Original Article

Epidemiology of Patients Presenting with Posterior Segment Trauma to a Tertiary Care Eye Hospital in Eastern Uttar Pradesh, Following Closed Globe Injury

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Abstract

Purpose: Closed-globe injuries represent a significant form of ocular trauma leading to a varying degree of vision loss. Posterior segment pathologies are critical components of these injuries, and early diagnosis is pivotal in reducing the disease burden. A comprehensive understanding of demography, injury mechanisms, clinical findings, management strategies, and outcomes can enhance prevention and treatment approaches.

Methods: A tertiary care hospital-based retrospective study was done analysing electronic medical records of patients with closed-globe injuries who presented between January 2022-January 2023. Variables studied included age, sex, literacy level, mechanism of injury, primary diagnosis, treatment approach, and posterior segment pathologies. Management and outcomes were evaluated based on medical and surgical interventions and visual prognosis.

Results: 43 patients were included in the study predominantly consisting of males(84%), with a mean age of 30.5 years, 56% being illiterate. The common modes of these injuries were road traffic accidents (47%), falls (23%), and wood stick injuries (12%). At presentation, 58% of patients exhibited severe visual impairment. Retinal detachment (46%), traumatic optic neuropathy (21%), and vitreous haemorrhage(14%) were common pathologies observed. 77% of treated patients experienced visual improvement after appropriate intervention.

Conclusion: This study underscores the epidemiology of closed-globe injuries and their impact on vision. Posterior segment pathologies such as retinal detachment, traumatic optic neuropathy, and vitreous haemorrhage were relatively more common. Early diagnosis and timely intervention are crucial, directly translating to better visual outcomes. Future efforts should focus on preventive strategies and optimizing surgical interventions to enhance visual prognosis.

key words: Ocular Trauma, Posterior Segment Injuries, Retinal Detachment, Vitreous Haemorrhage, Traumatic Optic Neuropathy, Blunt Eye Injury

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Introduction

Ocular trauma, exceptionally closed globe injuries involving the posterior segment, is a significant cause of visual impairment and blindness worldwide. The global annual incidence of ocular trauma is around 55 million, of which 750,000 cases require hospitalization each year.[1] In India, the reported incidence of ocular trauma varies from 1% to 5% [2]. Posterior segment pathologies occurring after non-penetrating trauma like traumatic lens dislocation, vitreous haemorrhage, berlin's edema, retinal detachment, choroidal tears, traumatic optic neuropathy, and macular hole [3,4].

Traumatic lens dislocation disrupting the zonules post blunt trauma, leads to lens displacement out of the patellar fossa. This can result in altered refraction, secondary cataract formation, or glaucoma due to angle crowding[5,6]. Mild cases may only require optical correction, whereas significant displacement may necessitate surgical intervention, such as lens repositioning or intraocular lens implantation[3,4], and pars plana vitrectomy (PPV) [5]. Delayed presentation in closed-globe injuries results in complications such as lens-induced glaucoma or corneal decompensation, leading to a worse visual outcome compared to open-globe injuries [10]. Cases of combined pathologies, including giant retinal tears with subretinal crystalline lens dislocation, worsen the visual outcome and necessitate early surgical intervention [5,9,11,12].

Traumatic vitreous haemorrhage results from trauma-induced rupture of retinal or choroidal vessels, leading to blood accumulation in the vitreous cavity [4,13,14]. Patients typically report sudden vision loss or floaters. Persistent haemorrhage may require vitrectomy. Visual outcomes vary; if associated retinal damage is absent, the prognosis is good, but if complicated by proliferative vitreoretinopathy, long-term vision loss is observed. [13,15]

Traumatic retinal detachment (TRD)is commonly associated with open or closed-globe injuries [4]. The impact of trauma causes retinal breaks, giant retinal tears, or vitreoretinal traction, leading to fluid accumulation under the retina and subsequent detachment. TRD is frequently seen in young males due to sports injuries, motor vehicle accidents, or occupational hazards [13,16–18]. Severe cases may present with profound vision loss, especially if the macula is involved with poor visual prognosis. Diagnosis relies on dilated fundoscopic examination, ocular ultrasonography [19] in cases of media opacity, and optical coherence tomography (OCT) to assess macular involvement. Management depends on the severity and extent of detachment. Surgical interventions include pars plana vitrectomy (PPV), scleral buckling, and pneumatic retinopexy. PPV [16,20] is the preferred treatment for complex TRD cases and internal tamponade with gas or silicone oil. Advances in microincision vitrectomy surgery (MIVS) have improved surgical outcomes.

