

Demographic pattern, Indications and Visual outcomes of traumatic cataract in a Tertiary eye care Hospital in Bangladesh: Retrospective Study

Muliha Rahman¹, Mohamed Abdus Salam², Chandana Sultana³, Md. Abdul Muntakim Shahid⁴, Md. Abdul Mueed⁵, ASM Moin Uddin⁶, Mohammed Rashed Alam⁷

Abstract

Purpose: To evaluate the age, gender, type of injury, occupations, ocular associations, management, and visual outcome of traumatic cataract surgery.

Methods: This observational retrospective study was conducted on forty eyes of forty patients who underwent surgery for traumatic cataracts at Ispahani Islamia Eye Institute and Hospital from July 2021 to December 2021. All cases of traumatic cataracts were included in this study, except those lost to early follow-up. A detailed history, presenting visual acuity, ocular examination including complete anterior and posterior segment examination, to see other associated injuries, intraocular pressure assessment, and B-scan ultrasonography when required, were performed. Patients were treated medically or surgically as the case may be. The best-corrected post-operative vision was evaluated for each case. The average follow-up was 6 months.

Results: Among study subjects 67.5% were male and 32.5% were female. The male-female ratio was 2:1 (Fig:1). The most common age group involved in the present study was 20-29 years of age. The mean age \pm SD was 40 ± 19.8 years (Fig:2). In occupation students & housewives are more than 27.5% & 25% (Table -1). In our study penetrating injury was 25% of study cases and more than 50% of cases by blunt injury (Table 2), the most common ocular association was vitreous in A/C (45%) then corneal wound (22.5%). (Table -3). In this study, BCVA at presentation was less than 6/60 in 90% of study subjects (Table 4). In our study duration between trauma and surgery was less than 1 month in 12.5% (Table -5). Implantation of IOL was done in the capsular bag in the posterior chamber in 21 eyes whereas 11 received it by scleral fixation (Table 6). In the present study, 7 patients (17.5%) achieved "useful acuity of vision" ($>6/18$) at follow-up. There were, however, 08 patients who had very poor acuity of vision because of being unable to implant IOL (Table 7).

Conclusion: Surgical management of traumatic cataracts if done with a complete pre-operative evaluation, a careful surgical approach, and good post-operative management, is a safe and effective means of vision restoration. The visual outcome is limited by associated ocular structural damage.

Keywords: Traumatic cataract, Visual outcome, Demographic pattern.

Introduction

Ocular trauma is a prominent cause of visual disability and blindness worldwide. The burden of blindness is related to both its inevitable effect on the quality of life and the loss of productivity that subsequently occurs in the patients. Ocular trauma

includes mechanical eye injury (open globe injury and closed globe injury) and non-mechanical eye injury¹. Each of these categories can cause a traumatic cataract, which might damage the vision. The cause of a traumatic cataract is complex. It might have been brought on by zonular ligament or lens capsule rupture, lens

1. Consultant & Assistant Professor, Ispahani Islamia Eye Institute & Hospital, Farmgate, Dhaka.

2. Consultant & Associate Professor, Ispahani Islamia Eye Institute & Hospital, Farmgate, Dhaka.

3. Consultant & Associate Professor, Ispahani Islamia Eye Institute & Hospital, Farmgate, Dhaka.

4. Consultant & Assistant Professor, Ispahani Islamia Eye Institute & Hospital, Farmgate, Dhaka.

5. Consultant & Associate Professor, Ispahani Islamia Eye Institute & Hospital, Farmgate, Dhaka.

6. Consultant & Associate Professor, Ispahani Islamia Eye Institute & Hospital, Farmgate, Dhaka.

7. Consultant & Associate Professor, Ispahani Islamia Eye Institute & Hospital, Farmgate, Dhaka.

Address of Correspondence: Dr. Muliha Rahman, Consultant & Assistant Professor, Ispahani Islamia Eye Institute & Hospital, Farmgate, Dhaka 1205, Bangladesh, Email: muliha.rahman@gmail.com

metabolism disease, or collision-induced oscillation of the lens cortex. Traumatic cataract development may be seen right away or years after an eye injury^{1,2}. The shape of a traumatic cataract may be total, local, rosette, swollen, or other irregular shapes. The location of the opacity may be at the anterior or posterior cortex or the capsule. Patients who have any of these types of cataracts will experience visual issues^{3,4}. To investigate the etiology, the type of trauma, the morphological characteristics, associated ocular structural trauma, surgical management, and ultimate visual outcome following rehabilitation, and to evaluate the surgical complications that may arise in traumatized eyes, ⁵we started a study on patients who presented to us with traumatic lens injury. This was done to better understand the behavior of such eyes and to enlighten ourselves to better manage such cases in the future.

