Original Article

A study of outcome of posterior iris-claw lens at tertiary health care center

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Abstract

Background: The absence of adequate capsule support, complicates intraocular lens implantation at the time of penetrating keratoplasty. In such cases, an iris-supported anterior or posterior chamber intraocular lens, or a trans-sclerally sutured, fibrin glue-assisted sutureless lens can be implanted. Each of the available options has its own risks and complications. Posterior iris-claw lens implantation has the advantage of preserving the natural anatomy of the eye and seems to be an ideal alternative to overcome these complications. The present study was undertaken to evaluate the outcome of posterior iris-claw lens in different aphakic situations without adequate capsular support. **Material and Methods:** In this prospective study conducted at a tertiary care center, 70 aphakic eyes of 70 patients of the age group 35-75 years were enrolled. Posterior iris- fixated IOL was implanted all cases. Postoperative follow-up was done by a single observer on day 1, day 7, 1 month, 3 months and 6 months for visual acuity, anterior chamber reaction, IOP, specular microscopy, OCT was completed by all patients. **Results:** Majority of patients (57% of the cases) were in the age group 60–70 years. The ECD changes after 6 months was statistically significant. The mean postoperative cell density at 6 months was 1243.51. Percentage of endothelial cell loss was 8.12%. Visual outcome at 6 months was as per the WHO guidelines. 88% of the patients, had visual acuity of 20/40 or better. None of the patient had any major complication. **Discussion:** The complications related to posterior iris-claw lens implantation were minimal compared with its benefits. Therefore, use of posterior iris-claw lens implantation for secondary implantations is a better option to the scleral-fixed or an angle-fixated IOL implantation.

Key Words: Aphakia, inadequate capsular support, posterior iris-claw lens, outcome.

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INTRODUCTION

Surgeons need to correct aphakia with glasses, contact lenses, keratorefractive surgery, and intraocular lenses (IOLs). The IOLs are growing in popularity among patients and surgeons. Anterior chamber IOL (ACIOL), scleral fixated IOL and iris fixated IOL, both anterior and posterior are the various IOLs available[1,2]. The absence of adequate capsule support, complicates intraocular lens implantation at the time of penetrating keratoplasty. In such cases, an iris-supported (e.g. iris-claw) anterior chamber intraocular lens (ACIOL), a trans-sclerally sutured, fibrin glue-assisted sutureless or iris fixated posterior chamber intraocular lens (PCIOL) can be implanted[3,4]. Each of the available options has its own risks and complications. ACIOLs can be associated with complications including corneal endothelial cell loss, leading to pseudophakic bullous keratopathy, iris sphincter erosion, secondary glaucoma, chronic inflammation and hyphema[5]. Whereas, trans-sclerally fixated IOLs are associated with disadvantages such as difficult suture technique, longer surgical time, IOL decentration, hypotony, possible intraoperative bleeding and damage to the ciliary body[6,7]. The ideal position of the IOL remains behind the iris plane[8]. Therefore, posterior iris-claw lens implantation seems to be an ideal alternative. In addition, it has the advantage of preserving thenatural anatomy of the eye, especially in younger patients. The present study was undertaken to evaluate the

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outcome of posterior iris-claw lens in different aphakic situations without adequate capsular support.