Choroidal detachment occurs due to trauma-induced accumulation of fluid or blood in the suprachoroidal space, often due to vascular damage or hypotony[4,21]. This condition presents with visual field defects and decreased visual acuity. Management ranges from observation to surgical drainage depending on severity. Prompt treatment can fully recover vision, but complications like hypotony maculopathy can lead to poor visual outcomes[22]

Berlin's edema, also known as commotio retinae, is caused by blunt ocular trauma, disrupting photoreceptors and retinal pigment epithelium, leading to intracellular swelling and retinal whitening. [18].Patients with transient visual blurring show a milky-white retina, with conservative treatment and good visual recovery. But persistent photoreceptor damage has poor prognosis.

Traumatic optic neuropathy (TON) is a severe condition resulting from craniofacial trauma, affecting 1-5% of patients with closed head injuries, causing field defects and vision loss.[23]. Optical nerve injury (TON) is a condition resulting from trauma, often caused by accidents, falls, or assaults. Patients often experience sudden vision loss, ranging from mild to complete blindness. Diagnosis involves imaging modalities like CT and MRI, as well as electrophysiological tests like VEP. Management strategies include high-dose corticosteroids to reduce inflammation and edema, but their efficacy is debated. Surgical decompression of the optic canal is another approach, but its benefits are uncertain. The visual prognosis varies depending on the severity of the initial vision loss and intervention timing,

with some patients recovering spontaneously while others suffer permanent deficits. Recent research focuses on neuroprotective therapies and optic nerve regeneration, exploring molecular pathways involved in retinal ganglion cell survival [23–25]. Advancements in neuroprotection and regenerative medicine offer hope for better future treatments.

Traumatic macular holes, caused by blunt trauma, result in full-thickness defects in the central retina, impairing central vision.[26]Central scotomas or metamorphopsia are common chief complaints, requiring observation for small holes and surgical intervention such as vitrectomy with internal limiting membrane peeling for larger ones. Early repair improves outcomes, but long-standing holes can cause permanent vision loss.[27–29]

The Research gap which this study addresses is that a lot of primary care givers only focus on the visible external injuries and provide symptomatic treatment. The posterior segment injuries get missed which leads to severe complications with limited treatment options and results when they are finally detected.

This study examines the epidemiology, clinical characteristics, management, and visual prognosis of posterior segment injuries from blunt trauma, specifically focusing on cases presenting within 3 months of trauma to a tertiary care hospital in north India from January 2022 to January 2023.

Methods

A retrospective study was conducted utilizing electronic medical records of patients who presented with closed globe injuries sustained within 3 monthsat a tertiary care center between January 2022 and January 2023. The study adhered to the tenets mentioned in the Declaration of Helsinki. Comprehensive data were extracted from the electronic medical records of hospital including demographic details (age and sex), detailed ocular history (mode of injury, location of trauma, prior interventions if any, and temporal characteristics of the injury), as well as clinical presentation and management outcomes. Documentation included initial visual acuity (presenting vision) post-trauma and final visual acuity at discharge or at the conclusion of follow-up.

Eachpatientunderwentathoroughophthalmological evaluation. Anterior segment assessment was performed using slit-lamp biomicroscopy. Intraocular pressure (IOP) was measured using rebound or applanation tonometer after ruling out open globe injury or globe rupture. Posterior segment evaluation was carried out using both direct and indirect ophthalmoscopy. Ancillary investigations, including orbital radiography, computed tomography (CT) scans, ultrasonography (B-scan), and other relevant imaging modalities, were employed where clinically appropriate. Visual acuity (VA) measurements were recorded using Snellen's chart or Landolt's E chart, either best-corrected visual acuity (BCVA) or pinhole VA, depending on the patient's cooperation and the feasibility of accurate assessment. As per the medical records the medical interventions were in terms of antibiotics, steroids and other symptomatic management. Surgical interventions included a pars plana vitrectomy in cases of retinal detachment, posterior dislocation of lens and macular hole.

Inclusion Criteria

Patients included in the study met specific criteria: they were diagnosed with posterior segment injuries resulting from blunt trauma within 3 months, had complete medical records available, and did not have any penetrating, perforating injuries or pre-existing ocular pathology involving the posterior segment.

