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Comparative Study Of Visual Outcomes Following Corrective Vitrectomy: Non-Traumatic Versus Traumatic Etiologies

Research Article

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Abstract

Introduction: Nucleus drop is a rare and serious complication. We investigated visual outcomes following corrective surgery, and compared outcomes between surgeries that followed traumatic injuries and those where the etiology was non-traumatic.

Method: A retrospective cohort study was performed using information collected from medical records regarding cases of vitrectomy performed for nucleus drop. Patients were grouped into traumatic and non-traumatic cases. After pars plana vitrectomy and nucleus removal with use of a phacofragmatome, all data were collected according to a standard follow-up format.

Results: Our cohort consisted of 37 eyes of 37 patients. Mean patient age was 58.8+/-9.35, ranging from 31 to 75 years (Table1). Of these cases, 12 (32.4%) were traumatic and 25 (67.6%) followed cataract surgeries. We found that vision in 15 (40.4%) cases improved to more than 6/24 and in 5 (13.5%) it did not improve (>1/60).

Conclusion: Visual outcome following corrective vitrectomy for nucleus drop may be satisfactory if managed well; no significant difference in outcome was noted based on etiology.

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Introduction

Cataracts are responsible for 47% of all cases of blindness worldwide. The epidemiological impacts of cataracts vary among different countries, and the rate of occurance is associated with economic conditions. All stakeholders wish to improve the quality and quantity of cataract surgery. [2]

Various postgraduate training programs in cataract surgery are currently available in many parts of the world, at different government and nongovernmental institutions, with a range of facilities. [2]

Differences in infrastructure, patient load, and skill of the faculty at various training facilities lead to the acquisition of differing skill levels and differing surgical results. Modern cataract surgery has a steep learning curve.

It is important to monitor the outcomes of surgical treatment for cataracts [3]. Cataract surgery is usually performed by phacoemulsification, but manual small incision cataract surgery (MSICS) is an important technique that is often used in developing countries, with comparable surgical outcome safety and efficacy. [4,5]

Nucleus drop is one of the serious complications of cataract surgery. Visual outcomes are poor following nucleus drop. [6,7]

Trauma is a cause of monocular blindness in the developed world, although few studies have addressed the problem of trauma in rural areas. [8-11]

Ocular trauma can cause cataracts. [8] The methods used to evaluate visual outcomes in eyes managed for traumatic cataracts and senile cataracts are similar[11], but damage to other ocular tissues may compromise visual gain in eyes operated on for traumatic cataracts. Hence, the success rates may differ between eyes with these two types of cataract. Traumatic cataract is one of the important causes of loss of vision following ocular trauma. [11-13]

With the introduction of the Birmingham Eye Trauma Terminology System (BETTS), the documentation of ocular trauma has been standardized. [5] Therefore, it should be valuable to study

the visual outcomes following traumatic cataract surgery and determinants predicting that outcome, especially in relation to the BETTS. Visual outcomes for traumatic cataracts have been reported in some cases. [12-15]

Methods

Design: Retrospective cohort study.

Inclusion

We enrolled all patients with nucleus drop, with iatrogenic or traumatic etiologies, following cataract surgery by phacoemulcification or by manual small incision cataract surgery. We collected data from the medical records of all such cases. We excluded cases with follow-up of less than four weeks following surgical treatment. All methods were approved by our ethics committee.

All enrolled patients had their vision tested using a Snellen chart, received an anterior examination using a slit lamp, and had posterior segment findings documented using indirect ophthalmology. When the fundus was not visible, B-scan ultrasonography was used to access the posterior segment. Pars plana vitrectomies were performed using a non-contact viewing system. We removed nuclei of varying toughness using phacofragmentation. We followed up patients following a standard format and schedule.

All cases of nucleus drop due to ocular trauma had been treated with systemic corticosteroids.

All data were entered in an online pretested form, exported to an Excel spreadsheet, and analysed using SPSS [17]. Frequency distributions and cross-tabulation were analyzed, calculating 95% confidence intervals. Effects were considered significant if the value of P was <0.05.

Results

Our cohort consisted of 37 eyes of 37 patients. Mean age was 58.8+/-9.35 years, and ranged from 31 to 75 (Table 1). Of these, 12(32.4%) were classed as traumatic nucleus drop and 25 (67.6%) followed cataract surgeries (Table 2). In the iatrogenic group, 18 (48.6%) suffered nucleus drop during phacoemulcification and 7 (18.9%) following manual small incision cataract surgeries. In the entire cohort, we were able to insert a posterior chamber intraocular lens in 22 (59.5%) cases; the other 15 cases remained aphakic.

When we examined visual outcomes of all patients following surgical management of nucleus drop, we found significant improvements (p=0.029, Table 3). We found that 15 (40.4%) cases improved more than 6/24, and 5 (13.5%) did not improve more than 1/60, because of comorbidities.

