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Original Research Article

Study of visual outcome and complications of primary and secondary retropupillary iris claw lens implantation in absence of adequate capsular support

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ABSTRACT

Aim: This study was conducted to assess and compare the visual outcome and complications of retropupillary iris claw lens implantation in absence of adequate capsular support.

Materials and Methods: This prospective, comparative, intervention, was conducted. All the patients who reported ophthalmology indoor department were divided into two groups. In 1^{st} group patients with IMSC/MSC/Traumatic cataract/Repaired corneal tear with traumatic cataract/Subluxated IOL in which primary retropupillary iris claw lens implantation was done in the department of Ophthalmology through SICS/Phacoemulsificstion were categorised. In 2^{nd} group patients with Aphakia in which cataract surgery was performed through SICS/Phacoemulsification and were left aphakic due to PCR in the department of Ophthalmology, JLN Medical College & Hospital and outside indoor patients at various ophthalmology centres.

Result: In primary RPICL in 23(76.7%) patients found to be BCVA between 6/36 to 6/18 and in secondary RPICL 26(86.7%) patients found to be BCVA between 6/12 to 6/6. In primary cases RPICL ovalisation of pupil in 6(20%), tilted IOL with raised IOP in 3(10%) optic capture in 3(10%), iridodialysias in 3(10%), bullous keratopathy in 3(10%). In secondary RPICL optic capture in 2(6.67%), CME with raised IOP in 1(3.33%), ovalisation of pupil in 1(3.33%) was found.

Conclusion: Results of present study suggest that secondary cases (group II) showed better visual outcome and lesser complications when compared with primary cases (group I) after retropupillary iris claw lens implantation.

1. Introduction

Cataract' is in fact the most common cause of blindness if untreated.[1] This disorder involves the unclear opacified lens which obscures the passage of light; hence this progressive disorder requires treatment.[2–6] Its global prevalence is 15.2 million people became blind and 78.8 million people remained visually impaired. Posterior capsular rent is one of the potential complications of cataract surgery. Which was seen to occur in 0.45%–5.2% of cases.[7,8] Cataract surgery can result in adverse outcome in case of an improperly managed Posterior capsular rent. Patients who are left aphakic are visually impaired without glasses which result in increased prevalence of blindness which is not treatable. Thus, cataract surgery won't reduce the prevalence of blindness. 'Loss of vitreous' is most important factor which determines the visual acuity in post-surgery scenerio.[9]

Primary Iris claw implantation means that the IC-IOL which is to be implanted, is done in the same sitting after cataract removal. While secondary Iris claw lens implant is done in aphakic eyes without capsular support and can be done post cataract surgeries (In the second sitting) when the eye is left aphakic due to complications like lens drop/nucleus drop/vitreous loss occurred because of

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posterior capsular rupture.[10]

Because of its peculiar means of fixation, to the mid peripheral iris, the IC-IOL implantation can be done in any eye with sufficient support to iris. In addition, the iris claw lenses are much better than angle-supported Anterior chamber lenses when compared in terms of endothelial cell loss. IC-IOL placement can be done either anterior to the iris or can be retro fixated. An anterior fixated IC-IOL may show many complications, like those caused by AC-IOL, for example endothelial decompensation. Therefore, most of the surgeons like to prefer retropupillary fixation of IC-IOL so as to enhance endothelial safety. Hereby, in this study we have compared the outcomes of primary and secondary retropupillary fixated iris claw lenses.

Conventional secondary IOL implantation via scleral sutures is the treatment of choice, as the position of the scleral-fixated IOL (SF-IOL) is also ideal with respect to the anatomy of the eye. However, this technique necessitates the use of sutures and sufficient operative experience, and has a longer surgical time.[7] Secondary IOL scleral fixation can also lead to other severe intraocular complications, such as vitreous hemorrhage, retinal detachment, choroidal detachment, and suture-related complications.[8]

This RPICL implantation technique also gained popularity after Mohr et al. released the 1-year clinical outcomes for this technique in 2008.[9] Structurally, RPICL provides better stability and lowers the risks of IOL tilt or dislocation as compared to iris- or scleral-sutured lenses. Further, the absence of sutures for IOL scleral fixation lowers the risk of suture-related complications, like conjunctival erosion, scleromalacia, and endophthalmitis.[10,11] Many previous studies have also supported the secondary RPICL to be a safe and efficacious technique for correcting various aphakic conditions with[12–18] or without IOL dislocation.[7,19]

2. Materials and Methods

This prospective study was conducted after taking an informed consent from patients or their relatives who was attending the OPD in Department of Ophthalmology, J.L.N. Medical College and Associated group of Hospitals, Ajmer (Raj.) over a period of 18 months (Oct. 2020 to March 2022) after obtaining ethical committee approval.

