EVALUATION OF POSTOPERATIVE VISUAL OUTCOME IN TRAUMATIC CATARACT AND A STUDY OF POSTOPERATIVE COMPLICATIONS IN SUCH CASES

Shantanu Bhattacharjee[1], Arvind Ram[2], Ipsita Aparajita Nanda[3], Durgacharan Pan[4]

[1]Assistant Professor, Department of Ophthalmology, IQ City Medical College, Durgapur, West Bengal.
[2]Associate Professor, Department of Ophthalmology, IQ City Medical College, Durgapur, West Bengal.
[3]Senior Resident, Department of Ophthalmology, IQ City Medical College, Durgapur, West Bengal.
[4]Professor and HOD, Department of Ophthalmology, IQ City Medical College, Durgapur, West Bengal.

ABSTRACT

BACKGROUND

Cataract formation is commonly observed as a result of blunt or penetrating ocular injury and constitutes one of major causes of acute or longstanding visual loss. The surgical technique, timing of surgery and postoperative complications have all been considered to be significant factors in determining the final visual outcome.

The aim of the present study is to evaluate postoperative visual outcome in a series of patients with traumatic cataract and to assess the postoperative complications conducted at IQ City Medical College, Durgapur, West Bengal.

MATERIALS AND METHODS

A consecutive series of 45 patients with traumatic cataract were carefully selected from outpatient department between May 2015 and April 2017. All the patients had undergone manual Small Incision Cataract Surgery (SICS) with IOL implantation. Postoperative visual outcome and postoperative complications were assessed.

RESULTS

Corrected Visual Acuity (VA) at the end of 6th week in 45 cases ranged between 6/6 and 6/60. Subjective correction with glasses ranged from -2 dioptre spherical to +1.5 dioptre spherical. 25 cases (55.5%) had VA 6/6-6/9, 15 cases (33.3%) had VA of 6/12 to 6/18, 4 cases (8.9%) had VA between 6/24 and 6/36 and 1 case had VA 6/60. The group which had VA between 6/12 and 6/18 was due to the presence of posterior capsular opacification.

CONCLUSION

The present study reveals most of the traumatic cataract cases had favourable visual outcome. Considering the fact that a good number of paediatric patients were treated in this study, it assumes more significance with the favourable visual outcome that could be achieved, thus preventing deprivation amblyopia and blindness.

KEYWORDS

Traumatic Cataract, Small Incision Cataract Surgery (SICS), Visual Outcome.

HOW TO CITE THIS ARTICLE: Bhattacharjee S, Ram A, Nanda IA et al. Evaluation of postoperative visual outcome in traumatic cataract and a study of postoperative complications in such cases. J. Evid. Based Med. Healthc. 2017; 4(93), 5662-5665. DOI: 10.18410/jebmh/2017/1136

BACKGROUND

Cataract formation is commonly observed as a result of blunt or penetrating ocular injury and constitutes one of major causes of acute or longstanding visual loss. The incidence of traumatic cataract in the literature varies based on the patient selection and inclusion criterion for each study, but the prevalence of cataracts is 30% to 65%.[1] In most cases, the traumatic cataract interferes with the visual axis, and, whatever the aetiology, removal should be performed promptly, especially when the lens capsule is ruptured, because the crystalline lens matter liberated into the anterior chamber is a potent stimulator of intraocular inflammation.[2]

Conversely, in cases with minimal and localised lens damage with a clear visual axis, lens extraction can be deferred and performed only if it causes visual impairment. Secondary lens removal may also be indicated in severe corneal injury and marked corneal oedema, which may interfere with intraocular visualisation. Although, the surgical and optical techniques are continually improving the treatment of traumatic cataract in childhood is still complicated by such problems as amblyopia, strabismus and monocularity.[3] The surgical technique, timing of surgery and complications have been considered to be significant factors in determining the final visual outcome.

The factors[4,5] that Correlate to a Favourable (>6/18) Visual Outcome after Ocular Trauma are-

1. Initial visual acuity at presentation of ≥6/60.
2. Absence of an afferent pupillary defect.
3. Location of wound anterior to the pars plana.

