

Study of Visual Outcome in Patients with Traumatic Cataract with Intraocular Lens Implantation

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Abstract:

Background: The leading causes of visual impairment worldwide is Ocular trauma and an important public health problem. Ocular trauma includes mechanical injuries (open globe and closed globe injury) and non-mechanical injuries. Each of these categories can lead to traumatic cataract causing visual impairment. Traumatic cataract grossly differs from other forms of senile or acquired cataract and hence the present study aims to evaluate the post operative visual outcome in cases of traumatic cataract.

Materials and Methods: This was a hospital based prospective interventional study among 25 patients diagnosed with traumatic cataract attending out patient department of ophthalmology, SVRRGGH, Tirupati during Dec 2019 to Nov 2020. Patients with pre-existing ocular disease, posterior segment involvement and retained intraocular foreign body were excluded from the study. After taking written and informed consent detailed history and ophthalmological evaluation was done. Depending upon the clinical situation, the surgical management of traumatic cataract was performed. The associated ocular damage was managed initially followed by cataract extraction with intraocular lens implantation. The surgical procedure performed was based on the morphology of cataract, the status of the lens capsule and zonules and the condition of tissues other than the lens. Extracapsular cataract extraction either manual small incision cataract surgery (temporal/superior) or phacoemulsification with posterior chamber intraocular lens (rigid/foldable IOL) implantation was performed. Patients were followed up subsequently and visual acuity was recorded. Appropriate statistical tests were applied.

Results: It was found that majority of cases 44% were aged between 51 to 60 years. 72% (18 out of 25) cases had sustained blunt trauma and 28% of cases (7 out of 25) had sustained penetrating injury. The final visual acuity was between 6/6 to 6/9 in 60% of cases. The predictive value of Ocular trauma score is comparatively higher in the present study but statistical significance was not present.

Conclusion: Traumatic cataract is a visually challenging sequel of trauma and causes psychological stress and a significant economic burden in developing countries like India. The factors that influence the final visual outcome are: initial visual acuity, type of injury, wound location, associated ocular injuries, the timing and type of surgical procedure and IOL implantation. The management of traumatic cataract requires many individualized and conscious decisions regarding the timing, type of surgery and methods to follow to achieve the best possible outcome.

Keywords: Traumatic cataract, ocular trauma, visual outcome.

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I. Introduction

Ocular trauma is often the most important cause of unilateral blindness, particularly in developing countries (1). 18 million people worldwide suffer from ocular trauma each year (2). Ocular trauma includes mechanical injuries (open globe and closed globe injury) and non-mechanical injuries which can lead to traumatic cataract causing visual impairment. Traumatic cataract grossly differs from other forms of senile or acquired cataract not only in morphology but also in the visual outcome that can be achieved (3). Such cataracts are usually associated with injuries to other ocular structures. These factors help in determining the ultimate visual prognosis in the 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 (4). The extent of associated damage to the anterior and posterior segment, time of intervention, operative, and postoperative complications determine the ultimate prognosis (5). It is essential to study the effect of time interval between injury and first intervention as the morphology of traumatic cataracts is influenced by

this interval. The present study was conducted to evaluate the postoperative visual outcome in cases of traumatic cataract.

II. Materials And Methods

This was a hospital based prospective interventional study conducted over a period of one year from Dec 2019 to Nov 2020 at Department of Ophthalmology , Sri Venkateswara Medical College and SVRR Government General Hospital, Tirupati, Andhra Pradesh, which included 25 patients diagnosed as traumatic cataract attending the outpatient department of Ophthalmology SVRRGGH, Tirupati.

Inclusion Criteria:

Cases of traumatic cataract fulfilling the following criteria and who gave written and informed consent (in case of children consent was taken from their parents / guardian)

1. Age group of 6 to 60 years.
2. Traumatic cataract due to blunt and penetrating injuries.
3. Traumatic cataract with injury to the anterior segment of the eye.

Exclusion Criteria:

1. Traumatic cataract associated with pre-existing ocular disease.
2. Traumatic cataract having posterior segment involvement (retinal detachment, optic nerve damage, macular disorders).
3. Traumatic cataract due to retained intraocular foreign body.