Materials & Methods

This observational retrospective study was performed on forty eyes of forty patients who underwent surgery for traumatic cataracts in Cornea & Anterior segment department of Ispahani Islamia Eye Institute and Hospital From July 2021 to December 2021. The subjects who were included in the study gave their informed consent. A detailed history of the patient was taken, with an agent of trauma, time lag at presentation, and place of trauma being noted, along with any initial treatment taken. A meticulous ocular examination was performed with Snellen's visual acuity documented in each case detailed with photographic documentation of cataract morphology, with a retinal examination, if possible, or evaluation of the posterior segment was done with a B-scan ultrasound. Tonometry was done as per requirement. Keratometry and A-scan were done to calculate IOL power. Demographic variables: Age, Gender, Occupation, Duration between trauma and surgery & Clinical variables: Type of injury, Visual acuity (Pre and post-operative), Associated ocular morbidities, Surgical options of traumatic cataract were analyzed in this study. All cases with penetrating or blunt injury was included in this study. After taking detailed history, patient was sent for corneal repair, if corneal injury was present. On subsequent follow up, patient with traumatic cataract was evaluated whether cataract surgery

done or not, aphakia or not, IOL given or not, what type of lens given -PCIOL/ACIOL/SF IOL. We selected cases where corneal injury (if present) was not in the visual axis. Age-related cataracts, Complicated cataracts, and patients with associated injuries to the posterior segment were excluded from this study. Data were collected in a pre-designed data collection sheet and then compiled accordingly. Appropriated descriptive statistical analysis was done using computer-based software SPSS (Statistical Package for Social Sciences, version 22, SPSS Inc, Chicago, IL, USA).

Results

Among study subjects 67.5% were male and 32.5% were female. The male-female ratio was 2:1 (Fig:1). The most common age group involved in the present study was 20-29 years of age. The mean age \pm SD was 40 ± 19.8 years (Fig:2). In occupation students & housewives are more than 27.5% & 25% (Table -1). In our study penetrating injury was 25% of study cases and more than 50% of cases by blunt injury (Table 2)., the Most common ocular association was vitreous in A/C (45%) then corneal wound (Table -3). In this study, BCVA at presentation was less than 6/60 in 90% of study subjects (Table 4). In our study duration between trauma and surgery was less than 1 month in 12.5% (Table -5). Implantation of IOL was done in the capsular bag in the posterior chamber in 21 eyes whereas 11 received it by scleral fixation (Table 6). In the present study, 7 patients (17.5%) achieved "useful acuity of vision" ($>6/18$) at follow-up. There were, however, 08 patients who had very poor acuity of vision because of being unable to implant IOL (Table 7).

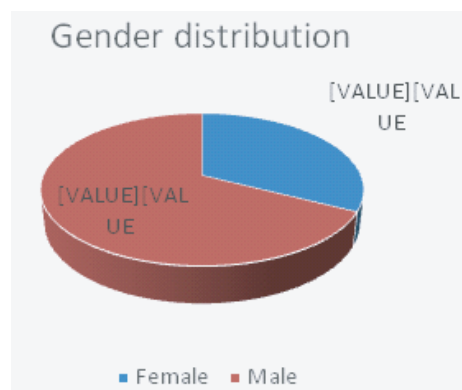


Fig.1: Pie chart showing gender distribution of study subjects

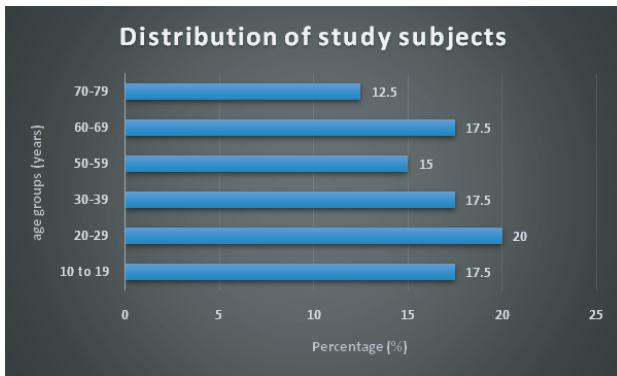


Fig.2: Bar diagram showing distributions of study subjects according to age group (n=40)

Table 1 : Showed distribution of study subjects according to the occupation (n=40)

Occupation	Frequency	Percent (%)
Day labor	7	17.5
Student	11	27.5
Businessman	5	12.5
Housewife	10	25.0
Service holder	5	12.5
Driver	1	2.5
Farmer	1	2.5
Total	40	100.0

Table 2 : Showed distribution of study subjects according to the type of injury (n=40)

Type of ocular injury	Frequency	Percent
Penetrating injury	10	25.0
Blunt injury	21	52.5
Details not available	9	22.5
Total	40	100.0

Table 3 : Showed distribution of study subjects according to ocular associations (n=40)

Ocular association	Frequency	Percent
Vitreous in A/C	18	45.0
Corneal wound	9	22.5
Zonular weakness	6	15.0
No association	5	12.5
Raised IOP	1	2.5
Iaido dialysis with vitreous in A/C	1	2.5
Total	40	100.0

Table 4 : Showed BCVA of study subjects at presentation (n=40)

BCVA (at presentation)	Frequency	Percent
6/9-6/12	0	0.0
6/18 -6/24	1	2.5
6/36-6/60	3	7.5
Less than 6/60-1/60	20	50.0
CF	13	32.5
HM	3	7.5
Total	40	100.0

CF- Counting finger, HM- Hand movement

Table 5 : Showed duration between injury and cataract surgery (n=40)

