

Original Research Article

Outcomes of retropupillary iris-claw lens implantation

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ABSTRACT

Background: Inadequate posterior capsular support during cataract surgery makes it difficult to implant posterior chamber intraocular lens. One of the secondary intraocular lens implantation options is iris claw lens. Retropupillary iris claw lens is preferred than anterior because chances of damage to the anterior chamber angle and iris root are avoided as the lens is fixed to the mid periphery of iris. The prospective study aims to analyse the visual outcomes and immediate postoperative complications after retropupillary iris-claw lens implantation in a tertiary care hospital.

Methods: It was a prospective study done conducted on 24 patients with inadequate posterior capsular support in which retropupillary iris-claw lens implantation was done from December 1, 2021 to May 31, 2022 at Government Regional Eye Hospital, Visakhapatnam. Immediate postoperative complications were noted. Final visual outcomes were noted after 2 months.

Results: The study comprised of 24 eyes. The mean patient age was 55.91 years (range 44-77 years). The IOLs were inserted during primary lens surgery in 16 eyes (66.6%) and as a secondary procedure in 8 aphakic eyes (33.4%). The mean postoperative intraocular pressure was 15.1 mmHg. Majority of the eyes had best corrected visual acuity of 6/12 (41.6%). The most common immediate postoperative complication was pupil ovalization (25%) and striate keratopathy (25%). Least common complication was choroidal detachment (3.6%).

Conclusions: Visual outcomes of primary and secondary iris claw implantation were similar. The retro-pupillary iris-claw lens implantation provided good visual outcome with tolerable complications. It can be used in eyes with inadequate posterior capsular support.

Keywords: Iris claw, Aphakia, Secondary lens implantation, IOL, Cataract

INTRODUCTION

Inadequate posterior capsular support during cataract surgery makes it impossible to implant posterior chamber intraocular lens.

Leaving the eye aphakic affects the quality of life as it causes high hypermetropia and anisometropia. In such conditions, secondary intraocular lens implantation options are sutured scleral fixation, intrascleral fixation, angle-supported anterior chamber, and anterior chamber or retropupillary iris-claw IOLs.¹ Scleral sutured PCIOL are anatomically closer to the original IOL resulting in good

visual outcome but they are technically difficult to insert and passing scleral needle passes increase the risk of intraocular hemorrhage, suture breakage and endophthalmitis.

One of the major limitations associated with ACIOL is limited availability of its size with respect to the diameter of the anterior chamber which is necessary to maintain the lens in position and to avoid complications. If the lens is too short, it causes dislocation increasing the chance of damage to the corneal endothelium and angle of anterior chamber. If the lens is too large, it would cause an uneven pressure over the anterior chamber angle increasing the

chances of glaucoma.^{2,3} Iris claw lens can be the procedure of choice if iris support is feasible. Peripupillary iris claw lens has high incidence of postoperative complication. Retropupillary iris claw lens is most commonly used because chances of damage to the anterior chamber angle and iris root are avoided as the lens is fixed to the mid periphery of iris. Iris claw IOL does not interfere with physiological vascularisation.^{2,3}

METHODS

It is a prospective study done on 24 patients without adequate capsular support in which retropupillary iris claw lens implantation was done. The study was conducted at Government Regional Eye Hospital, Visakhapatnam. The study period was from December 1 2021 to May 31 2022.

Inclusion criteria

Patients with intra-op inadequate posterior capsular support; with aphakia and with normal iris anatomy were included.

Exclusion criteria

Patients with gross iris abnormalities like aniridia, diffuse iris atrophy, rubeosis iridis, pro-found iridodonesis, active uveitis, any pathology in retina, traumatic mydriasis, and surgical aphakia with decompensated corneas were excluded.

Pre-operatively the investigations performed were: best corrected visual acuity using Snellen chart; anterior segment examination using slit lamp; posterior segment examination using 78 D lens in slit lamp or B scan; keratometry; biometry; IOP measurement using applanation tonometry. The IOL power was calculated using the SRK/T formula and an A constant of 116.5. The lens used was an Iris claw lens made of polymethyl methacrylate.

