



Ocular Injury; Hazard to Society: A Case Series

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ABSTRACT

Purpose: To describe various types of ocular trauma due to different modes of injury occurred on the same day

Design: Prospective interventional study (case series)

Materials & Methods: A series of cases of ocular trauma in different age group on the same day.

Results: Five patients of ocular trauma were studied & managed. All five patients were males. Out of 5 cases, 3 cases had open globe injury and 2 cases had closed globe injury. Three out of five patients required surgical intervention while 2 patients were managed with 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.

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.

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I. 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 15th 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 1/3rd & lateral 2/3rd 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 reveal any intraocular foreign body. X-ray left orbit shows no bony injury.

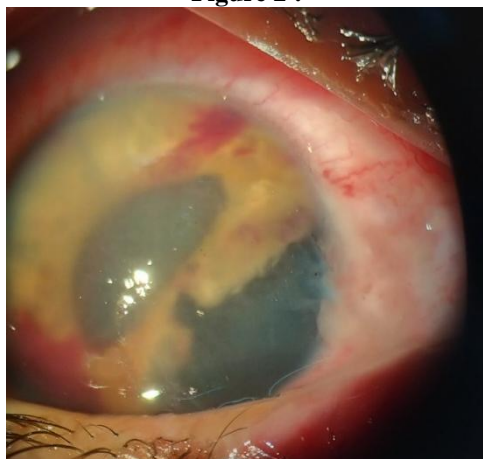
As a primary procedure lower lid laceration was repaired following patient was kept on close supervision after admitting and conservative management with antibiotics, cycloplegics, lubricants, antiglaucoma drugs. Intraocular pressure was 22 and 12mmHg by non-contact tonometer in the morning hours. 3rd 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:



- 4th day post-conservative management.

Figure 4:



- Follow-up after 1 month

CASE 2: A 17-year-old male patient visited to hospital on 15th November 2020 with painful left eye after met with RTA on hitting a jeep by bike on 14th 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 1/3rd& lateral 2/3rd. 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 descemets 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.

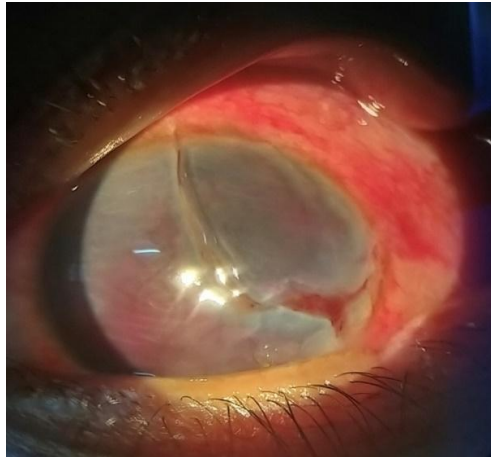
The patient's ocular and medical history was unremarkable. He was not taking any medications and had no known drug allergies.

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 5:



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

Figure 6:



- Intraoperative iris tissue prolapse while exploring the wound for which iris tissue abscission done.

Figure 7:



- Day 1 post-operation of Left eye showing sutured corneal laceration with reformed anterior chamber by airbubble
- Deformed corneal contour from 12'o to 4'o clock.

Figure 8 :



- Day 4 post-operation showing sutured corneal laceration.

CASE 3: A 50-year-old patient visited to hospital on 15th 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'o 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 reveal any intraocular foreign body. X-ray left orbit shows no bony injury.

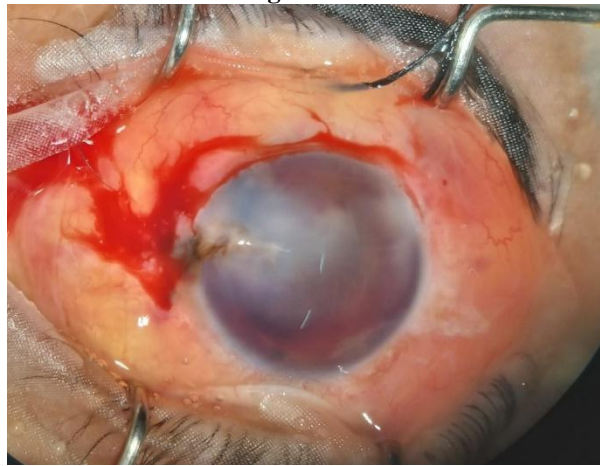
As a primary procedure wound explored and corneal laceration was repaired under local anaesthesia. The eyelids and conjunctival sac of the left eye irrigated with 5% povidone iodine as a prophylactic measure to prevent postoperative endophthalmitis. Sideport created at 3'o clock for anterior chamber 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 9:



