

Clinical Outcomes of Management of Traumatic Cataract in a Tertiary Care Centre.

Anu Radha Bharti¹, Pallavi Sharma¹, Sachit Mahajan², Bhavani Raina³, Sanjay Kai⁴

1. Senior resident, Upgraded Department of Ophthalmology, Government Medical College, Jammu.

2. Junior Resident, Upgraded Department of Ophthalmology, Government Medical College, Jammu

3. Lecturer Upgraded Department of Ophthalmology, Government Medical College, Jammu.

4. Professor, Upgraded Department of Ophthalmology, Government Medical College, Jammu

Corresponding address: Dr. Sachit Mahajan, Lane No. 2 (Down), Greater Kailash, Jammu, Jammu and Kashmir, India. 180011. Ph +91-9419238870

Email: mahajansachit1992@gmail.com

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ABSTRACT

Background and Objectives : Ocular trauma can lead to development of cataract when natural lens is damaged by either blunt or penetrating injury. The management of traumatic cataract follows the same principle as for senile cataract but associated damage to ocular tissues and several post-operative complications may lead to suboptimal visual outcome. This study was conceptualized to evaluate the visual outcomes following management of traumatic cataracts.

Material and Methods : This prospective, longitudinal study was conducted on 80 patients with traumatic cataract in tertiary care centre. Patients were managed surgically and were followed up for a period of six months. Visual acuity was measured at every follow-up visit and any post-operative complications were noted and managed, accordingly. Final visual acuity was assessed at the end of six months.

Results: Maximum cases of traumatic cataract (53.75%) were observed in age group of <20 years with male to female ratio of 2.63:1. Maximum patients (92.15%) were implanted posterior chamber intraocular lens, either as a primary or secondary procedure. Uveitis and posterior capsular opacification were most common post-operative complications (30%) and 68.75% cases achieved a final visual acuity of 6/6-6/18 at the end of six months.

Conclusions

Traumatic cataract is an important cause of ocular morbidity specially in young patients. Surgery in cases of traumatic cataract can yield good visual outcomes if posterior segment is not involved and if post-operative complications are managed efficiently.

Key words: Cataract; Eye injuries; Visual Acuity; Intraocular Lens; Cataract Extraction.

Background and objectives

Trauma is a major cause of unilateral blindness and visual impairment worldwide.¹ The World Health Organization (WHO) has estimated that 55 million ocular injuries occur each

year, out of which 750000 people require hospitalization.² The prevalence of ocular trauma has been estimated to be around 2.4% in India.³ Ocular trauma can lead to development of cataract when natural lens is damaged by either blunt or penetrating injury. The management of traumatic cataract follows the same principle as for senile cataract but associated damage to ocular tissues may lead to compromise the final visual acuity.⁴ Several post-operative complications like inflammation, corneal scarring, secondary glaucoma, pupillary capture, posterior capsular opacification, macular edema and retinal scarring may lead to suboptimal visual outcome.⁵⁻⁹ Keeping in view the complications associated with management of traumatic cataracts, this study was conceptualized to evaluate the visual outcomes following management of traumatic cataracts, in a effort to generate evidence for managing traumatic cataracts more effectively.

Materials and Methods

This prospective, longitudinal study was carried out over a period extending from December 2018 to March 2020 in a tertiary care teaching hospital after obtaining appropriate ethical clearance from Institutional Ethics Committee.

This study included 80 patients of traumatic cataract as a result of ocular injury from blunt or penetrating injury. Patients who fulfilled the following criteria were included in the study and a written informed consent was taken from all the study participants after explaining the purpose of the study.

Inclusion criteria:

Patients above 5 years age and of either gender, having traumatic cataract due to blunt or penetrating injury.

Exclusion criteria:

1. Patients less than five years of age.
2. Traumatic cataract with retained intraocular foreign bodies, vitreous haemorrhage, retinal detachment.
3. Cases with corneal laceration >10 mm.
4. Cases with anterior segment injuries like iridodialysis, zonular dehiscence, gross pupillary distortion.

After admission to the hospital, detailed occur history regarding age, mode of injury, cause of injury, time and place of injury was recorded. Pre-operative best corrected visual acuity (BCVA) was recorded with Snellen visual acuity chart. Extraocular movements, detailed slit lamp examination of anterior segment, pupillary reflexes, intraocular pressure (IOP) were recorded. Dilated fundus examination with indirect ophthalmoscopy and B-scan ultrasound was also done.

Keratometry, axial length measurement with ultrasound biometer and intra-ocular lens (IOL) power calculation was done.

