

Traumatic cataract: different modalities of treatments and its outcome

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Abstract

Introduction: Damage to the crystalline lens is an important manifestation of ocular trauma which results in the formation of a cataract. This forms a special clinical type since it is seen in young individuals and children since trauma is more common in this age group. Traumatic cataract due to blunt trauma can be managed by intracapsular cataract extraction, extracapsular cataract extraction with or without intraocular lens implantation or by phacoemulsification. Traumatic cataract in penetrating trauma is treated by two options. In first option immediate repair of corneal laceration leaving the cataract for second operation. In second option simultaneous corneal repair and cataract extraction is done. **Aims and objectives:** To study different modalities used for management of traumatic cataract and To study intraoperative and postoperative complications and to evaluate final visual outcome. **Material and method:** All the patients of traumatic cataract were enrolled in the study. The detail of these patients such as age, sex and other demographic detail were asked and were entered in a prestructured proforma. Type of injury, side of the eye involved and the cause of injury were also inquired and were noted down. Various surgical modalities used in the treatment of these patients were recorded. And the visual outcome after six months of treatment was recorded. **Results:** Agricultural injuries and other occupational accident (25.5% each) were the commonest cause. Corneal damage (45%) was most frequently associated with traumatic cataract. Preoperative visual loss reducing vision up to perception of light and projection of rays was found (45%). Most frequently used modalities of lens surgery were phacoemulsification with posterior chamber intraocular lens implantation and extracapsular cataract extraction with posterior chamber intraocular lens implantation (32.5%) each. Vitreous loss was most frequently found intraoperative complication (15%). Commonest postoperative complication was found to be uveitis (35%). Final visual acuity was good (visual acuity better than 6/18) in 47.5 % cases. Blindness (visual acuity less than 6/60) was seen in 7.5 % cases. **Conclusion:** Most frequently used treatment modalities in traumatic cataract was phacoemulsification with PCIOL implantation and ECCE with PCIOL implantation each. Vitreous loss was the most common intraoperative complication whereas uveitis was most common post operative complication. Final visual outcome was better in cases with intraocular lens implantation. **Key Word:** traumatic cataract, intraocular lens implantation, vitreous loss.

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INTRODUCTION

Crystalline lens forms an important component of optical system of eye and its transparency and integrity

is vital for normal functioning of eye. Damage to the crystalline lens is an important manifestation of ocular trauma which results in the formation of a cataract. This forms a special clinical type since it is seen in young individuals and children since trauma is more common in this age group. In this era of industrialization the incidence of traumatic cataract has increased in spite of the fact that the eyes are well protected by the lids, projected margins of orbit, the nose and cushion of fat from behind. Lens can be damaged by both blunt as well as penetrating trauma resulting in the formation of a cataract known as traumatic cataract. Such cataract is usually associated with injuries to other ocular structures. All these factors go a long way in determining the

ultimate visual prognosis in these injured eyes. Such a lens needs extraction along with treatment of other associated ocular injuries. To solve the problem of unioocular aphakia an intraocular lens needs to be implanted.¹ An Indian study on ocular injury in Pondicherry shows 39.90% of traumatic cataract in penetrating type of injury and 14.92% in blunt type of injuries.² Hence visual rehabilitation will be possible in such eyes preventing them from becoming amblyopic in children and visually incapacitating in adults. Various surgical treatment modalities have been demonstrated by various authors. Traumatic cataract due to blunt trauma can be managed by intracapsular cataract extraction, extracapsular cataract extraction with or without intraocular lens implantation or by phacoemulsification. Now a day's intracapsular cataract extraction is reserved for subluxated and dislocated lenses.³ Most of the times cryo-extraction is treatment of choice. Wire vectis can be applied if vitreous is already present in anterior chamber. In intracapsular cataract extraction, decreasing intraocular pressure is necessary procedure by giving preoperative intravenous mannitol and oral acetazolamide starting 2 days before surgery. Retrobulbar anesthesia with good ocular massage is given to prevent vitreous loss. If vitreous loss occurs, either open sky vitrectomy or automated anterior vitrectomy is done. Pupil is constricted with pilocarpine and air is injected to push vitreous back. Complications frequently associated with dislocated lenses are glaucoma, uveitis or retinal detachment. Coexisting pathologies are managed either medically or surgically.³ Scleral fixation intraocular lens can be used for optical correction particularly if other eye is emmetropic. Encouraging reports are appearing in this concern, thus avoiding complications related to anterior chamber intraocular lens implantation.⁴ Extracapsular cataract extraction and phacoemulsification are the methods for removal of traumatic cataract. Traumatic cataract in penetrating traumas is treated by two options. In first option immediate repair of corneal laceration leaving the cataract for second operation. In second option simultaneous corneal repair and cataract extraction is done. Thus the present study was undertaken to study the different modalities used for management of traumatic cataract and also to study intraoperative and postoperative complications and to evaluate final visual outcome.

AIMS AND OBJECTIVES

- To study different modalities used for management of traumatic cataract and
- To study intraoperative and postoperative complications and to evaluate final visual outcome.

