



## OCULAR INJURY; QUALITY OF LIFE AFFECTED: A CASE SERIES

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**ABSTRACT** **Objective:** To describe various types of ocular trauma due to different modes of injury among different age group occurred on the same day. **Methods:** Prospective interventional study (case series). **Results:** Five patients of ocular trauma were studied & managed. All five patients were males. Out of 4 cases, 2 cases had open globe injury and 2 cases had closed globe injury. Two out of four patients required surgical intervention while 2 patients were managed with conservative medical therapy. **Conclusion:** This study describes the types and characteristics of ocular trauma presenting in eye department. The frequency of ocular trauma is common in males, affecting the quality of family and economic status, intum creating a social burden. Eye injuries resulting from ocular trauma pose a frequent threat to vision the world over. While a focussed history and prompt ocular examination are essential to immediate management, patient education regarding safety precautions and risk reduction help to prevent future recurrences.

**KEYWORDS :** Ocular morbidity, Ocular Injury, globe rupture, iridodialysis, fire cracker injury, hyphema, Road Traffic accident (RTA), loss of vision.

## INTRODUCTION

Trauma to the eye is a common cause of ocular morbidity encountered by ophthalmologists. Ruptured globes represent one of the most serious consequences of ocular trauma and often lead to some degree of permanent vision loss(1). Often patients will present with a history of a blunt trauma, fall or a sharp object penetrating their eye. Indian eye trauma registry system was started during International Society of Ocular Trauma-conference held at Jaipur in the year 2012 with a motive to prevent and to improve the safety standards in the work place. (2) The surgical management probably depends on the surgeon to tackle the emergency situation and the facilities available for the primary repair of the wounds. The goal is towards the reconstruction of the anterior segment as a first aid and referring further to posterior segment experts for vitreoretinal problems

## CASE 1 :

A 7-year-old boy presented to the hospital on 15<sup>th</sup> November 2020 with a painful right eye after Fire cracker burst injury outside of his home 5 hours earlier. He remember some hard object hitting his right eye followed by firecracker burst.

He denied trauma to any other part of his body. Parents made his eye rinse with water prior to being seen at hospital. No history of loss of consciousness, vomiting, headache in a span of last 5 hours.

His chief complaints were ocular pain, and loss of vision in the right eye. Examination of right eye revealed swelling of lids, with 0.5x2cm abrasion over lower lid at the junction of media 1/3<sup>rd</sup> & lateral 2/3<sup>rd</sup> and lower lid laceration 3mm lateral to lower punctum. Orbital margins were intact. conjunctiva showed mixed congestion. Slit lamp examination of the right eye showed a corneal abrasion around 3 to 4mm in the superotemporal quadrant of cornea from 12'o to 3'o clock involving pupillary area and rest of the cornea was hazy. Anterior chamber was shallow and irregular with dispersed hyphema evident at 1'o clock and 7'o clock. Heterochromia iridis and Iridodialysis from 3'o to 6'o clock. Lens examination was insufficient due to clouding of the anterior segment structures with hazy and abraded cornea. There was no light perception in injured eye. Intraocular pressure could not be measured due to severe pain. Left eye examination was normal with heterochromia iridis.

The patient's ocular and medical history was unremarkable. He was not taking any medications and had no known drug allergies.

Computed ocular tomography did not revealed any intraocular foreign body. X-ray left orbit shows no bony injury.

As a primary procedure lower lid laceration was repaired following patient was kept on close supervision after admitting and conservative management with antibiotics, cycloplegics, lubricants, antiglaucoma drugs. Intraocular pressure was 22 and 12mmHg by non-contact tonometer in the morning hours. 3<sup>rd</sup> day B-scan ultrasound of the right eye revealed eye ball contour irregularly thickened in posterior wall with thickness of 2.5mm with few intermediate signal mobile echoes in the posterior chamber.



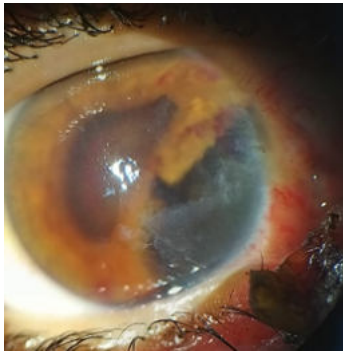
Figure 1:

- Right eye lower lid laceration of about 0.5 x 0.5 x 1cm present 3mm lateral to lower punctum.
- Corneal abrasion of about 3 to 4mm involving nasal half and pupillary area.