2.1. Inclusion criteria

1. All patients of Surgical aphakia during surgery with no capsular support due to posterior capsular rupture in an extracapsular cataract extraction surgery (SICS/Phaco) where PCIOL implantation was not possible to implant (primary cases).
2. All patients of traumatic, surgical aphakia or subluxated PCIOL (secondary cases).

2.2. Exclusion criteria

1. Patients having no perception of light (PL) and defective projection of rays (PR) in traumatic cataract
2. Significant iris pathology
3. Glaucoma
4. Chronic or recurrent uveitis/iritis
5. Severe diabetic eye disease
6. Corneal pathology: Corneal scarring, irregularities, or opacities

All patients were investigated thoroughly, and proper consent was taken.

2.3. Study design

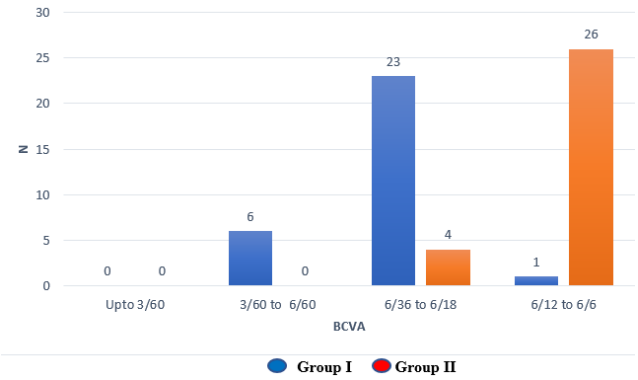
This study was a hospital based, prospective, interventional, clinical study conducted in a tertiary eye care centre. We studied the secondary iris-claw IOL implantation in 60 patients who fulfilled the criteria discussed above, over a period of 24 months. All patients were thoroughly investigated before undergoing secondary iris-claw lens implantation. Post-operatively, best-corrected visual acuity (BCVA), intraocular pressure (IOP) and complication encountered were noted at a regular follow-up of immediate post-operatively, 1 week, 1 month, 2 month & 3 months. 60 eyes of 60 patients in which 30 patients with primary retropupillary iris claw lens and 30 with secondary retropuillary iris claw lens fulfilled the above mentioned criteria. (Figures 1 and 2)

3. Results

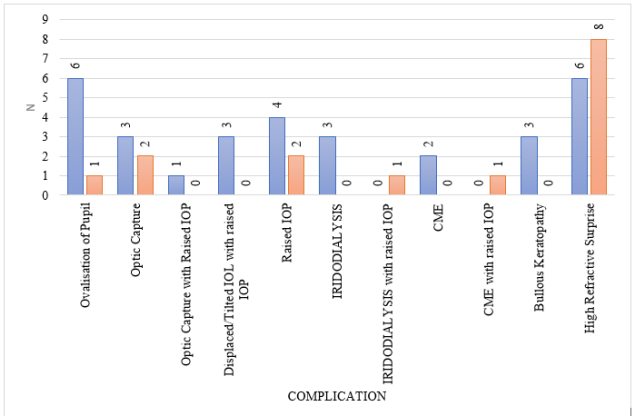
1. Group I: Primary cases
2. Group II: Secondary cases

Distant vision (BCVA) at 3^{rd} month follow up: The BCVA in both group I and group II was noted during the 3^{rd} month follow-up, it was observed that, 1 (3.3%) and 26 (86.7) patients had 6/12 to 6/6visual acuity from group I and group II cases respectively. Similarly, 6 (20%) patients had BCVA between 3/60 to 6/60 in group I but none of the patients were in group II. In group I and group II cases, 23 (76.7%) and 4 (13.3%) patients respectively had BCVA between 6/36 to 6/18.

Various complications in group I and group II at 3^{rd} month follow up: Complications were documented at 3^{rd} month follow-up from each patient from group I and group II cases; it was observed that, high refractive surprise was found in high in 8(26.67%) patients in group II and 6 (20%) patients in group I. Ovalisation of pupil was found in 6 (20%) patients in group I and 1(3.33%) patient in group II. Raised IOP was also noticed in 4 (13.33%) and 2 (6.67%) patients from group I and group II respectively. Optic capture was found in 3(10%) and 2 (6.67%) patients from group I and group II respectively. Displaced/Tilted IOL with raised IOP, Iridodialysis and Bullous Keratopathy were