MATERIAL AND METHOD

The present observational study was conducted in department of ophthalmology at Lokmanya Tilak municipal medical college, Mumbai. The data was collected from June 2012 to May 2013.

Following inclusion and exclusion criteria was used to select the cases of traumatic cataract.

Inclusion Criteria

- All the patients with traumatic cataract attending ophthalmology department during the study period.

Exclusion Criteria

- Patients with preoperative posterior segment pathologies.
- Patients with intraocular foreign body.
- Patients not willing to participate in the study.

Thus total 40 cases of traumatic cataract were diagnosed during the study period using the above mentioned inclusion and exclusion criteria. The detail of these patients such as age, sex and other demographic detail were asked and were entered in a prestructured proforma. Type of injury, side of the eye involved and the cause of injury were also inquired and were noted down. Visual acuity of the affected eye was also calculated. Then patients were subjected to specific investigations and management. Surgical treatment for traumatic cataract was performed under local or general anesthesia depending on the condition of patients. Written informed valid consent of the patient was taken before conducting the surgical treatment. Intraoperative and postoperative complications were if any were recorded. All the 40 patients were followed up for at least 6 months during which ocular examination and best corrected visual acuity were recorded.

RESULTS

Table 1: Distribution of patients according to various factors

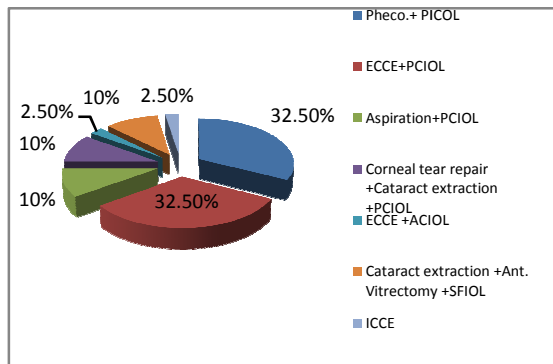
	Variable	No.	%
Aetiology of trauma	Agricultural Accidents	10	25%
	Other Occupational Accidents	10	25%
	Domestic Accidents	06	15%
	Assault	04	10%
	Accidents while Playing	08	20%
	Road traffic accident	02	5%
	Associated trauma	Corneal tear	16
Cortex in AC	07	17.5%	
Dislocation / Subluxation of	04	10%	

	lens		
	Secondary glaucoma	03	07.5%
	Adherent leucoma	03	07.5%
	Strabismus	03	07.5%
	Corneal opacity	02	05.0%
	Sclearal tear	02	05.0%
Extent of visual loss (preoperative)	>6/60	01	2.5%
	>1/60	08	20%
	Finger counting	13	32.5%
	Hand movement (PL+ PR+)	18	45%
	No PL	00	00%

In the present study it was observed that majority of the individuals were young males. Agricultural injuries and other occupational accident (25.5% each) were the commonest cause. Corneal damage (45%) was most frequently associated with traumatic cataract. Preoperative visual loss reducing vision up to perception of light and projection of rays was found (45%). There were no patients with visual loss up to faulty projection of rays or no perception of light as all the patients with preoperative posterior segment Pathology were excluded.

Table 2: Distribution of patients according type of Lens surgery

Type of surgery	No. of eyes	Percentage (%)
Pheco. + PICOL	13	32.5%
ECCE +PCIOL	13	32.5%
Aspiration +PCIOL	04	10%
Corneal tear repair +Cataract extraction +PCIOL	04	10%
ECCE +ACIOL	01	2.5%
Cataract extraction +Ant. Vitrectomy +SFIOL	04	10%
ICCE	01	2.5%



Graph 1: Distribution of patients according type of Lens surgery

In the present study majority of cases has received intraocular lens implants. 13 cases (32.5%)

underwent phacoemulsification with posterior chamber intraocular lens. The cases who had cortex prolapsed in anterior chamber underwent aspiration with PCIOL. Anterior vitrectomy was done whenever necessary. Simultaneous corneal tear repair, cataract extraction with PCIOL was done in 4 cases (10%). 5 cases that had dislocated or subluxated lens underwent ICCE or cataract extraction with SFIOL. In one case where posterior capsule was not intact and ciliary sulcus implantation not possible, ACIOL implantation was done.

Table 3: Distribution of patients according to complication

Complication	No. of eyes	Percentage (%)	
Intra operative complication	Vitreous loss	06	15%
	Posterior capsular tear	02	5%
	HypHEMA	01	2.5%
	Uveitis	14	35%
	Vitrites	03	7.5%
Post operative complication	Brelins`edema IOL decentration	03	7.5%
	Retinal detachment	01	2.5%
		01	2.5%

Intraoperative and post operative complications in the patients were studied. It was observed that vitreous loss (15%) was the most common intraoperative complication. While 5% cases had posterior capsular tear. Majority of vitreous loss occurred in penetrating cases. One patients (2.5%) had hypHEMA intraoperatively. Most frequent early post operative complication was development of uveitis (35%). Mild postoperative iritis was present in most of the cases was treated by local steroids instillation. 3 patients developed Vitrites, one case developed intraocular lens displacement due to inadequate support for intraocular lens as patient had intraoperative posterior capsule rupture along with vitreous loss. One patient had retinal detachment postoperatively. One patient had severe cystoids macular edema which was detected postoperatively most probably secondary to severe blunt trauma. Same patient developed macular scarring later.

