



ORIGINAL RESEARCH PAPER

Ophthalmology

SURGICAL RESULTS OF DROPPED NUCLEUS OR IOL

KEY WORDS:

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ABSTRACT

PURPOSE: To evaluate visual outcome of patients who underwent pars plana-vitrectomy for dropped nucleus or IOL (IOL).
METHOD: This prospective study was performed on patients who underwent pars-plana vitrectomy for dropped nucleus or IOL. Data on demographics, preexisting eye condition, surgery details of cataract and vitrectomy, presenting symptoms, interval between cataract surgery and vitrectomy, secondary IOL implanted or not, details of follow-up visits, and postoperative complications were noted. The corrected VA, IOP (IOP), SLE (SLE) and fundus evaluation was done during each visit and was included in statistical analysis.
RESULTS: Out of the 56 patients, 40 cases following cataract surgeries, included 20 cases of nucleus drop and 20 cases of IOL drop. In post-traumatic group, 13 cases were of nucleus drop and 3 cases of IOL drop. All the patients had undergone 3 ports standard pars plana-vitrectomy with or without secondary IOL implantation. ACIOL in 22 cases, SFIOL in 8 cases, while 26 patients were kept aphakic. Out of 56 patients 32.14% patient had VA (VA) of more than or equal to 6/18, 32.14% with VA <6/18 but >6/60 and 35.71% had VA <6/60. Mean post-operative VA of post-operative group was 1.17 and post-traumatic group was 1.49. Major cause for poor visual outcome included corneal decompensation (21.42%), secondary glaucoma (5.35%) and RD (RD)(1.78%).
CONCLUSION: Dropped nucleus or IOL following cataract surgery or trauma is a severe complication, but appropriate and timely management can restore VA.

INTRODUCTION:

The lens is a vital refractive element of human eye. In 2002, the World Health Organization estimated that lens pathology (cataract) was the most common cause of blindness worldwide.¹ Not surprisingly, cataract surgery is the most common surgical procedure performed in developed world²

A Mathai, R Thomas et al in 1999 found that incidence of nucleus drop into vitreous was 0.8%. Incidence for experience surgeon was 0.3% and for those learning was 1.23%.³

Associated clinical signs, which improved gradually, included corneal edema, glaucoma, uveitis, and vitreous opacities. However, other complications such as RD causing profound visual loss were also seen⁴⁻⁶.

OBJECTIVE

The primary objective of study is to evaluate visual outcome of patients who underwent pars-plana-vitrectomy for posteriorly dislocated lens nucleus or IOL, to compare outcomes between surgeries that followed traumatic and non-traumatic etiology and to evaluate incidence of complications.

MATERIALS AND METHODS

This prospective study was conducted at Tertiary Eye Hospital, from August 2012 to July 2014.

Inclusion Criteria

All patients of age more than 20 years, having dropped nucleus or dropped IOL following cataract surgery or blunt trauma

Exclusion Criteria

- Only cortical fragment without nucleus material
- Any pre-existing macular or retinal pathology, glaucoma, uveitis, RD
- Penetrating ocular trauma
- Traumatic glaucoma
- previous PPV

Preoperative Assessment

History including demographic data, preexisting eye disease,

details of previous cataract surgery, and IOL implantation, history of trauma.

Complete ophthalmic examinations which included best corrected VA (BCVA) using Snellen chart at a distance of 6 meter, IOP measurement, SLE to look for peri-limbal injection, corneal edema, anterior chamber reaction, hyphaema, hypopyon, retained lens matter or vitreous in anterior chamber, state of the vitritis, indirect ophthalmoscopy to check for approximate size, number, location and mobility of nuclear fragments in the vitreous cavity, vitreous haemorrhage, retinal tear, RD, cystoid macular edema, and choroidal effusion, etc., SLE with 90D lens especially for macular status.

In cases where fundus was not visible, B-scan was performed.

A-scan for bio-metry, special investigation like specular microscopy was done.

Surgical Technique

- All surgeries were performed under local anesthesia.
- Standard 3-ports (23 gauge) pars-plana-vitrectomy was procedure of choice.



- Central and peripheral vitrectomy was performed to avoid jabbing the vitreous during aspiration.

