

The Visual Outcomes of Traumatic Cataract Aspiration with IOL Implantation in Children

HAMMAD ALI ASGHAR, MUHAMMAD AWAIS MAHMOOD, SHEN JIAQUAN, LULU LI, YIN YAN WANG.

ABSTRACT

Objective: To evaluate the visual outcomes of traumatic cataract aspiration with intraocular lens implantation in children.

Methods: Thirty children with unilateral traumatic cataract aged from 3-12 underwent traumatic cataract aspiration and intraocular lens (IOL) implantation surgery. There were 21 male cases (70%) and 9 female cases (30%). These patients underwent surgery between November 2009 to March 2011. The cases were prospected and evaluated. This study was conducted at a private hospital, Saira Miraj Memorial Hospital Begum Kot Lahore Pakistan.

Results: Visual acuity improved from Perception of light pre-operatively to 6/24 to 6/18 in 16 cases, 6/12 to 6/9 in 4 cases and 6/6 in 2 cases. Perception of light in two cases hand movement in two cases, counting fingers in one case, 6/60 to 6/36 in 3 cases. Overall the vision improved in 82.97% of the cases postoperatively. The poor visual outcome in rest of the patients was due to postoperative complication which included uveitis in 3 cases, hypema in 1, pupillary capture in 2 upward drawn pupil in three cases and posterior capsular opacification (PCO) was seen in 9 patients after a long follow up.

Conclusion: Unilateral traumatic cataract treated with lens aspiration and posterior chamber IOL implantation followed by anterior vitrectomy shows good results and the patient should be advised to visit the eye clinic regularly for better outcomes of postoperative complications.

Key words: Traumatic cataract, aspiration, intraocular lens (IOL), posterior capsular opacification.

INTRODUCTION

Pediatric ophthalmic trauma can lead to cataract formation and other ocular problems such as loss of lens position and amblyopia. It is difficult to manage amblyopia and it is estimated that the burden of a disabled child is almost equal to that of ten adult blind persons. Cataract has been the leading cause of reversible blindness in developing countries including Pakistan¹. Both penetrating and blunt trauma may lead to cataract². Children, especially boys have higher percentage of exposure to trauma and also have a higher incidence of traumatic cataract³. Studies have shown that IOL implantation after cataract removal in traumatic cataract cases give good visual outcomes^{4,5}. According to a survey by Ministry of Health Pakistan, cataract causes 53% of the total blindness in Pakistan with a prevalence of 1.05%. A study from India on ocular trauma by Panda⁶ revealed that the incidence of traumatic cataract is 20.53% and Khan MD⁷ from Pakistan revealed that the incidence of traumatic cataract is 12.9%. The aim of this study was to assess the visual outcomes and postoperative complications in children

with traumatic cataract after IOL implantation and cataract extraction surgery. These methods of treatment and management give satisfactory results if aphakia and amblyopia is treated properly.

MATERIAL AND METHODS

Thirty patients with traumatic cataract between the age group of 3-12 years underwent cataract aspiration and IOL implantation at Saira Miraj Memorial Hospital Begum Kot Lahore Pakistan.

A written consent was signed by all patients, which informed the patients about the possible outcomes of the surgery and post operative complications. All children had a thorough ophthalmic examination including. Slit lamp examination was carried out if it was appropriate. A & B scan was performed in all cases to exclude posterior segment pathologies. Calculation of the power of IOL was carried out by using keratometer.

Surgical techniques which were used in this study included small incision cataract surgery, irrigation aspiration, anterior vitrectomy (AV) and implantation of intraocular lens (IOL) depending upon the circumstances of the patient.

The eyes were divided for surgery in two groups depending upon the extent of injury. Group 1 patients underwent lens matter aspiration, anterior vitrectomy

Department of Ophthalmology, Provincial Hospital affiliated to Shandong University, Jinan, Shandong 250021 China.