Graph 1: Distant vision (BCVA) at presentation



Graph 2: Various complications at presentation

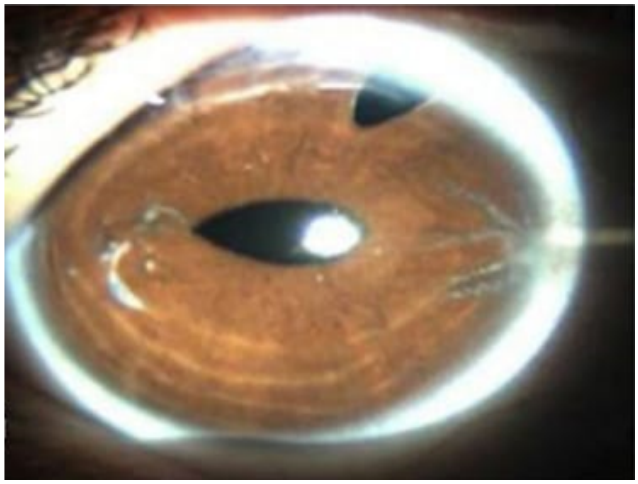


Fig. 1: Showing ovalization of pupil 3^{rd} month follow up after secondary retropupillary iris claw lens implantation

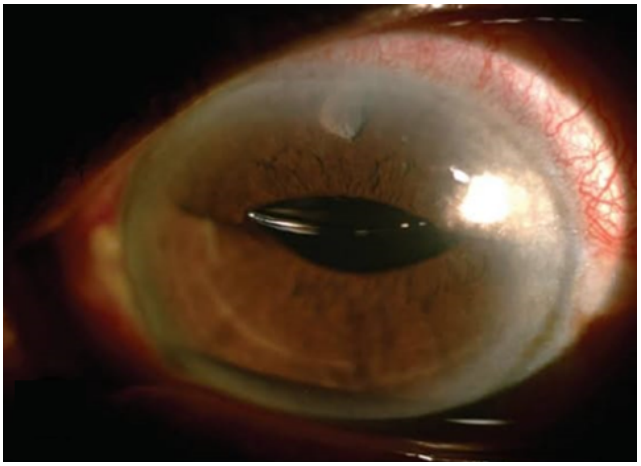


Fig. 2: Showing tilted IOL with raised IOP 3^{rd} month follow up after primary retropupillary iris claw lens implantation

found in 3(10%) patients from group I but none were found in group II. Further, CME was noticed in 2 (6.67%) and 1(3.33%) patient from group I and group II. Iridodialysis with raised IOP and CME with raised IOP were noticed only in 1(.33%) patient from group II, but none were found in group I.

Overall data has conferred a statistical significance with P value of 0.001 in both groups.(Graphs 1 and 2)

4. Discussion

In observational study done by Ashwini R Mahajan et al[20] (2014) found that, 73.4% patients with ICIOL were having final BCVA 6/18 to 6/6 and 23.33% ICIOL patient were having BCVA between 6/60 to 6/24 group which is in accordance with our study results in secondary cases and higher than our study results in primary cases.

In observational study done by Navya C et al[21] (2020) found final BCVA 6/18 to 6/6 in 86.67% cases which is in accordance with our study results in secondary cases and higher than our study results in primary cases.

In observational study done by Kanekar et al[22] (2020) found BCVA from 6/18 to 6/6 in 85% cases which is in accordance with our study results in secondary cases and higher than our study results in primary cases.

Ravindra et al (1994)[23] reported a BCVA of 6/18 or better in 80.7% cases which is in accordance with our study results in secondary cases and higher than our study results in primary cases.

In a cross-sectional observational study done by Trivedi K et al (2021)[24] found that, nearly 39.62% eyes had best-corrected visual acuity in the range of 6/18–6/36, which is lower than our study results in primary cases and higher than our study

In observational study done by Gonnermann et al[25](2012) ovalization of pupil was found in 24.8% cases,

which was found in accordance with our study results in primary cases and lower than our study results in secondary cases. Tilted IOL in 8.7% cases, which is in accordance with our study result in primary cases CME in 8.7% cases which are in accordance with our study result in both primary and secondary cases.

In observational study done by Kalode V et al[26](2019) ovalization of pupil found in 12% cases which is lower than our study results in primary group and higher than our study result in secondary group.

In observational study done by Shanida HS et al[27](2018), optic capture found in 6.6% cases which is lower than our study result in primary cases and in accordance with our study results in secondary cases.

In observational study done by Sumita CV et al[17] (2020), pseudophakic bullous keratopathy found in 16.7% cases, which is higher than in our study results in both primary and secondary cases. Tilted IOL in 11.1% cases which is in accordance in our study results in primary cases and higher than our study results in secondary cases. 25% cases having ovalization of pupil which is in accordance our study result in primary cases results and higher than our study results in secondary cases.

5. Conclusion

Results of present study suggest that secondary cases (group II) showed better visual outcome and lesser complications when compared with primary cases (group I) after retropupillary iris claw lens implantation.

6. Source of Funding

None.

7. Conflict of Interest

None.

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