

Open globe injuries in the child population in hyderabad

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Abstract

• **AIM:** To evaluate the causes, frequency, severity of eye injury, management, visual outcome and prevention in children with penetrating ocular injury.

• **METHODS:** The study was conducted on patients under 15 years presenting with penetrating ocular injuries. Anterior segment slit lamp examination was performed for cornea and corneo-scleral penetration, hyphema, iris prolapse, etc. Posterior segment slit lamp examination with 90D fundusscopes was done in selected cases. After performing necessary investigations, urgent surgical intervention was carried out.

• **RESULTS:** Out of 43 (55%) registered patients; boys were 67%, and girls 33%. The agents of trauma were glass, pencil, stick, etc. The site of entrance through cornea was 62.7%, sclera 25.6%, and limbus 11.7%. The presenting visual acuity was 6/60 and above in 32.5% children, 6/24 in 9.3%, and 6/12 and above in 2.3% cases. 37.2% cases had perception of light. Out of 36 operated eyes, twenty-nine completed post operative follow up. 10.4% subjects had final visual acuity (FVA) of 3/60. 24.2% had FVA of 6/60. 17.2% children had FVA of 6/24 partial. In 34.4% subjects, the FVA was restricted to perception of light. 10.4% developed phthisis bulbi.

• **CONCLUSION:** Ocular trauma is a significant cause of visual loss in child population. Preventive efforts are extremely important in domestic and outdoor activities.

• **KEYWORDS:** ocular injuries; children; visual outcome; blindness

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INTRODUCTION

Ocular trauma is one of the main causes of severe visual impairment in young adults and children leading to blindness^[1]. The penetrating eye injury is indeed an important preventable global public health problem with a remarkable socioeconomic impact^[2]. The children due to limited common sense and poor motor skills frequently suffer from penetrating eye injuries^[3]. According to WHO declaration, out of 55 million ocular injuries occurring each year

worldwide, about 1.6 million patients developed total loss of vision^[4]. A survey from United States reported that approximately 2 million eye injuries per year. Out of which more than 40 thousands subjects developed permanent blindness^[5]. In an recent study from 1992 through 2002, there was a remarkable decline in the global incidence of ocular trauma that ranged from 8.2 to 13.0 per 1000 population^[6]. In Queensland rural setting, the rate of eye injury was 11.8 per 100000 populations^[7]. The extent of eye injury is related to the involvement of ocular tissue. Proper evaluation and prompt treatment can prevent visual loss^[8]. In spite of timely approach and a good surgical intervention, the cosmetic disparity and the chances of developing amblyopia has an impact on social status of a child who has still to move along^[9].

PATIENTS AND METHODS

Patients This is a retrospective clinical study conducted on the patients having serious eye injury requiring hospitalization, over a thirty months period, from January 2005 to June 2007 at Liaquat University Eye Hospital Hyderabad.

The patients of both sexes under 15 with open eye injury presenting for the first time during the study period were selected. All the subjects with blunt injury, previous ocular trauma coming for follow up, and above fifteen years were excluded.

Methods The initial examination was performed in the outpatient emergency section by two permanently posted senior ophthalmologists and four medical officers. After getting informed consent, the subjects were interviewed and assessed for: General History: (1) Age, sex, residency, eye affected, exact time, extent, location of trauma and financial status. (2) Use of corrective lenses to rule out spectacle injury. (3) Diplopia to rule out blow out orbit fracture, lens dislocation and cranial nerve palsy. Physical examination: (1) The initial visual acuity (IVA) was documented for injured and normal eye, using Snellen's chart and E-chart for illiterate children. (2) Slit lamp anterior segment examination if possible was performed in cooperative patients to localize the site of injury and to rule out associated injuries. Posterior segment slit lamp examination with 90 D funduscope was done in selected cases. (3) Pupils were examined for size, shape and light reflex. (4) The intraocular pressure was checked by applanation tonometer in selected cases to confirm hypotony in ocular penetration.

After admission routine investigations like complete blood count, bleeding and clotting time, X-Ray chest etc were done.

A three view plain x-ray orbit was performed; waters view for orbital floor and detection of air-fluid levels in the maxillary

sinuses; Caldwell or antero posterior view for medial and lateral orbital wall, superior orbital rims, ethmoidal and frontal sinuses; Lateral view for the orbital roof, maxillary and frontal sinuses, zygoma, and sella turcica.

CT scanning was done in selected cases to visualize anatomy of the globe and orbit and to detect any intraocular metallic foreign body. MRI was performed to localize a nonmetallic foreign body, etc. A and B scan ultrasonography was done in subjects with opaque media obstructing the posterior segment examination.

Type of management: After admission the injured eye was covered with plastic shield for protection. The emergency medications such as analgesics (paracetamol), antiemetics (promethazine etc) were given. Prophylactic antibiotic eye drops such as ofloxacin, chloramphenicol eye drops were administered half hourly to avoid secondary infections and endophthalmitis.

