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Retropupillary Iris-claw Lens As Secondary IOL – A Silver Lining in Aphakia

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ABSTRACT:
Aims and Objectives: To evaluate the visual outcome of retropupillary iris claw lens used as secondary IOL implantation in patients who have been left aphakic after primary cataract surgery.
Materials and Methods: This was a Hospital based prospective,interventional clinical study conducted in our tertiary care hospital from 2019 to 2021. 30 eyes of 30 patients were taken, that had been left aphakic during the primary cataract surgery.Preoperative visual acuity, slit-lamp examination, and fundus examination was carried out in these patients. Anterior vitrectomy and retropupillary fixation of iris-claw lens were done. The primary outcome measure waspostoperative best-corrected visual acuity (BCVA) which was recorded at week 1, week 4, 3rd month and 6th month. The patients were also looked for any complications during the follow-up period.
Results:
Out of total 30 cases 18 (60%) were females and 12 (40%) were males.Mean age of the patients was 60.27±10.57 (35-80 yrs).Baseline mean best corrected visual acuity converted to logMAR units was 0.64±0.18. At week 1, week 4, month 3 and at month 6 these values were 0.31±0.176, 0.25±0.24, 0.25±0.24 and 0.23±0.24 respectively, p-value being <0.0001 at all the follow ups. Thus showing that these values are statistically significant. Amongthe complicationsovalisation of pupil was most commonly observed complication seen in 10 (33.33%) of the eyes. Iris Atrophy at the site of iol enclavation was seen in 6 (20%) eyes, Pigment clumping on iol was seen in 5 (16.6%) eyes and Macular edema in 1 (3.33%) eye.
Conclusion:
From this study it was concluded that retropupillary fixated iris-claw lens is an effective, safe, and simple procedure for secondary IOL implantation forvisual rehabilitation in aphakic eyes . It comes as a silver lining in the clouds of eyes that had been left aphakic because of any complication during primary cataract surgery.

Keywords: Aphakia, Secondary IOL, Retropupillary Iris Claw Lens,Cataract

I. INTRODUCTION

In cataract surgeries the lens is ideally placed in the capsular bag, it is the basic standard of care. However during a complicated cataract surgery, zonular dialysisor posterior capsular tear/dehiscence, there is inadequatecapsular support and sometimes it is not possible to implant "in the bag"IOL or ciliary sulcus supported IOL.[1] In such casesAngle supportedanterior chamber intraocular lens (ACIOL)[2], anteriorchamber(AC) iris-claw lens[3], retropupillary iris fixatedIOL[4,5] and Scleral-fixated IOL (SFIOL)[6] are the variousoptions available for surgical correction of aphakia.Anterior chamber IOLs, though are easy to place, areassociated with increased corneal decompensation and secondary glaucoma.[7] Scleral-fixated IOLs preserveanatomical integrity, but are technically challenging and time-consuming with few intraoperative andpostoperative complications such as suture erosion, IOL-related complications, and, rarely, retinal detachment.[8] It has been seen that Iris-claw IOLs compensate the corneal complications noted in ACIOLs and are technically less challenging andless time-consuming than SFIOL implantation.[9] Retropupillary fixation of iris-claw IOL has been seen to preserve the anatomyof anterior segment and is associated with good visual outcome with a low incidence of intraoperative andpostoperative complications.[10,11]

So we conducted this study to evaluatethe visual outcome and incidence of any major complications in the surgical management of aphakia with retropupillary iris claw lens fixation as a secondary IOL implantation option.

AIM OF THE STUDY
To evaluate the visual outcome of retropupillary iris claw lens used as secondary IOL implantation in patients who have been left aphakic after primary cataract surgery.