Figure 2:

- Right eye showing Iridodialysis from 3'o to 6'o clock with dispersed hyphema and oedematous cornea.



**Figure 3:**

- 20th day post-conservative management.

**CASE 2:**

A 17-year-old male patient visited to hospital on 15<sup>th</sup> November 2020 with painful left eye after met with RTA on hitting a jeep by bike on 14<sup>th</sup> November 2020 during night hours. The details of RTA was unclear. He did not specifically remember the incident happened. Post accident he was unconscious for 5-6 hours with one episode of vomiting . No history of ENT bleeding. He got a primary care in a local hospital on the same day following he was refer to our hospital next day morning.

His chief complaints were ocular pain and loss of vision in the left eye, associated with watering. Examination revealed lowerlid laceration of about 0.5x0.5x1cm at the junction of medial 1/3<sup>rd</sup> & lateral 2/3<sup>rd</sup>. Tenderness along inferior orbital margin. Left eye conjunctiva showed congestion. Slit lamp examination of the left eye showed a full thickness semi-lunar shaped corneal laceration extending from 12'o to 4'o clock involving pupillary area . The lacerated corneal edges were oedematous and fragile. Rest of the cornea was oedematous and showed descemet's fold. The anterior chamber was shallow and irregular with dispersed total hyphema. Pupillary and Lens examination was insufficient due to clouding of the anterior segment structures with oedematous cornea and dispersed hyphema. There was a severe hypotony present. The Perception of light was present but the projection of rays were inaccurate in left eye. Right eye examination was normal.

The patient's ocular and medical history was unremarkable. He was not taking any medications and had no known drug allergies.

Computed ocular tomography did not revealed any intraocular foreign body. X-ray left orbit shows no bony injury.

As a primary procedure left eye corneal laceration was repaired under local anaesthesia. The conjunctival sac was irrigated with 5% povidone iodine as a prophylactic measure to prevent postoperative endophthalmitis. open sky vitrectomy of clogged vitreous in the anterior chamber was done. Corneal laceration was repaired by interrupted sutures with 10-0 Nylon. Through 9'o clock sideport , AC wash done. A mixture of air bubble and Ringer's lactate was used to reform the anterior chamber. Post-operative B-scan ultrasound of the left eye revealed posterior wall thickness with few echoes of mobile intermediate signal seen in posterior chamber and lens not visualised separately. Intraocular pressure was unrecordable in left eye and 14mmHg in right eye.



**Figure 4:**

- Left eye showing "L" shaped full thickness corneal laceration with total dispersed hyphema.



**Figure 5:**

- Day 1 post-operation of Left eye showing sutured corneal laceration with reformed anterior chamber by air bubble , deformed corneal contour 12'o to 4'o clock.



**Figure 6:**

- Day 4 post-operation showing sutured corneal laceration.

**CASE 3:**

A 50-year-old patient visited to hospital on 15<sup>th</sup> November 2020 with painful left eye after accidental injury to left eye with pointed iron fence at farm field 6 hours earlier.

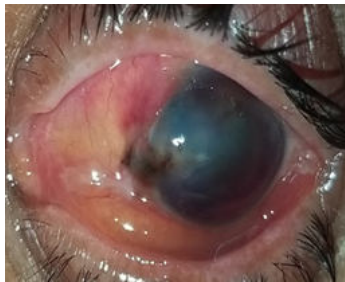
His chief complaints were ocular pain and loss of vision in the left eye, associated with watering. Examination revealed congested left eye with swollen eyelids. Orbital margins were intact. Slit lamp examination of the left eye showed conjunctival tear at 9'o clock extending along limbus superiorly . There was a horizontal corneal laceration about 3mm at 9'o clock extending along the limbus upto 11'0 clock and also extending horizontally to sclera about 2mm with iris tissue prolapse at 9'o clock limbus. The cornea was oedematous. The anterior chamber was irregular and dispersed total hyphema observed. Pupillary examination was insufficient due to clouding of anterior segment structures with oedematous cornea and dispersed hyphema. Lens showed traumatic cataract changes. The perception of light was present, projection of rays were inaccurate. There was left eye hypotony observed by digital tension technique. Intraocular pressure could not be measured due to severe ocular pain. No intraocular foreign bodies were seen in the left eye. Right eye examination was normal with visual acuity – 20/40 PH 20/30.

