ORIGINAL ARTICLE

ANALYSIS OF VISUAL PROGNOSIS AFTER SURGERY IN TRAUMATIC CATARACT

Dakshayani[1], Rakesh[2]

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INTRODUCTION: Cataract may be an early or late manifestation of ocular trauma. The two basic types of trauma-related lens abnormality are loss of transparency and loss of position. They may be combined and complicated by lens fragmentation or swelling.[1] Both penetrating and concussion injuries can cause cataract, the type of trauma, extent of lenticular involvement and associated damage to the ocular structure go a long way in determining the ultimate prognosis. The methods used to evaluate the visual outcome in eyes managed for traumatic cataracts and senile cataracts are similar, but the damage to other ocular tissues due to trauma may compromise the visual gain in eyes operated on for traumatic cataracts. Hence, the success rates may differ between eyes with these two types of cataracts. Any strategy for prevention requires knowledge of the cause of injury, which may enable more appropriate targeting of resources toward preventing such injuries. Both eye trauma victims and society bear a large, potentially preventable burden.[2] However regarding the time of intervention of cataract surgery it has been emphasized that in adults the treatment should be carried out and completed within a year following initial surgery and in children perhaps within six months.[3]

OBJECTIVES OF THE STUDY:

PRIMARY OBJECTIVE: To analyze the visual prognosis after surgery in traumatic cataract.

SECONDARY OBJECTIVES:

- To know the age and sex distribution of traumatic cataract.
- To know the distribution of object causing injury.
- To know the associated injuries with traumatic cataract.
- To know the visual prognosis in relation to various associated injuries.

REVIEW OF LITERATURE: Lacmanovic Loncar et al[1] performed a retrospective analysis of 24 eyes with traumatic cataract and found that visual acuity improved in 17 eyes. Phacoemulsification was performed in 4 cases and extracapsular cataract extraction (ECCE) in 20 cases. Intraocular lens was implanted in 22 cases Seven out of 24 patients did not benefit from cataract surgery because of traumatic involvement of the retina and opacification of posterior capsule.

Mehul Shah[2] in their study of traumatic cataracts found Open globe injury has a favorable prognosis for visual recovery after the management of traumatic cataracts.

Bhatia CM, Panda et al[3] (1982) conducted a study of 101 cases of traumatic cataract found the cause of poor vision was posterior capsular opacification.

Daljith Singh et al[4] (1982) in their studied of 61 cases of traumatic cataracts - final visual acuity of 6/6 to 6/12 was achieved in 70% of cases.

Das R, Roy M, Midya A[5] (1989) in their study of 14 cases of traumatic cataract who underwent cataract extraction with IOL implantation has proved to be useful.

Jones WL[6] (1991) studied the mechanism of traumatic cataract, concussive trauma to the eye produces shock-wave that progress and causes insult to both anterior and posterior structures.

Gupta AK, Grover AK, Gurha N[7] (1992) studied 22 cases of traumatic cataract who underwent intraocular lens implantation plays major role in good visual outcome.

Marcus Blum, Manfred R Tetz, Claudia G Reiners[8] (1996) studied 148 eyes with traumatic cataract. Blunt trauma group-A included 85 eyes, average age was 56.1±15.6 years. Penetrating trauma group-B included 63 eyes. Average age was 43.6±19.2. Post traumatic morphological changes included anterior chamber angle recession. Iris defects in almost every second eye. More than one-third eyes showed luxation or subluxation of lens.

Rate of secondary glaucoma was 14.4%. Group-A – 72 patients (84.7%), a posterior chamber IOL was implanted. Postoperatively 69 patients (82.1%) had mean visual acuity of 20/30, seven patients (8.2%) remained hand movements because nine of severe post traumatic retinal pathology. 9 patients with aphakia reached 20/40. In group B, 42 eyes (66.6%) PCIOL were implanted. This has postoperative visual acuity of 20/35. Twenty one eyes with aphakia had visual acuity in 14 eyes (22.2%) had of 20/45 and seven eyes (11.1%) had visual acuity of hand movements and light perception because of extensive damage to posterior segment.

Murali Krishnamachary, Varsha Rathi[9] (1997) reviewed 137 children, 110 boys and 127 girls who developed traumatic cataract. Nature of injury, type of cataract, management and outcome were evaluated and found ECCE with intraocular lens implantation provides satisfactory result. Associated posterior segment complication and development of PCO are major obstacles to visual rehabilitation.

MANAGEMENT: The most common various techniques advocated for extracting traumatic cataracts and dislocated lenses have been aspiration, loop extraction of the lens, erysophake extraction, extraction with a loop plus needle, a double needle operation, (in which lens is trapped and supported by passing two needles through pars plana posterior to the lens), a Calhoun–Hagler double needle (a double probed needle introduced behind the lens to trap it), and cryoextraction. The development of vitrectomy, phacoemulsification instrumentation and sophisticated irrigation and aspiration systems has added a safer dimension to the surgical treatment of this lens injuries.[20]

Medical Management: Medical therapy for a traumatically dislocated lens includes use of dilating or constricting drugs to minimize astigmatism resulting from off centering of the lens or effects of the lens edge within the visual axis. Mydriatics, conversely may allow some patients to view around a subluxated, cataractous lens using aphakic correction.[20]

Surgical Management: The optical rehabilitation of unilateral traumatic cataract patients with IOL implants is now widely accepted. However, there is no consensus on whether the traumatic cataract should be removed during the initial repair of the ocular laceration (primary procedure) and/or whether to implant an IOL at the time of lens removal (primary implantation).

