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Visual Outcome of Cataract Surgery After Primary IOL Implantation in Traumatic Cataract in West Bengal Region

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ABSTRACT
Ocular trauma often leads to traumatic cataract, which continues to be a major cause of visual impairment and physical handicap despite improvements in diagnosis and treatment. Eye injury remains a topic of contention and the discussion about how to manage it continues. The international categorization of eye injuries suggested over 15 years ago has to be reassessed and made more reliable in terms of forecasting the result of open-globe injury (OGI). Material and methods: This was a research that followed 100 participants who underwent cataract surgery with primary intraocular lens (IOL) implantation for traumatic cataract at a specialized facility. All patients who had traumatic cataract due to a penetrating injury and received early cataract removal with the implantation of a primary intraocular lens. The primary criterion we used was visual clarity at 3 to 6 months, evaluated using Snellen's chart. Results: 100 eyeballs from 100 patients were included in the study. The majority of patients were males and aged 35 years or younger. All eyes experienced impaired vision during the presentation. The preoperative examination revealed peripheral corneal perforation in 90 eyes, central corneal perforation in 6 eyes, abnormal pupil in 30 eyes and posterior synaechiae in 14 eyes. After the surgery, the eyesight was satisfactory (6/6-6/12) in 55 eyes, somewhat uncertain in 40 eyes and unsatisfactory (= 6/60) in 5 eyes. The main reason for reduced visual clarity was mostly due to cloudiness in the cornea and the area behind the lens. Conclusion: In the past twenty years, efforts have been undertaken to tackle these problems and significant advancements have been achieved in various areas of the effective treatment of traumatic cataracts. It is not usually required to remove the cataract during the initial operation. Primary cataract surgery can also lead to positive outcomes in certain people. Un-favourable outlook is linked to the presence of visual axis involvement and difficulties in the posterior region. The significance of eye protection should be highlighted to the high-risk group through ongoing and consistent health education.

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Key Words
Intraocular lens, trauma and Birmingham

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INTRODUCTION

Ocular trauma often leads to traumatic cataract, which continues to be a major cause of visual impairment and physical handicap, despite improvements in diagnosis and treatment. It happens as a result of blunt or penetrating trauma. Ocular injury can cause the development of cataracts as well as other eye issues[1-6]. The techniques employed to assess the visual results in eyes treated for traumatic and senile cataracts are comparable. However, the harm caused to other eye tissues due to injury can further affect the improvement in vision after the operation. Thus, the visual result may vary depending on coexisting conditions. The subject of eye injuries is still a source of dispute and the discussion about how to handle them is on going. The international categorization of eye injuries suggested over 15 yrs ago has to be reassessed and made more reliable in terms of forecasting the result of open-globe injury (OGI)[7]. The implementation of the Birmingham Eye Trauma Terminology System (BETTS) has established a uniform method for documenting ocular injuries[8]. Therefore, the visual results after traumatic cataract surgery and the factors that can predict the outcome can be studied in relation to the BETTS category[9]. While there have been reports of visual outcomes associated with traumatic cataracts, the majority of investigations have focused on small groups or individual cases.

The timing of cataract surgery is crucial for improving vision, particularly in youngsters, as there is a high risk of amblyopia due to media opacity and the use of intraocular lens (IOL) implantation in traumatic cases is still a topic of global controversy. Several problems related to the handling of traumatic cataract are still unresolved. The increased likelihood of amblyopia and inflammation inside the eye, along with the strong adhesions between the vitreous and retina in children, necessitate a distinct approach to treatment. It is not feasible to conduct prospective, controlled clinical investigations of OGI. Multiple studies have shown that performing cataract surgery with intraocular lens implantation at an early stage in cases of traumatic cataract leads to positive visual outcomes[1-6]. This study was conducted to evaluate the visual improvement that can be achieved by early removal of cataracts and implantation of intraocular lenses (IOLs) in traumatic cataracts caused by penetrating injuries at a tertiary hospital.

MATERIAL AND METHODS

This was a research that followed 100 consecutive individuals who had cataract surgery with the insertion of a primary intraocular lens (IOL) for traumatic cataract at a specialised hospital. All patients who had traumatic cataract due to a penetrating injury and received early cataract removal with the implantation of a primary intraocular lens (IOL). The primary criterion we used was visual clarity at 3-6 months, evaluated using Snellen's chart. Participants with damage in the back parts were not included in the study. An informed consent was obtained from the parents or guardians who were present after providing a comprehensive explanation of the methods included in the study. Early surgery was described as surgery performed within two weeks of the injury. Information was gathered on age, gender, visual acuity before surgery, visual acuity 3-6 months after surgery and reasons for unsatisfactory surgical results.