Methodology:

After obtaining institute ethics committee approval and written informed consent from all the subjects, patients underwent a complete ophthalmic examination which included the following:

History was taken from the patient or the parents in case of a child regarding, decrease in vision and associated complaints of redness, pain, photophobia and watering, nature of trauma, the object causing trauma, duration between the occurrence of injury and initiation of treatment and pre-existing ocular diseases. Ocular Examination involved

- Visual acuity at presentation was recorded using self-illuminated distant Snellen's visual acuity chart in adults and in cooperative children 'E' chart was used for vision testing.
- A detailed anterior segment examination was done under diffuse illumination and by slit lamp biomicroscopic examination (Carl Zeiss Meditec AG 07740 Jena, Germany)
- Tonometry by Goldmann applanation tonometer in cases without corneal involvement. In cases with corneal surface irregularities e.g., corneal abrasion, lacerations estimation of intraocular pressure couldn't be done.
- Nasolacrimal duct syringing
- Direct ophthalmoscopy
- Indirect ophthalmoscopy for peripheral retina visualization.
- B-scan ultrasonography to rule out posterior segment involvement (except in open globe injuries)
- Gonioscopy was done in blunt trauma cases to rule out angle recession
- Keratometry was done to determine preoperative astigmatism (in case of corneal scarring keratometry of another eye was calculated).
- A-scan biometry was done to determine the power of the intraocular lens to be implanted. In case of corneal scarring the power of the other eye was calculated.
- Ocular trauma score calculation was done and the prognosis was explained to the patient.

MANAGEMENT

Ocular damage associated with the trauma was managed initially, In cases of corneal laceration, repair was done first followed by cataractous lens extraction after an interval of 6 weeks. Corneal wounds are closed with 10-0 nylon burying knots. In paediatric cases, the wound was closed with higher tension than juxtaposition as the cornea are more elastic. In cases of iris prolapse, abscission of the iris was done and lens extraction with implantation of the intraocular lens was performed at a later date. A delay of 3 to 4 weeks was allowed for corneal healing and reduction of the inflammatory response. Extracapsular cataract extraction either small incision cataract surgery (temporal/ superior) or phacoemulsification with posterior chamber intraocular lens (rigid/foldable IOL) implantation were performed in the present study. After obtaining informed written consent for surgery, the preoperative regimen had systemic antibiotics, oral acetazolamide and topical antibiotic drops. Systemic and topical antifungal was used in cases of stick injury. On the day of surgery, dilatation was done with topical 0.8% tropicamide, 5% phenylephrine hydrochloride eye drops. Flurbiprofen eye drops was instilled every 15 minutes for 2 hours. In adults, surgery was performed under peribulbar anaesthesia and in

children under general anaesthesia. The surgical procedure was based on the morphology of cataract, the status of the lens capsule and zonules and the condition of tissues other than the lens. In cases with zonular weakness, capsular tension ring was implanted to stabilize the bag and anterior vitrectomy was done whenever required. At the end of the surgery the wound was assessed for leakage and all wounds were completely sealed. Post operatively all cases received topical steroid- antibiotic and cycloplegic eye drops. The study subjects were regularly followed up after 1 week, 4 weeks, 6 weeks postoperatively. At each follow-up visit visual acuity and acuity with pinhole and BCVA was assessed. Slit-lamp examination was done Keratometry was done at the end of 6 to 8 weeks to determine the postoperative astigmatism. Fundus examination was done at each visit to rule out posterior segment complication. After 6 weeks retinoscopy was performed for all cases and correction was given. The final results were recorded. Postoperative complications were noted and the cause for decreased visual acuity was determined. The other eye was looked for signs of sympathetic ophthalmitis.

Statistical Analysis:

Data was entered into excel sheet and statistical analysis was done using SPSS version 22.0 and p-value <0.05 was statistically significant. Distribution of variables were assessed and chi square test was employed.

III. Results

A total of 25 eyes of 25 patients of traumatic cataract were included in the study. These cases were studied according to the age, gender, mode of injury, associated ocular damage, morphology of traumatic cataract, pre and post-operative visual acuity and postoperative causes of decreased visual acuity.

Table 1 shows the distribution of 25 cases of traumatic cataract according to age. It was found that majority of cases were in the age group of 51 to 60 years (44%), males constituted higher proportion than females.

TABLE 1: Distribution of cases according to age and gender

AGE (years)	TOTAL NO OF CASES	PERCENTAGE OF CASES (%)
<10	3	12
11 –20	1	4
21 –30	2	8
31 –40	4	16
41 –50	4	16
51 –60	11	44
GENDER DISTRIBUTION		
MALES	18	72
FEMALES	7	28

Table 2 shows distribution of 25 cases of traumatic cataract cases according to the type of trauma. 18 cases (72%) have sustained blunt trauma and 7 cases (28%) have sustained penetrating type of injury. The most common type of injury causing traumatic cataract in the present study was blunt trauma.

TABLE 2: Distribution of cases according to type of trauma

TYPE OF TRAUMA	TOTAL NO OF CASES	PERCENTAGE OF CASES (%)
BLUNT	18	72
PENETRATING	7	28

Table 3 shows distribution of cases according to the object causing trauma. Among 25 cases of traumatic cataract, the most common object causing trauma was stick in 11 cases (44%) followed by stone in 7 cases (28%), thorn in 2 cases (8%), pen in 2 cases (8%), wooden piece in 1 case (4%), cow tail in 1 case (4%) and fingernail in 1 case (4%). In this study, the objects that caused blunt injuries were wooden piece, stick, cow tail, and stone. The objects that caused penetrating injuries were stick, thorn, pen, and fingernail.