Both secondary procedure and secondary implantation are rationalized to reduce the potential risk of increased inflammation and infection after closure of the wound and to avoid complicated implantation during an emergency operation.

The indications for surgical removal of a traumatic cataract are the same as for any cataract, but with some additional indications unique to the traumatized eye:

1. Vision decreased to a level unacceptable to the patient
2. The need to access, treat or follow retinal or optic nerve pathology
3. Capsule rupture with lens swelling
4. Lens induced inflammation
5. Secondary glaucoma caused by cataract
6. Other trauma related ocular pathology requiring surgical treatment.

The presence of a dislocated or subluxated lens is not necessarily an indication for surgical removal. Emergency surgical intervention is required only when there is an immediate threat to the health of the eye, as with relative papillary block, or dislocation into the anterior chamber. Induced myopia, astigmatism or extreme mono-ocular diplopia that cannot be treated with glasses or miotic therapy is relative indications for elective lens extraction.[20]

MATERIALS AND METHODS: The present study consists of 50 cases of traumatic cataract in age group of 5-45 years attending Minot Eye Hospital.

Out of 50 cases, 40 were males and were 10 females. SICS with PCIOL were done on 43 cases. Plain lens extraction was done on 3 cases. SFIOL implantation was done on 2 cases. Posterior segment surgeries were done on 3 cases which had intraocular foreign bodies. These 50 cases were asked detail history regarding cause of trauma, duration.

Associated ocular injury intra operative and postoperative complications were noted. All the patients were put on topical antibiotic steroids post operatively. The vision on post-operative day 1, 30 and 2 months were noted.

Inclusion Criteria: All the patients from age of 5-45 years having traumatic cataract due to blunt and penetrating injuries.

Exclusion criteria:

- Patients with adult onset cataract with traumatic cataract.
- Patients with complicated cataract.
- Patients with optic nerve avulsion.

These 50 cases of traumatic cataract were admitted and the following tests were done preoperatively:

1. Routine blood analysis.
2. Routine urine analysis.
3. Lacrimal patency test
4. Intraocular pressure measurement
5. Systemic examination
6. Blood pressure
7. Radiological study, B-Scan ultrasonography to rule out IOFB(intraocular foreign body), RD (retinal detachment), vitreous hemorrhage.

ANALYSIS OF DATA AND RESULTS: The study group consists of fifty cases of traumatic cataract. The age wise distribution, etiological distribution of traumatic cataract, type of cataract, associated ocular injuries, associated complications the surgical procedure, complication of the procedure and final visual outcome were analyzed.

AGE AND SEX ANALYSIS:

Age group	Male	Female	Total	Percentage
<10 years	9	0	9	18%
11-20 years	15	3	18	36%
21-30 years	5	4	9	18%
31-40 years	8	1	9	18%
>40 years	3	2	5	10%
	40(80%)	**10(20%)**	**50**	**100%**

TABLE 1: AGE AND SEX ANALYSIS

Age and sex analysis was done. Majority were between 11-20 years (36%), and 54 % were below 20 years. 80 % were males and 20 % females. Male to female ratio was 4:1.

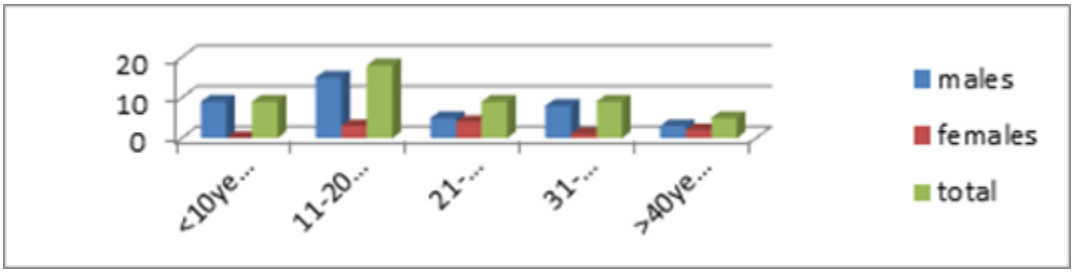

FIGURE 1: AGE AND SEX ANALYSIS

TYPE OF TRAUMA:

TYPE	MALE	FEMALE	TOTAL	PERCENTAGE
BLUNT	16	4	20	40%
PENETRATING	24	6	30	60%
TOTAL	**40**	**10**	**50**	**100%**

TABLE 2: TYPE OF TRAUMA

The type of trauma was noted. 60% (30) of the cases presented with penetrating injuries and 40% (20) of the cases presented with blunt trauma.