The patient's ocular and medical history was unremarkable. He was not taking any medications and had no known drug allergies.

Computed ocular tomography did not revealed any intraocular foreign body. X-ray left orbit shows no bony injury.

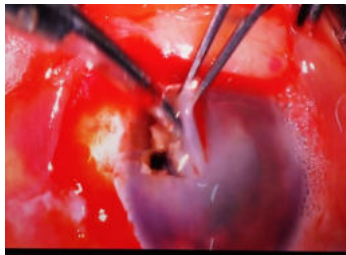
As a primary procedure wound explored and corneal laceration was repaired under local anaesthesia. The eyelids and conjunctival sac of the left eye irrigated with 5%povidone iodine as a prophylactic measure to prevent postoperative endophthalmitis. Sideport created at 3'o clock for anterior chamber depth maintenance. Open sky vitrectomy of prolapsed vitreous done. Corneoscleral laceration repaired with 10-0 Nylon with iris tissue abscission. Through sideport

AC wash tried, but hyphema was organised and couldn't removed. A mixture of air bubble and Ringer's lactate was used to reform the anterior chamber. Post-operative B-scan ultrasound of the left eye revealed floating hyperreflective echoes in the posterior segment suggestive of choroidal detachment and vitreous detachment.



**Figure 7:**

- Left eye showing Horizontal corneal laceration at 9'o clock with uveal tissue prolapse at limbus



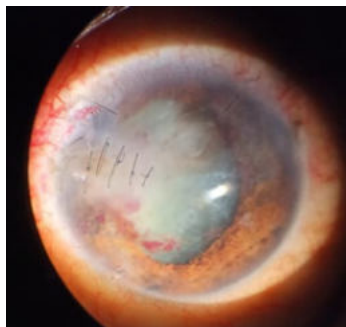
**Figure 8 :**

- Intraoperative wound exploration identifies Extended laceration along limbus superiorly from 9'o clock to 12'o clock and also laceration extended towards sclera.



**Figure 9:**

- Day 4 left eye Post-operation showing intact corneal sutures, conjunctival sutures and reformed anterior chamber.



**Figure 10:**

- Follow-up after 1month shows intact sutures with traumatic cataract.

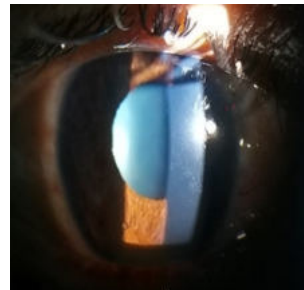
**CASE 4 :** A 30-year-old male patient visited to hospital on 29<sup>th</sup> November 2020 with painful right eye having an history of trauma to

right eye with stone following firecracker burst on 15<sup>th</sup> November 2020.

His complaints were ocular pain and redness in right eye since 4 days. Patient was having symptoms like pain and redness in right eye since the day of injury, for which he took a painkiller from local medical dispensary. Also having difficulty in near vision. He visited to our hospital when the symptoms flared up. Examination revealed circumciliary congestion of bulbar conjunctiva .Orbital margins were intact. Slit-lamp examination of the right eye revealed few Nebulomacular opacities over inferior cornea. Small Pigmented Keratic precipitates seen on the inferior corneal endothelium. Anterior chamber was normal in depth with Aqueous cells – 4+, Aqueous flare – 3+(as per SUN classification) . There was multiple, small sphincter pupillae tear from 11'o to 1'o clock and at 5'o clock with traumatic mydriasis. Lens showed posterior subcapsular cataract - grade 1, Anterior vitreous cells – Trace. Visual acuity of right eye is 20/30 PH 20/20p. Intraocular pressure was 16mmHg & 14mmHg in OD & OS. On gonioscopy , there was an abnormal wide ciliary body band over 270° in right eye and other eye shows normal finding. Fundus examination was normal. Left eye examination was normal with visual acuity 20/20.