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II. MATERIALS AND METHODS

Our study was a Hospital based prospective, non-comparative, interventional clinical study conducted in the Department of Ophthalmology, SKIMS Medical College Hospital, Srinagar from 2019 to 2021.30 eyes of 30 patients were taken in the study that had been left aphakic secondary to previous cataract surgery due to intraoperative complications, precluding adequate capsular support, zonular dialysis ≥180°, subluxated lens etc

Patients were fully informed aboutthe risks and benefits of the surgery and informedconsent was obtained.

INCLUSION CRITERIA

Aphakic eyes of Patients of 18–85 years of age

EXCLUSION CRITERIA

Patients with pre-existing pathologies that intervened with the visualoutcome such as aphakic bullous keratopathy, repaired corneal tears with aphakia, iris sphincter tears, broadiridectomies, and iridodialysis with inadequate support for the iris-claw lens, glaucoma, and posterior segmentpathologies .

METHODS

All the patients went through a standard examination protocol includingobjective refraction, BCVA, slit-lamp examination, intraocular pressure (IOP) measurement, dilated fundus examination with indirect ophthalmoscopy.Ultrasound biometry in aphakic mode with IOL power calculation .

All patients underwent standard procedure of choice - Anterior vitrectomy and Iris claw lens implantationby a single experienced surgeon.

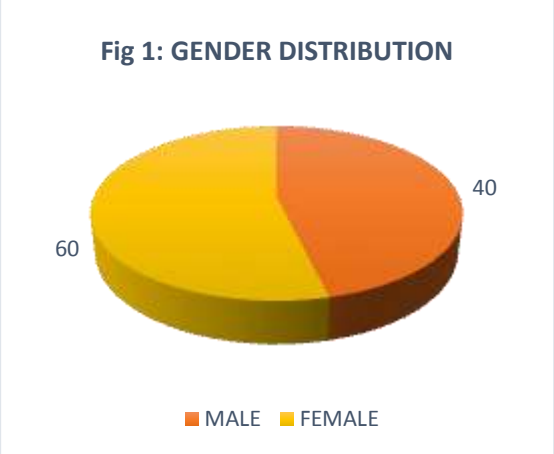
The pre-existingsclerocorneal tunnel was opened. Two limbal side portsat 3and 9 o'clock were made,anterior vitrectomy was done to ensure thatthere were no residual vitreous strands in the AC or wound.Remnants of anterior and posterior capsule along with the

cortex were removed. Intracameral 0.1 ml of pilocarpinenitrate 0.5% was used toconstrict the pupil. Viscoelastic (Hydroxy propyl methylcellulose 2%) was injected into the AC. Using iris-clawholding forceps, iris-claw IOL was introduced in the AC,and the haptics were rotated to 3 and 9 o' clock, usinga Sinskey hook. The optic was held in the center of thepupil with forceps, and the haptic was dipped under the irissurface. Using a Sinskey hook through the side port,the mid peripheral iris was gently tapped at the center ofthe haptic to enclave the IOL to the posterior iris surface. The other haptic was also enclaved in a similarway.IOL was tapped to check for theIOL stability. Viscoelastic was removed and side ports werehydrated. Scleral incision was sutured.

Postoperatively, all the patients were prescribed topical prednisolone acetate 1% and moxifloxacin 0.5% fourtimes/day, tapered over a period of 6 weeks. Patients wereasked to come for follow-up at 1 week, 1 month, 3months, and 6 months.

III. RESULTS

Retropupillary iris claw lens fixation was done in 30 eyes of 30 patients. All the patients completed 6 months follow-up. Out of total 30 cases 18 (60%) were females and 12 (40%) were males Fig 1.



Mean age of the patients was 60.27±10.57 (35-80 yrs).

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Mean pre-operative BCVA was 0.64±0.18 LogMAR and mean post-operative BCVA at 6 months was 0.23±0.24 LogMAR, which was statistically significant. Table 1.

Table 1.