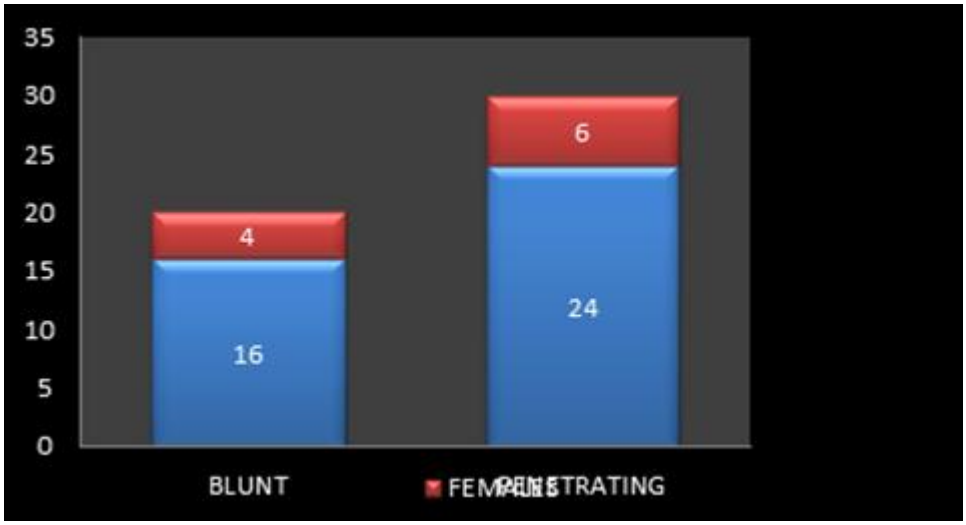

FIGURE 2: TYPE OF TRAUMA

OBJECTS CAUSING INJURY:

OBJECTS	NO. OF CASES	PERCENTAGE
STICK/WOOD	20	40%
STONE	8	16%
HAND/FINGER	5	10%
IRON	5	10%
PEN/PENCIL	4	8%
OTHERS	8	16%
TOTAL	**50**	**100%**

TABLE 3: OBJECTS CAUSING INJURY

The objects causing traumatic cataract were analyzed. Majority of the cases were caused by stick or wood injury (40%), followed by stone injury.

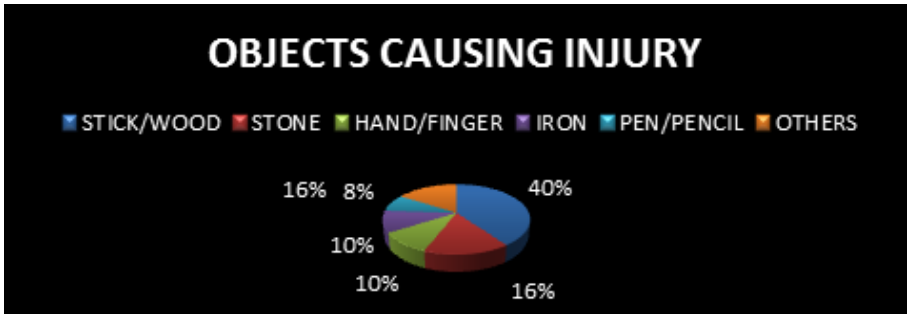

FIGURE 3: OBJECTS CAUSING INJURY

TIME OF PRESENTATION SINCE INJURY:

TIME SINCE INJURY	NO. OF CASES	PERCENTAGE
< 1 Week	11	22%
1week – 1 Month	11	22%
1 Month-6 Month	15	30%
.> 6 Months	13	26%
TOTAL	**50**	**100%**

TABLE 4: TIME OF PRESENTATION SINCE INJURY

22 % of the cases had presented within one week of injury, and majority of the cases (30%) presented between 1 month to 6 months. Penetrating trauma presented earlier then blunt trauma.

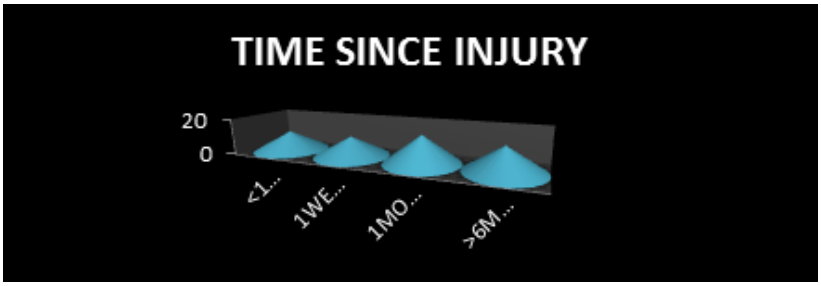

FIGURE 4: TIME OF PRESENTATION SINCE INJURY

VISUAL ACUITY AT PRESENTATION

VISUAL ACUITY	NO OF CASES	PERCENTAGE
Perception of light	9	18%
Hand movements	22	44%
Counting close to face	10	20%
1/60	4	8%
2/60	3	6%
6/36	2	4%
Total	**50**	**100%**

TABLE 5: VISUAL ACUITY AT PRESENTATION

Visual acuity at presentation was recorded by snellen's chart and converted into logMAR. Majority of the cases had poor vision. 82 % of the patients had vision less than counting fingers. Only two patients had visual acuity more than 6/60. The mean log MAR was 2.3879.