TABLE3:Distributionofcasesaccordingtotheobjectcausingtrauma

OBJECT CAUSING TRAUMA	TOTAL NO OF CASES	PERCENTAGE OF CASES (%)
Wooden piece	1	4
Stick	11	44
Cowtail	1	4
Thorn	2	8
Stone	7	28
Pen	2	8
Fingernail	1	4

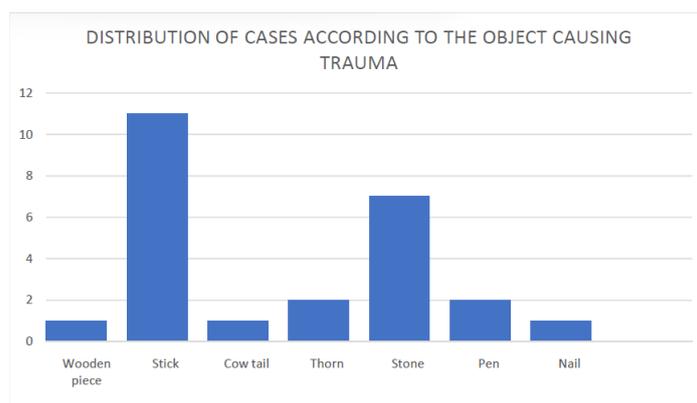


Figure 1: Object causing Trauma

Table 4 shows the distribution of cases according to ocular trauma score (OTS) in which majority of subjects, 22 out of 25 cases (88%) of traumatic cataract had OTSscore3. Out of 25 cases (12%) had OTSscore 4.

Table4: Distributionofcasesaccording totheoculartraumascore

	OTScore3	OTScore4
Blunt	17(68%)	1(4%)
Penetrating	5(20%)	2(8%)
Totalnoof cases	22(88%)	3(12%)

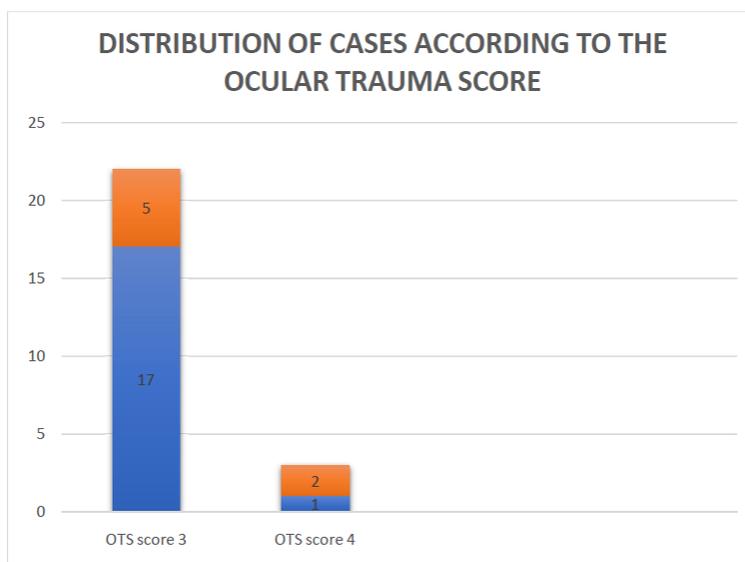


Figure 2: Distribution according to OTS

On comparison of OTS score with final BCVA, table 5 shows that 22 out of 25 cases have an OTS score of 3. Among them 18 cases have achieved a postoperative BCVA of $\geq 6/12$ which is 81 % in the present study. According to the Betts OTS the estimated probability of follow up visual acuity of $\geq 6/12$ with OTS score of 3 was 44%. In the present study, out of 25 cases OTS score 4 is seen in 3 cases and all the three cases have achieved a postoperative BCVA of $\geq 6/12$ (100%). According to the Betts OTS the estimated probability of follow up visual acuity of $\geq 6/12$ with the OTS score of 4 was 74%. On comparison of OTS score with final BCVA, the statistical significance was not obtained (p- value 0.063).

Table 5: COMPARISON OF OTS SCORE WITH FINAL BCVA

OTS SCORE	FINAL BCVA		TOTAL	Chi square (p value)
	6/6-6/9	6/12-6/60		
3.00	13	9	22	0.063 (1.000)
	86.7%	90.0%	88.0%	
4.00	2	1	3	
	13.3%	10.0%	12.0%	
Total	15	10	25	
	100.0%	100.0%	100.0%	

Table 6 shows the morphology of traumatic cataract. Out of 25 cases of traumatic cataract, it was found that 11 cases (44%) had total cataract, 6 cases (24%) had white soft cataract, 4 cases (16%) had anterior capsular cataract, 3 cases (12%) had membranous cataract, and 1 case (4%) had rosette type of cataract.