The duration between injury and surgery	Frequency	Percent
1 week	5	12.5
1 month	11	27.5
2 months	4	10.0
3 months	16	40.0
4 months	2	5.0
6 months	2	5.0
Total	40	100.0

Table 6 : Showed types of cataract surgery (n=40)

Types of surgery	Frequency	Percent
Secondary IOL	18	45.0
Vectis removal of Lens without IOL	8	20.0
SF IOL	6	15.0
Vectis removal of Lens + SF IOL	5	12.5
Phaco with PC IOL with CTR	3	7.5
Total	40	100.0

PC-Posterior chamber, IOL-Intra ocular lens, CTR- Capsular tension ring, SF IOL- Scleral fixating IOL

Table VII: Showed BCVA of study subjects after surgery (n=40)

VA(After surgery)	Frequency	Percent
6/9-6/12	7	17.5
6/18-6/24	5	12.5
6/36-6/60	9	22.5
Less than 6/60-1/60	11	27.5
CF	4	10.0
HM	3	7.5
PL,PR	1	2.5
Total	40	100.0

CF- Counting finger, HM- Hand movement, PL-perception of light, PR-projection of rays.

Discussion

This study included 40 eyes with traumatic cataracts that were presented to and managed at the cornea and anterior segment department of Ispahani Islamia Eye Institute and Hospital, Dhaka from July 2021 to December 2021. Among study subjects 67.5% were male and 32.5% were female. The male-female ratio was 2:1. Mean age \pm SD was 40 ± 19.8 years. In a previous study from Andhra Pradesh, India Singhal A, et al.^{6,7,8} 2020 showed a male-to-female ratio of 3.3:1 and a mean age \pm SD was 29.48 ± 15.29 years.

Another study by Janjua MI et al.⁹ from Rawalpindi, Pakistan in 2016 showed a male predilection of 3:1. Males are more than females because of the involvement of males in hazardous outdoor activities like sports and work.

The most common age group involved in the present study was 20-29 years of age. 50% of patients were from 4 to 20 years of age in another study conducted by Janjua et al.⁹ Another study by Memon MN et al.¹⁰ found the most common age group was 10 to 19 years of age. This shows that ocular trauma is a major cause of visual morbidity in productive age groups.

In our study penetrating injury were 25% of study cases and more than 50 % of cases by blunt injury. About two-thirds of patients in Shah SM, Shah

SB, et al studies were affected by penetrating trauma.¹¹

Penetrating trauma causes cataracts found in more than 65% of cases in Janjua MI et al previous study.

In this study, BCVA at presentation was less than 6/60 in 90% of study subjects. More than 88% of patients had a pre-op BCVA of 6/60 or less with only 10% with a BCVA of 6/36 or better in the Singhal A, Sharma et al study.^{11,12}

In a previous study in India Bekibele CO, et al reported pre-op BCVA of less than 6/60 in about 90% of patients with traumatic cataracts.¹³

In our study, the most common ocular association was vitreous in A/C (45%) and then corneal wounds (22.5). But another previous Krishnamachary M, et al study represented corneal wound was the most common ocular association with traumatic cataracts.¹⁴

In our study duration between trauma and surgery was less than 1 month in 12.5 % and one month and more duration in the rest of the patients. Thakur et al. found that the duration of trauma and cataract surgery was < 1 month in 37.90% of patients, 1–12-month duration in 54.03% of patients, and 1 year – 20-year duration in 8.06% of patients.^{11,12,13}

After traumatic cataract removal, the ability to implant an IOL in traumatized eyes depends on the presence of capsular support. If capsular and zonular support is sufficient, a capsular bag or sulcus fixation is chosen.

Implantation of IOL was done in the capsular bag in the posterior chamber in 21 eyes whereas 11 received it by scleral fixation. Vectis removal of the lens without IOL was done in 8 cases but planned implantation of IOL at a later date.

It has been widely agreed that a vision of >6/18 is considered to be useful/satisfactory following surgery for a traumatic cataract.

In the present study, 7 patients (17.5%) achieved "useful acuity of vision" (>6/18) at follow-up. There were, however, 08 patients who had very poor acuity of vision because of being unable to

implant IOL.

The follow-up of the present study was short and long follow-up studies are required to evaluate the long-term results of the IOL implantation in traumatic cataracts and the results of foldable IOL versus non-foldable IOL may vary with another factor of intact capsular bag.^{14,15} So, early and late intervention could be considered equally according to the situation of each case and the treatment environment. However, we need more trials addressing mentioned limitations to say the correct timing of traumatic cataract surgery.

Conclusion

Our study identified five variables that affected the final VA: the initial VA, the kind of injury, the location of the wound, the cataract removal process, and the IOL implantation technique. Surgical management of traumatic cataracts either as a primary or secondary procedure, if done with a good pre-operative evaluation, a careful surgical approach, and meticulous post-operative management, is a safe and effective means of a satisfactory visual outcome. We recommend and encourage other researchers to conduct more studies about a long follow-up to evaluate the long-term results of IOL implantation in traumatic cataracts.

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Conflicts of interest

There are no conflicts of interest.

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