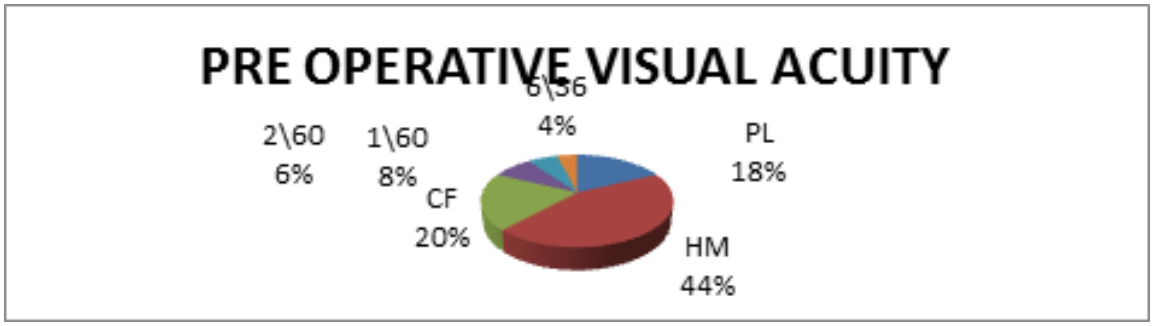

FIGURE 5: VISUAL ACUITY AT PRESENTATION

TYPE OF CATARACT:

TYPE	NO. OF CASES	PERCENTAGE
COMPLETE	15	30%
CORTICAL	17	34%
WHITE SOFT	14	28%
MEMBRANOUS	4	8%
ROSETTE	0	0%

TABLE 6: TYPE OF CATARACT

The type of traumatic cataract was analyzed. 17 cases (34 %) were of cortical type, where as there were 15 cases of complete cataract and 14 cases of white soft type. There were 4 cases of membranous cataract. No cases of rosette cataract were seen in our study of 50 cases.

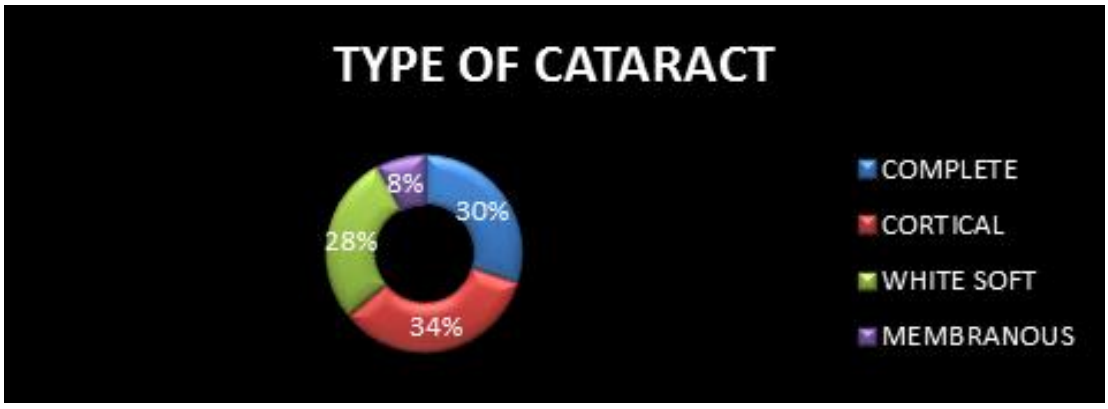

FIGURE 6: TYPE OF CATARACT

ASSOCIATED OCULAR INJURIES OR COMPLICATIONS:

Injuries	No. of cases	Percentage
Lid tear	1	2%
Esotropia	1	2%
Exotropia	4	8%
Sub conj hemorrhage	3	6%
Conjuctival tear	2	4%
Sclera tear	3	6%
Corneal tear	14	28%
Corneal opacity	19	38%
Iris holes	3	6%
Iridodialysis	3	6%
Posterior synechiae	14	28%
Anterior capsule rupture	14	28%
Lens subluxation	3	6%
Posterior capsule rupture	7	14%
Vitreous hemorrhage	5	10%
Retinal detachment	3	6%
Macular scar	2	4%
Endophthalmitis	1	2%

TABLE 7: ASSOCIATED OCULAR INJURIES OR COMPLICATIONS

The associated ocular injuries were analysed. Majority of the cases had corneal injuries. 19 cases (38%) had corneal opacities and 14(28%) had associated corneal tear. 5 cases (10%) had squint in the involved eye, in which 4 had exodeviation and one had esodeviation. 14 cases had posterior synechiae and 14 cases had rupture of the anterior capsule. 3 cases (6%) had lens subluxated. There were 7 cases with posterior capsule rupture. Among the posterior segment involvement, 5 (10%) had vitreous haemorrhage, 3 (6%) had retinal detachment, 2 (4%) had macular scar and one case had presented as endophthalmitis.