Table 6: Distribution of cases according to morphology of traumatic cataract

MORPHOLOGY	TOTAL NO OF CASES	PERCENTAGE OF CASES (%)
Total	11	44
Rosette	1	4
White soft	6	24
Membranous	3	12
Anterior capsular cataract	4	16

Table 7 shows, Out of 25 cases of traumatic cataract, 15 cases (60%) had associated corneal injury in form of corneal opacity in 9 cases and corneal perforation in 6 cases. 10 cases (40%) had associated iris damage in form of iris prolapse in 1 case, iris incarceration into the wound in 2 cases, traumatic mydriasis in 1 case, sphincter tear in 1 case, and iridodonesis in 1 case. The other associated ocular damage noted were the lens subluxation in 1 case (4%) and zonular weakness in 1 case (4%).

Table 7: Distribution of cases according to associated ocular damage

ASSOCIATED OCULAR DAMAGE	TOTAL NO OF CASES	PERCENTAGE OF CASES (%)
Corneal involvement	15	60
Iris involvement	10	40
Lens subluxation	2	8
Zonular weakness	2	8

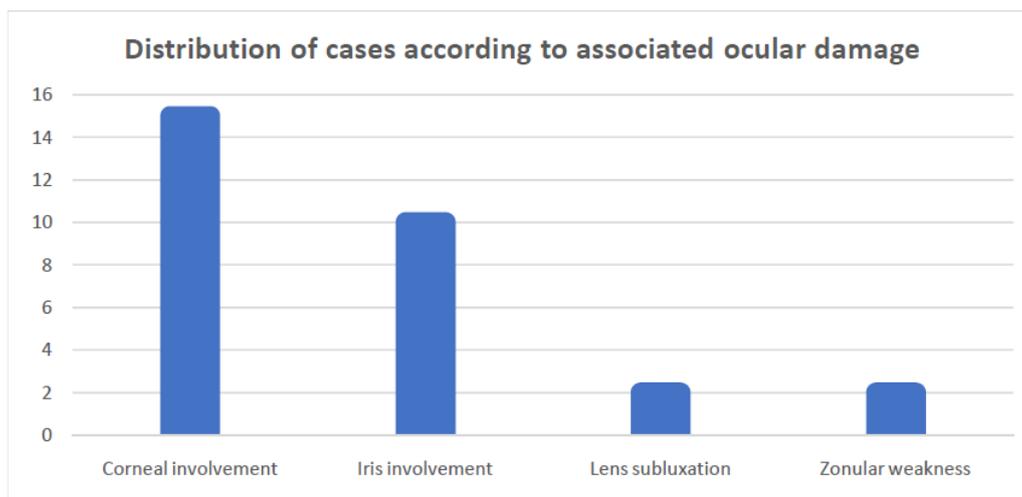


Figure 3: Distribution of cases according to associated ocular damage

In this study, in table 8 shows the distribution of cases according to the visual acuity of the injured eye at presentation. Preoperative visual acuity was recorded in all the cases. In 3 cases (12%) the preoperative visual acuity was 6/60. The preoperative visual acuity was <3/60 in 6 cases (24%). 3 cases (12%) had preoperative visual acuity of counting fingers close to face and 4 cases (16%) had hand movements and 9 cases (36%) had PL+VE vision at presentation.

Table8: Distribution of cases according to visual acuity of the injured eye at presentation

VISUAL ACUITY	TOTAL NO OF CASES	PERCENTAGE OF CASES (%)
6/60	3	12
<3/60	6	24
CFCF	3	12
HM	4	16
PL+VE	9	36

In table 9, the final postoperative best corrected visual acuity (BCVA) was assessed at the end of 6 weeks following surgery. In the present study out of 25 cases, 15 cases (60%) had BCVA of 6/6 – 6/9, 7 cases (28%) had BCVA of 6/12 – 6/18, 2 cases (8%) had BCVA of 6/24– 6/36, and 1 case (4%) had BCVA of 6/60 or less.

Table9: Distribution of cases according to the final postoperative visual acuity (BCVA)

VISUAL ACUITY	TOTAL NO OF CASES	PERCENTAGE OF CASES (%)
6/6 – 6/9	15	60
6/12 – 6/18	7	28
6/24 – 6/36	2	8
6/60 or less	1	4

In Table 10, Out of 25 cases of traumatic cataract majority of them, 14 cases (56%) were operated between 6 to 8 weeks duration. Among them, 40 % have gained a good postoperative best corrected visual acuity of 6/6 - 6/9 and 1% (1 out of 25 cases) of the study population had a vision of 6/60 or less. 3 cases (12%) out of 25 were operated in the duration of less than 1 week and all the 3 cases gained good postoperative best corrected visual acuity of 6/6. In this study, the time interval between injury and surgery had no significant effect on the visual outcome (**P-value 0.162**).

