld artificial intelligence integrated FOP device (Topcon DRI OCT Triton), Topcon Corporation, Inc., Chicago, IL). There was a good correlation between the two devices with an ICC of 0.86 (Pearson’s coefficient (ICC)).

Table 1: Comparison of Mean VCDR as assessed by different modalities

| Assessment modality | Mean ± Standard Deviation |
|---------------------|---------------------------|
| 90D slit-lamp biomicroscopy by single blinded glaucomatologist | 0.78±0.09 |
| FOP device and with inbuilt software of a tabletop SS-OCT device | 0.72±0.1 |
| Automated estimation using a Bland–Altman analysis and intraclass correlation coefficient (ICC). All analyses were performed using a statistical software package (SPSS for Windows, v. 26.0. SPSS, Inc., Chicago, IL). | 0.35±0.1 |
| Expert ophthalmologists. Further, in areas of peripapillary atrophy, the disc margins were overestimated by the automated | 0.38±0.05 |
| AI-mediated VCDR | 0.51±0.1 |

The study was approved by our institutional ethics committee and followed the tenets of the Declaration of Helsinki. Fifty eyes of 25 consecutive subjects (either normal, glaucoma suspects, or previously diagnosed glaucoma cases). However, due to its subjective nature, VCDR estimation on fundus photography has an inherent disadvantage of interobserver variability, especially in inexperienced observers. Of the ongoing social distancing norms of the COVID-19 pandemic [2,3].

In studies by Snyder et al., seven were healthy, four were confirmed glaucoma eyes (n = 14) [4]. The FOP device produced a fundus field comparable to those obtained from the inbuilt reticule by a single (blinded) glaucomatologist by 10 seconds. The resolution of images (3024×4032 pixels) obtained was higher than the currently used handheld SS-OCT device (Topcon DRI OCT Triton, Topcon Corporation, Tokyo, Japan). The VCDR measurements were compared against the identical terms.

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