All cases were underwent surgery under local or general anaesthesia. Small incision Cataract Surgery (SICS) with posterior chamber IOL implantation, primary lens aspiration at the time of wound repair with primary or secondary IOL implantation were performed. Patients were started on topical steroids, cycloplegics and topical antibiotics postoperatively and were discharged on second day after the surgery. Patients were followed up after five days, once a week for next six weeks and then monthly for six months. On every follow-up visit, visual acuity and IOP were recorded, detailed slit lamp biomicroscopy was done to rule out any complications. Posterior segment evaluation with indirect ophthalmoscopy was also done.

All the data was entered into Microsoft excel and subsequently analyzed.

Results

In this study, 53.75% patients were < 20 years of age, followed by 31.25% patients between 21-40 years of age and 15% patients >40 years of age, with age range of 7-60 years. The male to female ratio was 2.63:1 with 71.25% males.

Majority of patients (65%) had penetrating injury 35% had blunt injury. The most common causative agent were wooden objects (65%) like sticks, arrows; followed by metallic objects (17.5%) like wires. (Figure 1)

Visual acuity at the time of presentation is shown in table 1.

The morphology of cataract is shown in figure 2.

The time interval to surgery was less than 1 month in 22 (27.5%) cases, between 1-3 months in 36 (45%) cases, 4-6 months in 14 (17.5%) cases and more than six months in 8 (10%) cases.

Fifty nine (73.75%) cases underwent SICS with IOL implantation as standard procedure. 16 (20%) cases, which had ruptured anterior lens capsule underwent primary lens matter aspiration. 9 cases out of these, underwent primary IOL implantation, and 7 cases underwent secondary IOL implantation. Five cases remained aphakic. The type of IOL implanted in patients is shown in figure 3.

Various intraoperative and postoperative complications during surgery is shown in table 2

In patients with severe posterior capsular opacification, Nd:YAG capsulotomy was done in 16 (20%) cases.

The final visual outcome of patients at the end of six months is presented in table 3

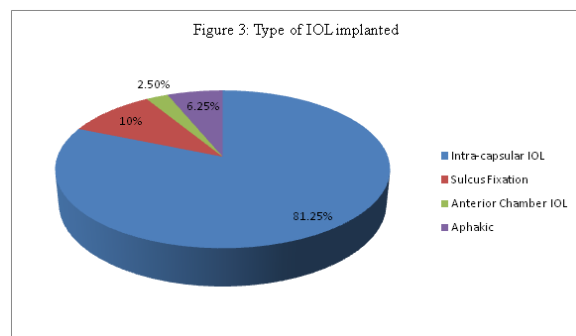
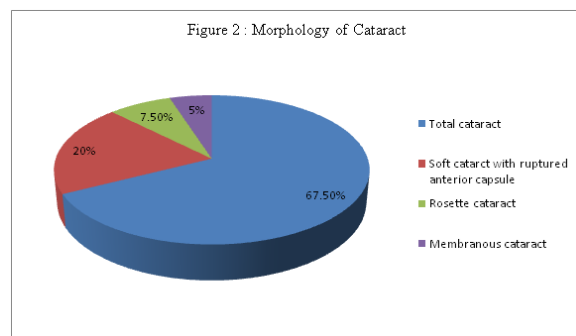
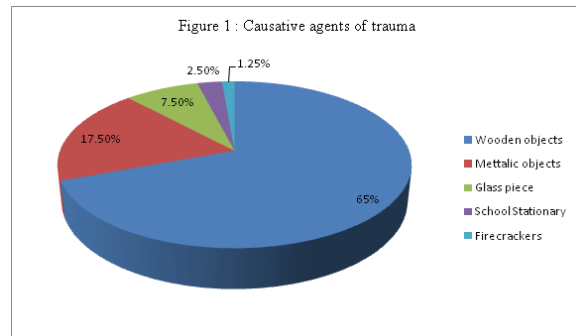


Table 1: Visual acuity at the time of presentation

Visual acuity	n	percentage
>6/60	4	5%
1/60- 6/60	20	25%
Counting fingers	5	6.25%
Hand movements	7	8.75%
Perception of light	44	55%

Table 2 : Intra-operative and post-operative complications encountered during surgery

Complications	N	Percentage
Intra-operative		
Vitreous loss	5	6.25%
Hyphema	3	3.75%
Post-operative complications		
Increased IOP	7	8.75%
Uveitis	24	30%
Pupillary capture	5	6.25%
Posterior capsular opacification	24	30%
Macular edema	8	10%
Corneal edema	7	8.75%
Hyphema	5	6.25%

Table 3: Final Best corrected visual acuity at the end of six months

Visual acuity	N	Percentage
6/6 – 6/18	55	68.75%
6/24- 6/60	22	27.5%
<6/60	3	3.75%

Discussion

In present study, 53.75% were under 20 years of age with male to female ratio of 2.63:1. Sofi IA et al, reported that 50% patients were <20 years of age and 32.5% patients were in the age group of 21-40 years, with a male to female ratio of 3:1 in their study.¹⁰ Similarly, Zaman M et al reported maximum patients (50%) in the age group of 5-15 years, with male to female ratio of 8.6:1.¹¹ Bhandari AJ et al, reported that maximum patients (38%) were in the age group of 26-35 years, with male to female ratio of 1.5:1.¹² Panda A et al reported maximum patients (31.25%) in the age group of 15-24 years and 21.42% patients in the age group of 35-44 years, with male to female ratio of 2.5:1.¹³ Young males are more commonly affected with ocular trauma due to their involvement in outdoor and sports related activities.

