



CLINICAL STUDY OF OCULAR MANIFESTATIONS IN CLOSED GLOBE INJURY

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KEYWORDS :

INTRODUCTION

The prevalence of ocular injuries is a significant problem in epidemiology, as our society heavily relies on visual information and interaction. A study using data from the United States Eye Injury Registry (USEIR) discovered that the median age of patients suffering from legal blindness (defined as having vision worse than 20/200) due to trauma was 25 years old. Out of all eye injuries, around 39% are closed-globe (blunt) injuries. Closed-globe injuries often have a more favourable prognosis compared to open-globe injuries. Given the significant prevalence of illness and the seriousness of visual impairment, it is crucial for eye doctors to acquire knowledge and raise awareness within their communities regarding this avoidable ailment. Ocular trauma is one of the major causes of visual impairment worldwide. Closed Globe Injuries are defined as injuries without full thickness defects to the eyewall, that is cornea or sclera. This study has been designed to study the ocular manifestations in closed globe injuries

AIMS AND OBJECTIVES

The purpose of this study is to evaluate the ocular manifestations in closed globe injuries and assess visual outcome among patients presenting to a tertiary care hospital

MATERIAL AND METHODS

This is a hospital-based prospective study conducted in patients with closed globe injury attending the casualty and the Ophthalmology department after applying the inclusion and exclusion criteria. A detailed and comprehensive ophthalmic examination was performed and visual acuity was noted at the presentation and follow-ups. 104 Patient's aged between 1-80 years with closed globe injuries reporting to the casualty and ophthalmology OP GGH, Guntur were included. Patients aged less than one year and those aged more than 80 years, those carrying war-related injuries, thermal injuries, ultrasonic injuries, radiation injuries, chemical injuries, orbital injuries with fractures and patients with any pre-existing ocular disease, patients with a history of any intraocular surgeries, those who failed to attend regular follow-ups were excluded from the study. Visual Acuity testing was done with Snellen chart. Examination of the fundus was done using a direct ophthalmoscope and 90D lens. Intra Ocular Pressure measurement was done using Goldmann applanation tonometer. Anterior segment evaluation was done using slit lamp biomicroscopy, angle of anterior chamber was assessed using gonioscopy and posterior segment evaluation was done using B-scan.

RESULTS:

The mean age of the study population was 32.2 +/- 3.2 years. The age range of the participants was 1- 50 years. The ocular manifestations

have been mentioned in the table 1

Table 1:

Features	No of cases
Periorbital Edema	64
Ecchymosis	58
Lid edema	44
Laceration	28
Emphysema	2
Iridodialysis	1
Abrasion	7
TON	10
Optic Nerve Avulsion	3
Hyphaema	11
Vossius ring	1
Conjunctival tear	2
Angle recession	2
Partial thickness corneal tear	2
Subconjunctival hemorrhage	75
Iris Spincter tear	1
Lens subluxation	1
Corneal abrasions (erosions)-fluorescent stain positive	6
Traumatic mydriasis	4
Rosette (traumatic cataract)	1
Berlin's edema	1
Anterior dislocation of lens	2

In the current study, among 104 cases, 75 cases (72.1%) had subconjunctival hemorrhage, 64 cases (61.5%) had periorbital edema, 58 cases (55.8%) had ecchymosis, 44 cases (42.3%) had lid edema, 28 cases (26.9%) had laceration, 11 cases (10.6%) had hyphaema, 10 cases (9.6%) had Traumatic Optic Neuropathy TON 7 cases (6.7%) had abrasions, 6 cases (5.76%) had corneal abrasions, 4 cases (3.8%) had traumatic mydriasis, 3 cases (2.88%) had Optic Nerve Avulsion, emphysema, conjunctival tear, angle recession, partial thickness corneal tear, anterior dislocation of lens each constitute 2 cases (1.96%) respectively and irido dialysis, vossius ring, iris spincter tear, lens subluxation, rosette (traumatic) cataract, berlin edema each constitute 1 case (0.96%) respectively.