Immediate postoperative complications were noted on post-operative day 1. Final visual outcomes were noted after 2 months. The institutional ethics committee approval was obtained and informed consent was taken from the patient. Data is recorded in specially designed proforma and transferred to Google sheets.

Procedure

Cataract surgery performed was small incision cataract surgery (SICS). After noticing vitreous in the anterior chamber, careful anterior vitrectomy was done. Acetylcholine 1% was injected into the anterior chamber to achieve miosis. Anterior chamber was filled with viscoelastic to protect the corneal endothelium. Paracentesis were made in the limbus 180° apart. The iris claw IOL was placed over the iris, one haptic was guided below the iris and enclaved in the mid-peripheral iris using a blunt sinsky hook. The same procedure was repeated for

the other haptic. Finally, wound integrity was checked and wound sutured if required. Sub-conjunctival steroids were injected in all cases. Immediate postoperative complications were noted on post-op day 1.

RESULTS

A total of 24 eyes of 24 different patients (10 males, 14 females) were treated with retropupillary iris claw lens. Mean age of the patients was 55.91±9.9 (min-max: 41-78 years). 15 (62.5%) patients' right eyes and 9(37.5%) patients left eye were treated. Maximum patients were in the age range 51-60 years (Table 1).

The IOLs were inserted during primary lens surgery (SICS) in 16 eyes (66.6%) and as a secondary procedure in 8 aphakic eyes (33.4%) (Figure 1).

The mean immediate post-operative intraocular pressure was 15.1 mmHg. Immediate post-operative complications included: pupil ovalization in 7 eyes (25%); striate keratopathy in 7 eyes (25%); descemet membrane folds in 6 eyes (21.5%); shallow anterior chamber in 4 eyes (14.2%); corneal edema in 3 eyes (10.7%); choroidal detachment in 1 eye (3.6%).

BCVA attained were in the range 6/24 to 6/6, maximum patients being in the visual acuity of 6/12 (10 cases; 41.6%) and minimum in the acuity of 6/24 (1 case; 4.2%).

Mean spherical equivalent was -0.59±1.08.

Table 1: Demographic characteristics of the study.

Demography	N	%
Sex		
Males	10	42
Females	14	58
Age (years)		
Mean age	55.91	
41-50	7	29
51-60	10	42
61-70	5	21
71-80	2	8
Eye		
Right eye	15	62.5
Left eye	9	37.5

Table 2: Immediate post-operative complications after iris claw lens implantation.

Complications	N	%
Pupil ovalization	7	25
Striate keratopathy	7	25
Descemet membrane folds	6	21.5
Shallow anterior chamber	4	14.2
Corneal edema	3	10.7
Choroidal detachment	1	3.6

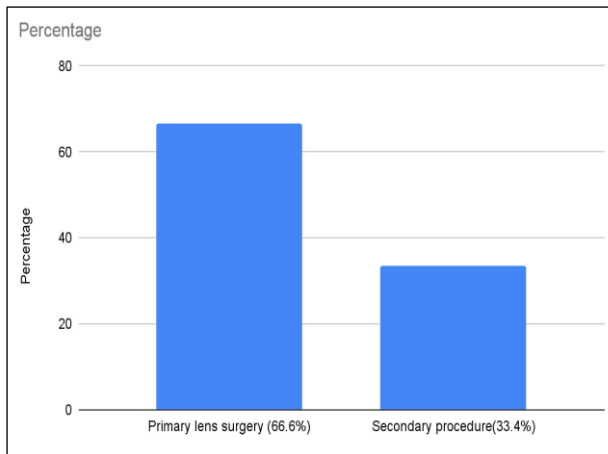


Figure 1: Bar graph showing percentage of IOL insertion as a primary and secondary procedure.

