



### Original Research Article

## A Hospital Based Prospective Study to Evaluate the Safety and Efficacy of Iris-Claw Intraocular Lens Implantation

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### Abstract

**Objective:** *The advantage of iris-claw lens is that it can be fixated to the iris without applying sutures because the peripheral iris is incarcerated between the claws, so implantation of this lens takes a few minutes only, thus the hypotonic open sky phase is shortened compared to combined surgery. Our aim of this study was to evaluate the safety and efficacy of retropupillary iris-claw intra ocular lens implantation in our institution.*

**Methods:** *In this study 36 eyes with aphakia without capsular support were included prospectively. All the patients were evaluated properly and subsequently retropupillary iris-claw intra ocular lens implantation was done.*

**Results:** *The mean age of patients was 63.6 years with SD of 10.5 years. Highest number of patients were in the age group of 60-70 years (46%). The mean follow-up of patients was 3.1 years ranging from one month to six years. Out of 36 eyes, 25 (69%) eyes had visual acuity of 6/9, five (14%) eyes had 6/12, three eyes (8%) had 6/6 vision, two eyes had 6/24 and one presented with only perception of light and projection of rays. The most common postoperative complication was subconjunctival hemorrhage, seen in 13 (36%) cases. Two eyes developed secondary glaucoma in postoperative period due to pupillary block. Retinal detachment was observed in one eye. We have not seen any case of bullous keratopathy, infection or cystoid macular edema till last follow-up.*

**Conclusion:** *From our study as well as from other studies we have noted that, retropupillary iris-claw implantation in such patients is safe and effective among all the treatment modalities available at present.*

**Keywords:** *Iris-claw lens, Aphakia, Capsular support, Retropupillary.*

### Introduction

It was Worst in 1980 who invented iris-claw lens method in aphakic eyes in order to correct the refraction, which was a coplanar single-piece poly

methyl methacrylate (PMMA) intra ocular lens<sup>1</sup>. The iris claw implant was initially designed for use in aphakic eyes. This lens is fixated to the iris surface anteriorly by enclavation of a fold of iris

tissue into two opposed claws of the lens. By this technique the natural anatomy of the eye is preserved. The fixation sites are located in the mid periphery of the iris, which is immobile during pupillary movement. Amar<sup>2</sup> proposed the technique of posterior fixation of iris-claw lens and later it was modified by Mohr et al<sup>3</sup>. This lens was later modified into a convex-concave design and was manufactured as Artisan/Verisyse lens and followed by a foldable model as Artiflex<sup>4</sup>. Early models needed to be sutured. Although technically its implantation is relatively easy, but few disadvantages include the incision size, which if sutured usually generates astigmatism, and the relatively high cost of the lens. The first-generation models of iris-claw lens such as the Binkhorst<sup>5,6</sup> and the Medallion intra ocular lens<sup>7</sup> were associated with complications such as lens dislocation, glaucoma, cystoid macular oedema and uveitis<sup>8</sup>. The advantage of iris-claw lens is that it can be fixated to the iris without applying sutures because the peripheral iris is incarcerated between the claws, so implantation of this lens takes a few minutes only, thus the hypotonic open sky phase is shortened compared to combined surgery<sup>9</sup>.

### Material and Methods

This was a prospective study in which 36 aphakic eyes without capsular support were included for evaluation. All these eyes were aphakic due to post cataract surgery, and subsequently retro-pupillary implantation of iris-claw lens was done by the same team of surgeons. All these patients were informed in detail about the procedure, its risks and advantages, and written signed consent were obtained from the patients. The study design was approved by medical ethics committee of our institute. Demographic data was collected from the patients. In addition to this, data was also collected preoperatively about, best corrected visual acuity measured with snellen's decimal scale, intraocular pressure measured by goldmann applanation tonometry, refraction measured with auto refractometry, former operations, any

previous disease and biometry measured with optical method. Only those eyes were included in the study who landed with post-cataract surgery aphakia resulted either from intra or post-operative complications. Patients having aphakia other than post-cataract surgery were excluded from the study, in addition to this patients with total aniridia or rubeosis iridis were excluded.