Tetanus antitoxin injection was given at the dose of 700 to 1500 international units depending on the age of a child. The patient was kept on empty stomach for six hours before surgical intervention.

The surgical repair for anterior segment was done within first 24 hours by either of two senior ophthalmic surgeons. Secondary repair was done in selected cases. All those penetrations which extended to posterior segment were referred to vitreoretinal surgeon.

All patients were requested to complete the postoperative follow up criteria of this study. The final visual acuity (FVA) was documented on the sixth week postoperative follow-up.

RESULTS

A total of seventy eight (78) subjects with ocular trauma presented within the study period. Out of which forty three (55%) children suffering penetrating eye injury were selected. Boys were twenty nine (67%), and girls fourteen (33%). Nine (21.0%) patients were under 5, twenty three (53.4%) between 6 to 10 years, eleven (25.5%) subjects were between 11 to 15 years. Twenty six (60.4%) children lived in rural area, and seventeen (39.6%) were of urban residency. Nine (21.0%) subjects were using corrective spectacles. Two (4.6%) patients presented with diplopia after injury. Four (9.3%) subjects belonged to upper class living standard, eleven (25.5%) to middle class and twenty eight (65.1%) had lower socioeconomic status. All of the patients had unilateral eye injury (Figure 1,2). The most commonly affected age group was between 6 to 10 years (23 cases).

Five patients of 6 to 10 years of age, and three of 11 to 15 years were injured by pencil, six subjects of 6-10 yrs and four of 11-15 yrs were injured by stick. Glass injury was observed in three patients of 6-10 years. Two patients under 5 years and one under 10 years were injured by house scissors. Two children under 5 years and two under 10 years injured by knife. Two subjects under 15 years were injured by screw driver. Four children under 15 years were hit by stone. Two patients under 5 years, two under 10 and one under 15 years had the history of fall. The cause of eye injury in four patients



Figure 1 Right eye corneoscleral perforation

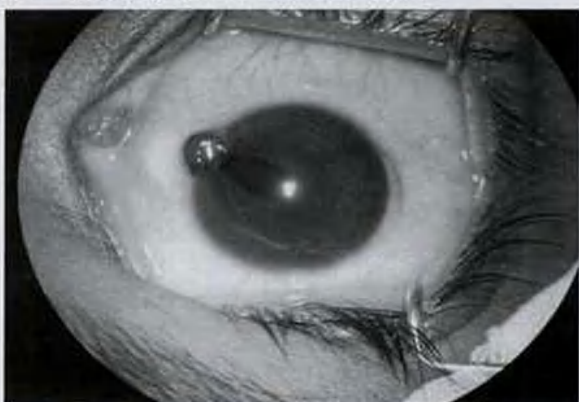


Figure 2 Left eye corneal limbal perforation with iris prolapse

was unknown. At first emergency visit; Penetration through cornea was 62.7% (27 eyes), limbus 25.6% (11 eyes), and sclera extending posterior to equator 11.7% (5 eyes). The additional findings were; Lid swelling (33 eyes), lid swelling with sub-cutaneous hemorrhage (14 eyes), lid cut (6 eyes), trauma to lower lacrimal system (2 eyes), sub-conjunctival hemorrhage (21 eyes), iris prolapse (23 eyes), uveal prolapse (18 eyes), traumatic cataract (12 eyes), hyphema (17 eyes), vitreous hemorrhage (14 eyes), retinal detachment (9 eyes), endophthalmitis (12 eyes), periorbital swelling (7 eyes).

Out of forty three registered patients, 23 (53.4%) children presented on the day of injury. Remaining 20 (46.6%) subjects reported after first 24 hours. Seven patients were not willing to receive surgery and left for some other place. The surgical repair was done on thirty six patients. Out of which 19 (52.7%) subjects had surgical repair in first 24 hours (Figure 3, 4). Seventeen (47.2%) children received repair after 1st 24 hours. Eleven (30.5%) subjects were referred to vitreoretinal department for management of posterior segment. Out of 43 children, the initial visual acuity (IVA) at admission was, 6/60 and above in nine (20.9%) subjects, 6/24 in four (9.3%), 6/12 in one (2.3%) patient. Thirteen (30.3%) patients presented with only the hand movement at one meter distance. In nine (20.9%) children, the IVA was restricted to perception of light. Seven (16.3%) patients did not fully cooperate for IVA.