TYPE OF SURGERY:

TYPE	PROCEDURE	PERCENTAGE
SICS WITH PCIOL	43	86 %
PLAIN LENS EXTRACTION	3	6%
SFIOL IMPLANTATION	1	2%
WITH POST SEGMNT PROCEDURES	3	6%
A) 3PPV +LENS EXTRACTION+VITRECTOMY+FB REMOVAL+SFIOL	1	
B) 3PPV+LENS EXTRACTION+VITRECTOMY +FB REMOVAL +EL	2	

TABLE 8: TYPE OF SURGERY

ASSOCIATED PROCEDURES:

PROCEDURE	NO. OF CASES	PERCENTAGE
CT RING	1	2%
MEMBRANECTOMY	3	6%
TRABECULECTOMY	1	2%
CORNEAL TEAR REPAIR	1	2%

TABLE 9: TYPE OF SURGERY

The operative procedures were accessed. SICS with posterior chamber intraocular lens implantation were done on 43 cases (86%). Plain lens extraction was done on 3 cases. SFIOL implantation was done on 2 cases. Posterior segment surgeries were done on 3 cases which had intraocular foreign bodies.

COMPLICATIONS:

Complications	No. of cases	Percentage
Intraoperative		
Hyphaema	1	2%
Vitreous loss	3	6%
Post-operative		
Corneal edema	7	14%
Striate keratopathy	13	26%
Iritis	4	8%
Pupillary capture	2	4%
Posterior capsule opacification	3	6%
Choroidal detachment	1	2%

TABLE 10: COMPLICATIONS

The intraoperative and post-operative complications were studied. 3 cases had inadvertent posterior capsule rupture and vitreous loss. One case had hyphaema. Among the post- operative complications, 13 (26%) had striate keratopathy and 7 had corneal edema. 4 cases had severe iritis. One case of SFIOL implantation had choroidal detachment post operatively. 3 cases had posterior capsule opacification at a later date.

FINAL VISUAL ACUITY:

VISUAL ACUITY	NO. OF CASES	PERCENTAGE
<1/60	2	4%
1/60-3/60	7	14%
3/60-6/60	8	16%
6/60-6/18	17	34%
>6/18	16	32%

TABLE 11: FINAL VISUAL ACUITY

Final visual acuity after 2 months was accessed. Out of the 50 patients, only 2 had vision less than 1/60. 17 patients (34%) had vision between 6/60 -6/18. 16 patients (32%) had vision >6/18. The mean log MAR was 0.8573, compared to 2.3879 during pre-operative period. The mean log MAR in patients with corneal opacity was 0.968. The mean log MAR in patients with associated posterior segment surgeries was 1.4183. Each patient's pre-operative value was compared with post-operative value and paired t test was done. P value was found to be <0.0001, indicating that the result was statistically significant.

DISCUSSION: This is a prospective study of 50 patients who presented with traumatic cataract at Minto Ophthalmic Hospital &RIO.

Trauma is an important cause of monocular blindness in the developing world.[2] The incidence of traumatic cataract reflected in ophthalmic history varies from 1% to 15% of all ocular injuries.[25]

Successful rehabilitation of cases of traumatic cataract depends upon the type, the extent of injury, the first aid received, the time and quality of specialist's attention and the choice of rehabilitative procedures adopted. The success rate with cataract lenses or intraocular lenses depends upon the choice of the patients, the surgical technique employed, the operative and postoperative complications encountered etc. In lens implant cases the success will further depend upon the experience of the surgeon and the choice of intraocular lens design. A high rate of success has been reported by various authors.[4]

Age wise analysis in this study showed that traumatic cataract was seen more commonly in the young. 54% were in the age group below 20 years. And majority of the patients were males (80%). This may be due to greater outdoor activities of this age group and males, and aggressive kind of sports compared to females. Other studies also showed a similar result.

Age group	This study (n=50)	Daljit Singh et al[4] (n=61)
<10	18%	18.03%
11-20	36%	16.39%
21-30	18%	32.78%
31-40	18%	11.47%
>40	10%	19.66%

TABLE 12: COMPARISION OF AGE DISTRIBUTION

The median age of patients reported by Lacmanovic Loncar V [1]was 25 years (range, 3-45). Out of 101 cases of traumatic cataract studied by Bhatia IM et al[3], 63 were children and 38 were adults. The M:F ratio was 4:1, the same ratio as in this study.

TYPE OF TRAUMA: Majority of the cases were penetrating (60%) compared to blunt injuries (40%). Daljit Singh et al reported 54 % of the cases to be of penetrating and perforating and 39.3% to be blunt injuries. Renuka Srinivasan et al [33]reported that 88%of the cases were penetrating and the rest blunt. Mehul Shah et al[2] found in their study of 555 patients found that 344 patients had penetrating injuries.

OBJECTS CAUSING INJURY: In this study majority of the cases were caused by stick or wood injury (40%), and rest by stone (16%), hand (10%), iron (10%), pen/pencil(8%) and rest by others. Majority were caused due to stick or wood injuries as majority were from rural areas and children had a habit of playing with sticks and adults usually got injured when they worked in the fields. Mehul Shah et al.[2] in their study that 56.4% of the patients got injured by wooden stick and 13% by stone.

