

Anterior chamber fixation of a posterior chamber intraocular lens: A novel technique

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We aimed to evaluate the implantation of a posterior chamber intraocular lens (IOL) in the anterior chamber (AC) with the haptics passing through two iridectomies to the posterior chamber. A total of 33 eyes of 33 patients with inadequate posterior capsular support due to either previous aphakia or posterior capsular rupture during cataract extraction were included in the study. A double iridectomy was performed on all patients using a vitrectomy probe on the midperiphery of the iris. IOLs were implanted in the AC, and the haptics were passed through the iridectomies to the posterior chamber. The mean follow-up time was 25.3 months. AC hemorrhage occurred in five patients during the iridectomy procedure. Corneal edema was detected in eight of 14 patients with primary IOL insertions. Haptic dislocation was detected in only one patient. This technique may be a good alternative to scleral-fixed IOL implantation in eyes with aphakia.

Key words: Aphakia, capsular support, inadequate, intraocular lens implantation, iris fixation

Posterior capsular rupture is a serious intraoperative complication of cataract surgery.^[1] In patients with insufficient posterior capsule support after cataract surgery, different IOL implantation techniques have been used. The most favorable options are the anterior chamber (AC) or scleral fixation of IOLs, and contact lenses.^[2,3] However, there is another easy and practical way: The implantation of a PC IOL into the AC with the haptics passing through two iridectomies to the PC.

The aim of the present study is to describe a novel IOL implantation technique for the optical rehabilitation of patients with aphakia or posterior capsule rupture.

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Materials and Methods

Thirty-three eyes of 33 patients who underwent implantation of PC IOLs into the AC between May 2006 and July 2008 were evaluated retrospectively. Fourteen eyes had inadequate support due to posterior capsular rupture during phacoemulsification, and 19 eyes were previously aphakic.

Surgical technique

The procedures were performed under topical or subconjunctival anesthesia. If the remaining capsular support was considered to be insufficient for IOL implantation during phacoemulsification, an anterior vitrectomy was performed and acetylcholine was injected into the AC for miosis. The vacuum level of the vitrectomy was set to 200 mmHg and the frequency to 50 cuts/min. Two iridectomies were performed on the midperipheral iris with a vitrectomy cutter at the 7 and 1 o'clock positions. The IOLs were implanted in the AC with the haptics passing through the iridectomies to the PC. The first five patients received polymethylmethacrylate (PMMA) IOLs (Aurolab, Madurai, Tamil Nadu, India), while single piece foldable IOLs (Ocuva, VSY, Istanbul, Turkey) were implanted in the remaining 28 patients. Fig 1 shows our surgical technique.

Results

The mean age of the 16 men and 17 women was 56.3 ± 12.2 years. The mean follow-up time was 25.3 months. Fourteen eyes had inadequate posterior capsular support due to posterior capsular rupture during phacoemulsification and underwent primary IOL implantation. Nineteen eyes that had previously been left aphakic for various reasons underwent secondary IOL implantations.

Intraoperatively, transient hemorrhage occurred in five eyes during the iridectomies. Hyphema in these eyes resorbed in the first postoperative week without sequelae. Mild corneal edema, which resorbed in 5-7 days, was detected in eight of 14 patients with primary IOL implants. No corneal edema was observed in patients with previous aphakia. Pupillary block developed in two of the first five patients who had received a PMMA IOL, and neodymium-doped yttrium aluminum garnet (Nd: YAG) laser iridotomies were performed to relieve the block in these eyes. One of the patients with a PMMA IOL presented with dislocation of the haptic into the AC. The haptic was resutured to the iris with a 10/0 nylon suture for this patient.

Mild pupil distortion occurred in six eyes. None of the patients had longlasting corneal edema, iris atrophy, uveitis, corneal contact with IOL, or retinal detachment during the follow-up period. Pigment dispersion was seen in four patients; however, we did not document any pigmentary glaucoma. While mild guttata was seen in five eyes during the follow-up period, none of the eyes had corneal decompensation.

A marked increase in visual acuity was observed in the patients with posterior capsular rupture during surgery compared to the preoperative levels (20/50 versus 20/25), while visual acuity increased moderately from 20/40 to 20/30 in those who were previously aphakic and underwent secondary IOL insertion. Table 1 shows the refractive outcomes and documented complications of the patients.