Department of Ophthalmology, Saira Miraj Memorial Hospital Begum Kot Lahore Pakistan.

Correspondence to Dr. Shen Jiaquan, Tel: 15168887733, E-mail: jiaquanshen@sdu.edu.cn

with intraocular lens implantation. Whereas group 2 included lensectomy and vitrectomy without intraocular lens implantation due to absence of adequate anterior or posterior capsule for implantation of IOL.

Irrigation aspiration with intraocular lens implantation in twenty five (83.3%) cases and lensectomy and vitrectomy was done in five (16.7%) cases.

All surgeries were done under general anesthesia, eye ball cleaned and painted with Betadine and draped. After that lid speculum applied and superior rectus bridle suture was applied to restrict the movement of the eye ball. An anti-eyebrow small scleral tunnel incision was given and vision blue stain applied to the torn edge of anterior capsule. After waiting 2 minutes vision blue washed away by irrigation aspiration with the help of a simco canula. viscoelastic injected in anterior chamber. Anterior capsulotomy was done with 26 gauge 1cc needle. a simco canula is used to aspirate soft lens matter and viscoelastic is injected .After that intra ocular lens implantation was done. Posterior capsulorhexis and anterior vitrectomy done.1 to 3, 10/0 nylon stitches applied .At the end of the surgery all patients were given subconjunctival injection of 2mg gentamicin and 2mg dexamethasone. Dexamethasone was also given intravenously to all patients (0.2mg/kg of the body weight).the operated eye remained covered with the bandage till the next morning.

Postoperatively all eyes received betamethasone drops (0.1%) 6-8 times daily, 0.3% ciprofloxacin drops 4 times a day tropicamide 2 times a day and Neosporin ointment at bed time. the use of topical medications were gradually reduced over the period of six weeks. Antiglaucoma therapy can be started if there are indications.

The patients were assessed on daily basis for the whole period of their stay at hospital. Parents or guardians were advised to bring the child to hospital after one week of discharge from the hospital for evaluation and then after 3 weeks and then after 6 weeks. At the sixth week patient is also evaluated. Post operative evaluation include slit lamp examination, indirect ophthalmoscopy, pre and post operated visual acuity was assessed by snellen's E chart depending the age of the child ,intraocular pressure measurements were recorded. Parents were advised for regular visits to doctor, at least once in 3 months. Amblyopia therapy was given where ever needed.

For Statistical analysis we used SPSS 18.0 software and we performed the T-test to get our results. In order to get our statistical values we assigned scores to each patient according to their

preoperative and postoperative visual acuity in which 1 being the lowest and 7 being the highest as shown in Table 5.

RESULTS

There were 30 patients in all out of which 21were boys and 9 were girls. Male to female ratio is 3:1. Right eye involved in eighteen (60%) cases and Left eye involved in 12(40%) cases.

The nature of injury showed that perforating injuries present in 22(73.3%) and blunt injuries in 8(26.7%) case. Cornea was scared in thirteen (43%) and clear in 17(57%) cases. Capsular tear was present in 18(60%) and intact capsule in 12(40% cases). Patching was advised only in 8(26.7%) cases.

Preoperative visual acuity showed that the vision was very low in all the patients as shown in Table 1. The final visual acuity evaluation showed that the vision improved in majority of the cases as shown in Table 2. Comparison between Pre and postoperative visual acuity is shown in Table 3.

Postoperative complications included Postoperative uveitis in three (10%) cases. Hyphema was present in one (3.3%) case. Decentration of intraocular lens in one (3.3%) case. Pupillary capture in two cases (6.6%). Upward drawn pupil in three cases (10%) Posterior capsular opacification in 9 cases (30%).

Group 1 patients who underwent aspiration, anterior vitrectomy with intraocular lens implantation had better visual out come as compared to that of Group 2 patients who underwent lensectomy and vitrectomy without intraocular lens implantation as shown in Table 4. Statistical analysis shows significant difference between preoperative and post operative scores as shown in the Table 5. Preoperative score for patients was 1.83. Postoperative score for patients was 4.830.