Table10: Association between duration of injury and surgery & Final BCVA

Duration of Injury	Final BCVA				Total
	6/6 –6/9	6/12–6/18	6/24–6/36	6/60 or less	
≤1 week	3 (12.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3(12.0%)
1.1– 2 wks	2 (8.0%)	2 (8.0%)	1 (4.0%)	0 (0.0%)	5(20.0%)
2.1– 6 wks	0 (0.0%)	3 (12.0%)	0 (0.0%)	0 (0.0%)	3(12.0%)
6.1– 8 wks	10(40.0%)	2 (8.0%)	1 (4.0%)	1 (1.0%)	14(56.0%)
Total	15(60.0%)	7(28.0%)	2(8.0%)	1(4.0%)	25(100%)
ChiSquaretestvalue	13.009		Pvalue	0.162(p>0.05)	

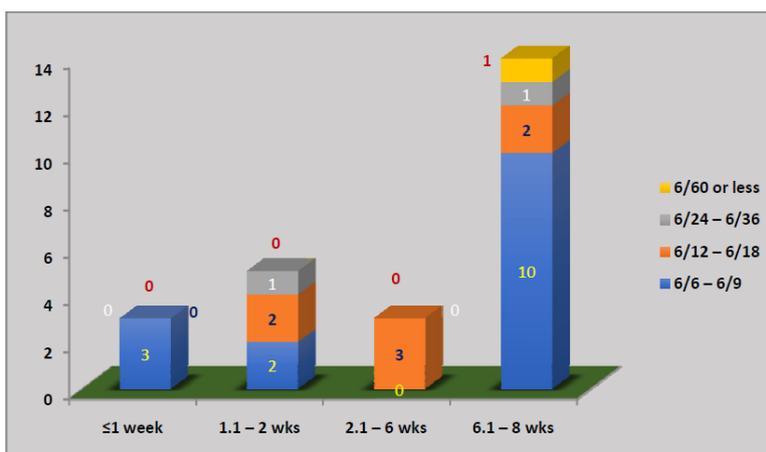


Figure 4: Effect of duration between injury and surgery & final BCVA

In the table 11, 72% (18 out of 25) cases have sustained blunt trauma. Among them, 28% (7 out of 25) and 20% (5 out of 25) of cases have gained postoperative BCVA of 6/6 and 6/9 respectively. 28% of cases (7 out of 25) have sustained penetrating injury. Among them, 12% (3 out of 25) of cases have gained postoperative BCVA of 6/9.

Table11: Association between final BCVA and type of TRAUMA

Final BCVA	Type of TRAUMA				Total
	Penetrating	%	Blunt	%	
6/6	0	0.0%	7	28.0%	7 (28.0%)
6/9	3	12.0%	5	20.0%	8 (32.0%)
6/12	3	12.0%	3	12.0%	6 (24.0%)
6/18	1	4.0%	0	0.0%	1 (4.0%)
6/24	0	0.0%	2	8.0%	2 (8.0%)
6/60	0	0.0%	1	4.0%	1 (4.0%)
Total	7	28.0%	18	72.0%	25(100%)
ChiSquaretestvalue	8.259		Pvalue	0.143(p>0.05)	

