We report a case series of 8 toric intraocular lenses (IOLs) noted to have paracentral inherent opacities after implantation in uneventful phacoemulsification cataract surgery. Defective areas had a microbubble appearance embedded paracentrally in the lens material. All patients were followed up at 1 day, 1 week, and 3 months postoperatively; uncorrected distance visual acuity was unaffected in all cases. None of the 8 patients reported symptoms of increased glare or significant visual distortion postoperatively. It is likely that the defective areas were induced by the manufacturing process and less likely that they were the result of instrument manipulation or ophthalmic viscosurgical device use. To our knowledge, this is the first report of defective toric IOLs with no effects on visual acuity.

Reports of long-term follow-up after cataract extraction and intraocular lens (IOL) implantation are numerous; however, data on defective lens material or progressive opacifications are limited.1 These defects can be caused by manufacturing flaws2,3 and IOL material changes, such as glistening and calcification, over time.4–6 This can affect vision, necessitating IOL exchange.7,8 We report a case series of toric IOLs (Acrysof Toric, Alcon Laboratories, Inc.) with paracentral linear bubble-like opacities and the effect of the opacities on the visual outcomes.

CASE REPORT

Eight eyes with cataract and corneal astigmatism had uneventful phacoemulsification cataract surgery by the same surgeon (E.W.) between January 2014 and July 2017. All eyes received a toric IOL; all the IOLs were noted to have paracentral linear intralenticular opacities. The defective areas resembled microbubbles within the IOL material, which had a smooth optical surface; the areas were located paracentrally as seen under the surgical microscope at high magnification (Figure 1). The decision was made not to explant the IOL because the defective area was paracentral with no effect on IOL integrity and there were no available toric IOLs of the same power; such IOLs are preordered.

All patients were examined 1 day, 1 week, and 3 months postoperatively. Slitlamp photographs were taken, and uncorrected distance visual acuity (UDVA) was documented. At all follow-up intervals, there was no change in the shape or size of the defective areas (Figure 2) and the UDVA ranged from 0.1 to 0.0 logarithm of the minimum angle of resolution. Postoperatively, none of the 8 patients reported increased glare or visual disturbance that would necessitate IOL exchange.

DISCUSSION

Glistening and calcification are well-known changes that occur in acrylic IOLs in the late postoperative period.7–9 They represent actual changes in the IOL material over time. However, the defects in our cases were of a different nature and were noted intraoperatively after IOL insertion. They could have been the result of flaws in the manufacturing process, especially during cast molding. Localized gap formation and temperature changes can cause the formation of these linear microbubbles in the IOL material.
IOL material, which in most cases occur near the posterior IOL surface. Although improvements in the formulation, molding, and curing procedures during the manufacturing process have decreased glistening formation,\textsuperscript{10} aberrations can still be present.

The defects in our cases were less likely to be related to the cartridge, ophthalmic viscosurgical device, IOL forceps, or injector use because they were inside the lens material and all procedures were performed by the same surgeon using the same instruments in other surgeries in which an IOL of the same type and material was implanted. No defects were noted in the other types of IOLs used, including several brands of monofocal and multifocal IOLs. Reversible IOL opacification has been reported in the early postoperative period\textsuperscript{11}; the opacification was possibly caused by inflammation. The shape or size of the defects in our cases did not change over time. All the defects were in the paracentral area of the IOL, which might have helped preserve the visual acuity without the need for IOL exchange.

To our knowledge, this is the first report of defective toric IOLs with no consecutive effects on vision. Further studies are needed to determine the possible causes of such defects to prevent possible adverse effects on vision, especially if they are along the visual axis, increasing the chance that the IOL would have to be exchanged.

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Figure 2. A: Intraoperative photograph of a defective IOL. B: Slitlamp photograph of the same IOL 9 months postoperatively. The arrows indicate defective areas (IOL = intraocular lens).