Table 4: Distribution of patients according corrected visual acuity after 6 month

Visual acuity	No. of eyes	Percentage (%)
>6/12	20	50%
6/18 -6/60	16	40%
6/60 – PL+ PR+	03	7.5%
PL+PR faulty	01	2.5%

Post operative visual acuity was measured after six months of operative treatment. Visual acuity of 6/12 or better was attained in 50% cases. Visual impairment

i.e. visual acuity of 6/18 to 6/60 was attained by 16 patients (40%). Blindness i.e. visual acuity less than 6/60 was present in 4 cases (10%).

DISCUSSION

Present study was conducted with the objective to study the different modalities used for management of traumatic cataract and also to study intraoperative and postoperative complications and to evaluate final visual outcome. In the present study it was observed that majority of the individuals were young males. Various etiological factors were identified in the study causing traumatic cataract. Most common cause identified was agricultural accidents and other occupational accidents (25% each) followed by domestic accidents (15%). H.K. Tewari *et al*⁵, M. Krishnan *et al*² also reported similar observations in their study. Most common associated ocular damage was that of cornea in the form of corneal tear 40% and corneal opacity 5%. Overall corneal involvement was 45%. Obviously it was due to fact that cornea is the most exposed part of globe and therefore most liable to trauma. D. Hiles⁶ (50%), Koenig⁷ (50%), M. Blum⁸ (61%) and D.Singh⁹ (37.7%) have also noted a similar preponderance of corneal damage in their study. At the time of presentation visual acuity better than 6/60 was found only in one patient. Visual acuity less than 1/60 was found in 52.5%, preoperative hand movement close to face was present in 45% cases. Treatment modalities in the study patients were chosen depending upon the type of injury, associated complication, extent of vision loss and duration since injury etc. In present study there were 21 cases of blunt trauma and all underwent primary surgery while 4 out of 19 cases (21%) of perforating injury underwent primary lens surgery while 15 cases (79%) underwent secondary lens surgery. 32.5% of cases underwent Phacoemulsification with posterior chamber intraocular lens implantation. While other 32.5% of cases underwent extracapsular cataract extraction with posterior chamber Intraocular lens implantation. In studies conducted by M. Blum⁸, Koenig *et al*⁷, M. Eckstein *et al*¹⁰ extracapsular cataract extraction with intraocular lens implantation was procedure of choice. In four cases that had lens matter in Anterior chamber underwent aspiration with posterior chamber intraocular lens implantation. In one patient multiflex anterior chamber intraocular lens was implanted as patient had large posterior capsular rupture with vitreous loss. Simultaneous corneal tear repair with cataract extraction with posterior chamber implantation was carried out in 4 patients. Muga and Maul¹¹ advocated simultaneous corneal tear repair and lens extraction. According to them one step procedure was technically easier to perform with less postoperative inflammation and earlier visual

rehabilitation. J. Lamkin *et al*¹² also emphasized simultaneous corneal tear repair with cataract extraction with intraocular lens implantation as operative and anesthetic risk are reduced postoperative recovery is less complicated. Most frequent intraoperative complication was vitreous loss (15%) followed by posterior capsular tear in 5% cases. Small percentage of hyphema (2.5%) was also observed. Daljit Singh⁹ and J. Lamkin *et al*¹² also found nearly similar proportion of vitreous loss in their study. In our study, most frequent complication occurring in earlier postoperative period was moderate to severe uveitis (35%). In a study conducted by J.P. Bruke *et al*¹³ found that fibrinous uveitis more in pediatric population. In our study also, most of the patients having fibrinous uveitis were from pediatric age group. Koenig *et al*⁷ also found fibrinous uveitis leading to posterior synechiae, pupillary block glaucoma and lenticular membrane formation. Intraocular lens decentration was found in 2.5% of the patients while in earlier studies by David Hiles¹⁴, J.P. Bruke¹³ and others it was about 8%. Intraocular lens decentration was mostly due to inadequate support because of posterior capsular rupture with vitreous loss. Corrected visual acuity after 6 month of operative treatment was measured and it was observed that good visual acuity that is 6/12 or better was seen in 50% patients. Visual impairment (visual acuity of 6/18 to 6/60) was seen in 16 cases (40%). Blindness was taken to the visual acuity of less than 6/60. It was seen in 3 cases (7.5%). D. Benzra *et al*¹⁴, Churchill *et al*¹⁶, M. Eckstine *et al*¹⁰, D. Singh *et al*⁹ and Bhatia *et al*¹⁷ also reported significant post operative improvement in vision in their studies.

CONCLUSION

Most frequently used treatment modalities in traumatic cataract was phacoemulsification with PCIOL implantation and ECCE with PCIOL implantation each. Vitreous loss was the most common intraoperative complication whereas uveitis was most common post operative complication. Final visual outcome was better in cases with intraocular lens implantation.

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