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Original Research Article

A Hospital-Based Study Assessing Visual Outcome Following Management of Traumatic Cataract: A Cross Sectional Study

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Abstract

Aim: The aim of the present study was to assess the visual outcome following management of traumatic cataract.

Methods: The present study was a cross sectional study carried out in Ophthalmology outpatient Department for the period of 18 months. Study population was all the patients presenting with cataract. 80 cases from these cases of traumatic cataract were included for this study as the remaining patients did not fulfill the inclusion criteria.

Results: The age group ranged from 18-62 years. More number of cases was found in the age group of 21-40 years (60%). Out of 80 cases, 60 were males and 20 were females. Out of 80 cases of traumatic cataract, 24 were blunt and 56 were penetrating trauma. Pre-operative visual acuity was recorded in all cases. In 20 cases (25%), the preoperative visual acuity was PL/PR. In 36 cases (45%), the preoperative visual acuity was perception of hand movements. Visual acuity of the uninjured eye was recorded in all the patients and was found to be within the normal limit. Out of 80 cases of traumatic cataract, 74 cases underwent ECCE (Small Incision Cataract Surgery) with PCIOL implantation, 2 cases underwent small incision cataract surgery with PCIOL implantation with corneal tear repair, 2 cases underwent small incision cataract surgery with PCIOL implantation with anterior vitrectomy, 2 cases underwent small incision cataract surgery with aphakia. Out of 80 cases, final visual acuity of 6/6 to 6/18 was seen in 20 (25%) cases. Final visual acuity of less than 6/18 to 6/60 was seen in 50 patients (62.5%). 10 patients (12.5%) had visual acuity less than 3/60.

Conclusion: Traumatic cataract is a serious visually challenging sequel of trauma. In cases of traumatic cataract, to have a better visual outcome after surgery, early diagnosis followed by proper management plays an important role. Therefore stress has to be given on awareness of the public and ocular safety measures should be taken at work places to prevent the ocular hazards associated with the ocular trauma. In addition, early reporting and adequate follow up especially in cases of children needs to be emphasized.

Keywords: Visual Outcome, Management, Traumatic Cataract.

Introduction

Ocular trauma is the leading cause of visual disability and blindness. [1] Traumatic cataract is very common sequel of ocular trauma. [2] Traumatic cataract remains an important cause of visual impairment and physical as well as vocational disability in spite of recent diagnostic and therapeutic advances. It may occur secondary to blunt or penetrating trauma. Some other rare causes are infrared energy (glass-blower's cataract), electric shock, ionizing radiation (X-rays) etc. [3] The pathophysiology of traumatic cataract is believed to involve direct rupture of capsule or coup, countercoup and equatorial expansion due to hydraulic forces transferring the energy of trauma to the opposite side of the eye. It can be accompanied by anterior and posterior segment abnormalities depending on the force of trauma and depth of globe penetration. [4,5]

Traumatic cataract results most commonly from either penetrating injuries from sharp objects like stick or thorn with direct injury to lens or through blunt trauma by objects like stone, cricket ball etc. Rarely, it can occur from electrical shock, ionizing radiation or infra-red rays (glass blower's cataract). [6] Traumatic cataract following a perforating injury may be localized cataract, rosette cataract, intumescent cataract or lacerated cataract. Blunt trauma leads to concussion type of cataract due to coup or contre coup ocular injury. The lenticular opacity may be vossius ring, localized or diffuse type. [7-10]

For proper management a detailed history and a pre-operative examination is a must before performing surgery in a case of traumatic cataract. Intraocular foreign bodies and open globe injuries should be ruled out before surgery. [11] The final visual outcomes depend on the type of trauma, extend of lenticular involvement and associated damage to the ocular structures. In adults the time of intervention of cataract surgery should be carried out and completed within a year and within 6 months in children. [12] Surgery for traumatic cataract can be primary or secondary. When the lens is fragmentized, swollen causing a pupillary block or lens opacity blocking the view of posterior segment, primary cataract removal is done. However secondary cataract removal is more beneficial because of improved visibility, proper intraocular lens power calculation, and there is less chances of post operative inflammation. [13]

The aim of the present study was to assess the visual outcome following management of traumatic cataract.

Materials and Methods

The present study was a cross sectional study carried out in Ophthalmology outpatient Department of IGIMS, Patna, Bihar, India for the period of 18 months. Study population was all the patients presenting with cataract. 80 cases from these cases of traumatic cataract were included for this study as the remaining patients did not fulfill the inclusion criteria.