	LogMAR BCVA(Mean ±SD)	T-stat	p-value
Baseline	**0.64±0.18**	**--**	**--**
1 week	**0.31±0.176**	**-7.18**	**<0.0001**
4 week	**0.25±0.24**	**-7.12**	**<0.0001**
3 months	**0.25±0.24**	**-7.12**	**<0.0001**
6 months	**0.23±0.24**	**-7.48**	**<0.0001**

Out of 30 eyes in 24 eyes visual acuity was between 6/6 to 6/12. In 2 eyes vision deteriorated. BCVA in these eyes before and after surgery is given in Table 2.

Table 2: Visual acuity changes

BCVA	6/6-6/12	6/18-6/24	6/36	≤6/60
Pre-Operative	0	20	6	4
Week 1	22	7	1	0
Week 4	23	5	1	1
3 Month	24	4	1	1
6Month	24	4	1	1

No intraoperative complications were encountered in our study. The most common postoperative complicationsnoted were pupil distortion in 10(33.33%) eyes, iris atrophy at the enclaved site in 6(20%) eyes, pigment clumping over the IOL in 5(16.6%). Macular edema was seen in 1(3.33%) eye. Table 3. None of the patientsdevelopedpseudophakic bullous keratopathy or IOL dislocation.

Table 3: Complications

	Number	Percentage
Pupil distortion	10	33.33%
Iris Atrophy	6	20%
Pigment clumping on iol	5	16.6%
Macular edema	1	3.33%

IV. DISCUSSION

The most common cause of aphakia is complicated cataract surgery.The best method for secondary IOL implantation which offers the bestpossible visual rehabilitation with least complications has always been a matter of debate.Surgical correctionof aphakia is associated with better binocular visual acuitythan spectacle

correction or contact lens use. Variousintraocular lenses are available to correct aphakia likeanterior chamber IOLs (ACIOLs), AC iris claw IOL, scleralfixated IOLs and retropupillary iris fixated IOL.Each of the available method has its own pros and cons.The iris-claw lens method was invented by Worst in 1980 in order to correct the refraction in aphakic eyes.[12] The technique of posterior fixation of iris-claw lenses was proposed by Amar[13] and later modified by Mohr et al.[14] This technique preserves the natural anatomy of the eye. The popularization of this implantation technique has been observed recently.

In our study retropupillary iris claw lens fixation was done in 30 eyes of 30 patients. All the patients completed 6 months follow-up. Out of total 30 cases 18 (60%) were females and 12 (40%) were males. Mean age of the patients was 60.27±10.57 (35-80 yrs).Mean pre-operative BCVA was 0.64±0.18 LogMAR and mean post-operative BCVA at 6 months was improved to 0.23±0.24 LogMAR, which was statistically significant. In 24 eyes post-operative visual acuity was between 6/6 to 6/12.

Our results were consistent with the study done by Kelkar et al[4] which reported that the final mean CDVA improved from 1.36 ± 0.64 logMAR preoperatively to 0.36 ± 0.32 at 1-year follow-up.Another study by Tourino Peralba R et al[16]has reported improvement in CDVA from 1.66 ± 0.3 logMAR preoperative to 0.53 ± 0.5 logMAR (P = 0.00001) postoperatively, at 1 year.

The most common postoperative complications noted were pupil distortion in 10(33.33%) eyes, iris atrophy at the enclaved site in 6(20%) eyes, pigment clumping over the IOL in 5(16.6%). Macular edema was seen in 1(3.33%) eye.A comparable frequency of ovalization of the iris and other complications was observed in other studies conducted by J. Gonnermann et al[17]and M. Schallenberg et al.[18]

V. CONCLUSION:

Retropupillary implantation of the iris-claw lens for secondary implantations is a valid, safe and relatively safe alternative strategy to theclassic scleral-fixed or angle-supported IOL implantation in the cases of iatrogenic failure, which does not allow for intracapsular or sulcus implantation during primary complicated cataract surgerygiving better visual prognosis to the aphakic patients and is an easy and less time consuming procedure with minimum complications.Thus providing hope to the aphakic eyes.

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