MATERIAL AND METHODS

In this prospective study conducted at a tertiary care center, 70 aphakic eyes of 70 patients of the age group 35-75 years were enrolled. Inclusion criteria were patients with monocular surgical aphakia with no capsular support with endothelial counts more than 1000 cells, visual acuity of 20/200 or better with plus 10 Diopters on Snellen chart. Exclusion criteria were patients with binocular surgical aphakia, surgical aphakia with decompensated corneas, aphakic patients with posterior segment pathologies like cystoid macular edema, choroidal neovascular membrane, etc., and aphakic patients with insufficient iris tissue. Complete ophthalmologic examination including LogMAR visual acuity, slit-lamp examination of the anterior and posterior segment, and intraocularpressure (IOP) on Goldman applanation tonometer was done preoperatively. Patients underwent specular microscopy (Konan Specular Microscope X, model NSP-9900, Konan Medical Inc., Japan) for central endothelium cell count (ECC) and optical coherence tomography (OCT; Topcon 3D OCT 2000, Software 4.2 X, Topcon Corporation, Tokyo, Japan) for central macular thickness preoperatively. All cases were operated by a single surgeon under peribulbar block with 0.5% lignocaine anesthesia after a written informed consent of patients was obtained. The lens used in our study was Excelens (Excel Optics Pvt. Ltd., Chennai, India) polymethyl methacrylate single-piece biconvex iris-claw IOL with a total length of 8 mm and 5.5 mm optic size. The recommended A constant by the manufacturer was 117.2. We preferred SRK-T formula for achieving postoperative emmetropia. In elective secondary implantation, a 5.5 mm scleral tunnel was made or revised according to duration from primary surgery using a crescent knife. Two paracenteses were made at 3 and 9 O'clock position and pilocarpine (0.5%) was injected intracamerally. The anterior chamber was entered after injecting viscoelastic material. This was followed by anterior vitrectomy. Posterior iris- fixated IOL was implanted using an iris-claw IOL holding forceps and Sinskey hook and enclaved.on the posterior surface of the iris at 3 and 9 O'clock meridian. The lens optic was firmly held with the forceps and positioned in the center, posterior to the pupil. The mid-peripheral iris was gently enclaved in the claw using Sinskey hook. Peripheral iridectomy was done at 11 or 1 O'clock position. Viscoelastic material was removed. A suture was placed if needed to seal the wound. In eyes with intraoperative large posterior capsular rupture or zonular dehiscence with a posterior lens or IOL dislocation, implantation of posterior iris fixated IOL as explained above was preceded by standard three port 20-gauge pars plana vitrectomy (PPV) for posteriorly dislocated cataractous lens or IOL. The infusion was kept on during implantation of IOL as it does generate turbulence when the wound is open for implantation. However, it is kept in place in the unlikely event that IOL falls back into the vitreous cavity because insertion of infusion cannula in a soft eyeball can be challenging. Therefore, infusion cannula is disconnected only at the end of surgery. Subconjunctival injection of antibiotic and steroid was given in all cases. Postoperatively, topical steroid-antibiotic-mydriatic regimen was followed. The patients received 1% prednisolone acetate eye drops six times daily tapered over 6 weeks, 0.5% moxioxacin eye drops four times daily for 6 weeks, and 0.5% cyclopentolate eye drop once a day for a week. Postoperative follow-up was done by a single observer on day 1 (visual acuity, anterior chamber reaction) and day 7 (visual acuity, anterior chamber reaction, IOP), 1 month (visual acuity, anterior chamber reaction, IOP, UBM, specular microscopy), 3 months (visual acuity, anterior chamber reaction, IOP), and 6 months (visual acuity, anterior chamber reaction, IOP, specular microscopy, OCT) was completed by all patients.

RESULTS

A total of 70 patients with surgical aphakia with poor capsular support were included after a written informed consent was obtained. The Ethical Committee approval was taken before beginning the study. Majority of patients (57% of the cases) were in the age group 60–70 years. Out of the 70 patients, 54 were males and 16 were females. No major difference was observed in laterality in aphakia, with Right eye 58% and Left eye 42%. The ECD changes after 6 months was statistically significant with *P* value <0.05. The mean preoperative cell density (aphakia) was 1463.32 and postoperative cell density at 6 months was 1243.51. Percentage of endothelial cell loss was 8.12% (*P* value 0.002). Visual outcome at 6 months was as per the WHO guidelines. Most of the patients (i.e. 88%), had visual acuity of 20/40 or better. Major complications like cystoid macular edema, bullous keratopathy or retinal detachment were not observed in the present study.

DISCUSSION

Surgical correction of aphakia without capsular support remains a challenge. Each of the available options has its own risks and complications. Spectacle correction is associated with reduced peripheral visionand image magnification of 20–35%[1]. Surgical correction with IOL implantation can overcome these problems. Even though,

surgical aphakia has become less common, it can still be encountered as a complication of cataract surgery where there is insufficient capsular support to place posterior chamber IOL[9]. Implantation of an IOL into the anterior chamber (ACIOL) can be associated with complications. If the IOL is undersized, corneal endothelial cell damage might happen due to IOL rotation, resulting in corneal decompensation. In cases of oversizing, the patient might develop iris ischemia, hyphema, iritis, secondary glaucoma or cystoid macular edema[10]. A mean endothelial cell loss of 9.78% and pigment precipitation on IOL in 5.6% patients was reported by Chen *et al*[11]. In another study carried by De Silva *et al*, postoperative complication rates in anterior iris-claw IOLs were comparable with conventional ACIOLs, with postoperative IOP rise in 9.5% eyes and corneal decompensation in 1.7% of eyes[12]. The posterior enclavation is technically more difficult, but is gaining high popularity within the last decade. It has the advantage of a better physiological intraocular refractive correction, a safer distance to the corneal endothelium and is technically easier than suturing the lens to the sclera. Several studies have shown excellent results in terms of vision, postoperative complications and endothelial cell loss, after correcting aphakia with retropupillary implantation of an iris-claw IOL in adults[13-15]. We used the posterior chamber iris fixated IOL because of retropupillary position and lower risk of endothelial decompensation. Patients were followed up for 6 months; the two main parameters we checked were BCVA and ECD. Postoperatively, at the end of 6 months, most of the patients (i.e. 88%), had visual acuity of 20/40 or better and endothelial cell loss was 8.12%. No significant surgical complications like raised intraocular pressure and cystoid macular edema were seen in our series. In all of our cases, IOL remained well centered until the end of the follow-up period. To conclude, the complications related to posterior iris-claw lens implantation were minimal compared with its benefits. Therefore, use of posterior iris-claw lens implantation for secondary implantations is a better option to the scleral-fixed or an angle-fixated IOL implantation.

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