

Assessment of the Visual Outcome of Different Treatment Modalities of Traumatic Cataract

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ABSTRACT

Background: Traumatic cataracts pose a challenge to ophthalmologists, as they have an increased incidence of associated ocular abnormalities and intraoperative complications. Hence, astute surgical planning, careful surgical management and an intense post-operative follow up regime are imperative in the management of traumatic cataracts, to attain a reasonable visual outcome. The aim of the study was to investigate visual outcome of different treatment modalities of traumatic cataract.

Methods: This prospective study was carried out on 50 patients in the Department of Ophthalmology, Government Medical College, Ernakulam, from January 2009 to December 2011. The different treatment modalities undertaken in the current study were Small Incision Cataract Surgery (SICS) and Posterior Chamber Intra Ocular Lens (PCIOL) Implantation, Lens aspiration and PCIOL implantation, SICS with Anterior Chamber Intra Ocular Lens (ACIOL), Lens removal, vitrectomy and primary ACIOL implantation, Intra Ocular Foreign Body (IOFB) removal, lens aspiration and ACIOL implantation, Lens removal and vitrectomy and SICS Implantation.

Results: In the current study, SICS and Posterior Chamber Intra Ocular Lens (PCIOL) implantation was the most common operation (54%) performed. Out of 50, only 3 patients (6%) had a visual acuity of 6 /60 and 9(18%) had acuity of 6 /36. Three patients (6%) could achieve an acuity of 6/6. The patients who underwent SICS with PCIOL could achieve better overall visual acuity.

Conclusion: The best visual outcome was obtained in patients who underwent SICS and PCIOL implantation. In our series 69.6% of patients could achieve acuity of 6/18 or more at the end of follow up.

Keywords: Ocular abnormalities, Traumatic cataract, Visual outcome

INTRODUCTION

Traumatic cataract is common sequelae of ocular injuries in adults and children ^[1]. The incidence of ocular injuries varies across the world. In India, the reported incidence is 20.53% ^[2]. Management of traumatic cataract that results from either blunt or penetrating ocular trauma needs special consideration because of associated injury to ocular and periorbital structures ^[3]. Children and young adults, especially boys, are more predisposed to trauma and have a higher incidence of traumatic cataract ^[4].

Traumatic cataract remains a significant cause of visual impairment and physical disability in spite of diagnostic and therapeutic advances. It occurs secondary to blunt or penetrating trauma. Traumatic cataract has also been reported after vigorous ocular massage ^[5].

Traumatic cataracts pose a challenge to ophthalmologists, as they have an increased incidence of associated ocular abnormalities and intraoperative complications. Hence, astute surgical planning, careful surgical management and an intense post-operative follow up regime are imperative in the management of traumatic cataracts, to attain a reasonable visual outcome ^[6].

In the current study, the different treatment modalities undertaken were Small Incision Cataract Surgery (SICS) and

Posterior Chamber Intra Ocular Lens (PCIOL) Implantation, Lens aspiration and PCIOL implantation, SICS with ACIOL, Lens removal, vitrectomy and primary Anterior Chamber Intra Ocular Lens (ACIOL) implantation, Intra Ocular Foreign Body (IOFB) removal, lens aspiration and ACIOL implantation, Lens removal with vitrectomy and SICS without IOL implantation.

The aim of the study was to investigate visual outcome of different treatment modalities of traumatic cataract.

METHODS

This prospective study was carried out in the Department of Ophthalmology Government Medical College, Ernakulam, from January 2009 to December 2011. A comprehensive proforma was designed for this study. Patients who gave consent and were cooperative and willing for the surgery were included. Personal information of all the patients was recorded. In all cases cataract surgery was performed after a detailed ocular and systemic evaluation. All the patients who presented to the hospital with history of trauma to the eyes were included in the study. In the current study, a detailed history regarding the nature of trauma, type of trauma, site of trauma, time lag between trauma and presentation to the hospital and history of previous medical illnesses and surgeries including ocular surgeries were recorded. In order to undertake ocular examination, the eyes were examined in detail. The type and extent of injury as well as the type and extent of the lens opacity were noted. Fundus examination of both eyes, if possible was done. Intraocular pressure was determined. Any abnormalities or infection of the eyelids and lacrimal passage were excluded. Slit lamp examination was done in all cases. The different treatment modalities undertaken in the current study were Small Incision Cataract Surgery (SICS) and Posterior Chamber Intra Ocular Lens (PCIOL) Implantation, Lens aspiration and PCIOL

implantation, SICS with ACIOL, Lens removal with vitrectomy and primary Anterior Chamber Intra Ocular Lens (ACIOL) implantation, Intra Ocular Foreign Body (IOFB) removal, lens aspiration and ACIOL implantation, Lens removal with vitrectomy and SICS without IOL Implantation. All the surgeries were done under peribulbar anaesthesia in adult patients using Injection Lignocaine 2% with adrenaline and hyalase. In most of the pediatric patients, surgical interventions were done under general anaesthesia. This study was in accordance with the ethical standards of Declaration of Helsinki and was approved by the Ethical committee of the institution. A written informed Consent was taken from all the participants.

