
Visual Outcome of Secondary Implantation of Scleral Fixated IOL in Nucleus/ IOL Dislocation

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Abstract

One of the most dreaded complications of cataract surgery is nucleus or intraocular lens (IOL) drop in vitreous cavity. Scleral fixated intraocular lens (SFIOL) is treatment of choice in such cases of aphakia. Complication related to sutures, induced astigmatism, anterior uveitis and glaucoma can affect visual outcome in secondary SFIOL cases. We studied long term outcome of cases complicated with either nucleus or IOL drop managed with vitrectomy and secondary SFIOL. Timely and planned intervention even in cases of complicated primary cataract surgery can have good visual outcome.

Keywords: SFIOL, Nucleus drop, Aphakia, IOL dislocation, Cataract

Introduction

Cataract surgery is one of the most commonly performed surgery worldwide. Modern day cataract surgery is performed by phacoemulsification technique followed by posterior chamber intra ocular lens implantation. In developing countries still small incision cataract surgeries are performed in significant number of patients.

There are many complications which are seen with cataract surgery and nucleus drop and IOL drop is included among them. The incidence of posterior capsular rupture is in large part a function of the experience and skill of the surgeon. The incidence should probably be below 5%^{1,2}.

Harold Ridley³ is regarded as the pioneer of lens implantation, in 1949; he inserted the first artificial lens as a posterior chamber lens in the capsular bag. In the absence of capsule support, implanting an anterior chamber intraocular lens (ACIOL), attaching the IOL to the iris, or fixing the IOL into the posterior chamber by a transscleral suture (SFIOL) are management options.

Malbran et al⁶ were the first to describe transsulcus sclera fixation of posterior chamber IOLs in aphakia eyes that had previously undergone ICCE in 1986.

There are certain advantages of SFIOLs over ACIOLs, such as less corneal endothelial damage, reduced aniseikonia if the contralateral eye is phakic, and suitability in eyes with large-sector iridectomy or peripheral anterior synechiae^{4,5}. Many studies in literature describe about safety and efficacy of SFIOL but particularly in cases of nucleus and IOL drop outcome is not well

described. We report here single large population study of secondary SFIOL in cataract surgery complications.

MATERIALS AND METHODS

This retrospective study was conducted at a single tertiary eye care center (GGMC, Sir JJ Group of hospital, Mumbai, India) from January 2012 to November 2013. All cases referred after cataract surgery complication to our center with either nucleus or IOL drop were included in study. Patients with retinal pathology – retinal detachment, vitreoretinopathy, previous retinal surgery, corneal opacity, optic atrophy, pre-existing Diabetic or Hypertensive retinopathy which could preclude visual outcome were excluded from study. All cases were operated by single surgeon for vitrectomy and scleral fixated posterior chamber intraocular lens (SF-PCIOL) used were (AUROLAB®) was inserted. Single piece polymethyl methacrylate (PMMA) with modified C haptics with at least 2 dialing holes in the haptics, with an optic diameter of at least 6.5mm, with overall diameter 13.5mm. Post-operatively patients were evaluated on day 1, 7, 30, 90 and thoroughly examined for BCVA, intraocular pressure, retina and anterior segment. Data post 3 month follow up was gathered and analyzed. This study has been approved by the Institutional Review Board to ethically meet the Declaration of Helsinki.

RESULTS

Total of 50 eyes of 50 patients were included in our study. The age and sex demographics of the patients included in the study are demonstrated in Table 1. The mean patient age was 58.6 years and 27 (54%) of them were male. There was no statistically significant difference with respect to age or sex of the patients in nucleus drop (n=24) and IOL (n = 26) drop group.

At third month post-operatively out of 24 patients with <6/60 vision 1 patient deteriorated to FC 3 meters due to corneal decomposition. 4 (16.66%) patients regain vision 6/60-6/36. 10 (41.66%) patients improved to 6/24-6/18. 9 (37.5%) achieved 6/12 – 6/9

10 patients with 6/60 – 6/36 vision 2 (20%) improved to 6/24-6/18. Rest 8 (80%) patients improved to 6/12 and better (Table 2)

10 patients with preoperative vision 6/24-6/18, 2 (20%) patients retained vision of 6/24-6/18. Rest 8 (80%) patients improved to 6/12 and better vision

6 patients with preoperative vision of 6/12-6/9 out of which 2 patients (33.33%) improved to 6/6 and 4 (66%) patients remained 6/12-6/9

In our study we observed that out of 50 patients operated 3 patients had raised intraocular pressure (recorded on non contact tonometer) which was > 21 mm Hg, these patients had corneal edema post-operatively and were given tablet acetazolamide 250 mg TDS and topically started on antiglaucoma medication. Corneal edema resolved after starting treatment and IOP was controlled

4 patients developed postoperatively anterior uveitis detected on slit lamp examination and patient c/o blurring of vision and patients were continued on topical steroids, but 2 patients had anterior uveitis for more than 1 month. Which resolved after 6 weeks?