Lacmanovic Loncar V et al [1]reported in their study that injuries of the eye occur mostly during children play or in sport-related activities. Injuries are also often caused by a knife, toys, glass, bungee cord, wire, stick, pencil, or firecrackers.

TIME OF PRESENTATION SINCE INJURY: In this study 30% of the cases presented between 1 month to 6 months of the injuries and 22 % presented within 1 week of injuries. In general, penetrating injuries presented earlier in view of associated injuries and sudden loss of vision compared to blunt injuries.26 % presented more than 6 months after injuries. Bhatia et al[3] reported in their study that 3.3% cases presented on the same day and 17.7 % of the cases presented within a week. Majority of the cases (44.8%) presented within a year.

VISUAL ACUITY AT PRESENTATION: 82 % of the patients had vision less than counting fingers, and only two patients had visual acuity more than 6/60. The mean logmar was 2.3879. In studies by Renuka Srinivasan et al[33] and Krishnamachary M et al,[9] the preoperative visual acuity in the involved eye in majority of the cases was less than 6/60. The visual acuity of the other uninvolved eye also was recorded. All the eyes had good vision, better than 6/12.

TYPE OF CATARACT: 34 % were of cortical type, whereas there were 30% complete cataract and 28% of white soft type. There was 8% of membranous cataract. No cases of rosette cataract were seen in our study of 50 cases. Shah MA et al[2] in their study of 687 cases of traumatic cataract reported that there were 60 % of cases with white soft cataract, 26.6 % were of complete type, 12.2 % was of membranous type and 1.2 % was of rosette type.

ASSOCIATED OCULAR INJURIES: Majority of the cases had corneal injuries. 19 cases (38%) had corneal opacities, which had a poor visual prognosis post operatively. 5 cases (10%) had squint in the involved eye, in which 4 had exodeviation and one has esodeviation. Squint in involved eye may indicate stimulus deprivation ambyopia and indicates poor visual prognosis postoperatively.28% had posterior synechiae and 28% had rupture of the anterior capsule.

There were 14% of cases with posterior capsule rupture. Among the 8 cases which had posterior segment involvement, 5 (10%) had vitreous haemorrhage, 3 (6%) had retinal detachment, 2 (4%) had macular scar and on1 case had presented as endophthalmitis. Cases with posterior segment involvement had a poor prognosis compared to patients without posterior segment involvement.

Lacmanovic Loncar V et al [1]encountered the following preoperative complications corneal scar because of a previous large corneal laceration (28%), anterior capsular rupture (12.5),

anterior synechiae, sphincter damage, iridodialysis, zonulle loss, vitreous hemorrhage, and macular scar. Mehul et al[2] reported 71.3 % of cases were associated with corneal injuries.

	Corneal injuries	Iris injuries	Lens subluxation
Present study	66%	12%	6%
Daljit Singh et al[4]	37%	26.2%	6.5%
Krishnamachary et al[9]	60.5%	49.6%	---
Mehul et al[2]	71.3%	2.9%	---

TABLE 13: COMPARISION OF ASSOCIATED INJURIES

CONCLUSION: This study was done to analyze the visual prognosis after surgery in traumatic cataract and its relation to various associated injuries. 50 cases of traumatic cataract were studied who presented to Minto Ophthalmic Hospital & RIO, Bangalore Medical College. Majority of the patients were of the young age and males were 4 times more common than females. Majority of the cases were due to penetrating trauma. Most of the cases were caused by stick injury as most of them were from rural areas, followed by stone injury. Only 22% of the patients had presented within a week and rest presented later.

Majority of the patients had a preoperative vision of less than counting fingers. Most of the cataract was of complete and cortical type. Among the complications corneal injuries were common. Majority of of the patients underwent SICS with PCIOL like any other senile cataract. One case with zonular dehiscence was managed with CT ring. And two cases with PCR were treated with SFIOL. Among the post-operative complications, striate keratopathy was common. Post-operative vision was good in majority of the patients.

Only 18 % of the patients had vision less than 3/60 and 82% had vision more than 3/60. Post-operative vision was much less in patients with associated corneal opacities and posterior segement involvement. Each patient's pre-operative value was compared with post-operative value and paired t test was done. P value was found to be <0.0001, indicating that the result was statistically significant. IOL implantation could be done in 90% of our cases.

In conclusion majority of the cases can be treated successfully surgically with PCIOL implantation and visual outcome worsens if there is an associated corneal opacity or a posterior segment involvement.

SUMMARY: This was a prospective study done on 50 patients who presented with traumatic cataract from October 2010 to October 2012, to Minto Ophthalmic Hospital. Detailed evaluation was done preoperatively and recorded. 80% were males and 20 % females. 54 % of the patients were below 20 years of age.60 % of the cases was of penetrating type and 40 % of the cases were caused due to blunt trauma. Majority of the cases were caused by stick or wood injury (40%), followed by stone injury.