RESULTS

The study included a total of 100 eyeballs from 100 patients. The majority of patients were males and aged 35 years or younger. Everyone had a limited vision during the talk. The preoperative results showed peripheral corneal perforation in 90 eyes, central corneal perforation in 6 eyes, abnormal pupil in 30 eyes and posterior synaechiae in 14 eyes. After the surgery, the eyesight was satisfactory (6/6-6/12) in 55 eyes, somewhat uncertain in 40 eyes and unsatisfactory (= 6/60) in 5 eyes. The main reason for reduced visual clarity was mostly due to cloudiness in the cornea and the area behind the lens. Twelve instances experienced lens misalignment. Lens misalignments had no significant impact on vision

Table 1: Key characteristics of the cataract cases at presentation (n = 100)

Variable n (%)	No. of patients
Age group	
5-15	18 (18)
16-35	65 (65)
36-45	9 (9)
= 46	8 (8)
Sex	
Male	80 (80)
Female	20 (20)
Visual acuity at presentation	
Light perception	18 (18)
Hand movement	48 (48)
Counting fingers	22 (22)
6/60	12 (12)
Ocular conditions associated with traumatic cataract	
Central corneal perforation	15 (15)
Peripheral corneal perforation	90 (90)
Irregular pupil	30 (30)

Table 2: Visual outcome and long-term complications after surgery

Variable	No. of patients n (%)
Visual acuity at 3-6 months	
6/6-6/12	55 (55)
6/18-6/36	40 (40)
= 6/60	5 (5)
Long term complications	
Corneal opacity	70 (70)
Posterior synaechie	14 (14)
Irregular pupil	30 (30)
Stitch granuloma	8 (8)
IOL decentration	12 (12)

hence no action was necessary. Thirty instances had elevated levels of astigmatism as a result of corneal scarring caused by penetrating eye injuries and tightly sewn stitches. The number of sutures was reduced to an acceptable level about three months after the operation. Fourteen individuals experienced posterior synechiae and did not react to pupil dilatation or corticosteroid eye drops. However, these adhesions did not impact the eyesight, thus no action was taken. In these instances, the clarity of vision increased to 6/12 following the reduction of macular edoema. Seventy patients experienced corneal opacity as a delayed consequence.

DISCUSSIONS

The majority of eye injuries happen in children and people who are in the working age groups, which was also observed in our study. Eye injuries continue to be an overlooked issue in public health and can be avoided via the use of suitable measures. In our investigation on sex distribution, we observed that 80 out of 100% included in the study were male, accounting for 80%. It could be because males are more prone to eye injuries compared to girls, possibly because they are more likely to participate in risky activities and vocations.18 This discovery was in line with the research conducted by Tetz and his colleagues[19] and Synder *et al*.,[20] who reported 60% and 75% males, respectively. Surgical procedures for traumatic cataract in males can have varying outcomes[21].

In our investigation, 55 eyes (55 out of 100) fell within the acceptable vision range of 6/6 to 6/12. A significant proportion of positive results were obtained since none of these instances involved intraocular foreign bodies (IOFB) or retinal detachment. Our research contributes to the increasing amount of evidence demonstrating the significance of early IOL implantation, which offers a long-term remedy for aphakia and leads to a positive visual outlook[13]. The main causes of reduced vision in our investigation were corneal scarring and posterior capsular opacification. In a research conducted in Africa, around two-thirds of patients achieved a visual result of 6/18 or higher[22]. Two earlier local studies indicated that over 90% of patients achieved a visual result of 6/36 or higher[23,24]. An international study from Italy found that 48% of patients achieved a final BCVA of 6/12 or higher[25]. Another study conducted in Singapore showed that 35% of patients achieved a final BCVA of 6/12 or higher[26]. Both this study and earlier studies indicate that the excision of traumatic cataract and the implantation of posterior chamber IOL can lead to a favourable visual outcome. The results of our study show that successful visual recovery after traumatic cataract surgery caused by a penetrating injury is possible as long as the back part of the eye is not affected and the corneal scar does not obstruct vision.

CONCLUSION

In the past twenty years, all of these problems have been dealt with and significant advancements have been achieved in various areas of the effective treatment of traumatic cataracts. It is not usually required to remove the cataract during the initial surgery. In certain people, initial cataract surgery also leads to favourable results. Unfavourable outcome is linked to the presence of visual axis involvement and problems in the posterior segment. Continuous and persistent health education should stress the significance of eye protection to the high-risk group. The constraints of this investigation were a limited sample size and a restricted follow-up duration. By conducting more research involving a larger number of participants and extending the duration of the follow-up period, more comprehensive findings can be achieved.

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