RESULTS

The study included 50 patients, out of which there were 38 males (76%) and 12 females (24%). The age of the patients ranged from 4 to 77 years. Five patients (10%) were below 10 years of age and 6 (12%) were above 60 years of age. The vast majority of patients were below 40 years (32 patients, 64%). The median age of these patients was 34.5 years. The median age of the female patients was significantly less when compared to that of the male patients (19.5 years v/s 37.5 years).

Type of surgery performed was as per the below Table 1, SICS and Posterior Chamber Intra Ocular Lens (PCIOL) implantation was the most common operation performed. This operation was performed on 27 patients (54%). Lens removal and Anterior Chamber Intra Ocular Lens (ACIOL) implantation was the next common which was done on 7 patients (14%). Lens aspiration and ACIOL implantation was done on 6 patients (12%), SICS with ACIOL implantation was done in 1 patient, Lens removal vitrectomy with primary ACIOL implantation in 3, foreign body removal lens aspiration with ACIOL implantation in 1, lens aspiration alone in 3, lens removal with vitrectomy in 1 and SICS without IOL implantation in 1 patient.

Table 1: Type of operation performed

Type of operation	Number of patients	Percentage
SICS and PCIOL Implantation	27	54%
Lens aspiration and PCIOL implantation	6	12%
SICS with ACIOL Implantation	1	2%
Lens removal, vitrectomy and primary ACIOL implantation	3	6%
IOFB removal ,lens aspiration and ACIOL implantation	1	2%
Lens aspiration	3	6%
Lens removal and vitrectomy	8	16%
SICS without IOL implantation	1	2%
Total	50	100%

As per below Table 2, the patients were followed up at 1 week, 6 weeks and 3 months post op. The visual acuity was recorded at each time. At 1 week follow up,

19 patients (38%) had a visual acuity of 6/60, 16 (32%) had 6/36 vision, 8 (16%) had 6/24, 5 (10%) had 6/18, 2 (4%) achieved 6/12 vision. No patient had achieved vision of 6/9 or more. At 6 weeks follow up there were only 5 patients (10%) who had 6/60 vision. Eleven achieved 6/36, 14 had 6/24, 9 had 6/18, 7 had 6/12 and 4 had a visual acuity of 6/9. No patient had 6/6 vision. At the end of follow up at 3 months, most of the patients had a visual acuity of 6/24 or more (38 patients 76%). Only 3 patients (6%) had a visual acuity of 6 /60 and 9(18%) had an acuity of 6 /36. Three patients (6%) could achieve an acuity of 6/6.

Table 2: Break up of the patients with respect to final visual acuity and operation

Operation	No: of patients achieving visual acuity of 6/60	No: of patients achieving visual acuity of 6/36	No: of patients achieving visual acuity of 6/24	No: of patients achieving visual acuity of 6/18	No: of patients achieving visual acuity of 6/12	No: of patients achieving visual acuity of 6/9	No: of patients achieving visual acuity of 6/6	Total
SICS and PCIOL	0	2 (7.4%)	6 (22.2%)	3 (11.1%)	5 (18.5%)	9 (32.6%)	2 (7.4%)	27
Lens aspiration And PCIOL	0	1 (16.7%)	1 (16.7%)	3 (50.1%)	0	0	1 (16.7%)	6
SICS and ACIOL	0	0	1 (100%)	0	0	0	0	1
Lens Removal vitrectomy and primary ACIOL	1 (33.3%)	2 (66.7%)	0	0	0	0	0	3
IOFB removal lens aspiration and ACIOL	0	0	1 (100%)	0	0	0	0	1
Lens aspiration	1 (33.3%)	0	1 (33.3%)	1 (33.3%)	0	0	0	3
Lens removal vitrectomy	1 (100%)	0	0	0	0	0	0	1
Lens aspiration and ACIOL	0	2 (66.7%)	0	1 (25%)	0	0	0	3
Lens removal and ACIOL	0	1 (25%)	2 (50%)	1 (25%)	0	0	0	4
SICS	0	1 (100%)	0	0	0	0	0	1

From the below Table 3 and taking into consideration the type of operation, those patients who underwent SICS with PCIOL could achieve better overall visual acuity. Out of the 27 patients who underwent SICS with PCIOL, 19 patients (69.6%) could achieve a visual acuity of 6/18 or more. Six patients underwent lens

aspiration and PCIOL implantation, out of which 4 patients (66.7%) could achieve a visual acuity of more than 6/18. No other operation resulted in a satisfactory visual acuity of more than 6/12 in any patient. Considering patients who underwent PCIOL and ACIOL as separate patient groups, it was found that, out of the 33 patients who

underwent PCIOL, only 30.3% had a poor visual acuity of 6/24 or less. The rest (69.7%) could attain a visual acuity of 6/18 or more. On the other hand, only 2 out of 12

(16.7%) Patients who underwent ACIOL could achieve a visual acuity of 6/18 or more. No patient in the ACIOL group had visual acuity of 6/12 or more.

