COMPLICATIONS AND VISUAL OUTCOME OF INTRAOCULAR FOREIGN BODY: A STUDY OF 37 CASES PRESENTED TO A TERTIARY CARE CENTRE OF KHYBER PAKHTUNKHWA

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ABSTRACT

OBJECTIVE: to determine the complications and visual outcome of intraocular foreign body presented to a tertiary care centre of Khyber Pakhtunkhwa

STUDY DESIGN: A prospective, interventional case Series

PLACE AND DURATION: At Department of Ophthalmology, Govt Lady Reading Hospital, Peshawar from 1st July 2011 to 31st Jan 2013.

METHODOLOGY: 37 cases with intraocular foreign body from outdoor department were admitted for management. Patients were examined after detailed history and important findings noted.

RESULTS: The study population comprised of 37 cases. Male were in majority (70.2%). majority of our patients were young. Mean age 33 years. Common complications of intraocular foreign body include vitreous hemorrhage (32.4%), retinal detachment (37.8%), scleral perforation (32.4%) and endophthalmitis (27%). Visual progression was poor in majority of the eyes (54.04%).

CONCLUSION: Most serious cause of intraocular foreign body was Bomb Blast injury. Visual prognosis was poor in majority of the eyes; delayed presentation and complicated BBI were the top reasons.

KEY WORDS: Intraocular Foreign Body, Ocular Trauma, Visual Outcome, Complications.

INTRODUCTION

Trauma is one of the most common causes of visual morbidity and ocular problems especially when associated with intraocular foreign body (IOFB) [1]. Its incidence is on the rise due to increased use of weapons and wars especially in our part of the world. [2] Traumas whether blunt or penetrating results in series of ocular damage which at times becomes irreversible and may result in blindness. Penetrating trauma is even more dangerous because it gives rise to numerous ocular complications like endophthalmitis, vitreous hemorrhage, retinal detachment, optic nerve damage mainly because of penetration of intraocular foreign body (IOFB) [3]. There are various reasons, why a foreign body (FB) gets entry into the body. In our part of the world, bomb blast injuries, working while chiseling or hammering and accidental entry of stones etc are the most common reasons for IOFB. [4,5]

There are different types of IOFBs like metal, wood, stone, plastic and even hair can enter the globe and cause serious damage. IOFB can cause different types of complications. [6]

Common complications of IOFB are damage to cornea, lenticular damage, vitreous hemorrhage, retinal detachment, scleral perforation etc. Intraocular damage is often irreversible.[7]

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Timely repair of the defect, removal of IOFB and treatment of complications of IOFB are the key factors on which prognosis for vision depends along with type of IOFB. [8] Some IOFB are more damaging especially organic e.g. vegetables, wood, iron and metals. Some IOFB when left undetected may lead to chalcosis and siderosis with subsequent loss of the whole globe. [9]

Treatment of IOFB is complex and it not only involves removal of IOFB if it is indicated but also dealing with the complication of these FBs as well. So more or less it is a staged management. Despite all efforts it's very difficult to get good in majority of the victims. Those which are presented late and with complications, have poor prognosis despite surgery and medication[10]. Bomb blast injury (BBI) victims have multiple injuries and complicated trauma and are especially the risk group.[4]

Every penetrating trauma patient should be properly managed. Therefore, delayed and neglected IOFB left undetected results in many complications and even loss of whole eye. Hence it represents a challenge to the ophthalmologist.[11]

METHODOLOGY

This prospective, interventional study was carried out at Department of Ophthalmology, Govt Lady Reading Hospital, Peshawar from 1st July 2011 to 31st Jan 2013. 37 cases with intraocular foreign body from outdoor department were admitted for management. This was a prospective, Interventional study of patients with IOFBs. Patients were examined after detailed history and important findings noted. Patients were examined in detail. The following variables were recorded for the purpose of the study: age, gender, cause of trauma, occupation, complications, presenting best-corrected visual acuity (BCVA), slit lamp and fundus examination, ultrasound examination when ophthalmoscopy was not possible, foreign body localization based on orbital CT scan, size, site, and type of the foreign body, consequences of retained IRFB including complications, time interval since injury, details

were recorded. All patients underwent surgical removal of the IOFB. Final visual acuity at 6 month follow up visit was noted. Data was collected on special proforma and was presented in the form of tables. Non probability consecutive sapling technique was used.