22 % of the cases had presented within one week of injury, and majority of the cases (30 %) presented between 1 month to 6 months. Penetrating trauma presented earlier then blunt trauma. Visual acuity at presentation was recorded by snellen's chart and converted into log MAR. Majority of the cases had poor vision. 82 % of the patients had vision less than counting fingers.

Only two patients had visual acuity more than 6/60. The mean logMAR was 2.3879. 17 cases (34 %) were of cortical type, whereas there were 15 cases of complete cataract and 14 cases of white soft type. 19 cases (38%) had corneal opacities and 14 (28%) had associated corneal tear. 5 cases (10%) had squint in the involved eye, in which 4 had exodeviation and one has esodeviation. 14 cases had posterior synechiae and 14 cases had rupture of the anterior capsule.

3 cases (6%) had lens subluxated. There were 7 cases with posterior capsule rupture. Among the posterior segment involvement, 5 (10%) had vitreous haemorrhage, 3 (6%) had retinal detachment, 2 (4%) had macular scar and one case had presented as endophthalmitis. SICS with posterior chamber intraocular lens implantation were done on 43 cases (86%). Plain lens extraction were done on 3 cases.

SFIOL implantation was done on 2 cases. Posterior segment sugeries were done on 3 cases which had intraocular foreign bodies. Among the post-operative complications, 13 (26%) had striate keratopathy and 7 had corneal edema. 4 cases had severe iritis. One case of SFIOL implantation had choroidal detachment post operatively. 3 cases had posterior capsule opacification at a later date.

Final visual acuity after 2 months was accessed. Out of the 50 patients, only 2 had vision less than 1/60. 17 pts (34%) had vision between 6/60 -6/18. 16 patients (32%) had vision >6/18. The mean logMAR was 0.8573, compared to 2.3879 during pre-operative period. The final visual acuity decreased significantly if the patient had a corneal opacity. The mean log MAR in patients with corneal opacity was 0.968. The visual acuity in patients with associated posterior segment surgeries was worse. The mean log MAR in such patients was 1.4183. Each patient's pre-operative value was compared with post-operative value and paired t test was done. P value was found to be <0.0001, indicating that the result was statistically significant. IOL implantation could be done in 90% of our cases.

Thus our study showed that traumatic cataract can be successfully managed surgically with intraocular lens implantation with good visual outcome, unless there is associated corneal opacity or posterior segment involvement.

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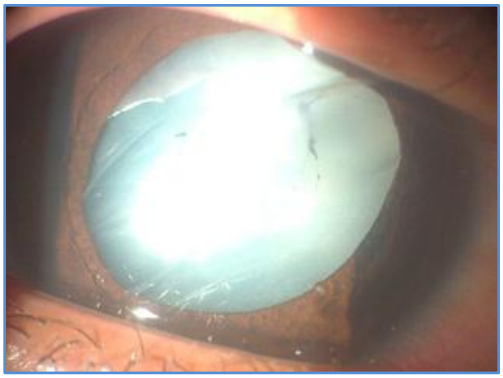
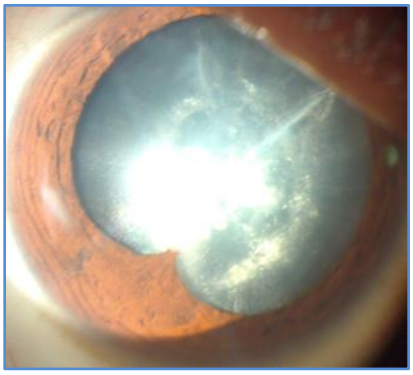
KEY TO MASTER CHART:

m- male
f-female
d-days
mn –month
y-year
r-right
l-left
p-penetrating
b-blunt
n-normal
eso- esotropia
pig-pimented
pvd-posterior vitreous detachment
vh-vitreous hemorrhage
fb- foreign body
rd- retinal detachment
sch- subconjuctival hemorrhage
tr- tear
pl- perception of light
cf – counting fingers
hm-hand movements
exo-exotropia