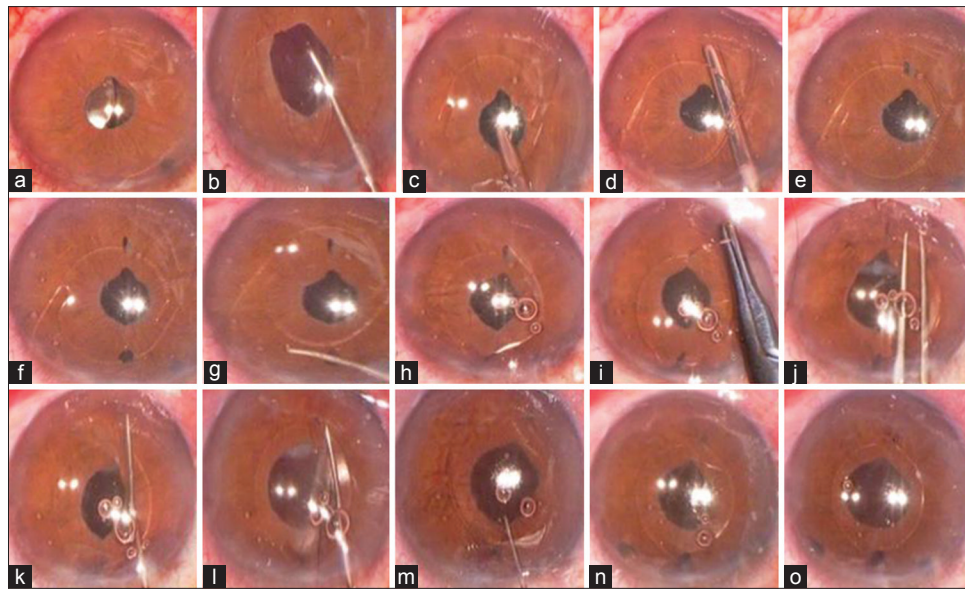


Figure 1: Our iris-sutured IOL fixation technique. (a) Intraoperative posterior capsule rupture and desantralization of the sulcus-fixed IOL. (b) The subluxed IOL was taken to the anterior chamber. (c) Anterior vitrectomy using a 20-gauge probe. (d-f) Using the same probe at 50-100 mmHg vacuum, two iridectomies were created at the 1 and 7 o'clock positions. (g and h) IOL haptics were implanted into the iridectomies using a dialer with the aid of ocular viscoelastic substance. (i-o) Suture of the inferior and superior IOL haptics to the iris using McCunel's technique

Discussion

Posterior capsular rupture is also a well-known intraoperative complication of cataract surgery.^[4,5] In the presence of a posterior capsular tear, an IOL can be placed in the sulcus if the capsular rim is available, or in the bag if the tear is small. If the remaining capsule does not offer sufficient support for the IOL implantation, the surgeon may choose one of following options: AC IOL, iris-claw IOL, iris-sutured IOL, PC iris-sutured IOL, sutureless IOL with iris anchors, or scleral-fixated IOL. AC IOLs and scleral-fixated IOLs are generally recommended when capsular support is insufficient or absent.^[1-3]

Complications associated with AC IOLs, including postoperative inflammation, pupillary transformation, glaucoma, and the loss of corneal endothelial cells have been reported.^[6] Even though there is no contact between scleral-fixated IOLs and the fine structures of the AC angle and corneal endothelium, these IOLs also have some drawbacks, which limit their usage.^[7-9] Recently, Totan and Karadag reported sutureless scleral fixation of a three-piece foldable IOL using 25-gauge transconjunctival sutureless vitrectomy trocars in patients with insufficient posterior capsule support.^[10] Iris-claw IOLs may be a good alternative, however higher costs limit their extensive usage. By implanting a PC IOL in the AC through two iridectomies, the optics and haptics of the IOL are placed in positions that are far from the corneal endothelium and the AC angle. We observed that patients had transparent corneas, centralized IOLs, and IOL haptics that fitted into the iridectomies throughout the follow-up period. The number of patients with complications was very small, and the complications were negligible and not vision-threatening. We also found that primary IOL implantations gave better postoperative visual results compared to secondary implantations. The main limitation of the study is the lack of availability of data associated with corneal endothelium pre- and postoperatively.

Table 1: The refractive and visual outcomes and numbers of documented complications in our study population

	Primary IOL implantation group (n=14)	Secondary IOL implantation group (n=19)
Preoperative spherical equivalent (diopters)	-1.0±0.50	+9.50±2.50
Postoperative spherical equivalent (diopters)	-0.75±1.25	-1.0±1.50
Preoperative visual acuity	20/50	20/40
Postoperative visual acuity	20/25	20/30
IOL dislocation	-	1
Uveitis	-	-
Pupillary block glaucoma	3	2
Guttata	2	3
Corneal decompensation	-	-
Anterior chamber hemorrhage/hyphema	3	2
Pupil distortion	4	2
Pigment dispersion/glaucoma	2	2
Cystoid macular edema	1	1

IOL: Intraocular lens

We created the iridectomies at one and seven o'clock positions 180° apart from the midperipheral iris. Intraocular lens haptic dislocation was observed in only one eye. In this technique, IOL dislocation may be due to large iridectomies, loose sutures or suture release, or the inappropriate positions of opposed iridectomies. However, IOL dislocation in this technique can easily be overcome by resuturing the haptic into position. The surgical correction of an IOL dislocation in our technique is less traumatic and complicated than that for sclera-fixated or posterior iris-fixated IOLs.

Conclusion

This study suggests that this technique is a practical alternative that leads to favorable visual outcomes and minimized risk of complications in eyes without adequate capsular support. However, a long-term study on a large population is required to confirm these findings.

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