Table 3: Comparison of Final Visual Acuity of Patients Who Underwent Posterior Chamber Intra Ocular Lens (Pciol) and Anterior Chamber Intra Ocular Lens (Aciol) Implantation

Visual acuity	No of Patients	No of Patients	No of Patients	No of Patients	No of Patients	No of Patients	No of Patients	Total
Type of operation	With visual Acuity of 6/60	With visual Acuity of 6/36	With visual Acuity of 6/24	With visual Acuity of 6/18	With visual Acuity of 6/12	With visual Acuity of 6/9	With visual Acuity of 6/6	
PCIOL	0	3(9.1%)	7(21.2%)	6(18.2%)	5(15.1%)	9(27.3%)	3(9.1%)	33
ACIOL	1(8.4%)	5(41.6%)	4(33.3%)	2(16.7%)	0	0	0	12
OTHERS	2(40%)	1(20%)	1(20%)	1(20%)	0	0	0	5
TOTAL	3	9	12	9	5	9	3	50

DISCUSSION

Traumatic cataract is one of the most common outcomes of ocular injuries. There is a 1-15% incidence of traumatic cataract in ocular injuries [7]. Churchill A J et al have evaluated factors affecting visual outcome following unioocular traumatic cataract in 32 children [8]. Twenty-four children obtained a visual acuity of 6/5 to 6/18. The factors adversely affecting the visual outcome are complex trauma, delayed referral for lensectomy, inadequate postoperative correction of aphakia and complications of contact lenses. The binocular functions are found to be worse in most of the cases when the visual acuity of the injured eye was 0.5 or less. A delay of more than 6 months in operative treatment appears to increase the likelihood of strabismus significantly. Also, a delay in surgery increases the chances of phacoanaphylaxis in the uninjured eye [8].

In the current study, the best visual outcome was obtained in patients who underwent SICS and PCIOL implantation. PCIOL implantation, either after SICS or other methods of lens removal has the best visual outcome. The final visual acuity of the patients has shown significant differences with different treatment modalities. The patients who underwent SICS and PCIOL implantation achieved the best final acuity. In our series 69.6% of patients could achieve an acuity of 6/18 or more at the end of follow up.

Lens aspiration and PCIOL implantation has also resulted in satisfactory

visual outcome. Out of the 6 patients who underwent lens aspiration and PCIOL implantation, 4 achieved a visual acuity of more than 6/18, confirming that PCIOL implantation has produced better visual outcome in patients with traumatic cataract. The decision whether to perform PCIOL or ACIOL implantation should be done in an individual patient was dictated by the integrity of the posterior capsule. In our patients PCIOL was implanted in cases with an intact posterior capsule and others underwent ACIOL implantation. Although there have been reports of PCIOL implantation even in the presence of posterior capsule breaks, it was our strategy to perform PCIOL implantation in patients with intact posterior capsule.

These results are similar to the other published results. Many series have been published assessing the long-term results of IOL implantation for traumatic cataract. In a study from Aravind Eye Hospital and PG Institute of Ophthalmology, Madurai, Eckstein M et al have reported a visual acuity of 6/12 or better in 67% of eyes after posterior chamber IOL (PCIOL). They have concluded that, the visual acuity results after PCIOL implantation for traumatic cataract are encouraging [9].

Another series by Bhuyan et al, have studied 137 patients with traumatic cataract and were retrospectively analyzed. [10] Sixty five and half percentage underwent Extra Capsular Cataract Extraction (ECCE) with PCIOL implantation and visual acuity

improved from 20/200 or worse in 97.7% of patients preoperatively to 20/60 or better in 74.1% of patients post operatively. Seventeen patients who had associated posterior segment failed to recover satisfactory vision. They concluded that ECCE with IOL implantation provide satisfactory result in traumatic cataract but associated posterior segment complications and development of posterior capsular opacity are major obstacles in visual rehabilitation ^[10].

Many series have been published assessing the long-term results of IOL implantation for traumatic cataract ^[11]. They have concluded that, the visual acuity results after PCIOL implantation for traumatic cataract are encouraging.

CONCLUSION

The best visual outcome for traumatic cataract patients can be achieved with SICS and PCIOL implantation. Once the injury has occurred, outcome depends on the extent of injury to the ocular and periorbital structures and immediate and professional approach must be taken to prevent blindness.

Conflict of Interest: None declared

Ethical Approval: The study was approved by the Institutional Ethics Committee.

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How to cite this article: Dhanya V S, Nair R, Abraham M. Assessment of the visual outcome of different treatment modalities of traumatic cataract. *International Journal of Research and Review.* 2020; 7(11): 185-189.