Results

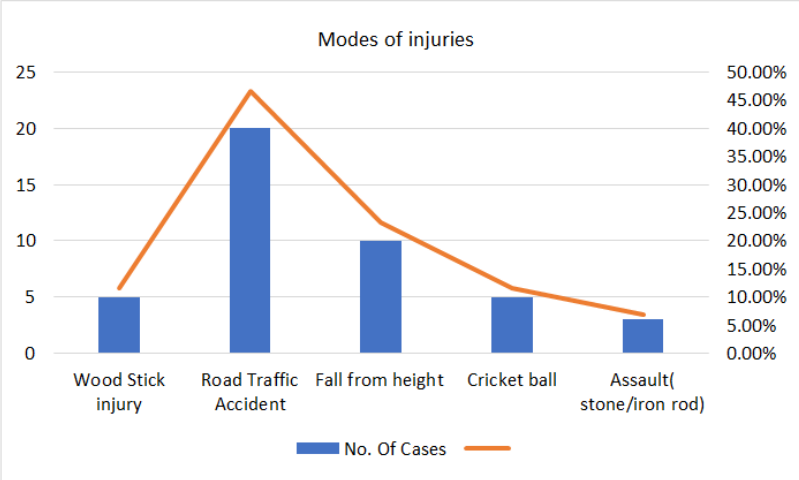
Patient Demographics

43 patients were analysed, with a mean age of 30.5 years. Predominantly illiterate (56%) men (84%) performing outdoor acitivites(74%) sustained blunt trauma injuries involving posterior segment.

Table 1. Age distribution of cases with non-penetrating ocular trauma with posterior segment pathologies

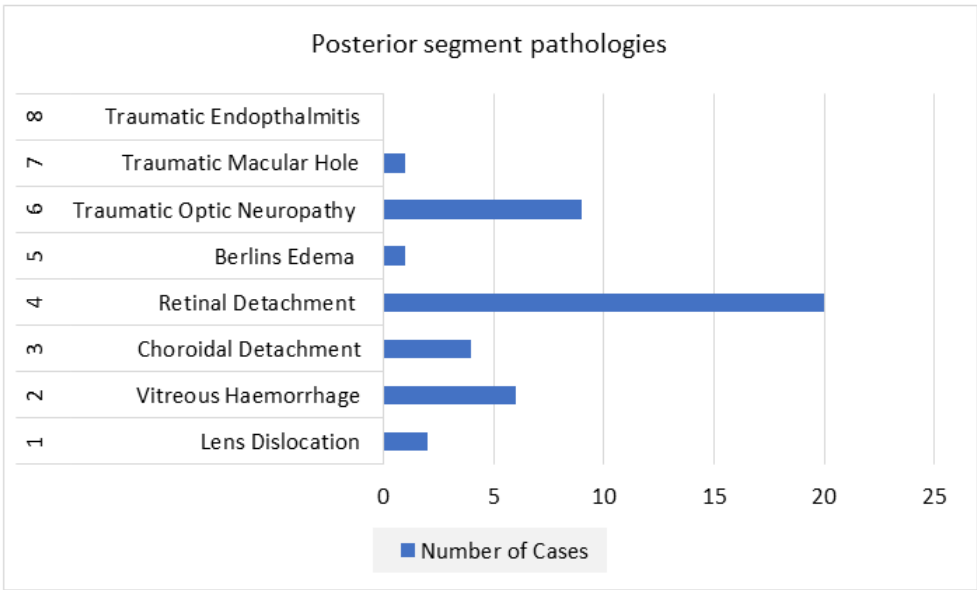
Age Group	No. of cases	Percentage
0 years - 10 years	1	2.33%
11 years -20 years	9	20.93%
21 years -30 years	13	30.23%
31 years- 40 years	12	27.91%
41 years - 50 years	2	4.65%
51years - 60 years	3	6.98%
61 years - 70 years	3	6.98%
71 years - 80 years	0	0.00%

The Table1 outlines the age distribution of the affected individuals. The 21–30 years age group had the highest number of cases, with 13 individuals (30.23%), followed closely by the 31–40 years group, with 12 cases (27.91%). Together, these two groups account for more than half of the total cases, highlighting a predominance among young to middle-aged adults. The 11–20 years group also had a notable number, with 9 cases (20.93%), indicating that a significant portion of the affected population is under 40. In contrast, older age groups such as 41–50 years (4.65%), 51–60 years (6.98%), and 61–70 years (6.98%) had fewer cases, and no cases were reported in the 71–80 years age group. Only 1 case (2.33%) was observed in the 0–10 years category.