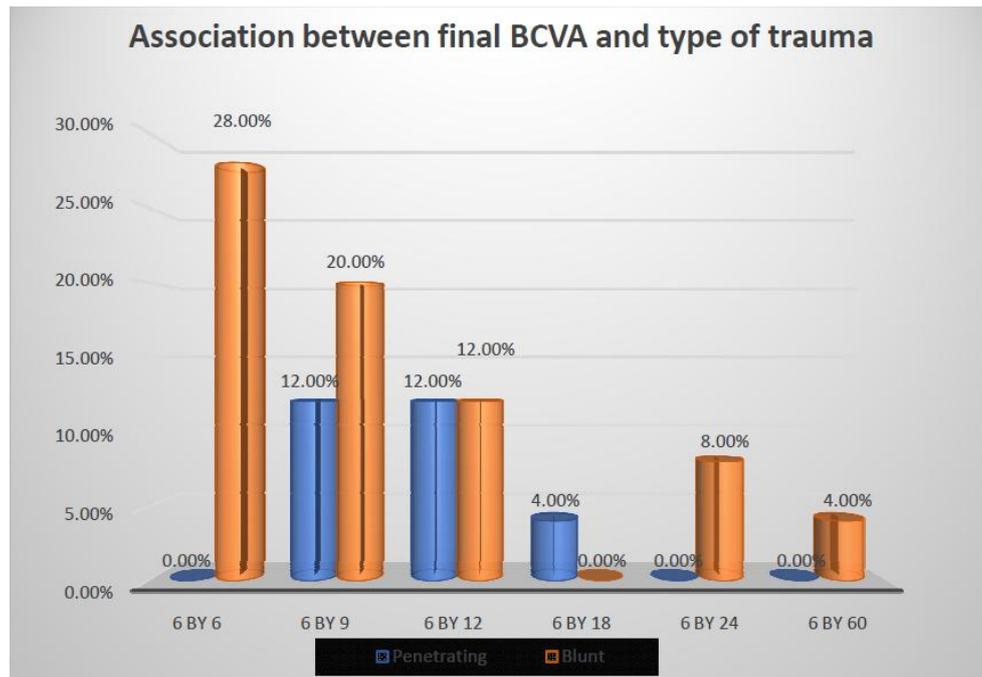


Figure 5: Association between final BCVA and type of trauma

In table 12, The mean astigmatism in the present study was found to be $1.49 \pm .867$. The mean astigmatism seen in patients who underwent SICS was $1.6750 \pm .752$ and in patients who underwent phacoemulsification was $0.7500 \pm .98$ which was found to be statistically significant on applying t- test (p- value = 0.30).

Table12: Amount of astigmatism following surgery

Surgery Performed	No of cases (N)	Mean	Standard Deviation	p-value (t-test)
SICS	20	1.67	0.75	0.030 (<0.05)
Phacoemulsification	5	0.75	0.98	

In table 13, Out of 18 cases of blunt trauma cases, 14 cases underwent SICS (77.8%) and 4 cases (22.2%) underwent phacoemulsification. The amount of astigmatism among the two groups was found to have no statistical significance (p-value 0.243).

Table13: Amount of astigmatism in patients with blunt trauma

Amount of Astigmatism	Blunt trauma				Total
	SICS	%	PHACO	%	
≤0.5	3	16.7%	3	16.7%	6 (33.3%)
0.6 –1.0	3	16.7%	0	0.0%	3 (16.7%)
1.1 –1.5	2	11.1%	1	5.6%	3 (16.7%)
1.6 –2.0	3	16.7%	0	0.0%	3 (16.7%)
2.1 –2.5	3	16.7%	0	0.0%	3 (16.7%)
>2.5	0	0.0%	0	0.0%	0 (0.0%)
Total	14	77.8%	4	22.2%	18(100%)
ChiSquaretestvalue	5.464		Pvalue	0.243(p>0.05)	

IV. Discussion

The most common cause of unilateral cataract in young patients is ocular trauma. At the time of presentation, a primary repair of corneal, iris and scleral wound may be necessary along with a thorough assessment of damage to the intraocular structures. A delay of 3 to 4 weeks before undertaking cataract surgery and intraocular lens implantation may allow corneal healing and reduce the inflammatory response. The longer postponement has to be avoided in children within the amblyopic age range. Placement of intraocular lens in the capsular bag is preferred when capsular support is available. Ciliary sulcus fixation can also be performed in the absence of adequate capsular support, but it may be associated with a greater incidence of uveitis and pupillary capture.

There are various concerns in the management of traumatic cataract cases that remain doubtful. A study conducted by Mehul Shah et al(6) have covered various aspects of controversies in traumatic cataract management. A complete evaluation of the nature and extent of the ocular damage, careful planning and counselling prior to surgery are essential in the management of these cases.

This was a prospective interventional study conducted at SVRRGG Hospital, Tirupati on 25 cases of traumatic cataract patients.

A study conducted by Mehul Shah(6) on various aspects of controversies in traumatic cataract management showed that there is a wide variation seen in the incidence of traumatic cataract in the world based on the retrospective information from registries of eye injury and depends on various factors which include demographic conditions and socio-economic conditions.

The present study showed a majority of cases (44%) of traumatic cataract occurred in the age group of 51 to 60 years. Manjula et al(7) study showed a higher prevalence of 49.17% of cases in younger age group of 11 to 30 years.

In the present study, the most common type of injury leading to traumatic cataract was blunt trauma in 72 % of cases. In a study conducted by Dr. Jyoti B et al(8), and Mousumi K et al(9) also showed the most common type of injury was blunt trauma in 58%, and 56.25% of cases respectively.

In this study postoperative visual outcome was found to be better in blunt trauma cases, the difference was not statistically significant (**p-value =0.143**). A study conducted by Mehul shah et al(10) in 555 patients of traumatic cataract showed open globe injury patients had a favorable visual outcome following surgery.

In the present study, stick (44%) was the most common object causing trauma. In a study conducted by Rajiv Mundada et al(11), agricultural accidents were the commonest cause of injury (40.32%) with wooden stick being the most common object causing trauma. In Manjula et al study(7), stick and thorn were the most common object causing trauma in 78% of cases. In a study conducted by Mousumi et al(9), wooden stick was the most common object causing trauma in 44 % of cases and iron nail in 12% of cases.