Financial or Other, Competing Interest: None.
Submission 16-11-2017, Peer Review 22-11-2017,
Acceptance 03-12-2017, Published 06-12-2017.
Corresponding Author:
Dr. Shantanu Bhattacharjee,
Associate Professor, Department of Ophthalmology,
IQ City Medical College, Durgapur, West Bengal – 713206.
E-mail: bhatshantanu9@gmail.com
DOI: 10.18410/jebmh/2017/1136

4. Size of wound ≤10 mm.
5. Sharp injury.

Factors Associated with Poor Visual Outcome (<6/60 or 5/200)[4]

1. Initial visual acuity <6/60.
2. Presence of an afferent pupillary defect.
3. Blunt injury causing globe rupture.
4. Wounds involving the sclera and/or extending posterior to the rectus muscle insertions.
5. Size of the wound >10 mm.
6. Subluxated lens or when the lens is lost through the wound.
7. A vitreous haemorrhage sufficient enough to obscure the view of the posterior segment.

MATERIALS AND METHODS

In the present prospective study, 45 consecutive patients with traumatic cataract were selected from the Outpatient Department of Ophthalmology at IQ City Medical College, Durgapur, West Bengal, during May 2015 - April 2017.

Exclusion Criterion Included-

1. Patients with no perception of light.
2. Pre-existing gross corneal or posterior segment pathology.
3. History of diabetic retinopathy or other intraocular surgery.

After proper case selection and thorough investigations like visual acuity measurement by Snellen's chart or E chart, slit-lamp examination, intraocular pressure measurement by Goldmann applanation tonometer and posterior segment evaluation by indirect ophthalmoscopy or with 90D lens, patients were scheduled for cataract surgery. Consent for surgery was taken from all the patients and guardians in case of minor patients. All the cases were done under peribulbar anaesthesia except few cases less than 15 years were operated under general anaesthesia. Apart from the standard preoperative investigations, x-ray orbit (AP and oblique view), in case of penetrating trauma and USG B-scan were included. Standard biometry procedures were done. All the cases were operated by manual SICS. In most of the cases, modified C-loop single piece PMMA, 12.5 mm posterior chamber lens was used. In other cases, 3 piece PMMA PCIOL was used. Standard postoperative treatment protocol was followed with postoperative examinations were done on day 1 and day 2 and subsequent follow-ups were scheduled on 2nd week and 6th week.

Patients were divided into two groups. Group A included those with blunt trauma and group B included those with penetrating trauma. In group A, surgical procedures included lens extraction by Small Incision Cataract Surgery (SICS) with implantation of posterior chamber IOL. When zonular support was sufficient, the surgeons attempted to place the IOL in the capsular bag with loop orientation perpendicular to the zonular defect; otherwise, sulcus placement was preferred. In the absence of posterior capsular support, scleral fixated IOL was implanted. In group B, eyes with penetrating injuries were first closed with 10-0 Ethilon and application of steroids and antibiotics. All cataract extractions were performed as a second surgical procedure about 4 to 6 weeks later. The surgical strategies including the positioning of the IOL and the use of viscoelastic substance were same as in group A.

In the present study, time interval between trauma and cataract surgery ranges from 5 days to 1 year. 57.7% patients presented between 5 days to 3 months. 28.8% patients presented within 4-6 months and 13.3% patients presented between 6 months to 1 year.

RESULTS

Out of 45 patients, 35 cases were blunt injury and 10 cases were penetrating injury, 31 cases were males and 14 cases were females. The age of patients ranged between 5 to 55 years (mean 25.256 ± 13.476).

Cases	Total
Eyes	45
Male	31
Female	14
Age (years)	5 to 55 years
Follow-up	Up to 6 weeks from the time of surgery

Table 1. General Features of the Patient Study

Age in Years	No. of Cases	Percentage
5-15	13	28.9
16-25	10	22.2
26-35	12	26.7
36-45	7	15.5
45-55	3	6.7
Grand Total	**45**	**100**

Table 2. Age Distribution

Preoperative VA	No. of Eyes	Percentage
6/60	2	4.5
3/60	3	6.7
FC	14	31.1
HM	11	24.4
PL	15	33.3
Total	**45**	**100%**

Table 3. Preoperative Visual Acuity of 45 Eyes

Complications	No. of Eyes	Percentage
Fibrinous uveitis	10	22.2
Iritis	11	24.4
Pigment dispersion	7	15.6
Striate keratopathy	15	33.3
Residual cortical matter	1	2.2
Distorted pupil	5	11.1
Hyphema	7	15.6

Table 4. Early Postoperative Complications

The early postoperative complications (up to 2nd week) like uveitis, hyphema, pigment dispersion, etc. are of less significance as these complications are eventually tackled with steroids and mydriatics consequently avoiding any significant visual disturbance.