One of our patient developed hypotony on post op day 1 , patients had desmets folds , patient was operated and re-sutured on same day . no retinal detachment or choroidal detachment noted .

2 patients had diffuse vitreous hemorrhage on post op day 7. Which resolved after a month?

Very few complications were noted after a month of surgery . out of 50 patients only 2 patients developed cystoids macular edema which was diagnosed on OCT macula . Patient were started on anti inflammatory medicine. and resolved subsequently which was confirmed on repeat ocular coherence tomography (OCT) .None of our patient developed endophthalmitis

Table 1 – Gender wise distribution

DIAGNOSIS	NUMBER		TOTAL
	MALE	FEMALE	
NUCLEUS DROP	14 (58.33 %)	10(41.66%)	24 (48 %)
IOL DROP	13 (50%)	13(50%)	26 (52 %)
TOTAL	27	23	50 (100 %)

Table 2 – Age- wise distribution

AGE	PATIENTS	PERCENT
41-50	8	16%
51-60	19	38%
61-70	23	46%
TOTAL	50	100%

Table 3 – Post operative 3 month visual acuity

POST OP	<6\60	6\60	6\36	6\24	6\18	6\12	6\9	6\6	
PREOP									
<6\60	1	2	2	3	7	7	2	0	24
6\60	0	0	0	1	1	1	1	2	6
6\36	0	0	0	0	0	1	3	0	4
6\24	0	0	0	1	1	0	1	1	4
6\18	0	0	0	0	0	3	3	0	6
6\12	0	0	0	0	0	1	2	1	4
6\9	0	0	0	0	0	0	1	1	2
6\6	0	0	0	0	0	0	0	0	0
	1	2	2	5	9	13	13	5	50

Table 4 – Early and delayed complications

COMPLICATIONS	NO OF PATIENTS	PERCENTAGE
Raised iop	3	6
Anterior uveitis	4	8
Hypotony	1	2
Vitreous hemorrhage	2	4

Iol subluxation	0	0
Uveitis > 1 month	2	4
Early endophthalmitis	0	0
Iol decentration	1	2
Cystoid macular edema	2	4
Retinal detachment	0	0
Suture breakage	0	0
Late endophthalmitis	0	0

Discussion

Malbran et al⁶ in 1986 first described scleral fixation of intraocular lenses and since there has been tremendous improvement and advances in technique and types of IOL available for scleral fixation. We used Ab externo technique of scleral fixation for PCIOL with 10-0 prolene suture. We studied 50 eyes of 50 patients with cataract surgery complications and operated them for vitrectomy and secondary SF IOL. 26 (52%) patients had an IOL drop preoperatively and 24 (48%) patients had nucleus drop. After 3 month follow up 18 (36%) patients gained vision to 6/9-6/6, 22 (44%) patients improved to 6/18-6/12. 1 patient had vision deterioration than preoperative vision due to corneal decomposition. Mean spherical error was -0.965 and mean cylindrical error was -1.065. In our study in 3 month follow up none of the patients developed endophthalmitis, retinal detachment. And visual improvement was found to be highly significant.

In a study Secondary implantation of scleral-fixated intraocular lenses Uthoff D et al⁷ where they studied 624 patients aphakic due to various reasons and operated them for secondary scleral fixating IOL had BCVA improved or remained unchanged in 92.0% of eyes; 8.0% lost one or two line. Dropped Nucleus During Phacoemulsification Faheem Ahmad⁸ study where they studied 15 patients for secondary IOL implantation found 9 (60 %) developed vision 6/18 to 6/9 while Shakir et al⁹ studied Visual Outcome of Pars Plana Vitrectomy for Dropped Nucleus after Phacoemulsification 48 patients and BCVA ranged from 6/9 to 6/18 in 34 eyes (70.83%), 6/24 to 6/36 in 8 eyes (16.66%) and 6/60 or less in 6 of 48 eyes (12.5%).

In a study Comparison of outcomes of primary and secondary implantation of scleral fixated posterior chamber intraocular lens Lee et al¹⁰ they studied 55 patients and found Postoperative BCVA of 6/12 or better was achieved in 58.6% in primary SFIOL and 76.0% in Secondary SFIOL group

In our study we found comparable results with 50 patients undergoing secondary IOL implantation 40 (80 %) regained vision >6/18 at 3 month follows up.