Table 1: Best corrected visual acuity (preoperative)

Method	Frequency	%age
Counting fingers	7	23.3
Hand movement	11	36.6
Perception of light P.L	12	40.0

Table 2: Visual acuity three-month (postoperative)

Method	Frequency	%age
PL+PR	2	6.7
Hand movement	2	6.7
Counting finger	1	3.3
6/60-6/36	3	10.0
6/24-6/18	16	53.3
6/12-6/9	4	13.3
Normal	2	6.7

Table 3: Comparison between pre and postop vision

Category	Preop Visual acuity	Postop Visual acuity	%age
A	30	5	17.0
B	0	19	63.0
C	0	6	20.0

A=low vision B= moderate vision C= good vision

Table 4: Postoperative visual acuity of group 1 & 2.

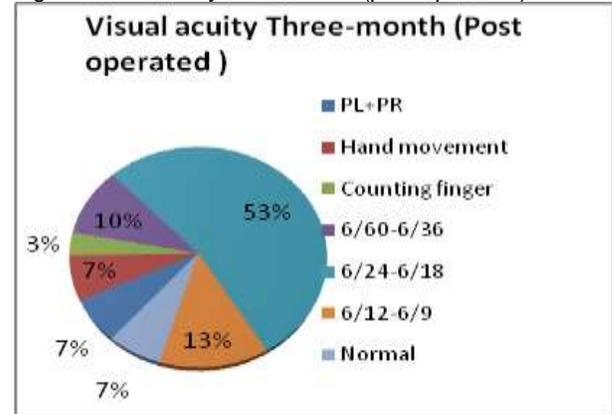
Method	Group 1	Group 2
PL+PR	0	2
Hand movement	0	2
Counting finger	0	1
6/60-6/36	3	0
6/24-6/18	16	0
6/12-6/9	4	0
Normal	2	0

Table 5: Statistical analysis

=n	Preop score	Postop score
1	1	1
2	2	1
3	2	2
4	1	2
5	1	3
6	1	4
7	2	4
8	1	4
9	2	5
10	2	5
11	1	5
12	1	5
13	3	5
14	2	5
15	1	5
16	1	5
17	2	5
18	3	5
19	1	5
20	2	5
21	2	5
22	1	5
23	1	5
24	2	5
25	3	6
26	3	6
27	2	6
28	3	6
29	3	7
30	3	7
Mean	1.183	4.830

Note: Preoperative and post operative scores comparison showed that $P < 0.01$

Fig. 1: Visual acuity three-month (post operative)



DISCUSSION

Accidental trauma in children is very common and it may lead to traumatic cataract associated with damage to other ocular structures. Traumatic cataract can present many medical and surgical challenges to ophthalmologist. Careful examination and management plan can simplify these difficulties and provide the best possible visual outcome^{8,9}. Management of unioocular cataract in a child is a great challenge. After removal of traumatic cataract in children we face a great problem of unioocular aphakia. There are various ways to correct it. The Spectacle correction does not help in developing binocular vision due to Astigmatism. Contact lenses are helpful to certain extent only but in our circumstances it is very difficult to maintain contact lenses in children. Now days due to the development of viscoelastic substances, improved technology and intraocular lens implantation we got good results of visual outcome.

Intraocular lenses are preferred and are gold standard for unilateral traumatic cataract at any age and appears to be the most appreciable option in children as it provides a full time correction of an aphakic eye, the optics of which closely simulate the human crystalline lens¹⁰. Moreover the IOL are easily affordable now days and are better than contact lenses as contact lenses need a high maintenance which is not suitable in children.

The incidence of traumatic cataract reflected in ophthalmic literature varies from 1% to 15% of all ocular injuries^[11]. The final visual outcome depends upon type of trauma, extent of lenticular involvement and associated damage to ocular structures. In Pakistan 12% of cases of trauma developed traumatic cataract Muzaffar Abbas. In India 14% of all cases of cataract in children are due to trauma. Number of patients who are blind due to cataract are more than 1 million¹².