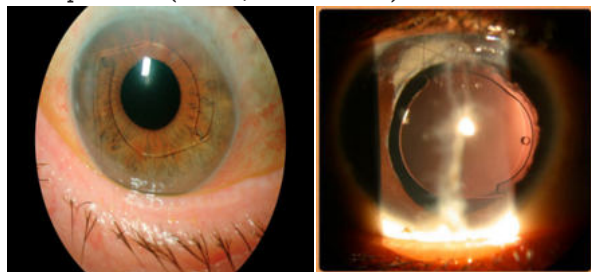


A: Attention To Complete Central Vitrectomy Allows Access To Retained Lens Fragments



B: Low Ultrasonic Fragmentation Power Allows More Controlled Removal Of Fragments.

- The density of nuclear fragments was re-assessed. Soft remnants were removed with vitreotome. Trapping/lifting/releasing maneuvers had to be repeated leaving small fragments, which were removed by vitreotome.
- The surgical procedure for dropped IOL was same till vitrectomy. After that the anterior chamber and the section were cleared of vitreous. Later the adhesions around IOL were released and brought into anterior chamber using intra-vitreous forceps, and then was removed.
- Examination of peripheral retina was done. If possible IOL implantation (ACIOL, scleral fixation) was done.



Post-operative Assessment

- There was a follow-up control of the patients on 1st post-operative day, 1st week, 6th week thereafter.
- The best corrected VA, IOP, SLE and fundus evaluation was done at each visit and included in the statistical analysis.
- Any complications if present were recorded.

Outcome Measure

The primary outcome measure was gain in BCVA. A poor visual outcome was defined as a VA worse than 6/18.

RESULTS

A clinical case series conducted on 56 eyes of 56 patients who underwent Pars-plana-vitrectomy at a tertiary care eye hospital.

Out of 56 patients, there were 39 males and 17 females, with mean age being 60.10 (±13.05) years.

Epidemiological Data

Table 1: Sex Distribution

SEX	No.
MALE	39 (69.64%)
FEMALE	17 (30.35%)
TOTAL	56

Table 2: Age Distribution

AGE GROUP	No.
21-40	4
41-60	25
61-80	24
>80	3

Table 3 Type Of Drop

TYPE	NUCLEUS DROP	IOL DROP	TOTAL
POST-OPERATIVE	20	20	40
POST-TRAUMATIC	13	3	16

TOTAL	33 (58.92%)	23 (41.07%)	56
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Table 4: Type Of Cataract Surgery

TYPE OF CATARACT SURGERY	No.
PHACO	20 (46.51%)
SICS	23 (53.48%)
TOTAL	43

Table 5: secondary Iol Implantation

POST-OPERATIVE IOL STATUS	No.
ACIOL	22
SFIOL	8
APHAKIC	26
TOTAL	30

- Comparison between pre-operative and post-operative values in individual groups was analyzed using PAIRED T TEST (in data following normal distribution) and WILCOXON MATCHED PAIRS TEST (in data not following normal distribution).
- Comparison between two different groups was analyzed using Mann-Whitney test
- “p” value ≤ 0.05 was considered statistically significant.

Table 6: Mean Change In Va (logmar) Of Total Cases

PARAMETER	PRE-OPERATIVE MEAN VALUE	POST-OPERATIVE (6 TH WEEK) MEAN VALUE	P VALUE
V/A	2.30 (SD 0.45)	1.20 (SD 0.86)	< 0.0001

- Table 6 shows that improvement in mean VA is statistically significant at 6th week follow up period.

Table 7: Comparison Of Final V/a Between Post-operative And Post-traumatic Cases

	POST-OPERATIVE	POST-TRAUMATIC	“p” VALUE
MEAN V/A AT 6 WEEKS	1.17 (0.85)	1.49 (0.95)	0.3756

- Both groups had improved VA at 6th week with no significant difference.

Table 8: Comparison Of Final V/a Between Aciol And Sfiol

	ACIOL	SFIOL	P VALUE
MEAN V/A (6 TH WEEK POST-OP)	0.60 (0.34)	1.15 (1.14)	0.8670

- No significant difference was found in final visual outcome in patients having ACIOL and SFIOL.