Graph 1. Clustered bar graph indicating Modes of Injury

The most common cause of injury was road traffic accidents, accounting for 20 cases (46.51%), making up nearly half of all reported injuries [Graph 1]. Falls from height were the second most frequent mode, with 10 cases (23.26%). Injuries due to wooden sticks and assaults involving stones or iron rods were equally reported, each contributing 5 cases (11.63%). Lastly, injuries from cricket balls were reported in 3 cases (6.98%). This distribution highlights the predominance of high intensity trauma, such as road traffic incidents, as a leading cause of ocular trauma in the observed group.



Graph 2. Horizontal bar graph depicting Frequency of Posterior Segment Pathologies

Posterior segment pathologies observed included retinal detachment, optic nerve injuries, vitreous haemorrhage, choroidal rupture, macular hole, Berlin's edema, lens dislocation [Graph 2]. The most prevalent pathology noted was Retinal Detachment (RD), found in (20)47% of patients followed by Traumatic optic neuropathy (9)21%, vitreous haemorrhage (6) 14%, choroidal tears (3) 9%. Very few cases of lens dislocation (5%) , berlins edema(2%) and macular hole(2%) were also seen.[Figure 1}

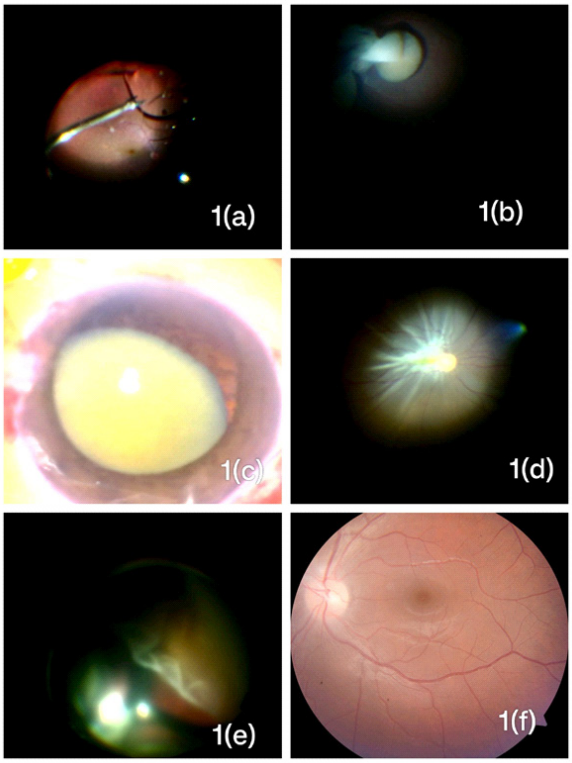


Figure 1: various posterior segmented pathologies in patients with closed globe injuries. (a) dropped Intra-ocular lens (b) dropped crystalline lens (c) subluxated crystalline lens (d) retinal detachment (e) retinal detachment and choroidal detachment with vitreous haemorrhage (f) optic neuropathy

Table 2. Profile of Retinal Detachment (RD) patients

Total cases of Retinal Detachment	20	
Exclusive RD	2	10.00%
RD+VH	2	10.00%
RD+ CD	2	10.00%
RD+CD+VH	8	40.00%
RD+CD+TRON	3	15.00%
RD+CD+VH+ LENS DILOCATION	0	0.00%
RD+ BERLIN +CD	3	15.00%

The Table 2 presents the distribution of 20 total cases of retinal detachment (RD), highlighting various combinations of associated ocular conditions. Only 2 cases (10.00%) involved exclusive retinal detachment without any accompanying complications. Several patients had RD with additional findings: 2 cases (10.00%) had vitreous haemorrhage (VH), and another 2 cases (10.00%) had choroidal detachment (CD). The most common presentation, seen in 8 cases (40.00%), involved a combination of RD, CD, and VH, indicating a more complex pathology. 3 cases (15.00%) showed RD with CD and traumatic retinal optic nerve (TRON) damage, while another 3 cases (15.00%) had RD, CD, and Berlin's edema. Notably, there were no cases involving lens dislocation along with RD, CD, and VH.