Figure 3 Right eye corneoscleral perforation wound repair on 2nd post operative day

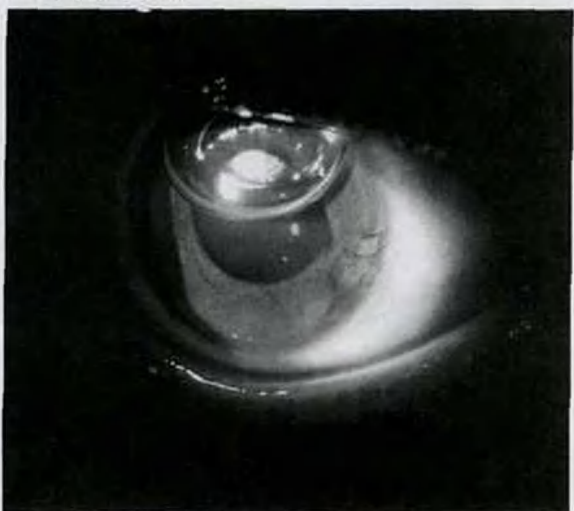


Figure 4 Left eye limbal repair on 2nd post operative day

Out of 36 patients underwent operation, only 29 (80.5%) subjects completed six weeks postoperative follow up. Regarding final visual acuity (FVA) after correction at the end of sixth week in 29 subjects, three (10.4%) patients had FVA 3/60. Seven (24.2%) had FVA of 6/60. Five (17.2%) children had FVA of 6/24 and above. One (3.4%) patient had FVA of 6/12, and in ten (34.4%) children the FVA was restricted to perception of light. Three (10.4%) patients developed phthisis bulbi.

DISCUSSION

Penetrating eye injury in children can result into irreversible damage to the functional capability of eye leading to severe visual impairment. Most of the injuries occur at home, fall during play, farming, child abuse etc. Among all age groups, children are more prone to subject to ocular trauma^[10]. The incidence of eye injuries presenting to the hospital (per 100000 populations per year) was 12.6% in Singapore^[11], 15.2% in Sweden^[12], 13.2% in United States^[13], and in Pakistan the hospital data revealed about 12.9%^[14]. In a local study conducted in 2006, about 43.5% children were reported to have serious eye injury. In our study 55.1% children were registered having perforating ocular trauma. More male subjects are usually affected than females^[15], probably due to

maximum outdoor activities of boys than girls. In this study 67.4% of victims were boys. This male to female ratio correlates with the study from India where 65.1% of sufferers were boys, and in another local study where the male preponderance was 76.9%^[11]. Most of the injured subjects live in rural areas, perhaps due to more laborious job, and frequent exposure to dangerous activities. In this series 60.4% of children with serious ocular trauma had rural residency. Such an escalated proportion of eye injury in rural population is quite consistent with the study from Nepal in 2004^[16]. The violence related eye injury is also an important factor in children. In one study the author reported ocular trauma due to violence in 31.2% subjects. In another study, the violence related injury was observed in 17% cases^[17]. In the present study, the injury by stick was 23.2% and 9.4% by throwing stones. In this study 46.6% of patients presented to the hospital after first 24 hours of injury. According to one study in 2006, the author reported 67.3% subjects of severe ocular trauma presented one week after injury^[11]. In another study from India in 2002, 34% of patients with eye injury reported after first 24 hours^[18]. This delayed approach to eye care centre was perhaps due to lack of awareness and long distances from hospitals.

The severity and site of ocular trauma are the common prognostic factors used to predict final visual outcome. In this study the penetration of globe at cornea was observed in 62.7% subjects. These results are consistent with one local study that reported higher incidence of corneal route of penetration^[19]. The nature of object, damage to the posterior segment such as lens dislocation, vitreous hemorrhage, and intraocular foreign body etc are the factors for poor visual prognosis. In this series, 17.2% subjects achieved 6/24 or better corrected visual acuity, while 34.4% had perception of light. Such a low final visual outcome was perhaps due to severity of ocular trauma, lack of awareness, late presentation, and poor compliance to treatment.

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巴基斯坦海德拉巴地区儿童人群眼球开放伤

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摘要

目的: 探讨儿童眼球开放伤的发生原因;频率;严重程度;治疗;视力恢复及预防。

方法: 本研究包括 15 岁以下儿童眼球开放伤。使用裂隙灯检查角膜及巩膜裂伤,前房积血,虹膜脱出等。部分病例使用裂隙灯联合 90D 眼底镜检查眼底。经必要的检查后行急诊手术。

结果: 注册的 43 例(55%)儿童中,男占 67%,女占 33%。致伤物为玻璃,铅笔,木棍等。致伤部位为角膜占 62.7%,巩膜占 25.6%,角巩膜缘占 11.7%。初次就诊伤眼视力 6/60 以上占 32.5%,6/24 以上占 9.3%,6/12 以上占 2.3%。37.2% 病例为光感。36 例手术病例中有 29 例有术后随访。10.4% 病例的最终视力为 3/60,24.2% 病例的最终视力为 6/60,17.2% 病例的最终视力为 6/24。34.4% 的病例的最终视力为光感。10.4% 的病例发生眼球萎缩。

结论: 眼外伤是儿童人群中视力丧失的一个主要原因。在家庭及户外活动中采用必要的预防措施至关重要。

关键词: 眼外伤;儿童;视功能;失明