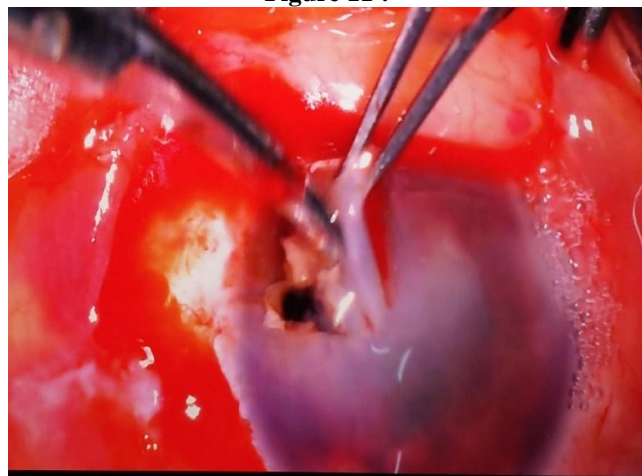
- Left eye showing Horizontal corneal laceration at 9'o clock with uveal tissue prolapse at limbus

Figure 10 :



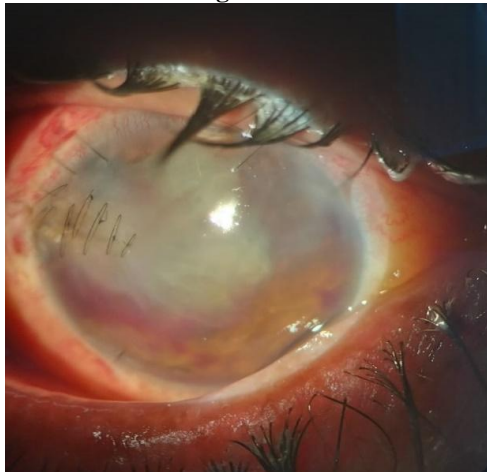
- Intraoperative wound exploration identifies conjunctival laceration and extension of corneal laceration towards sclera

Figure 11 :



- Intraoperative wound exploration identifies Extended laceration along limbus superiorly from 9'o clock to 12'o clock.

Figure12:



- Day 1-Left eye Post-operation showing sutured corneal and conjunctival laceration and reformed anterior chamber.

Figure 13 :



- Day 4 left eye Post-operation showing intact corneal sutures.

Figure 14:



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

CASE 4: A 50-year-old male patient visited to hospital on 15th November 2020 with painful & bleeding left eye after assault by stone from some known person 1dayprior.

His chief complaints were ocular pain, bleeding and loss of vision in left eye since the above mentioned incidence happened. There is an history of poor vision in left eye and corneal opacity since 2 years. Examination revealed swelling and ecchymosis of eyelids . conjunctiva shows congestion and severe chemosis. Orbital margins were intact .Slit-lamp examination of the left eye showed prolapsed intraocular contents through cornea . Rest of the anterior segment details were unclear. Severe hypotony was present. The perception of light in left eye was absent. Right eye examination was normal with vision 20/30 PH NI.

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

Computed ocular tomography showed disorganized globe with no evidence of bony injury. X-ray left orbit shows no bony injury.

The visual prognosis and possibility of intraoperative encounter to an irreversible damaged eye, needing evisceration was explained to the close relatives of the patient. The globe was hypotonus due to autoevisceration of the ocular contents. Evisceration was done on 16th November 2020.Patient was maintained on intravenous ceftriaxone(1g every 12h) and intravenous amikacin(500mg every 12h) systemically along with topical antibiotics.

Figure 15:



- Post trauma autoevisceration of ocular contents.

Figure 16:



- Day 1 of post evisceration .

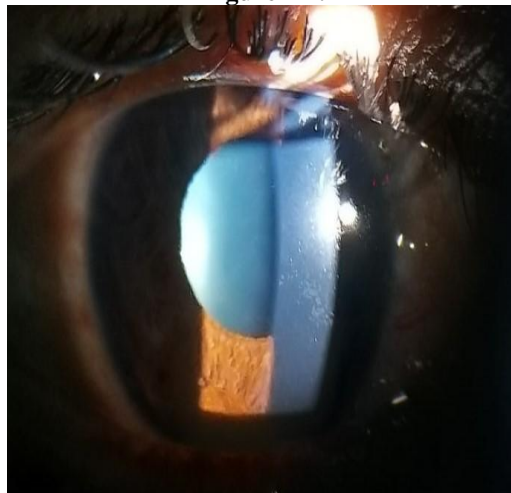
CASE 5 : A 30-year-old male patient visited to hospital on 29th November 2020 with painful right eye having an history of trauma to right eye with stone following firecracker burst on 15th November 2020.

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.

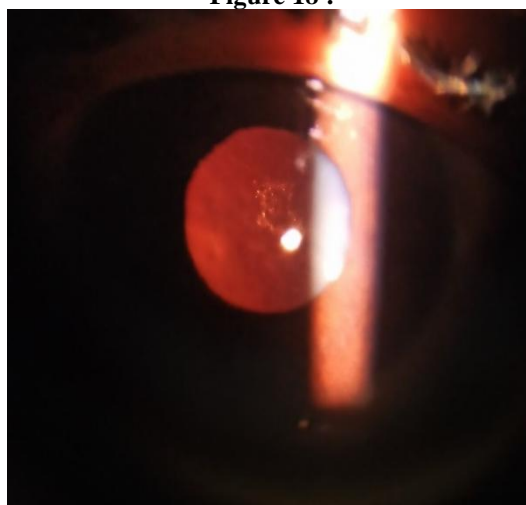
Patient was kept on conservative management with topical antibiotics , topical steroids, topical lubricant with oral antibiotics, oral NSAID's, Tab Vitamin C and advised for close follow-up .