All patients with history of intraocular foreign body were included in the study. Patients with history of ocular disease especially diabetic retinopathy, high myopia, past ocular surgery and bleeding disorders were excluded from the study.

RESULTS

We evaluated thirty seven cases of intraocular foreign body.

Table - I shows age and gender of the patients. For ease of description we divided the age of the patients into three groups in years. Age ranges from five years to sixty three years. Age was divided and in first group age ranges from five to twenty years. In the second group it is ranging from twenty one to forty years and in the third group from forty one to sixty three years. Majority of the patients belong to second group and there were 21 (56.7%) patients in group one, 7(19%) patients in group two and 10 (27.02%) patients in group three. Mean age was 33 years. So majority of our patients were young who spent life in outside environment. 26(70 .2%) patients were male and only 11 (29.8%) were female in our study.

TABLE – I: AGE AND SEX DISTRIBUTION OF PATIENTS (n=37)

Age	Number	Percentage
5 to 20 years	7	19
21 to 40 years	21	56.7
41 years and above	10	27.02
Total	37	100
Gender		
Male	26	70.2
Female	11	29.8

TABLE – III: OCCUPATION OF PATIENTS. (n=37)

Occupation of Patients	Number	Percentage
Labor	18	48.65
Sports and defense	11	29.74
Students	5	13.51
Others / accidental	3	8.1

TABLE - V: FINAL VISUAL OUTCOME (n=37).

Visual Acuity	Number	Percentage
Perception of light to no perception of light	20	54.05
1/60 to 6/60	17	46
Total	37	100

DISCUSSION

We studied cases with penetrating intraocular injury that underwent vitrectomy and foreign body removal. Visual outcomes and complications of surgical management for IOFBs were determined. Important observations reported in the literature were compared to the present study.

Among the different causes of the IOFB, hammering a chisel was the main cause (n=15, 40.55%). Bomb blast injury was seen in 13 (35.13%) patients and sports or accidents were seen in 4 (10.81%), while other causes reported unknown by the patients were 5 (13.51%) cases. (Table - II)

Different people involve in different sort of occupations who get IOFB .labor was the commonest occupation which were seen in 18 (48.64%) cases. sports and defense related people were seen in 11 (29.75%) , students and children in 5 (13.51%) and other accidental cases were only 3 (8.1%). (Table - III)

Intraocular complications of victims who suffered intraocular foreign body injuries shown in Table - IV. In 7(18.9%) cases cornea was perforated. 12 (32.4%) cases showed scleral perforation. In 10(27%) cases endophthalmitis was found. Vitreous hemorrhage was found in 12 (32.4%), Retinal detachment in14 (37.8%) cases, hyphema in 4 (10.8) cases while Cataract was found in 24 (64.9%) cases and it was the most common complication of intraocular foreign body in our study.

Finally visual progress at six month follow up was determined. Most cases end up in poor vision. Perception of light to no perception of light vision was noted in 20(54.05) cases and Counting finger or better vision up to 6/60 was noted in 17 (46%) cases. BBI and late presentation were the common reason for poor visual outcome. (Table V)

TABLE – II: CAUSES OF INTRAOCULAR FOREIGN BODY (n=37)

Causes	Number	Percentage
Hammering a chisel	15	40.55
Bomb blast injury	13	35.13
Sports or accidental	4	10.81
Others	5	13.51

TABLE - IV: COMPLICATIONS OF INTRAOCULAR FOREIGN BODY (n= 37)

Complication	Number	Percentage
Vitreous hemorrhage	12	32.4
Retinal detachment	14	37.8
Sclera perforation	12	32.4
Corneal perforation	7	18.9
Hyphaema	4	10.8
Cataract	24	64.9
Endophthalmitis	10	27

