

# Observational Study on Visual Outcome on Use of Iris Claw in Hypermature Cataract

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**Abstract:** *Retropupillary iris-claw intraocular lenses (ICIOLs) have been increasingly used recently as a primary or secondary procedure of IOL implantation in eyes with insufficient capsular or zonular support. Aim To study visual outcome, endothelial cell loss and complications after retropupillary Iris claw lens implantation in patients with hypermature cataract having deficient posterior capsule due to weak zonules. Methods: This cross-sectional study included 30 patients who underwent retropupillary iris claw lens implantation in patients with hypermature cataract having deficient posterior capsule. Demographic details and data regarding pre operative status and postoperative events were noted, and compared. Results: The mean Preop Vision was HMCF and it improved to LogMar 0.13± 0.12, postoperatively which is equivalent to 6/18. Refixation/retucking of iris claw lens was observed in 4 (13.3%) cases, hypotonia and corneal decompensation was seen in 2 (6.67%) cases each. Conclusion: Retropupillary Iris Claw lens implantation is less time consuming, cost effective, predictable and safe procedure with good visual outcomes and fewer complications.*

**Keywords:** Hypermature Cataract, Iris Claw Lens; Retropupillary; posterior capsule, rupture

## 1. Introduction

Cataract surgery has underwent changes in all these years. In cases of hypermature cataract pre operative risk factors like dense pseudoexfoliation, phacolytic glaucoma, phacodonesis, Lens induced uveitis were seen. Intraoperatively Large posterior capsular rent or whole bag removal, Large zonular dialysis, nucleus drop are seen.<sup>1</sup> The available treatment options are anterior chamber intraocular lens (ACIOL), a scleral fixated intraocular lens (SFIOL) or an iris fixated IOL.<sup>2,3</sup> The use of ACIOLs within iridocorneal angle has frequently caused endothelial cell loss and pseudophakic bullous keratopathy (PBK).<sup>4</sup> The scleral fixation of posterior chamber IOLs has disadvantages like difficult suture technique, longer surgical time and complications including hypotony, possible intraoperative bleeding, damage to the ciliary body, Choroidal haemorrhage, retinal detachment, vitreous incarceration and cystoid macular oedema. The Iris Claw lens was designed by Prof. Jan G.F Worst in 1978 and can be fixated to the iris either in the anterior chamber or in the posterior chamber. However with implantation of Iris claw lens in anterior chamber there is risk of reduction in endothelial cell count which can lead to pseudophakic bullous keratopathy. The technique of retro pupillary iris fixation of iris claw lens which was first reported by Andreas Mohr in 2002, is associated with a low-risk, cost effective, less time consuming method of surgery IOL haptics and appears to be better cosmetically than anterior chamber implants. It also enhances stability, prevents tilting of the lens and reduces the glare phenomenon.<sup>5,6,7</sup> There are disadvantages like disenclavation, pupillary deformity and iris atrophy. We have studied mainly the visual outcome, endothelial cell loss and complications of retropupillary iris claw lenses at follow up visit.

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## 2. Material and Method

### Study Design

The present study was prospective Cross-sectional study to evaluate visual outcome with use of Iris Claw Lens in Hyperature Cataract in Department of ophthalmology in tertiary care center. All cases of surgical aphakia attending OPD during period of 18 months were included. Permission to conduct study and ethical clearance was obtained from institutional ethical clearance committee from ethical committee. A total of 30 cases of hyperature cataract with pseudoexfoliation, phacodonesis satisfying inclusion criteria were included by Simple random technique. In the study, Sample Size calculation: By using formula sample size (N)=  $z^2pq/e^2$  p= Prevalence of hyperature cataract in India p=10% q=100-p=100-10=90 z=1.96 e=error=7% N=1.96\*1.96\*10\*90/7\*7=74. A total of minimum 74 patients required for the study with 20% loss for follow up i.e. 15. Hence a sample size of 100 was selected for the study. A sample of 30 patients were selected from the size of 100. INCLUSION CRITERIA: 1. All patients with age 60-90 years giving consent for with Posterior Capsule Rent as complication during cataract surgery were included.