Complications -

Faheem et al⁸ found intraocular pressure was raised in only 2 patients (13.3%). No patient developed retinal detachment. Dr Shakir Jafer et al⁹ described Complications including raised intraocular pressure in 6 eyes (12.5%) . T. kono et al¹¹ found main postoperative complications were hyphaema, intravitreal bleeding, transient high intraocular pressure. Two eyes underwent cleaning of anterior chamber because of hyphaema with high intraocular pressure.

Macalister et al¹² in their study found the most common postoperative complication was ocular hypertension (25 eyes [30.5%]). In our study we found comparable results with 3 (6 %) patients with raised intraocular pressure and corneal edema in first week follow up.

Amin F. Ellakwa et al¹³ reported 35% patients of ACIOL and 5% patients of SFPCIOL developing uveitis whereas it was more in SFPCIOL group in our study compared to ACIOL group.

Uthoff D et al studied 624 patients with secondary SFIOL implanatation found Severe uveitis occurred in 0.5%.In our study we found 4(8%) patients had anterior uveitis on 1 st week postoperative evaluation . after treatment with topical steroids 2 of them recovered and 2 persisted even after one month and resolved after 2 months with treatment .

Zia ul Mazhri et al¹⁴ reported vitreous hemorrhage in 16% patients and hyphaema in 10% patients in their study which resolved in all patients with no residual complications as also seen in our study. Vitreous haemorrhage is most probably attributed to rupture of pars ciliaris vessels By passage of 10-0 polypropylene suture.

Uthoff D et al post operatively vitreous hemorrhage in 1.0% of patients and in our study only 2(4%) patients developed diffuse vitreous hemorrhage post operatively after a 2 days and resolved subsequently .

Dr Faheem ahmad et al⁸ Cystoid macular edema was found in only 2 patients (13.4%).

Dr Shakir Jafer⁹ found corneal oedema and decompensation in 3 eyes (6.25%) and cystoids macular oedema in 4 cases (8.33%)out of 48 cases. Uthoff D reported CME in 5.8%, And in our study 2 (4%) patients experienced deterioration of vision on 1 month follow up . on examination which was later on confirmed on OCT macula and diagnosed as cystoid macular edema which resolved after treatment .

Zia ul Mazhri et al¹⁴ found an incidence of 4% retinal detachment in sclera fixation of intraocular lens. Shakir Jafer et al found retinal detachment in 2 eyes (4.1%) . in a study Secondary implantation of scleral-fixated intraocular lenses.⁹

Uthoff D, Teichmann KD found retinal detachment in 1.4% patient after secondary SFIOL implanatation. We did not notice any retinal detachment in our study at 3 months follow up in our patients.

CONCLUSION

In era of advanced cataract surgery with phacoemulsification there is also increased incidence of few dreaded complications. Nucleus and intraocular lens drop in vitreous cavity is one of serious and vision threatening complication of cataract surgery

Management of such patients post operatively with vitrectomy surgery with nucleus \ intraocular lens removal and implantation of secondary SFIOL intraocular lens is preferred and safe technique to provide good visual outcome.

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Figure 1 – Demonstrating scleral flap and heptic of SFIOL



Figure 2 – Posterior capsular tear with vitreous managed by vitrectomy

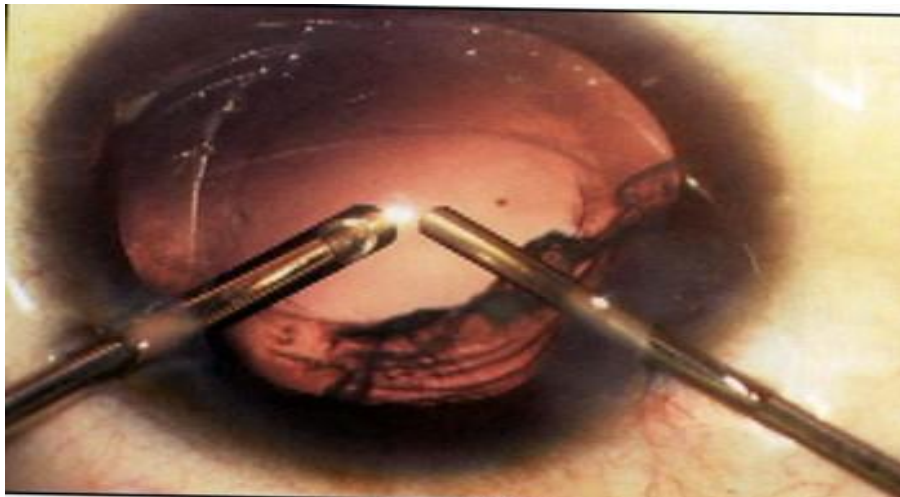


Figure 3 – Dropped nucleus in vitreous cavity