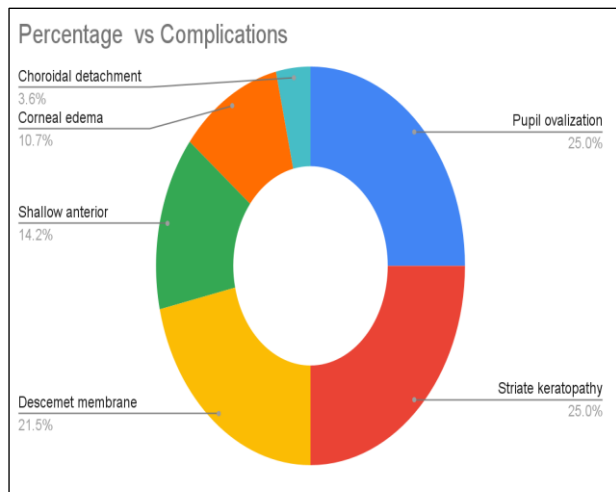


Figure 2: Immediate post-operative complications after iris claw lens implantation.

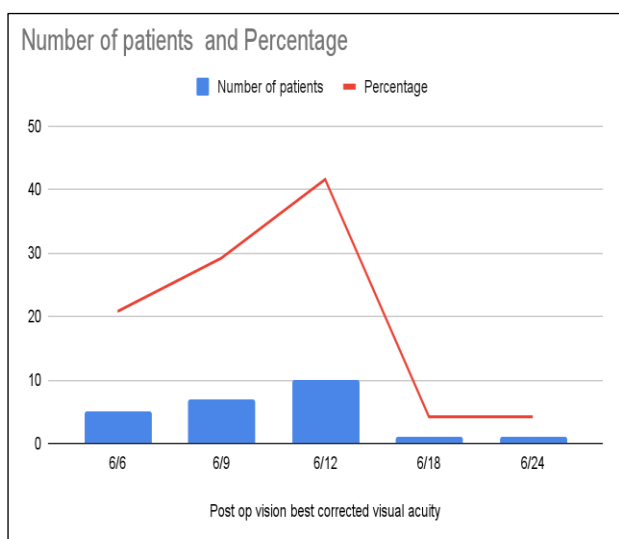


Figure 3: Post-op best corrected visual acuity after 2 months.

DISCUSSION

In this study we aimed to study the visual outcome and immediate post-op complications after retropupillary iris claw lens implantation. Both primary and secondary procedures gave comparable results similar to Madhvinan et al, Forlini et al, Helvaci et al, Jare et al concluding that IOL implantation can be done in the primary procedure to avoid an additional surgery (Table 3).^{4,7}

Table 3: Comparison with mean BCVA of different studies.

Study	Mean BCVA
The current study	6/12
Forlini et al	6/12
Helvaci et al	6/18(6/12-6/24)
Jare et al	6/9
Madhvinan et al	6/15

Most common immediate post op complication was pupil ovalisation (25%). Similar observations were reported by Madhivanan et al, Kelkar et al and Forlini et al, Tomasz Choragiewicz et al least common complication was choroidal detachment (3.6%). Similar observations were noted by Jayamadhury et al and Labeille et al (Table 4).^{4,5,8-11} Forlini et al stated cystoid macular edema was seen in 3 cases as one of the complications.⁵ No macular oedema developed as a complication in our study. One of the disadvantages of iris claw lens could be iol dislocation. No dislocation was observed in our study. Since patients included in the study had no ocular comorbidities, the visual outcome is directly a reflection of the lens implantation.

Table 4: Comparison of complications with other studies.

Study	Immediate post-op complications (%)
The current study	Oval pupil (25); choroidal detachment (3.6)
Forlini et al	Oval pupil (5)
Madhvinan et al	Oval pupil (16)
Kelkar et al	Oval pupil (20)
Labeille et al	Choroidal detachment (3)

Limitation

One of the limitations of the study is short follow up period and less sample size. Further studies can be planned with longer follow up period using LOG Mar visual acuity for better quantification of visual acuity. Late complications can also be documented in previous studies.

CONCLUSION

The retropupillary iris claw implantation provided a good outcome in patients with inadequate posterior capsular

support. Visual acuity in both primary and secondary implantation were similar concluding that iris claw lens implantation can be done in the primary setting rather than planning for secondary implantation at a later date. Most common immediate complications observed did not compromise the visual acuity after 2 months concluding that the complications are tolerable. One of the limitations of the current study is short follow up period (2 months). Further studies can be planned with documentation of late complications of iris claw lens implantation.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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