Inclusion Criteria:

All the patients presenting with cataract in the Ophthalmology outpatient department

Patients willing to participate in the study

Exclusion Criteria:

1. Patients presenting with any pathology other than cataract.
2. Ocular injuries without cataract.

Study was approved by ethical committee of the institute. A valid written consent was taken from the patients after explaining study to them.

All 80 cases were evaluated, with respect to a detailed history, regarding type of trauma, duration between trauma and presentation, associated ocular injury, intra- operative and post-operative complications. The visual prognosis after surgery was noted. All patients with traumatic cataract presenting at IGIMS, Patna, Bihar, India fulfilling sampling criteria were selected for surgery. Detailed Systemic examination was done. Each patient was subjected to detailed examination and investigation needed. Routine blood analysis Lacrimal syringing, Intraocular pressure assessment were done. Radiological investigation, B-scan ultrasonography to rule out intraocular foreign body, vitreous hemorrhage, RD. Ocular examination included Torch light examination, slit lamp biomicroscopic examination and indirect ophthalmoscopy. Preoperative visual acuity was recorded in both eyes. Keratometry and A-scan biometry was done for intraocular power calculation, but in case of corneal scarring the power of other eye was calculated. Topical antibiotics and NSAIDS were administered hourly the day before surgery. Antiglaucoma medication was given in cases associated with raised IOP. Pupil was dilated with 0.5% tropicamide with 10% phenylephrine until full dilatation was attained. In cases associated with inflammation it was controlled with topical steroids and antibiotics before surgery. Peribulbar block was given which consisted of a mixture of 2% lignocaine with adrenaline with hyluronidase 10 units per ml. All cases were operated under operating microscope with co- axial illumination. Eye was painted and draped. Superior rectus bridles suture was taken. Fornix based conjunctival flap was raised. A 6.5-7.00 mm partial thickness sclerocorneal tunnel was made. Side port entry was made. CCC was done. Hydro dissection was done where required. Nucleas was prolapsed in AC where possible and was expressed with viscoelastics, where it was imbibed lens matter it was directly aspirated. Epinucleas and residual cortex was aspirated with since cannula. A 6mm optic single piece PMMA lens was placed in the bag, sulcus as per the case. Wound hydration was done and wound was checked for its apposition. Subconjunctival injection dexamethasone and gentamycin was given and eye was padded and bandaged. Post operatively, Systemic analgesics were administered along with systemic antibiotics. Next morning eye was examined under slit lamp to look for any postoperative complications. Patients were started on topical antibiotic steroids, NSAIDS and mydriatics eye drops. Antiglaucoma medications were given in selected cases. Patients were discharged with postoperative instructions regarding the medications and other measures. Patient were instructed to come for follow-up after 1 week and after 6 weeks. Visual acuity was assessed with snellens chart at each postoperative visit along with slit lamp examination. Antibiotic steroid drops were gradually tapered. Refraction was done at 6th weeks postoperatively and glasses were prescribed based on patients refractive status. The clinical data of each patient was collected in the proforma for analysis of the study.

Data was analysed with SPSS version 22.

Results

Table 1: Distribution of traumatic Cataract patients according to age and sex

Age group (years)	Male	Female	Total	Percentage
11-20	6	4	10	12.5
21-30	18	6	24	30
31-40	19	5	24	30
41-50	15	3	18	22.5
>50	2	2	4	5
Total	60	20	80	100

The age group ranged from 18-62 years. More number of cases was found in the age group of 21-40 years (60%). Out of 80 cases, 60 were males and 20 were females.

Table 2: Distribution of traumatic Cataract patients according to type of trauma

Type of Trauma	N	%
Blunt	24	30
Penetrating	56	70
Total	80	100

Out of 80 cases of traumatic cataract, 24 were blunt and 56 were penetrating trauma.

Table 3: Distribution of traumatic Cataract patients according to pre-operative visual acuity

Visual acuity	N	%
3/60	7	8.75
CF ½mt	4	5
CF1M	4	5
CF2M	5	6.25
HM	36	45
PL+	4	5
PL+ PR+	20	25

Pre-operative visual acuity was recorded in all cases. In 20 cases (25%), the preoperative visual acuity was PL/PR. In 36 cases (45%), the preoperative visual acuity was perception of hand movements. Visual acuity of the uninjured eye was recorded in all the patients and was found to be within the normal limit.