Penetrating injuries were common (65%) as compared to blunt injuries (35%) in our study. Similar findings have been reported by Memon MN et al, who reported 68.3% cases of penetrating injuries,¹⁴ Sofi IA et al, who reported 62.5% cases of penetrating injuries¹⁰ and Synder A et al, who reported 78.6% cases of penetrating injuries.¹⁵ Staffieri SE et al, reported 88% cases due to penetrating injuries,¹⁶ which is much higher than

our study.

Maximum cases of injuries were caused by wooden objects (65%) in our study. Similar observations have been made by Shah M et al, who reported 56.4% cases of injuries caused by wooden objects and¹⁷ Memon MN et al, reported 31.7% cases of injuries by wooden stick and 17.1% cases caused by stone.¹⁴ Whereas, Zaman M et al, reported 19.48% cases of injuries by stone,¹¹ in their study.

Ahmed N et al reported 50% cases with visual acuity of hand movements¹⁸ and Kumar S et al reported maximum cases (85.96%) with visual acuity of perception of light¹⁹ which is similar to our study, where maximum patients (55%) had visual acuity of perception of light, followed by visual acuity of 1/60-6/60 in 25% cases.

With regards to morphology of cataract, Panda A et al, reported 74% cases with total cataract,¹³ Shah M et al, reported 59.9% cases with soft cataract and 26.6% cases with total cataract.¹⁷ Sofi IA et al, reported 67.5% cases with total cataract, soft cataract with ruptured anterior capsule in 24% cases, and rosette cataract in 8% cases,¹⁰ which is similar to our study with 67.5% patients with total cataract and 20% patients with soft cataract.

In our study 90% patients were operated with six months, with 72.5% cases undergoing surgery within three months and 27.5% cases undergoing surgery within a month. Eckstein M et al reported that 56% patients underwent surgery within a month and 87% patients in 6 months.²⁰ Zaman M et al, reported that 22.07% cases underwent surgery within a month and 35.06% cases underwent surgery in 1-3 months.¹¹ Memon MN et al, reported that 41.5% patients underwent surgery in 1 month and 39% patients in 1-6 months.¹⁴ All these studies are in corroboration with our study.

Regarding surgery, Panda A et al reported PCIOL implantation in 77.6% cases,¹³ Kumar S et al reported PCIOL implantation in 97% cases¹⁹ and Memon MN et al, reported 95.12% cases with PCIOL implantation,¹⁴ similar to our study where 81.25% cases had intra-capsular IOL implantation and 10% cases had sulcus fixation of IOL. Most common post-operative complications in our study were uveitis (30%) and posterior capsular opacification (30%). Similar rates of complications have been observed by Synder A et al, uveitis in 30.9% cases,¹⁵ Loncar VL et al, corneal edema in 8.3% cases, hyphema in 4.16% cases, uveitis in 20.83% cases and 21 Zaman M et al, PCO in 23.37% cases, anterior chamber inflammation in 25.97% cases, hyphema in 3.89% cases.¹¹ Patients with uveitis were managed with topical steroids and cycloplegics and patients with increased IOP were given anti-glaucoma medications depending on the rise of IOP from baseline. Nd:YAG capsulotomy was done in 20% cases due to severe posterior capsular opacification. Sofi IA et al, reported that 17.5% cases needed capsulotomy due to thick PCO, in their study.

Final visual outcome was favourable in most cases with 68.75% cases achieving visual acuity of 6/6-6/18 in our study. Memon MN et al, reported that 70.8% cases achieved visual acuity of >6/18 in their study.¹⁴ Eckstein M et al, observed that 67% patients achieved visual acuity of >6/12,²⁰ Zaman M et al, reported visual acuity of 6/6-6/12 in 68.83% cases¹¹ and Kumar S et al, reported 71.9% cases with visual acuity of 6/6-6/18,¹⁹ corroborating well with our study.

Conclusion

Thus, we conclude that traumatic cataract is an important cause of ocular morbidity specially in young patients. Penetrating injuries most commonly lead to development of traumatic cataract. Surgery in cases of traumatic cataract with posterior chamber IOL implantation can yield good visual outcomes if posterior segment is not involved and if post-operative complications are managed efficiently.

Conflicts of interest: None

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