Commentary on: How to achieve excellent rotational stability and posterior capsule adhesion for in the bag IOL implantation?

As per the Global Burden of Disease Index, the prevalence number of cataracts in the year 2019 were 97,022.04 × 10^3 that is a 129.17% increase from 42,336.68 × 10^3 in 1990.[1] Nowadays, the goal of any cataract surgery is to achieve near-perfect vision without any spectacles in the postoperative period, and it is made possible with the advent of newer and superior cataract surgeries with the development of advanced intraocular lens (IOL) calculating formulas.[2]

The postoperative real-world optical performance of any IOL depends on the position, orientation, and the IOL designs. The long-term orientation, stability, and centration of IOL are governed by the posterior capsule proximity to the postoperative IOL position.[3] The evolution of impetus techniques of cataract surgery is to provide a safer, more

efficient surgical experience with the lowest complication rate and endothelial cell loss and happy patients.[4]

The augmented intraoperative spectral domain optical coherence tomography (SDOCT) has earned a niche in plethoric ophthalmic practice enabling high-resolution, cross-sectional imaging of the eye. Intraoperative SDOCT is appropriate in assessing the posterior capsule in posterior polar and traumatic cataracts. It is one of the important applications to study the approximation between the IOL and the posterior capsule after cataract surgery.[3] This adhesion with the posterior capsule has a strong correlation with the IOL material. The highest propinquity is observed with the hydrophobic IOLs, followed by the hydrophilic IOLs, then the PMMA and the silicone IOLs. The rotational – stability is influenced by the IOL design, haptic type, juxtaposition, and angulation at the haptic-optic junction and the size of the capsular bag. The axial length, age, and other individual features affect the capsular bag size. Still with so much disparity in the capsular bag size and the axial length, standard size IOL of 12 to 13 mm is implanted in the utmost cataract – patients. This discordance may lead to residual refractive errors, tilt, or