All eyes were operated under local anesthesia and used the same surgical technique. We used both rigid as well as foldable iris-claw intraocular lens. Either at 3 or 9 o'clock position corneal or sclerocorneal paracentesis was done. Before injection of cohesive viscoelastic material through the incision, intracameral pilocarpine was injected for miosis, A 5.8 mm corneal incision was extended (in majority of eyes the existing cataract surgery site was used) followed by insertion of iris-claw intra-ocular lens in to the anterior chamber and then by special lens fixation forceps moved to posterior chamber. Haptics of the iris-claw lens were attached to the iris at 3 and 9 o'clock position with the help of spatula. An intraocular lens dialer was used through the incision for iris enclavation by applying minimum gentle pressure over it through the slotted center of the IOL haptic. Peripheral iridectomies were performed in majority of cases. Corneal or sclerocorneal incision was closed with few interrupted nylon sutures. Finally antibiotic and steroid were injected sub-conjunctively. Afterwards postoperatively steroid and antibiotics were given to all patients four times daily for few days.

### Results

The mean age of patients was 63.6 years with SD of 10.5 years. The patients ranged in age from 24–82 years. Highest number of patients 17 (46%) were in the age group of 60-70 years. Out of 36 patients 20 (56%) were males and 16 (44%) were females. The mean follow-up of patients was 3.1 years ranging from one month to six years. Postoperatively out of 36 eyes, 25 (69%) eyes had visual acuity of 6/9, five (14%) eyes had 6/12,

three eyes (8%) had 6/6 vision, two eyes had 6/24, and one patient had only perception of light and projection of rays in the follow-up period. The most common postoperative complication noted in this study was subconjunctival hemorrhage, seen in 13 (36%) cases. Superficial keratitis was noted in 10 (28%) eyes. In one case we have seen hyphaema postoperatively. The mean intraocular pressure at the end of follow-up was  $15.3 \pm 3.6$  mmHg. Two eyes developed secondary glaucoma in postoperative period due to pupillary block. In these cases we had not done iridectomy during intraocular lens implantation. Intraocular pressure remained  $>21$  mmhg postoperatively in these cases. Retinal detachment was observed in one eye. In one eye we had subluxation of iris-claw intraocular lens which was refixated properly without any difficulty. Rest in all the cases the lens was central and in stable position. On the lens surface pigment dispersion was noted in two eyes, and in one eye iris atrophy was noted at enclavation site. Irregular pupil was noted in two eye. We have not seen any case of bullous keratopathy, infection or cystoid macular edema till last follow-up.

### Discussion

This was a prospective study in which 36 eyes were included for evaluation. Till now it is still considered a challenge and matter of discussion to treat aphakia without capsular support surgically, because of various complications which are related to available treatment modalities. In patients of aphakic eyes, intraocular lens implantation had been done successfully in the anterior chamber by fixing the lens to anterior surface of iris. But this procedure carries more risk of decrease in the endothelial cell count<sup>10</sup>. While as, many studies have reported that retropupillary implantation of iris-claw lens does not show significant effect on endothelial cell count<sup>11</sup>.

In this study we have not observed any significant complication postoperatively which we could not manage at our hospital except in one case of

retinal detachment. The most common complication in our study was minor subconjunctival hemorrhage, which disappeared within few days without any further treatment. Many studies regarding implantation of retropupillary iris-claw intraocular lens noted pigment dispersion as a complication<sup>12</sup>. Our study also showed pigment dispersion in two patients which was at par with these studies. One major complication we noted postoperatively was secondary glaucoma, which occurred in two cases. In these two cases we had not done iridectomy at the time of lens implantation. These were managed by laser iridotomy in the follow-up period successfully and we were able to achieve a desirable intraocular pressure in them. Few studies have correlated retinal detachment though rarely with implantation of iris-claw intraocular lens<sup>13</sup>. In our series of cases we had one case of retinal detachment till last follow-up. This patient had undergone vitrectomy at the time of lens implantation. Retinal detachment had been observed in more patients of scleral fixation<sup>14</sup> than iris fixation of intraocular lens. We had to refer the patient to vitreoretinal surgeon for further management as the same was not available in our hospital. In one eye we recorded iris atrophy at the site of enclavation. Many studies have shown that iris atrophy is most common in places of enclavation<sup>15</sup>. In the current study we noted some other minor complications which needed no treatment in follow-up period other than observation only.

### Conclusion

In aphakic eyes without capsular support, retropupillary iris-claw lens implantation is easy to perform and gives us the good refractive outcome with all the physiological and optical advantages of posterior intraocular lens location at low risk of complication. From our study as well as from other studies we have noted that, retropupillary iris-claw implantation in such patients is safe and effective among all the treatment modalities available at present.

**Declaration**

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