Figure 17 :



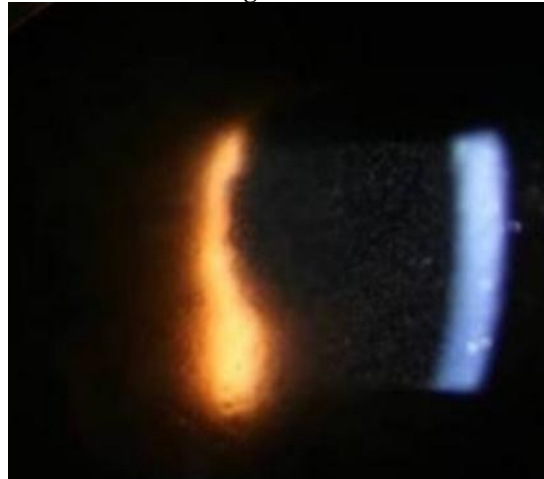
- Multiple NM opacities over inferior cornea with traumatic mydriasis.

Figure 18 :



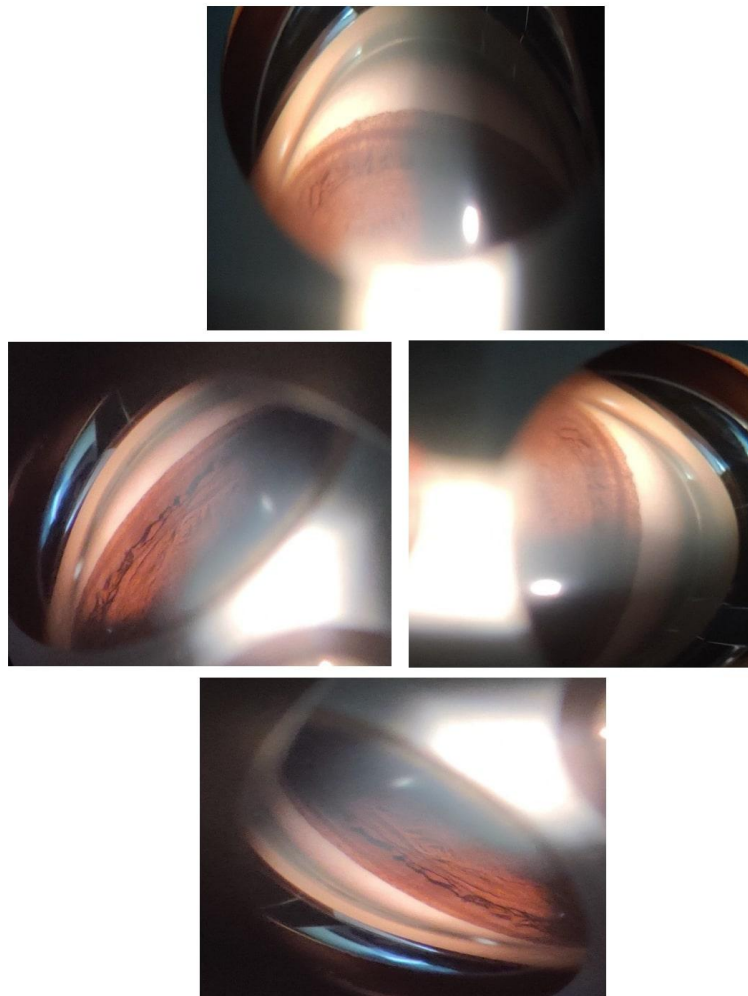
- Lens showing posterior subcapsular cataract.

Figure 19:



- As per SUN classification, Aqueous flare -3+, Aqueous cells - 4+

Figure 20:



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

II. DISCUSSION:

These cases are representatives of various types of ocular trauma frequently encountered 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 issues³.

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 blindness³. 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 detachments⁴.

III. 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 a high propensity of ocular injuries in males affecting the quality of life of family and economic status, which in turn creates the social burden. Considering the high rate of domestic eye trauma, more preventive measures and education required at working places and at home.

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FIGURE LEGEND:

- Figure 1 & 2 – Pg No 4
- Figure 3 & 4 -Pg No 5
- Figure 5 & 6 -Pg No 7
- Figure 7 & 8 -Pg No 8
- Figure 9 & 10 -Pg No 10
- Figure 11 & 12 -Pg No 11
- Figure 13 & 14 -Pg No 12
- Figure 15 & 16 -Pg No 14
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- Figure 19 -Pg No 17
- Figure 20 -Pg No 18