We evaluated 37 cases of IOFB and we studied the detail of those patients who suffered trauma and presented to us with IOFB. The main causes of eye injury have changed with advances in techniques and weaponry of warfare, with blast fragmentation injuries accounting for 50-80% of cases [12]. In a study by Muzaffar et al, It was observed that 60.7% patients had sustained ocular trauma of a variable degree as a result of the blasts. The mean age of the victims was 29 years and they were

all male. [13]

Mostly victims are those working in the field and exposed to environment. Significant prognostic factors for final visual outcome in patients with open globe injury are initial visual acuity, posterior extent and length of wound, presence of hyphaema and presence of vitreous prolapse. Awareness of the factors predicting a poor visual outcome may be helpful during counseling of patients with open globe injuries.

Profession like Labor was the commonest occupation and these were the main victim of IOFB. BBI is very common in our part of the world and 35% cases were victim of BBI. BBI were having worse prognosis and despite proper management and early intervention, results and final visual outcome was poor and disappointing. It was mainly because of multiple and complex type of injuries and severe ocular damage and associated ocular complications.

Several studies confirm that trauma of any type is common in male. [14] in our study males were in majority also. Similarly young to middle age people are the common group of people exposed to both accidental as well as occupational trauma[15,16]. In our study most of our patients were less than 40 years age.

Penetrating ocular injuries with retained posterior segment foreign bodies are challenging cases requiring urgent attention by vitreoretinal surgeons. Posteriorly located IOFBs can result in serious immediate and delayed vitreoretinal sequelae, such as retinal detachment and endophthalmitis. In a study, the rates of retinal detachment and endophthalmitis were 41% and 17% respectively. [3]

Types of IOFB complications were important factors for poor visual outcome[17]. In our study, Vitreous Hemorrhage was the commonest complication associated with it, as shown in another study as well[1]. Corneoscleral perforation was second most common complication. Collectively, Endophthalmitis is the most serious ocular problem, as proved in literature as well.

In our study, in these cases the prognosis for vision was very poor because of serious damage. The final visual acuity was Perception to no perception of Light vision only. In a study [3, 18], the incidence of traumatic endophthalmitis is around 14-17 % which is less than our study because of late referral and the more serious cause of injury.

In ocular trauma, the nature of the foreign body determines the clinical behavior; inert objects such as steel and glass may not cause significant inflammation. Removal of organic foreign bodies, however, is mandatory since these objects usually lead to secondary infection, like endophthalmitis. [19]

In our study, the final visual acuity was Hand Motion vision in majority (60%) of the cases and main reason besides endophthalmitis was BBI and late presentation as well as postoperative complications resulted in an attempt to remove IOFBs from the globe. Perception of Light visual acuity was in 35% cases in present study.

Several studies have shown that the visual prognosis is poor. In a study, 63% patients had final visual acuity of less than 5/200 at final follow-up. [20] In another study, visual acuity on admission between 6/60 to PL comprises highest number (64%) and also on discharge between 6/60 to PL comprises highest number of cases (50%). [17]

In our study, the average final Visual Acuity was only PL in majority of cases. We lost 05 patients at follow up. As mentioned earlier, the late presentation and BBI were main reasons for poor visual outcome. So majority have poor final vision even after treatment.

CONCLUSION

Vitreous Hemorrhage is the most common complication while Endophthalmitis is the most serious complication in trauma associated with intraocular foreign body. Majority of the cases end up with poor visual outcome; delayed presentation and BBI are the top reasons.

RECOMMENDATIONS

Counseling about postoperative complications of surgeries should be discussed in detail before surgical removal of the FB.Patients should be properly investigated for IOFB and its causes because many of them are completely curable while others are manageable only if referred and timely managed. This will help to reduce patients' suffering, improve quality of life and vision loss from complications of trauma.