Table 3. Visual Acuity at the time of presentation to the hospital

Visual Acuity at presentation	Number of Cases	Percentage
No Light Perception	1	2.33%
Perception of light	6	13.95%
Hand Movements	3	6.98%
Finger Count Close to Face	3	6.98%
0.5\60-6\60	12	27.91%
6\36->6\60	8	18.60%
6\12->6\36	5	11.63%
6\6->6\12	5	11.63%

The Table 3 presents the distribution of visual acuity among patients at the time of presentation. Out of all the cases, 1 patient (2.33%) had no light perception, indicating complete blindness. 6 patients (13.95%) could only perceive light, while 3 patients each (6.98%) were able to detect hand movements or count fingers close to the face. A significant portion, 12 patients (27.91%), had visual acuity ranging from 0.5/60 to 6/60, and 8 patients (18.60%) had acuity between 6/36 and greater than 6/60. Additionally, 5 patients each (11.63%) had visual acuity in the ranges of 6/12 to 6/36 and 6/6 to 6/12, indicating relatively better vision. Overall, the data shows a wide spectrum of visual impairment among the cases, with the 58% with severe visual impairment range which is visual acuity less than 6/60.

Table 4. Treatment Taken Before Hospital Visit

Primary Treatment	Total	Percentage
Local pharmacy	9	20.93%
Home Remedy	1	2.33%
Previous Hospital Visit	2	4.65%
First Visit to Hospital	31	72.09%

Table 4 outlines the primary treatment approaches taken by patients before or during their current medical encounter. The majority, 31 patients (72.09%), were making their first visit to a hospital. 9 patients (20.93%) initially approached a local pharmacy for treatment, while 2 patients (4.65%) had a previous hospital visit elsewhere, suggesting unresolved or ongoing issues. Only 1 patient (2.33%) relied on a home remedy.

Table 5. Visual outcomes of Managed cases

Visual Gain Post- medical / surgical management	33	76.74%
No Visual Gain Post Management	10	23.26%

The Table 5 illustrates the visual outcomes following medical or surgical management. Out of the total cases, 33 patients (76.74%) experienced a visual gain, indicating a significant improvement in vision post-treatment. In contrast, 10 patients (23.26%) showed no visual gain after management, suggesting either irreversible damage or limited effectiveness of the treatment in those cases.

Discussion

Comparative analysis with previous studies highlights important trends and variations in ocular trauma. Kuhn et al. (2006)[31], in their study of blinding trauma using the United States Eye Injury Registry, found that posterior segment involvement significantly increased the risk of blindness. Additionally, Nirmalan et al. (2004)[32] in a rural South Indian population highlighted that blunt trauma accounted for 54.9% of cases and was commonly associated with labor-related injuries. The present study seeks to build on these findings by evaluating the current patterns of modes of injuries, clinical presentations, management and visual outcomes.

The demographic characteristics of our study population were consistent with findings from multiple previous studies on ocular trauma. The mean age of our study cohort was 30.5 years, aligning with the results in the study by Wagh V et al where the mean age was post-ocular trauma 32.3 years [22]. Similarly, Kuhn et al [36] noted that the highest incidence of eye trauma occurred in young adults, particularly in the working-age population. In contrast, Nirmalan et al. (2004)[32] found a slightly older mean age of 40 years in a rural Indian population, likely reflecting the different occupational hazards faced by agricultural workers.

Regarding gender distribution, our study observed a male predominance (84%), which is consistent with global trends. Previous studies[31,33] reported that males accounted for over 80% of ocular trauma cases. Similarly, Nirmalan et al. (2004)[32] and the Birmingham Eye Trauma Terminology (BETT) study highlighted that men are disproportionately affected due to greater exposure to risk factors such as outdoor activities, occupational hazards, or involvement in high-risk situations like road traffic accidents, which were also shown to be a major cause of injury in earlier data.

Literacy levels also demonstrated notable differences. In our study, 56% of patients were illiterate, a rate significantly higher than that observed in Brinton et al. (1982)[33], where most patients had some level of education probably due to a study conducted in higher literacy region. Kuhn[31] and Nirmalan[32] similarly identified that lower literacy rates correlated with a higher incidence of ocular trauma. This could be due to decreased awareness of safety precautions, limited access to protective eyewear, and delays in seeking medical treatment. The Aravind Comprehensive Eye Survey[34] emphasized that illiterate individuals had a higher likelihood of presenting with advanced-stage ocular injuries, further complicating treatment and prognosis.

Overall, the demographic trends observed in our study closely mirror those reported in previous literature, underscoring the need for targeted preventive strategies, particularly among young, working-age males with lower literacy levels.

