Comment on: In vivo evaluation of a 1-piece foldable sutureless intrascleral fixation lens using ultrasound biomicroscopy and anterior segment optical coherence tomography

Mularoni et al. described in a short series the position of Carlevalle intraocular lens (IOL) using ultrasound biomicroscopy. Based on our experience in 22 patients, we would like to make some comments on their findings.

Our visual and refractive results were comparable. Median corrected distance visual acuity improved from 0.37 ± 0.47 logMAR to 0.07 ± 0.08 logMAR, and postoperative spherical equivalent and astigmatism were 0.75 ± 0.625 diopters (D) and 0.00 ± 0.25 D, respectively.

In our series, indications for surgery were mainly IOL dislocations (75%). Posterior vitrectomy (PV) combined with the Carlevalle implantation allowed an IOL exchange in a single procedure. We routinely place the 25-gauge trocars under the scleral flaps 1.5 mm from the limbus where the IOL plugs are positioned. Performing the PV through the scleral reduces the number of incisions and decreases the risk for endophthalmitis estimated in scleral-fixed IOLs up to 2.2%. In contrast to the study by Mularoni et al., we routinely perform a complete PV, to reduce the risk for vitreoretinal complications, especially retinal detachment, which is estimated to occur in 8.3% of scleral-fixed IOLs. Vitreoretinal complications are statistically higher in the anterior vitrectomy group (25%) than that in PV (0%). When comparing surgical times (45.30 ± 13:40 vs 33:36 ± 5:13), there was only a 12-minute increase in our series due to the complete PV.

Vitreous remnants may also contribute to a tilt of the IOL. We observed no horizontal (0.05 ± 0.02 mm) or vertical (0.02 ± 0.02 mm) tilt in our group, compared with 30% of vertical tilt in the study by Mularoni et al.

Tilt mainly depends on the location of the haptics and the individual anatomy of the eye. Surprisingly, only 50% of eyes had both haptics in the sulcus in the series by Mularoni et al. The intrascleral position of the haptic plugs depends on the initial creation of the sclerotomies. In the technique described by Mularoni et al., the needle was directed initially perpendicular to the sclera and then redirected parallel to the iris plane until the tip was visible. Unlike Mularoni et al., we create the sclerotomies by passing the trocars parallel to the iris from the beginning. This method ensures a proper haptic position and minimizes the risk for ciliary body trauma, although, depending on the ultrasound biomicroscopy location of the iris root, this may not be always exactly 1.5 mm from the surgical limbus.

We suggest that the cases of IOL anteriorization are secondary to an anterior and asymmetric design of the sclerotomies, not to the excessive IOL stretching. This is easily observed when the ultrasound biomicroscopy images are rotated so that the iris is completely horizontal and both temporal and nasal scans are overlapped (Figure 1).

Finally, larger axial length (AL), white-to-white distance, and sulcus-to-sulcus distance might influence the IOL position but not to the extent as described by the authors. In our series, 30% of patients were highly myopic, and no IOL anteriorization was detected. In the highly myopic group (AL ≥ 26 mm, mean AL = 26.9 ± 0.7 mm), white-to-white distance was 12.1 ± 0.7 mm compared with 12.1 ± 0.4 mm.

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in the rest of eyes (AL = 24.6 ± 1.0 mm). In addition, we observed in highly myopic eyes greater anterior chamber depth in the eyes with a Carlevale IOL (4.51 ± 0.40 mm) than that in the contralateral pseudophakic eyes (4.22 ± 0.91 mm). We hope that this discussion will contribute in improvement of the outcomes in Carlevale IOL.

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Reply: In vivo evaluation of a one-piece foldable sutureless intrascleral fixation lens using ultrasound biomicroscopy and anterior segment optical coherence tomography. We would like to thank Dyrda et al. for their comments on our article.1 First, Dyrda et al. mention that they routinely perform a posterior vitrectomy (PV) combined with the Carlevale intraocular lens (IOL) implantation. Many studies report no statistically significant difference in the rate of vitreoretinal complications and endophthalmitis between PV and anterior vitrectomy (AV) combined with the scleral fixation technique.2,3 Moreover, the risk for complications is mainly linked to sutured scleral fixation techniques, because of both the possible extrusion of the suture and the longer surgical times and manipulation of the eye. According to the literature, AV and PV are feasible options for managing aphakia, offering different risks and benefits, and in our opinion, the choice of one procedure over the other is mostly influenced by the presence of preexisting vitreoretinal comorbidities, in which case performing PV would become mandatory.

Second, in our series, vertical IOL tilt affected 3 eyes, no horizontal tilt was observed. The same experienced surgeon performed all sclerostomies at 1.5 mm from the posterior surgical limbus using the same surgical technique, according to the method of several authors. In addition, a careful cleaning of the vitreous was performed before implanting the IOL to minimize IOL dislocation caused by vitreous remnants. For these reasons, we believe that IOL tilt is mainly attributable to anatomical variability because the ciliary sulcus cannot be inspected directly during the ab externo scleral fixation technique.4

Third, Dyrda et al. attribute the IOL anteriorization to an anterior and asymmetric design of sclerorotmes rather than to an excessive IOL stretching. In the 3-piece scleral-fixated IOL technique, IOL tilt or displacement can occur because of the torque created by asymmetric placement of the sclerotomies. Because of its foldable design, the Carlevale IOL has proven to compensate for slight errors in intrascleral plug positioning by adapting its conformation. In the figure shown by Dyrda et al., the sclerorotmes appear slightly asymmetrical, but in our opinion, it was not to such a degree as to provoke an IOL displacement. We are convinced that the main reason for the IOL anteriorization is the abnormal sulcus-to-sulcus (STS) distance of 2 highly myopic eyes (13.84 mm and 13.62 mm), exceeding the extension capability of the IOL, which appears thinned and stretched. Dyrda et al. reported a mean white-to-white distance of 12.1 mm in myopic eyes, which is far shorter than the STS distance of the myopic patients in our study. Thus, we encourage the authors to assess the real intraocular position of the IOL and the STS distance with the ultrasound biomicroscopy technique because the corneal diameter is an indirect estimate of the STS distance. Finally, a larger number of cases will be necessary to understand the influence of STS distance on IOL stretching, which may or not may confirm the concluding remarks of our original publication.

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