### Exclusion Criteria:

1) Any past history of corneal trauma or with Corneal Opacity or history of Corneal Surgery or retinal surgery were excluded. Informed written consent of all patients included in the study was taken after explaining the procedure and purpose of the study. Complete preoperative evaluation, which included visual acuity by Snellen's chart, tonometry, slit lamp biomicroscopy, Ascan biometry, Bscan ultrasonography, keratometry, indirect ophthalmoscopy was done.

- Patients were treated postoperatively with 1% prednisolone acetate and 0.5% moxifloxacin eye drops 6 times a day tapered over 6 weeks.
- Post-operative evaluation includes visual acuity by Snellen's chart, applanation tonometry, slit lamp biomicroscopy, indirect ophthalmoscopy
- During the follow up period of 1,4,6 weeks and late follow up at 6 months, complications If any were treated, refraction done and best glasses prescribed

### Statistical Analysis

The data that was entered in Microsoft Excel, coded and analyzed using IBM SPSS 25.0 version. The data on categorical variables was presented as frequency and percentages and the data of continuous variables was presented as mean and standard deviation. The comparison of distribution of categorical variables was done using chi square test and comparison of distribution of continuous variables was done by unpaired t test. P value less than 0.05 was considered statistically significant.

### Surgical procedure

Under peribulbar anesthesia, conjunctival peritomy is done and 5.5mm sclerocorneal tunnel is made using a crescent knife. Sclerocorneal tunnel made and through side port anterior chamber is formed with viscoelastic and if vitreous is noted in the anterior chamber then automated vitrectomy is carried out accurately. Another side port is made opposite to the side port at 90 degree to the main wound. Pupil is

constricted by intracameral pilocarpine. The optic is held with lens forceps, one haptic is tilted down and pushed under iris. On the same side through paracentesis a sinsky hook is passed. To produce an indent on the iris the haptic is tilted once it is behind iris other haptic enclavation is done with similar maneuver. Peripheral iridectomy is done at 11 o'clock position. Viscoelastic is aspirated and anterior chamber formed with air. Side port hydrated. Sutures taken with 10-0 ethilon. Conjunctiva repositioned and subconjunctival dexamethasone is given.

## 3. Results

In the present study, the majority of patients were in age group 71-80 years (56%) followed by age group 61-70 years (21%) and 81-90 years (20%). The mean age among patients was  $71.56 \pm 10.28$  years. There were 17 males and 13 females as seen in Table 1. Out of 30 patients, 53% were involving right eye and 47% were left eye

It was observed that majority of patients pre-operative had vision HMCF (70%) while majority had vision 6/36 to 6/18 post-operative (50%). This shows there was improvement in vision post-operative with significant statistical significance as seen in Table 2

The mean Preop HMCF while it improved to 6/18, postoperatively and the difference was highly significant as seen in Table 3. The mean preoperative endothelial cell count was  $2207.18 \pm 615.29$  cells/mm<sup>2</sup>, and after six months of follow-up, it was  $1877.91 \pm 569.55$  cells/mm<sup>2</sup>. There was increase in IOP but was not significant. Refixation/retucking of iris claw lens was observed in 4 (4%) cases, hypotonia and corneal decompensation was seen in 2 (2%) cases each was seen as postoperative complication as in Figure 1.

**Table 1:** Distribution of subjects according to age and gender

Age group (In years)	Frequency (n)	Percentages (%)
51-60	00	00
61-70	07	24
71-80	17	56
81-90	06	20
Sex		
Male	17	56
Female	13	44

**Table 2:** Preop vs Postop mean best corrected visual acuity

Vision	Preoperative vision	Postoperative vision	P value
PL + PR +	4	00	P<0.01
HMCF	21	00	
FCCF	5	00	
6/24	00	05	
6/18	00	15	
6/12 to 6/6	00	10	
Total	30	30	

**Table 3:** Preop vs Postop mean best corrected LogMAR

Vision (LogMAR)	Pre-operative vision	Post-operative vision	P value
Mean	HMCF	6/18	P<0.0001