The number of male patients was greater because of involvement in outdoor activity and dangerous sports. According to the study of IIsar et al 1982, injuries are often caused by knife, toys, glass, cord, wire sticks, pencil or fire crackers or other play and sports activities. In Mianwi most of the injuries happened during domestic activity rather in sports¹³.

The visual outcome is usually good after traumatic cataract and can be further improved by intra ocular lens implantation. Now a days due to the development of viscoelastic substances, improved technology and intraocular lens implantation we got good results of visual outcome .Early surgery, proper post operative care and finally well motivation to the parents for regular follow up checkups to minimize the chances of development of amblyopia and to know the exact long term outcomes, thus avoiding further complications like irreversible blindness. Parents were informed about the expected outcome of the surgery and were advised to bring their child for regular checkups following surgery.

Statistical analysis showed that $p = 0.000 < 0.01$, which concludes that our study is a success and it can be widely used. Our study which is lens aspiration with IOL implantation gives very good visual outcomes and this is a very practical mean of restoring vision in children affected by trauma hence this method can be used worldwide by ophthalmologists in developing countries to get better visual outcomes.

REFERENCES

1. Anjum KM, Khan MB, KhanMA, Jan N, Ali A, Ahmad K et al. Cataract blindness and visual outcome of cataract surgery in tribal areas of Pakistan. *Br J Ophthalmol*, 2006;90:135-38.
2. Karim A, Loghari A. Therapeutic. and prognostic problems of traumatic cataract – Apopros of 45 cases. *J Ophthalmology*, 1998; 21:112-17.
3. Coody D, Banks J, Yetman R. Eye trauma in children: epidemiology, management, and prevention. *J Pediatric Health Care*, 1997;11:182-88.
4. Bekibele CO, Fasina O. Visual outcome of traumatic cataract surgery in Ibadan, Nigeria. *Niger J Clin Pract*, 2008;11: 372-75.
5. Reddy AK, Ray R, Yen KG. Surgical intervention for traumatic cataracts in children: Epidemiology, complications, and outcomes. *JAAPOS. J Am Association Pediatric Ophthalmology and Strabismus*. 2009; 13: 170-174
6. Panda A, Kumar S, Das H, Badhu BP. Striving for the perfect surgery in Traumatic cataract following penetrating trauma in a Tertiary care hospital in Eastern Nepal: *J Nepal Med Asso*, 2007;46:119-25.
7. Khan MD, Kundi N, Mohammad Z Nazeer AF. A 6.5 year survey of intraocular and intra orbital foreign bodies in the North West Frontier Province, Pakistan. *Br J Ophthalmol* 1987; 71:716-19.
8. Chuang, Lai Chi-Chun. Secondary intraocular lens implantation of traumatic cataract in open globe injury. *Can J Ophthalmol* 2005;40: 454–59.
9. Staffieri SE, Ruddle JB, Mackey DA. Rock, paper and scissors? Traumatic paediatric cataract in Victoria 1992-2006. *Clin Experiment Ophthalmol*, 2010; 38:237-41.
10. Crouch ER Jr, Pressman SH, Crouch ER. Posterior chamber IOL. *J Paed Ophthalmol Strabismus*, 1995;32:210-18.
11. Bloemendal W, de Jong, R Jaenicke, N.H. Lubsen, C Slingsby and A Tardieu. Aging and vision: structure, stability, and function of lens crystalline. *Progress in Biophysics and Molecular Biology* 2004;86:407-85.
12. Jadoon Z, Shah SP, Bourne R, Dineen B, Gilbert CE, Foster A. On behalf of Pakistan National Eye Survey Study Group, 2007.
13. Niiranen N, Raivio I. Eye injuries in children. *Br J Ophthalmol* 1981;65:436-38.