COLOUR PLATE 1

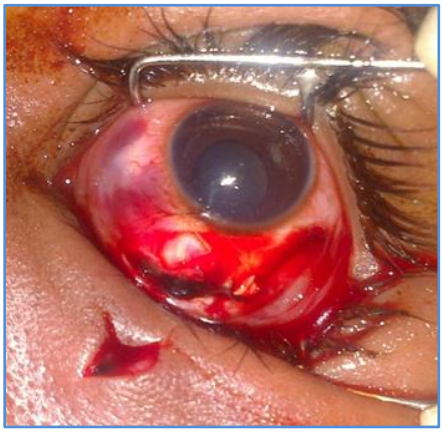


1. Total traumatic cataract with corneal tear

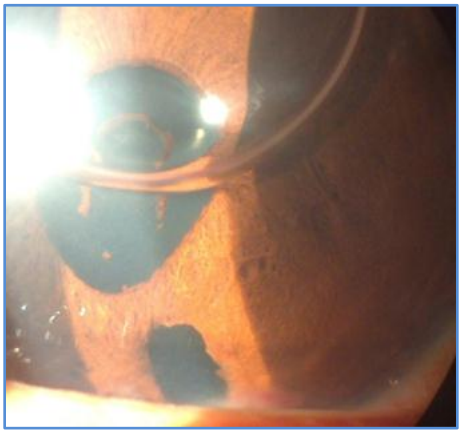


2) Traumatic cataract with posterior synechiae at 7'O clock

COLOUR PLATE 2

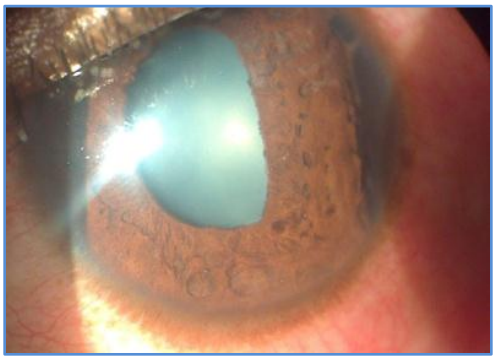


3) Scleral tear with Traumatic cataract

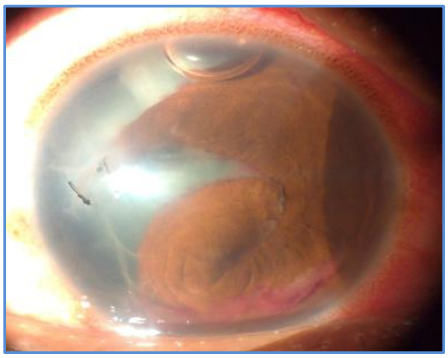


4) Vossius ring with iris hole

COLOUR PLATE 3

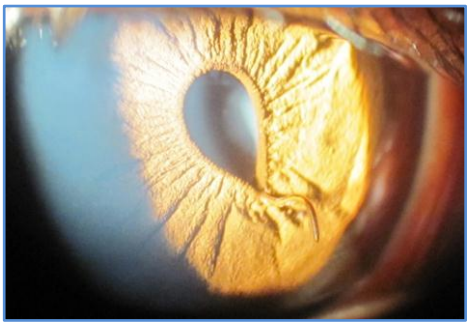


5) Traumatic cataract with iridodialysis

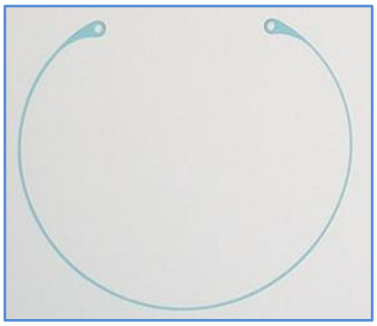


6) Traumatic cataract with repaired corneal tear with iridodialysis

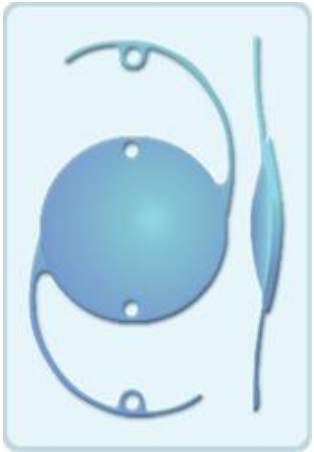
COLOUR PLATE 4



7) Traumatic cataract with foreign body (copper wire)

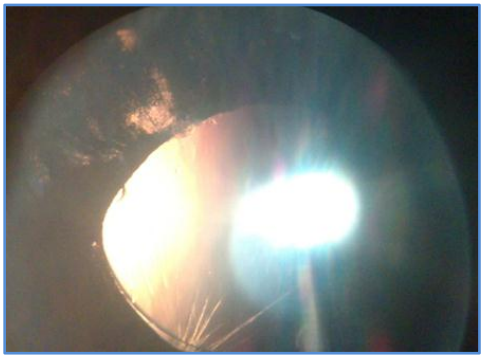


8) Capsular tension ring

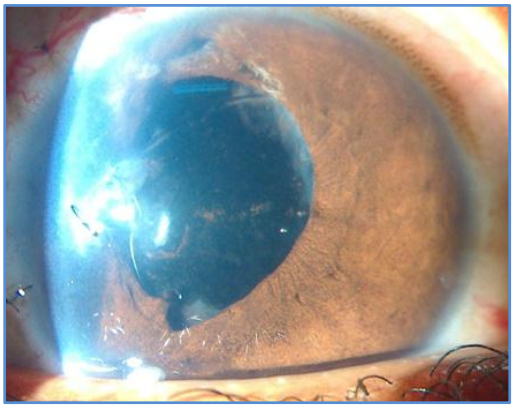


9) Scleral fixated lens

COLOUR PLATE 5



10) Postoperative case with PCIOL and iris atrophy



11) Post-operative case with corneal sutures and PCIOL

AUTHORS:

1. Dakshayani
2. Rakesh

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Ophthalmology, Bangalore Medical College and Research Institute, Bangalore.
2. Resident, Department of Ophthalmology, Bangalore Medical College and Research Institute, Bangalore.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Dakshayani,
Associate Professor,
Minto Eye Hospital & Research Institute,
BMC & RI, Bangalore.
E-mail: kousalya.kanakaraju@gmail.com

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