We compared visual outcomes by etiology, between traumatic and non-traumatic causes, following surgical management, and did not find any significant difference between these groups (p=0.606, Table 2).

No significant difference in visual outcome was seen between surgical management using 20- and 23-gauge vitrectomy systems (p=0.747, Table 4).

In comparing visual outcomes of surgical management with different time lags after primary procedure or trauma, we found no significant difference found. [11] (p=0.135 Table 5).

In the non-traumatic cases, no significant difference in visual outcome following surgical management was seen between primary surgery using phacoemulcification or manual small incision (p=0.09 Table 6).

Table 1. Age and Sex Distribution

Age Category	SEX		Total
	F	M	
30 to 40	1	1	2
41 to 50	2	4	6
51 to 60	5	11	16
61 to 70	2	10	12
71 to 80	1	0	1
Total	11	26	37

Table 2. Comparative Study of Post Operative Vision According Aetiology

POST OPERATIVE VISION	CATEGORY		Total
	TRAUMATIC	IATEROGENIC	
<1/60	2	3	5
1/60 TO 360	4	6	10
6/60 TO 6/36	1	6	7
6/24 TO 6/18	2	7	9
6/12 TO 6/9	3	3	6
Total	12	25	37

P=0.606

Table 3. Comparativ Study Of Pre And Post Operative Vision

POST OPERATIVE VISION	PRE OPERATIVE VISION					Total
	<1/60	1/60 TO 3/60	6/60 TO 6/36	6/24 TO 6/18	6/12 TO 6/9	
<1/60	3	1	1	0	0	5
1/60 TO 360	7	2	0	1	0	10
6/60 TO 6/36	0	4	2	1	0	7
6/24 TO 6/18	2	1	4	2	0	9
6/12 TO 6/9	0	1	1	3	1	6
Total	12	9	8	7	1	37

P=0.029

Table 4. Comparative Studyof Post Operative Vision According To Vitrectomy Gauge

POST OPERATIVE VISION	GAUGE		Total
	23	20	
<1/60	0	3	3
1/60 TO 360	3	5	8
6/60 TO 6/36	2	5	7
6/24 TO 6/18	3	4	7
6/12 TO 6/9	1	2	3
Total	9	19	28

P=0.747

Table 5. Comparativ Study of Post Operative Vision According to Duration Of Primary Procedure

POST OPERATIVE VISION	TRAUMATIC CATARACT DURATION					Total
	1 TO 10	11 TO 100	101 TO 300	NA	>300	
<1/60	0	2	0	3	0	5
1/60 TO 360	1	0	0	6	3	10
6/60 TO 6/36	0	0	0	6	1	7
6/24 TO 6/18	0	0	1	7	1	9
6/12 TO 6/9	0	3	0	3	0	6
Total	1	5	1	25	5	37

P= 0.135

Table.6 Comparativ Study of Post Operative Vision According Primary Surgery in Non Traumatic Group

POST OPERATIVE VISION	TYPE_OF_SX			Total
	NIL	PKE	SICS	
<1/60	2	0	3	5
1/60 TO 360	4	4	2	10
6/60 TO 6/36	1	4	2	7
6/24 TO 6/18	2	7	0	9
6/12 TO 6/9	3	3	0	6
Total	12	18	7	37

P=0.089

Table.7 Comparative Study of Visual Outcome According to Intra Ocular Lens

POST OPERATIVE VISION	POST__OP_EYE_STATUS		Total
	APHAKIA	PSEUDOPHAKIA	
<1/60	4	1	5
1/60 TO 360	4	6	10
6/60 TO 6/36	3	4	7
6/24 TO 6/18	2	7	9
6/12 TO 6/9	2	4	6
Total	15	22	37

P=0.328

Patients who were aphakic or pseudophakic showed no difference in visual outcome (p=0.328, Table 7).

Discussion

In this patient cohort, visual outcomes significantly improved following surgical management, as has been found by other authors. [6,7]

Kelantan et al. reported on the incidence of nucleus drop in posterior polar type cataracts, but we found it associated with all types of morphology, as many surgeries are performed by junior surgeons. [6,7]

Visual outcome was not significantly different when compared according to etiology (p=0.606). We are not aware of any other study that has examined this variable. In cases of ocular trauma, the lens is not the only structure that influences visual outcome. [16,17]

When we examined the time duration between primary insults and corrective surgery, we found no significant effect of greater time lag (p=0.135) on later vision. This may be because inflammation following the primary insult had subsided during the early period. When vitrectomy is performed late, visibility is better and no retinal detachment is found, suggestive of a better prognosis. Shah et al. suggested late intervention in traumatic cases. [17]

We did not find significant differences due to vitrectomy gauge, primary procedure, or presence or absence of an intraocular lens. We did not find any other study with which to compare these findings.

Conclusion

We conclude that, although nucleus drop is a serious complication, if it is managed well, a good visual outcome may be achieved. There was no difference in visual outcomes between traumatic and non-traumatic etiologies.

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