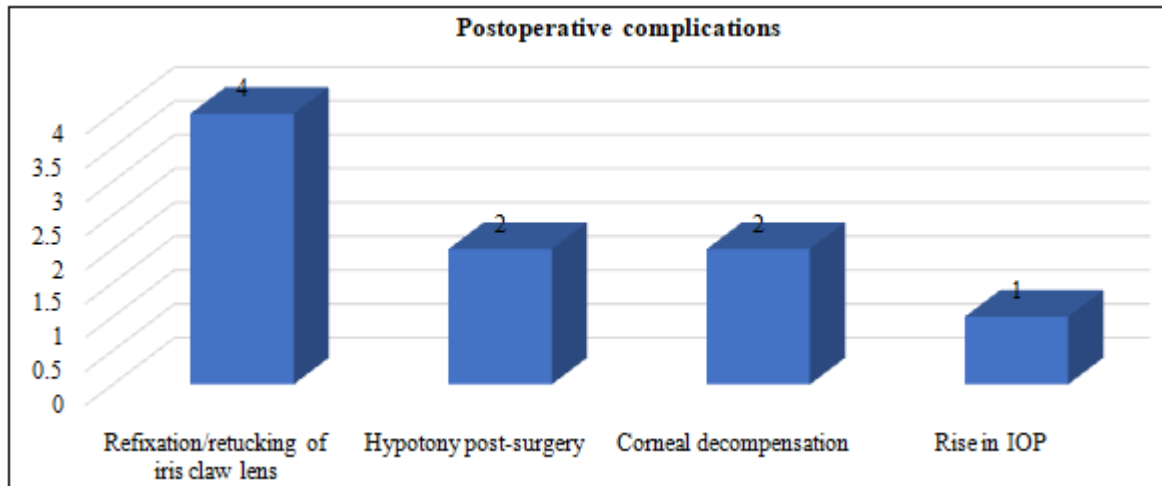


Figure 1: Post-operative complications

#### 4. Discussion

In this study, the majority of patients were in age group 61-70 years (56%) followed by age group 51-60 years (21%) and 71-80 years (20%). The mean age among patients was  $61.56 \pm 10.28$  years.

In Forlini M study the mean age was 59.7 years in patients with post-traumatic aphakia; 60.1 years in patients with post-cataract surgery aphakia; and 65.8 years in patients with post-cataract surgery aphakia.<sup>7</sup> In our study the mean Preop LogMAR was  $0.07 \pm 0.09$  while it improved to  $0.13 \pm 0.12$ , postoperatively which is equivalent to 6/18 and the difference, was highly significant. In Rajesh Goel study it is seen that 78 % eyes had vision better than 6 / 12 postoperatively followed by 12 % who had vision between 6 / 18 & 6 / 36. while only 10 % eyes had < 6 / 60 vision.<sup>8</sup> In study by Gonnermann J. the final mean corrected distance visual acuity (CDVA) ( $0.38 \pm 0.31$  [SD] logMAR) postoperatively was significantly better than preoperatively ( $0.65 \pm 0.58$  logMAR)<sup>9</sup>

In Sumitha CV study it is seen that main indications for retropupillary IC-IOL implantation were complicated cataract surgery and aphakia.<sup>10</sup> There was fall in mean postoperative endothelial cell count after six months of follow-up and increase in IOP but was not significant in our study. In a study by Raghvendra Rao, et al. postoperatively, at the end of 6 months, endothelial cell loss was 8.96%.<sup>11</sup> In Forlini M no post-operative increase in the mean intraocular pressure was seen.<sup>7</sup>

Postoperatively, refixation/retucking of iris claw lens was observed in 4 (13.3%) cases, hypotonia and corneal decompensation was seen in 2 (6.67%) cases each was seen in this study.

In De Silva, et al. study corneal decompensation happened in 1.7% of eyes.<sup>12</sup>

In Mansoor T study complications like Choroidal detachment CME, retinal detachment, ovalization of pupil, haptic disenclavation, corneal decompensation, and endophthalmitis were seen in 1.6%, 4.9%, 1.6%, 16.4%, 6.6%, 0.8% and 0.8% eyes respectively postoperatively.<sup>13</sup> In

study by Rajesh Goel acute postoperative iritis in 36 % , pupillary distortion 30 % , pigment clumping in 24 % ,iris chaffing in 21 % and IOL decentration in, 7 % eyes were seen.<sup>8</sup>

#### 5. Conclusions

Retropupillary iris claw intraocular lens implantation is found to clinically safe, less time consuming ,predictable and effective primary or secondary procedure in cases with deficient posterior capsule or inadequate capsular support with good visual outcomes and minimal complications. Therefore, retropupillary iris claw lens implantation is a better alternative for scleral-fixed or angle-supported IOL implantation.

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**Conflict of Interest:** None declared.

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