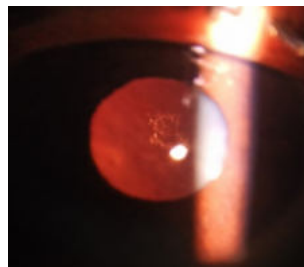
The patient's ocular and medical history was unremarkable. He was taking painkiller tablet from local medical dispensary, had no known drug allergies.

Patient was kept on conservative management with topical antibiotics , topical steroids, topical lubricant with oral antibiotics, oral NSAID's, Tab Vitamin C and advised for close follow-up .



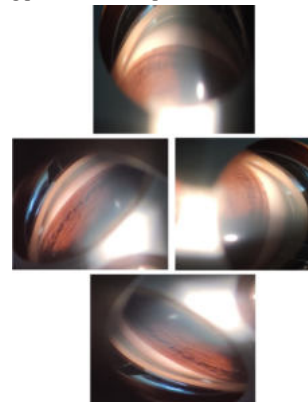
**Figure 11 :**

- Multiple NM opacities over inferior cornea with traumatic mydriasis.



**Figure 12 :**

- Lens showing posterior subcapsular cataract



**Figure 13:**



- On gonioscopy - More than 270° angle showing abnormally wide ciliary body band suspecting post traumatic angle recession

### DISCUSSION:

These cases are representatives of various types of ocular trauma frequently encounter in eye emergency. It is important to be aware of possible potential long-term effects of ocular trauma. Sudden occurrence of ocular injury may cause permanent visual handicap and affects the quality of life and occupational ability. Ocular trauma is also important for medico legal purposes like insurance claims & workers compensation issues<sup>3</sup>.

Patients with non-penetrating ocular trauma to be evaluated for the presence of sub-conjunctival haemorrhage, corneal abrasion, hyphema, traumatic mydriasis, traumatic iritis, choroidal rupture, traumatic optic neuropathy, retinal haemorrhages, commotio retinae, retinal breaks and angle recession.

Penetrating ocular trauma is a leading cause of blindness<sup>3</sup>. Small penetrating injuries of cornea may undergo self-sealing with mild visual morbidity if involving the visual axis. It may injure the anterior capsule of lens and leads to local or diffuse lenticular opacity. A Bell's phenomenon takes place as a part of protective reflex leads to upward rotation of eyeball due to which penetrating injuries often seen in inferior sclera. Majority of corneoscleral lacerations involves underlying structures and prolapsed uveal tissue needs to be replaced or removed before repair the wound. Posterior injuries involve the retina and development of vitreo-retinal traction responsible for the occurrence of complex retinal detachments<sup>4</sup>.

### CONCLUSION:

The circumstances and agents implicated in ocular injuries are variable. This case series highlights the propensity of grievous ocular trauma in a domestic environment. There is an high propensity of ocular injuries in males affecting the quality life of family and economic status, which in turn creating the social burden. Considering the high rate of domestic eye trauma, more preventive measures and education required at working places and at home. . According to the literature, approximately, 80% of those injured are male .(5,6) Male/Female ratio in the United States Eye Injury Registry (USEIR) was 4.6:1. Mostly, adults of third to fourth decades (62%) presented as MLC. According to the previous studies, most of those injured are young with an average age around 30 years. The average age in the USEIR is 33 years .(7)

Patients suffering from blunt ocular trauma pose several legal challenges for primary eye care practitioners. If specialized care is necessary, a timely referral must be arranged. Practitioners are liable for the acts or omissions of employees, and receptionists who schedule appointments should be able to triage patient complaints so that same-day appointments are scheduled for patients requiring urgent assessment and care. Documentation of the disposition of these patients is essential; forms are an ideal way to record and preserve essential information. (8)

When elimination of ocular hazards is not possible, personal eye protection becomes the last line of defense. Eye protection has been used successfully in a number of environments to reduce eye injuries. Eye protection programs can be difficult to implement. With these limitations in mind, some have suggested eye protection only for boys because of their increased risk of ocular trauma. (9)

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