Table 4: Distribution of traumatic Cataract patients according to type of surgery

Type of surgery	N	%
SICS+PCIOL	74	92.5
SICS+PCIOL with corneal tear repair	2	2.5
SICS+PCIOL with anterior vitrectomy	2	2.5
SICS+PCIOL with aphakia	2	2.5

Out of 80 cases of traumatic cataract, 74 cases underwent ECCE (Small Incision Cataract Surgery) with PCIOL implantation, 2 cases underwent small incision cataract surgery with PCIOL implantation with corneal tear repair, 2 cases underwent small incision cataract surgery with PCIOL implantation with anterior vitrectomy, 2 cases underwent small incision cataract surgery with aphakia.

Table 5: Distribution of traumatic Cataract according to final visual acuity

Age groups in years	Final visual acuity		
	6/6-6/18	<6/18-3/60	Less than 3/60
11-20	2	8	0
21-30	6	10	4
31-40	6	12	6
41-50	4	18	0
>50	2	2	0
Total	20	50	10

Out of 80 cases, final visual acuity of 6/6 to 6/18 was seen in 20 (25%) cases. Final visual acuity of less than 6/18 to 6/60 was seen in 50 patients (62.5%). 10 patients (12.5%) had visual acuity less than 3/60.

Discussion

Cataract remains the commonest cause of blindness in India contributing about 81%. The incidence of ocular injuries in India is estimated to be 20.5% with 75% cases occurring among those aged less than 40 years. Males are predominantly affected

than females with a male to female ratio of 9:1. Further ocular trauma is a major cause of monocular blindness and visual impairment throughout the world, although little is known about its epidemiology or associated visual outcome in developing countries. [14] Traumatic cataract results most commonly from either penetrating injuries from sharp objects like stick or thorn with direct injury to lens or through blunt trauma by objects like stone, cricket ball. Rarely, it can occur from electrical shock, ionizing radiation or infra-red rays (glass blower's cataract). [15]

Accidental ocular trauma can occur at any age but young people are more vulnerable. Cataract is a known complication after penetrating or blunt ocular trauma occurring in around 1-15%. [16] It is estimated that 14% of all cases of cataract in children are due to ocular trauma. The type of trauma, extent of lenticular involvement and associated ocular damage determines the ultimate visual prognosis. [17] The age group ranged from 18-62 years. More number of cases was found in the age group of 21-40 years (60%). A similar age group distribution was also showed by a study by Daljith Singh et al. [18] Out of 80 cases, 60 were males and 20 were females. This study showed a male preponderance. This was because men are more exposed to ocular trauma because of occupation and they are from age earning group.

Out of 80 cases of traumatic cataract, 24 were blunt and 56 were penetrating trauma. Pre-operative visual acuity was recorded in all cases. In 20 cases (25%), the preoperative visual acuity was PL/PR. In 36 cases (45%), the preoperative visual acuity was perception of hand movements. Visual acuity of the uninjured eye was recorded in all the patients and was found to be within the normal limit Out of 80 cases of traumatic cataract, 74 cases underwent ECCE (Small Incision Cataract Surgery) with PCIOL implantation, 2 cases underwent small incision cataract surgery with PCIOL implantation with corneal tear repair, 2 cases underwent small incision cataract surgery with PCIOL implantation with anterior vitrectomy, 2 cases underwent small incision cataract surgery with aphakia. In 1996, Marcus Blum et al [19] made a study in 148 eyes with traumatic cataract. There PCIOL was implanted in 42(66.6%) of penetrating injury group and in 72(84.7%) patients of blunt trauma. In 1998, Krishnamachary M, Rathi V et al [20] reviewed 237 children who developed traumatic cataract. In the study extra capsular cataract extraction with IOL implantation was performed in 65.67% of patients.

Out of 80 cases, final visual acuity of 6/6 to 6/18 was seen in 20 (25%) cases. Final visual acuity of less than 6/18 to 6/60 was seen in 50 patients (62.5%). 10 patients (12.5%) had visual acuity less than 3/60. Renuka Srinivasan, Kumudhan et al [21] noted a final visual acuity of 6/12 or better in 88.2% patients. Eckstein M et al [22] noted a visual acuity of 6/12 or better in 67% of patients who underwent cataract extraction with PCIOL implantation. Brar et al [23], have reported a visual acuity of 20/40 in 39% eyes in penetrating trauma compared to 87% in blunt trauma after surgery.

Conclusion

Traumatic cataract is a serious visually challenging sequel of trauma. In cases of traumatic cataract, to have a better visual outcome after surgery, early diagnosis followed by proper management plays an important role. Therefore stress has to be given on awareness of the public and ocular safety measures should be taken at work places to prevent the ocular hazards associated with the ocular trauma. In addition, early reporting and adequate follow up especially in cases of children needs to be emphasized.

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