REFERENCES

1. Szijarto Z, Gaal V, Kovacs B, Kuhn F. Prognosis of penetrating eye injuries with posterior segment intraocular foreign body. Graefes Arch Clin Exp Ophthalmol. 2008 ;246:161-65.
2. Rodoplu U, Arnold JL, Yucel T, Tokyay R, Ersoy G, Cetiner S. Impact of the terrorist bombings of the Hong Kong Shanghai Bank Corporation headquarters and the British Consulate on two hospitals in Istanbul, Turkey, in November 2003. J Trauma. 2005 ;59:195-201.
3. George J, Ali N, Rahman NA, Joshi N. Spectrum of intra-ocular foreign bodies and the outcome of their management in Brunei Darussalam. Int Ophthalmol. 2013 ; 33:277-84.
4. Shaikh MA. Hazard perception and occupational injuries in the welders and lathe machine operators of Rawalpindi and Islamabad. J Pak Med Assoc. 2001 ;51:71-74.
5. Zafar H, Jawad A, Shamim MS, Memon AA, Hameed A, Effendi MS, et al. Terrorist bombings: medical response in a developing country. JPakMed Assoc. 2011 ;61: 561-66.
6. Slusher MM.Intraretinal foreign bodies. Management and observations. Retina. 1990;10 Suppl 1:S50-4.
7. Maneschg OA, Resch M, Papp A, Németh J. Prognostic factors and visual outcome for open globe injuries with intraocular foreign bodies. Klin Monbl Augenheilkd. 2011 ;228:801-807
8. Erakgun T, Egrilmez S. Prognostic factors in vitrectomy for posterior segment intraocular foreign bodies.J Trauma. 2008 ;64:1034-37.
9. Lapira M, Karl D, Murgatroyd H.Siderosis bulbi as a consequence of a missed intraocular foreign body. BMJ Case Rep. 2014 ;2014. pii: bcr2013202904.
10. Obuchowska I, Sidorowicz A, Napora KJ, Mariak Z.Clinical

characteristics of penetrating ocular injuries with intraocular foreign body. Part II. Diagnostics and treatment. Klin Oczna. 2010;112:77-81.
11. McGimpsey SJ, Rankin SJ. Presentation of intraocular foreign body 25 years after the event. Clin Experiment Ophthalmol. 2005;33:665-66.
12. Wong TY, Seet MB, Ang CL.Eye injuries in twentieth century warfare: a historical perspective. Surv Ophthalmol. 1997 ;41:433-59.
13. Muzaffar W, Akbar K M, Malik KM , Durrani O. Mine blast injuries: ocular and social aspects.Br J Ophthalmol. 2000; 84(6): 626–30.
14. Kinderan YV, Shrestha E, Maharjan IM, Karmacharya S.Pattern of ocular trauma in the western region of Nepal. Nepal J Ophthalmol. 2012 ;4:5-9.
15. Han SB, Yu HG.Visual outcome after open globe injury and its predictive factors in Korea. J Trauma. 2010 ;69:E66-72.
16. Yalcin Tök O, Tok L, Eraslan E, Ozkaya D, Ornek F, Bardak Y.Prognostic factors influencing final visual acuity in open globe injuries. J Trauma. 2011;71:1794-800.
17. Hossain MM, Mohiuddin AA, Akhanda AH, Hossain MI, Islam MF, Akonjee AR, et al.Pattern of ocular trauma. Mymensingh Med J. 2011;20:377-80.
18. Szijártó Z, Gaál V, Kovács B, Kuhn F.Prognosis of penetrating eye injuries with posterior segment intraocular foreign body. Graefes Arch Clin Exp Ophthalmol. 2008 ;246:161-65.
19. Wang X, Xie Q, Wang X, Chen H, Sheng X. Orbital trauma with a large plant foreign body: a case report. Eye Sci. 2013 ;28:44-47.
20. Bauza AM, Emami P, Soni N, Holland BK, Langer P, Zarbin M, et al. A 10-year review of assault-related open-globe injuries at an urban hospital. Graefes Arch Clin Exp Ophthalmol. 2013 ;251:653-59.