Table 9: Post-operative Va

POST-OPERATIVE IOL STATUS	POST-OPERATIVE VA (AT 6 TH WEEKS) No.			TOTAL
	0-0.5 (6/6-6/18)	0.6-1 (6/24-6-/60)	< 1.82 (< 6/60)	
ACIOL	13 (59.09%)	8 (36.36%)	1 (4.54%)	22
SFIOL	4 (50%)	1 (12.5%)	3 (37.5%)	8
APHAKIC	1 (3.84%)	9 (34.61%)	16 (61.53%)	26
TOTAL	18 (32.14%)	18 (32.14%)	20 (35.71%)	56

Table 10: Mean Change In Spectral Count (cd) In Patients With Secondary Iol Implantation

TYPE OF IOL	PRE-OPERATIVE MEAN VALUE	POST-OPERATIVE (6 TH WEEK) MEAN VALUE	P VALUE
ACIOL	2005.5 (SD 266.50)	1966.18 (SD 248.70)	0.0003
SFIOL	1869.25 (SD 469.02)	1815.87 (SD 454.32)	0.0185

Table 11: Change In Spectral Count: Aciol Vs Sfiol

CD	ACIOL	SFIOL	P VALUE
POST-OPERATIVE (6 TH WEEK) MEAN VALUE	1966.18 (SD 248.70)	1815.87 (SD 454.32)	0.2546

- Post-operatively, there was significant change in density of endothelial cells at 6th week. However, Comparison of reduction was statistically found insignificant.

Table 12: Post-operative Complications

COMPLICATIONS	No. (%)
CORNEAL OEDEMA	12 (21.42%)
SECONDARY GLAUCOMA	3 (5.35%)
CME	1 (1.78%)
RD	1 (1.78%)
OPTIC ATROPHY	1 (1.78%)
TOTAL	18(32.14%)

No cases of endophthalmitis were noted

DISCUSSION

With advent of phaco-emulsification, there has been an apparent increase in the occurrence of retained lens fragments post-surgery. Review of the literature indicates lack of consensus regarding what effect the timing of PPV has on visual outcome.

- VA improved in all of our patients who underwent 23-G vitrectomy. 32.14% of eyes achieved a final acuity of 6/18 or better. Compared to the study done by Ali salehi,¹ Hassan Razmj, et al, in which they achieved final VA better than 6/18 in 42%.¹⁰ Oruc S, et al achieved VA of 6/18 or better in 51.8%.¹⁴
- In our study there were no significant changes in final VA following PPV among post-operative and post-traumatic groups with mean gain in VA of 1.17 and 1.49 respectively at 6 weeks follow up time, similar to study done by Shah MA, Shah SM, et al (p=0.606)¹⁵
- About 59.09% of patients with ACIOL and 50% patients with SFIOL had improved good VA of more or equal to 6/18, showing that type of IOL did not influence the visual outcome. This was supported by Oruc S, et al.¹⁴
- Among SFIOL group 3(37.5%) had poor visual outcome of < 6/60. This is because of the complications like RD, post-operative optic atrophy and corneal decompensation. Aphakic patients had poor visual outcome of < 6/60 in 61.53%,. Main cause of poor outcome was corneal oedema with corneal decompensation(75%) and secondary glaucoma(12.5%).
- The density of endothelial cells decreased postoperatively (6th week follow up period), showed insignificant difference (p value 0.2546) in endothelial cell loss between ACIOL and SFIOL at day 30. This correlation is not well mentioned in literature.
- Major cause of poor visual outcome in our study was corneal decompensation. With the incidence of post-operative complications, which included persistent corneal edema(21.42%), secondary glaucoma(5.35%), CME(1.78%) and RD(1.78%). While Kyung Min Koh, Hyoung Seok Kim, et al presented complications like elevated IOP(13.8%) and CME (2.7%)⁹.
- Oruc S, et al noted RD incidence of 8.2%, it was 4.95% in Borne MJ et al¹⁶ and 4.1% in Zafar S, et al¹³. While we noted only 1 patient (1.78%).
- CME was found in only 1 case (1.78%), while Pedro Romero-Aroca, et al found 31.91%¹¹ incidence of CME. Mean follow up in our study only 6 weeks which is a study limiting factor when compared to other studies as they have longer follow up.

CONCLUSION

- Final VA was significantly improved after PPV for nucleus/ IOL drop.
- Most common complication associated with PPV for dropped nucleus or IOL was persistent corneal edema.
- Prompt removal of lens matter by Pars-plana-vitrectomy and management of postoperative complications can ensure good visual outcome for the patient.

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