A study conducted by Mehul Shah(6) on various aspects of controversies in traumatic cataract management showed that there is no accepted morphological classification. The type of injury and the timespan between injury and surgery are the factors in which the morphology of traumatic cataract depends.

In the present study, majority of cases (44%) had total cataract, 6 cases (24%) had white soft cataract, 4 cases (16%) had anterior capsular cataract, 3 cases (12%) had membranous cataract, and 1 case (4%) had rosette type of cataract. Mehul A shah et al study(12) showed a higher prevalence of white soft cataract cases (60%).

In the present study, majority of cases (60%) had associated corneal injury in form of corneal opacity and corneal perforation. In Dr.U.Srivastava et al(13) study corneal injury was the most common associated ocular damage in the form of corneoscleral tear and corneal opacity. In another similar studies conducted by Jagannath C et al(14) and Manjula et al(7), corneal involvement was the most common associated ocular damage which constituted in 77% and 54% of cases respectively.

In the present study, the duration between trauma and time of surgery in the majority of cases (56%) was 6 to 8 weeks. In a study conducted by Jagannath C et al(14), it was found that in 52% of cases, the time of surgery was found between 1 week to 1month following trauma.

In the present study, the effect of time interval between injury and surgery and the final BCVA did not had a statistical significance (p value=0.162) which is comparable with Dr U. Srivastava et al(13) study (p-value 0.986) which showed that the time interval between injury and surgery did not influence the final visual outcome. In the present study, the patients operated more than 6 weeks after injury had better visual outcome postoperatively.

In this study out of 25 patients 20 patients underwent small incision cataract surgery with rigid posterior chamber intraocular lens implantation, among them 1 patient had CTR placement along with anterior vitrectomy for zonular weakness.5 out of 25 patients underwent phacoemulsification with foldable intraocular lens implantation, and 1 case had CTR placement with anterior vitrectomy for zonular weakness.

In a study conducted by Dr.Jyoti Bhuyan et al(8), out of 50 patients SICS with PCIOL implantation was done in 38 (78%) cases and SICS alone was performed in 5 cases. Lens aspiration with PCIOL was done in 3 cases and Phaco aspiration with PCIOL was done in 2 cases.

The final postoperative BCVA was assessed at the end of 6 weeks following surgery. In the present study out of 25 cases, 15 cases (60%) had BCVA of 6/6 – 6/9, 7 cases (28%) had BCVA of 6/12 – 6/18, 2 cases (8%) had BCVA of 6/24 – 6/36, and 1 case (4%) had BCVA of 6/60 or less.

The good visual outcome in the majority of cases can be attributed to the selection of cases in this study. Patients who underwent cataract extraction with posterior chamber IOL implantation alone were included in the study. Cases with posterior segment involvement and poor visual outcome were excluded from the study.

These results were similar to Dr. Jyoti Bhuyan et al (8) study in March 2017, with 81% of cases having vision ranging from 6/6 to 6/18. Akshay J. Bhandari et al (15) study in Feb 2016 reported that 56% of cases had a vision of 6/6 to 6/12. A study conducted by Jagannath C et al (14) showed that 70% of cases had best-corrected visual acuity of \geq 6/18 following intraocular lens implantation.

In the present study out of 25 cases of traumatic cataract, 22 cases had a OTS score of 3. Among them 18 cases had achieved a postoperative BCVA of \geq 6/12 which is 81%. Out of 25 cases OTS score 4 was seen in 3 cases and all the three cases had achieved a postoperative BCVA of \geq 6/12 (100%). The predictive value of OTS score was comparatively higher in the present study but statistical significance was not present (p-value 0.063). In a study by Mehul A. Shah et al (16) the OTS prediction was not significant but was found to be a reliable tool to assess the postoperative final visual outcome after 6 weeks duration.

According to the study conducted by Mehul Shah et al (6,17) the important predictive factors in calculating OTS are the initial visual acuity and RAPD. Assessment of visual acuity in children is difficult rendering the OTS score inaccurate, hence a new pediatric ocular trauma score (POTS) (18) was recently published in which initial assessment of vision was not possible but it lacks the statistical power of OTS due to its small sample size (19).

In the present study, the cause for decreased postoperative vision despite surgery was found to be irregular astigmatism in 8 cases (32%), corneal opacity in 4 cases (16%), and posterior capsular opacification in 4 cases (16%). A study conducted by Jagannath C et al (14) showed similar findings and irregular astigmatism was seen in 27.5% of cases, central corneal opacity in 9% of cases and posterior capsular opacification was seen in 15% of cases.

Therapeutic and prognostic factors of visual acuity in cases of traumatic cataract were related to the nature of anterior and posterior segment involvement, presence of pre-existing ocular conditions, morphology of traumatic cataract, timely and proper medical management of these cases, surgical technique followed, close follow up and management of postsurgical complications.