Isolated periorbital edema, ecchymosis, lid edema, lid laceration, abrasions and sub conjunctival haemorrhage cases had 6/36 or better vision at presentation and vision gradually improved on follow ups.

Traumatic optic neuropathy (TON): 10 cases of TON had 6/60 or lower

vision at presentation and none of them improved or gradual worsening of vision noted at week 1 and 1 month.

Angle recession: 2 cases of angle recession were identified and at presentation, all 2 had 6/18 vision and at 1 week and at 1 month, they improved to 6/9 partial and intraocular pressure is being maintained on antiglaucoma medication.

Optic nerve avulsion: 3 cases of optic nerve avulsion were identified , presented with no perception of light, where vision didn't improve during followups.

Partial Thickness Sclero-corneal And Conjunctival Tears: 4 such cases presented with 6/36 or lower vision and significant improvement to 6/18 or better was seen in the two conjunctival tear cases and vision improved to 6/18 in the two sclero corneal tear patients.

Hyphema: 11 cases of hyphema presented with 6/60 or lower vision and they improved to 6/9 or better vision at 1 month follow up

Rosette (Traumatic cataract): 1 case of traumatic cataract presented with 6/24 and vision remained the same on follow ups.

Corneal abrasions: 6 cases of corneal abrasions (epithelial erosions) with fluorescent stain positive presented with 6/36 or lower vision and they improved to 6/9 or better vision on follow ups.

Vossius Ring: 1 case of vossius ring presented with vision 6/9 partial and vision improved to 6/6 partial at 1 month follow up.

Traumatic mydriasis: 4 cases of traumatic mydriasis noted among which one was with iris spincter tear presented with vision 6/12 or lower vision and they improved to 6/9 or better vision on follow-ups.

Lens dislocation: 1 case of lens dislocation presented with counting fingers ½ meter and vision remained the same on follow ups.

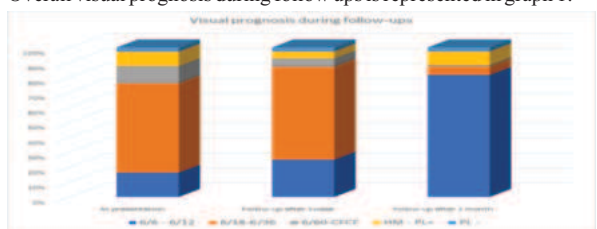
Berlin edema: 1 case of berlin edema presented with 6/36 and later improved to 6/9 vision at 1 month of follow -up.

Overall visual prognosis during follow ups is presented in table 2 :

Table 2:

	At Presentation	Follow-up After 1 Week	Follow-up After 1 Month
VISI ON	6/6-6/12 17 CASES	6/9 17 CASES (100%)	6/9 - 6/6 17 CASES (100%)
	6/18-6/36 62 CASES	≥6/36 57 CASES (92%) 6/18 4 CASES (6.5%) 6/24 1 CASE (1.5%)	6/18-6/6 61 CASES (98%) 6/24 - 1 CASE (2%)
	6/60-CFCF 12 CASES	6/12-6/9 6 CASES (50%) NO IMPROVEMENT 6 CASES (50%)	≥6/9 6 CASES (50%) CF ½ Metre 1 CASE (9%) PL (+ve) 5 CASES (41%)
	HM-PL (+ve) 10 CASES	≥6/36 5 CASES (50%) NO IMPROVEMENT 5 CASES (50%)	≥6/12 5 CASES (50%) NO IMPROVEMENT 5 CASES (50%)
	PL(- ve) 3 CASES	PL (-ve) 3 CASES (100%)	PL (-ve) 3 CASES (100%)

Overall visual prognosis during follow ups is represented in graph 1:



Gender Distribution Represented In Graph 2:

Of 104 patients,65 patients were male (62.5%), 39 (37.5%) patients were females.