Complications	No. of Eyes	%
Pigment dispersion (visually insignificant)	21	46.7
Posterior capsular opacification	5	11.1
Partial iris implant synechiae	2	4.4
Cystoid macular oedema	1	2.2
Secondary glaucoma	2	4.4

Table 5. Delayed Postoperative Complications

Delayed postoperative complications (at 6 weeks) like posterior capsular opacification assumes significance particularly in children as failure of detection may lead to deprivation amblyopia, if it occurs during critical period of visual development. A comparison of the present study with few reported incidence of postoperative complications are shown.

Complications	Blum et al[6] No. (%)	Gupta et al[3] No. (%)	Gimble et al[7] No. (%)	Present Study No. (%)
Fibrinous uveitis	3 (3.53)	18 (81.8)	12 (18.7)	10 (22.2)
Hyphema	4 (4.76)	-	-	7 (15.6)
Striate keratopathy	-	13 (60)	20 (33.3)	15 (33.3)
Posterior Capsular Opacity (PCO)	-	-	31 (48)	5 (6.7)
Pigment Dispersion	-	-	-	7 (15.6)
Exudative membrane on IOL	-	4 (18.1)	3 (4.7)	-
Cystoid Macular Oedema (CME)	-	-	-	1 (2.2)

Table 6. Comparison Table of Postoperative Complications

Visual Acuity	No. of Cases (%)
6/6-6/9	25 (55.5%)
6/12-6/18	15 (33.3%)
6/24-6/36	4 (8.9%)
6/60 or less	1 (2.2%)

Table 7. Corrected Visual Acuity (By Snellen's Chart)

Corrected VA at the end of 6th week in all 45 cases ranged between 6/6 and 6/60. Subjective correction with glasses ranged from -2 dioptre to +1.5 dioptre spherical. 25 cases (55.5%) had VA 6/6-6/9, 15 cases (33.3%) had VA of 6/12-6/18 and 4 cases (8.9%) had between 6/24 and 6/60. The group which had VA between 6/12 and 6/18 could be largely attributed to the presence of posterior capsular opacification and corneal scarring from penetrating injury. One case (2.2%) had VA of 6/60 due to cystoid macular oedema.

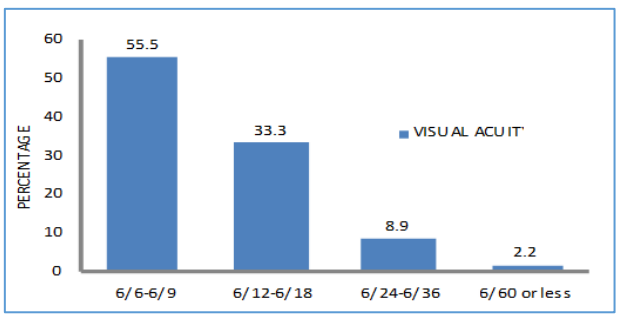

Figure 1. Bar Diagram Showing Corrected Visual Acuity

Group	6/6-6/9 (%)	6/12-6/18 (%)	6/24-6/36 (%)	6/60 (%)
Blunt (35)	24 (68.5)	9 (25.7)	2 (5.7)	-
Penetrating (10)	1 (10)	6 (60)	2 (20)	1 (25)

Table 8. Postoperative Visual Acuity in Blunt and Penetrating Groups

From the above comparison table, it seems that in the present study, blunt traumatic cataract had better visual prognosis than penetrating injury cataract if it is not associated with posterior segment traumatic abnormalities. However, it could not be directly implicated that visual prognosis of penetrating injury group is less than that of blunt injury group. In penetrating injury group, visual acuity is poor due to the presence of corneal scar mark.

A comparison table between the postoperative visual acuity of the present study with few previously published studies are shown below.