V. Conclusion

Traumatic cataract is a visually challenging sequel of trauma and causes psychological stress and a significant economic burden in developing countries like India. The factors that influence the final visual outcome are: initial visual acuity, type of injury, wound location, associated ocular injuries, the timing and type of surgical procedure and IOL implantation. The management of traumatic cataract requires many individualized and conscious decisions regarding the timing, type of surgery and methods to follow to achieve the best possible outcome.

References

- [1]. Thylefors B. Epidemiological patterns of ocular trauma. *Aust N Z J Ophthalmol.* 1992 May;20(2):95–8.
- [2]. Abbott J, Shah P. The epidemiology and etiology of pediatric ocular trauma. *Surv Ophthalmol.* 2013 Oct;58(5):476–85.
- [3]. Vivek Som, Nikhila Yadav, Kavita Kumar. Traumatic cataract- factors affecting visual outcome. *Trop j ophthalmol otolaryngol [Internet].* 2019 Jul 31 [cited 2022 Nov 2];4(3). Available from: <https://ophthalmology.medresearch.in/index.php/jooo/article/view/67>
- [4]. Eckstein M, Vijayalakshmi P, Killedar M, Gilbert C, Foster A. Use of intraocular lenses in children with traumatic cataract in south India. *Br J Ophthalmol.* 1998 Aug;82(8):911–5.
- [5]. Bhatia IM, Panda A, Sood NN. Management of traumatic cataract. *Indian Journal of Ophthalmology.* 1983 May 1;31(3):290.
- [6]. Shah M, Shah S, Upadhyay P, Agrawal R. Controversies in traumatic cataract classification and management: a review. *Canadian Journal of Ophthalmology.* 2013;48(4):251–8.
- [7]. Mangane M, Pujari MR, Murthy CN. Clinical study of traumatic cataract and its management. *Med Innov.* 2016;5:20–4.
- [8]. Bhuyan J, Deka B, Kadhao AV. A Study on Visual Outcome After Surgery for Traumatic Cataract.
- [9]. Krishnatreya M, Sarma KD. Clinicoepidemiological Study on Traumatic Cataract. *International Journal of Contemporary Medical Research.* 2016;3:1539–41.
- [10]. Shah M, Shah S, Shah S, Prasad V, Parikh A. Visual recovery and predictors of visual prognosis after managing traumatic cataracts in 555 patients. *Indian J Ophthalmol.* 2011 Jun;59(3):217–22.
- [11]. Mundada R, Shinde S, Pathan MS, Badaam KM. Traumatic Cataract Epidemiology at Tertiary Care Hospital in Aurangabad Maharashtra India: An Observational Study. undefined [Internet]. 2014 [cited 2022 Nov 2]; Available from: <https://www.semanticscholar.org/paper/Traumatic-Cataract-Epidemiology-at-Tertiary-Care-in-Mundada-Shinde/18e6ff70c6c19935474d32f735940a8dbc2b9702>
- [12]. Shah MA, Shah SM, Shah SB, Patel CG, Patel UA. Morphology of traumatic cataract: does it play a role in final visual outcome? *BMJ Open.* 2011 Jul 29;1(1):e000060.
- [13]. Srivastava U, Lalramhluri R, Rawat P, Bhaisare V. Clinical evaluation of post traumatic cataract in tertiary care hospital. *International Journal of Scientific & Research Publications.* 2014;4(10):1–6.

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- [14]. Jagannath C, Penchalaiah T, Swetha M, Prabhu GR. Visual outcome of traumatic cataract in a tertiary care hospital, Tirupati. 2015 [cited 2022 Nov 2]; Available from: <http://imsear.searo.who.int/handle/123456789/164943>
- [15]. Bhandari AJ, Jorvekar SA, Singh P, Bangal SV. Outcome after cataract surgery in patients with traumatic cataract. *Delta Journal of Ophthalmology*. 2016;17(2):56.
- [16]. Shah MA, Shah SM, Applewar A, Patel C, Shah S, Patel U. OcularTrauma Score: a useful predictor of visual outcome at six weeks in patients with traumatic cataract. *Ophthalmology*. 2012 Jul 1;119(7):1336–41.
- [17]. Shah M, Shah S, Gupta L, Jain A, Mehta R. Predictors of visual outcome in traumatic cataract. *World Journal of Ophthalmology*. 2014 Nov 12;4(4):152–9.
- [18]. Shah MA, Agrawal R, Teoh R, Shah SM, Patel K, Gupta S, et al. Pediatric ocular trauma score as a prognostic tool in the management of pediatric traumatic cataracts. *Graefe's archive for clinical and experimental ophthalmology*. 2017;255(5):1027–36.
- [19]. Zamora-de la Cruz D, Garzón M, Arrieta-Camacho J. Management of traumatic cataract. *EyeNet Magazine*. 2016;37–9.

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