Graph 2:



Percentage Of Manifestations In Various Ocular Structures Shown In Graph 3:

Orbit -119%- Periorbital edema, ecchymosis, emphysema

Eyelids-76%-lid edema, laceration, abrasion

Conjunctiva-74%-sub conjunctival haemorrhage, conjunctival tear

Cornea-7.7%-corneal abrasions, partial thickness corneal tear

Anterior chamber-12.5%- hyphaema, angle recession

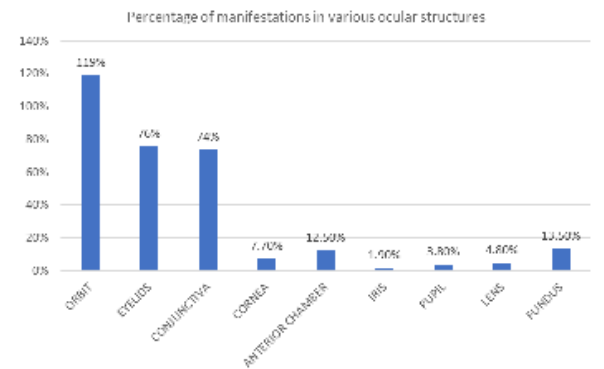
Iris-1.9%- iridodialysis, iris spincter tear

Pupil-3.8%- traumatic mydriasis

Lens - 4.8%- anterior dislocation of lens, vossius ring, lens subluxation, traumatic cataract

Fundus-13.50%-Traumatic Optic Neuropathy, Optic Nerve Avulsion, Berlin's edema.

Graph 3:



DISCUSSION

Studying the ocular manifestations of blunt eye injuries is crucial due to the significant impact these injuries can have on vision and overall eye health. Blunt trauma to the eye can lead to a range of serious conditions, such as retinal detachment, hyphaema, and traumatic optic neuropathy, which may result in partial or complete vision loss if not promptly diagnosed and treated. Understanding the spectrum of ocular damage caused by blunt injuries aids in the development of effective diagnostic and therapeutic strategies. Early and accurate assessment is vital for preserving vision and preventing long-term complications. Furthermore, research into these manifestations informs preventative measures and public health initiatives aimed at reducing the incidence and severity of such injuries, especially in high-risk activities and environments. This knowledge is also essential for healthcare professionals, enabling them to provide better patient education, management, and follow-up care.

Closed-globe ocular trauma is more common than open globe injury and can also result in severe loss of vision as the force of injury is largely transmitted to the structures of the eye without an opportunity for release. This subsequent compression and expansion of the globe can damage the anterior segment, causing hyphaema, injury to iris-angle and traumatic cataract and the posterior segment vitreous hemorrhage, retinal hemorrhage, retinal tears, RD, Choroidal injury, and TON. The closed globe injuries are further classified as contusion and lamellar laceration. Injury is either due to the direct force of the object (e.g., choroidal rupture) or changes in the shape of the globe (e.g., angle recession) Types of closed-globe trauma can also be divided into two categories, direct and indirect. The diagnosis is

clinical and rarely laboratory and imaging are warranted. Laboratory investigations are needed in critical patients and patients requiring surgical intervention. The management depends on the type of injury and the need for surgical intervention. The final visual outcome is governed by the mode of trauma, time of presentation, the extent of ocular damage, time of surgical intervention and post-operative care of the patient.

In 2022, Wagh et al. did a study on the clinical study and profile of ocular trauma. Ocular trauma was most prevalent among those aged 31-40 years. There were a total of three patients who were older than 60 years, while 15 patients fell under the paediatric age range, which includes individuals between the ages of 1 and 20 years. Males experienced a much higher incidence of ocular injuries (88.33%) compared to females (11.67%). Both eyes were similarly affected in this investigation. 45% of patients had the right eye affected, whereas 55% had the left eye affected. The researchers determined that road traffic accidents were the predominant cause of eye injuries among patients seeking medical attention at this rural hospital in central India. The involvement of specific ocular structures and the forms of ocular trauma have a substantial impact on the visual outcomes of these patients (1). The results were similar to the results in our study.

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