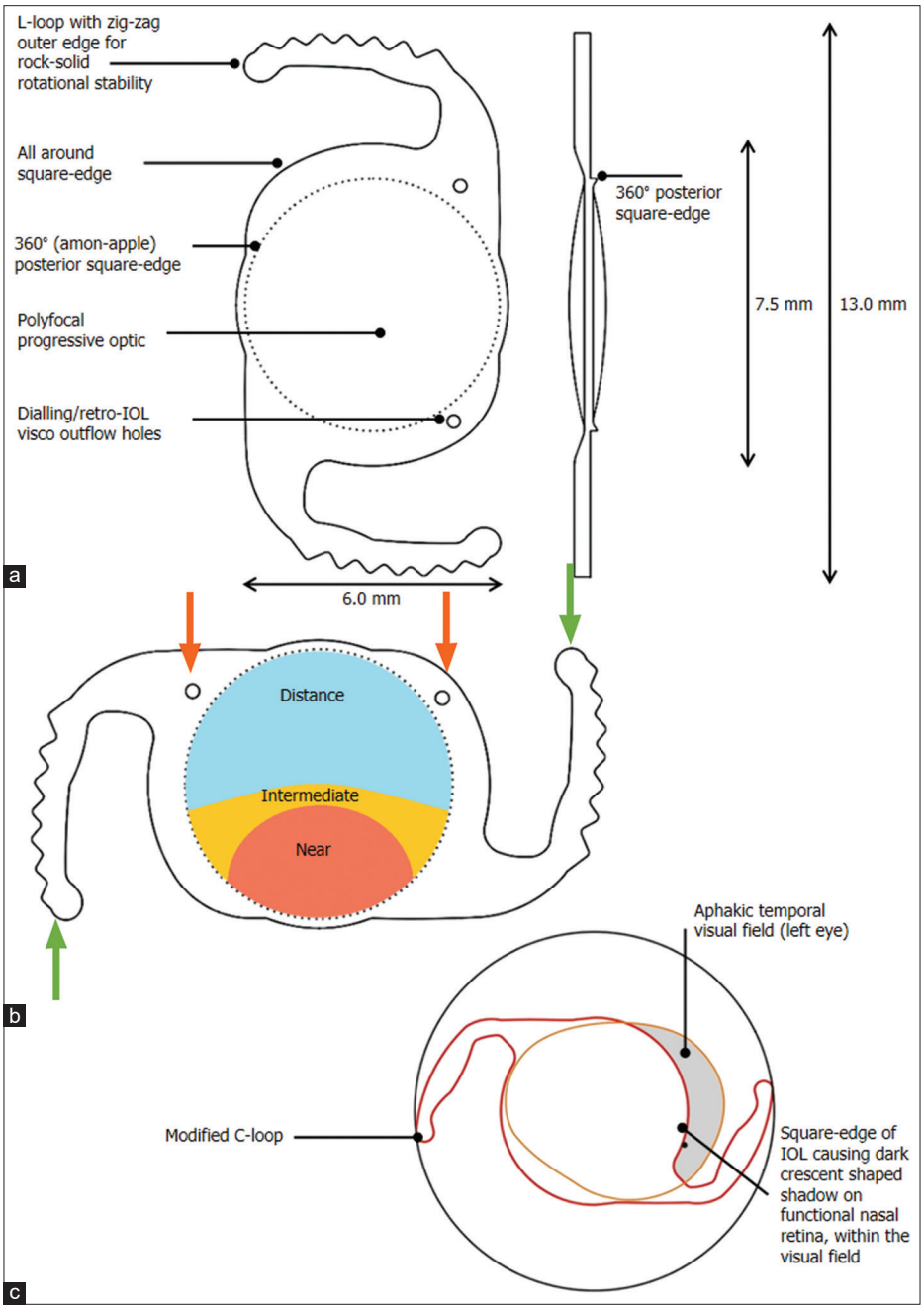

Figure 1: Progressive polyfocal intraocular lens with GRIN technology (Spirant Autofocus Pro, Lifeline Medical Devices Private Limited, India). (a): Design features of the intraocular lens (IOL); (b): Demonstration of polyfocal ringless GRIN technology and L-loop haptics with zig-zag edges (green arrows). The dialing holes are position indicators to be kept in the upper half of the eye; they also help to drain remaining retro-IOL viscoelastic (red arrows); (c): Disadvantages of conventional IOLs that are overcome by the oval optic diameter of 7.2 mm and larger optic size. IOL: Intraocular lens

decentration of the IOL. The gap between the optic of the IOL and the posterior capsule depends upon myriad factors like the axial length of the eye, the status of the vitreous and zonular fibers, capsular bag – size, IOL design, and even the intraocular pressure at the end of the cataract surgery.[3]In most of the premium IOLs, the optic – size is of 6 mm with a modified C-loop haptic, so only a few mm of the approximation with the capsular – fornix that may lead to late postoperative rotation, decentration, and tilt. There is an IOL, Spirant Autofocus Pro (Lifeline Medical Devices Private Limited, India), which has a progressive polyfocal optic with gradient refractive index (GRIN) technology akin to a progressive spectacle lens to provide distance, intermediate, and near vision. The refractive and diffractive-free optic, with a size of 7.3 mm, is absolutely free from glare, halos, and negative dysphotopsia. Its unique L-shaped outer serrated haptic edges provide an excellent rotational – stability as the whole 6 mm is in contact with the capsular fornix [Fig. 1].[5]

In the above study by N Shetty *et. al*, the authors had studied IOL tilt and decentration using intraoperative SDOCT and found out that the closest of proximity is observed when the haptics are aligned vertically.[3] Although this is a unique study, more multicentric prospective studies with greater sample – size and cataract surgeries by multiple phaco surgeons will be required to make these early observations to be more conclusive.

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Quick Response Code:

Website: https://journals.lww.com/ijo

DOI: 10.4103/IJO.IJO_2442_24

Cite this article as: Morya AK. Commentary on: How to achieve excellent rotational stability and posterior capsule adhesion for in the bag IOL implantation? Indian J Ophthalmol 2025;73:400-2.