Authors	6/6-6/9	6/12-6/18	6/24-6/36	6/60 or Less
R. Das et al[8]	3 (21.4%)	5 (35.7%)	4 (28.5%)	2 (14.2%)
Rubsamen et al[9]	7 (50%)	4 (28.6%)	3 (21.4%)	-
Anwar et al[10]	8 (53.5%)	3 (20%)	2 (13.3%)	2 (13.3%)
Gupta et al	6 (27.3%)	9 (40.9%)	3(13.6%)	1 (4.5%)
Present Study	25 (55.5%)	15 (33.3%)	4 (8.9%)	1 (2.22%)

Table 9. Comparative Visual Acuity (VA) with Other Studies

DISCUSSION

In the present study, the early postoperative complications were from first postoperative day to second postoperative week. The most frequently encountered postoperative complications were anterior uveitis and pigment dispersion over IOL surface.

The postoperative complications like uveitis, hyphema, pigment dispersion, etc. are of less significance as these complications are eventually tackled with steroids and mydriatics, consequently avoiding any significant visual disturbance. Posterior capsular opacification assumes significance particularly in children as failure of detection may lead to deprivation amblyopia if it occurs during critical period of visual development. Gupta et al evaluated 22 cases who underwent posterior chamber IOL implantation. Postoperative complications were corneal striae varying from a few striae to frank striate keratopathy on biomicroscopic examination in 13 (59%) cases; fibrinous uveitis in 18 (81%) cases; thin exudative membrane on the IOL surface in 4 (18.1%) cases.

A comparative table between the postoperative visual acuity of the present study with few previously published studies reveal similar results. R. Das and associates[8] reported 14 cases of traumatic cataract belonging to the age group of 8-23 years implanted with IOL. 3 patients (21.4%) had 6/9 vision; 2 (14.2%) of them had 6/12 vision; 3 (21.4%) cases had 6/18 vision and 2 cases (14.2%) had 6/60. Rubsamen et al[9] reviewed visual results of 14 cases

who underwent primary IOL implantation in a setting of penetrating ocular trauma. 3 cases achieved VA 6/6 (21.4%); 4 cases (28.6%) had VA 6/9; 2 cases (14.3%) achieved VA 6/12; 2 cases (14.3%) had VA of 6/18; 1 case (7.1%) had 6/24 and 2 cases (14.8%) had VA of 6/36.

CONCLUSION

With the refinement of surgical technique, availability of prompt medical care following a trauma and good postoperative management, it has become possible to treat the ocular trauma cases successfully with intraocular lens implantation. Considering the fact that a good number of paediatric patients were treated in this study, it assumes more significance with the favourable visual outcome that could be achieved and thus preventing deprivation amblyopia and blindness.

REFERENCES

[1] Dannenberg AL, Parver LM, Brechner RJ. Penetrating eye injuries in the workplace. The national eye trauma system registry. Arch Ophthalmol 1992;110(6):843-848.
[2] Sinskey RM, Karel F, Ri ED. Management of cataracts in children. Journal of Cataract & Refractive Surgery 1989;15(2):196-200.
[3] Gupta AK, Grover AK, Gurha N. Traumatic cataract surgery with intraocular lens implantation in children. J Pediatric Ophthalmology and Strabismus 1992;29(2):73-78.
[4] De Juan E, Sternberg P, Michels RG. Penetrating ocular injuries. Types of injuries and visual results. Ophthalmology 1983;90(11):1318-1322.
[5] Esmaeli B, Elner SG, Schork A, et al. Visual outcome and ocular survival after penetrating trauma. A clinicopathologic study. Ophthalmology 1995;102(3):393-400.
[6] Blum M, Tertz MR, Greiner C, et al. Treatment of traumatic cataracts. J Cataract Refract Surg 1996;22(3):342-346.
[7] Gimbel HV, Neuhann T. Development, advantages and methods of the continuous circular capsulorhexis technique. Journal of Cataract & Refractive Surgery 1990;16(1):31-37.
[8] Das R, Roy M, Midya A, et al. Intraocular lens (I.O.L) implant in traumatic cataract. Ind J Ophthalmol 1989;37(2):89-90.
[9] Rubsamen PE, Cousins SW, Winward KE, et al. Diagnostic ultrasound and pars plana vitrectomy in penetrating ocular trauma. Ophthalmology 1994;101(5):809-814.
[10] Anwar M, Bleik JH, von Noorden GK, et al. Posterior chamber lens implantation and primary repair of corneal lacerations and traumatic cataracts in children. J Paediatric Ophthalmology and Strabismus 1994;31(3):157-161.