A comparison of injury modes reveals significant variations across studies. In our study, road traffic accidents (47%) were the leading cause of injury, followed by falls (23%) and wood stick injuries or

assault by iron rod or stones injuries both accounting for 12% cases. This is consistent with Jawade, Kuhn and Choovuthayakorn[10,13,31] who also found RTAs to be a predominant cause of ocular trauma. However, Nirmalan et al. [38] reported that agricultural labour injuries were more common in rural Southern India, which was not a significant factor in our dataset. These variations emphasize the importance of regional differences in occupational and environmental risk factors influencing ocular trauma patterns. The American Journal of Ophthalmology and others[33,35] also highlighted firearm injuries as a notable contributor, which was not a significant factor in our dataset. These variations emphasize the importance of regional differences in occupational and environmental risk factors influencing ocular trauma patterns.

A comparison of posterior segment pathologies between our study and previous [10,22,36,37,42], reveals several important trends. In our study, Retinal Detachment (RD) was the most common posterior segment pathology (20)47%, followed by Traumatic optic neuropathy (9)21% , vitreous hemmorrage (6) 14%,choroidal tears (3) 9%. Very few cases of lens dislocation(5%) , berlins edema(2%) and macular hole(2%) were also seen. These findings aligned with the findings of Kuhn et al. (2006)and others [4,10,13,28,37,38] who focused on the epidemiology of blinding trauma, highlighting that retinal detachment, choroidal rupture, and vitreous hemorrhage were key predictors of visual impairment. This is consistent with our study, where retinal detachment and vitreous hemorrhage were frequently observed, particularly in cases with severe trauma. However, Dagwar et al. (2020)[13] reported a highest incidence of traumatic optic neuropathy in cases of blunt ocular trauma in males due to Road traffic accidents, with optic nerve injuries frequently leading to severe visual impairment which is second most prevalent posterior segment pathology observed in our study. The study by Nirmalan et al. (2004)[34], which examined ocular trauma in a rural Indian population, reported a notable prevalence of lens dislocation and traumatic macular holes, both of which were also present in our study but at lower rates (5% and 2%, respectively). This suggests regional and occupational variations in trauma mechanisms, with rural populations potentially exposed to different injury risks.

Frasure et al ,Dadgostar et al. (2008) and others[19,36,39] highlighted the role of ultrasonography in diagnosing posterior segment injuries specially vitreous haemorrhage, retinal detachment, and in cases where clinical examination was hindered by corneal opacity or hyphema. This aligns with our findings, where advanced imaging techniques were crucial in identifying complex retinal and choroidal pathologies. Additionally, the Birmingham Eye Trauma Terminology (BETT) reinforced the need for standardized classification in ocular trauma, aiding in better assessment and treatment planning. Our study benefited from the structured classification of posterior segment injuries, allowing for a more detailed comparison of pathology prevalence and treatment outcomes.

Overall, the comparison underscores the consistency of posterior segment pathologies across different studies while highlighting regional and methodological variations. Retinal detachment, traumatic optic neuropathy, and vitreous haemorrhageremain the most common and visually significant injuries, necessitating early diagnosis and intervention to optimize outcomes.

A comparison of visual acuity at presentation between the present study and previous literature highlights notable trends.[10] In this study 58% of cases presenting with severe visual impairment (visual acuity worse than 6/60). Kuhn et al.[31] reported that 27.1% of eyes had worse than 20/200 vision at final follow-up, aligning with the prevalence of significant vision impairmentpost treatment in this study(23%). Nirmalan et al.[32] noted that cases with better initial visual acuity had improved prognoses, a trend observed here, where 12% of patients had near-normal vision at presentation which was better than 6/12. These findings reinforce the correlation between initial acuity and treatment outcomes, emphasizing the importance of early intervention.

A significant number of patients (72%) had not received any prior treatment before presenting to the tertiary care centre, highlighting a delay in medical intervention as also observed in Aravaind eye care survey of south Indian rural population and Nirmalan[10,34]. Among those who sought initial care, 21% relied on self-medication from local pharmacies, while 4.65% had a previous hospital

visit elsewhere, suggesting unresolved or ongoing issues. Only 2.33% relied on a home remedy. This trend is concerning as delays in proper medical attention can exacerbate posterior segment injuries, leading to poorer visual outcomes. Many patients initially sought care from unqualified practitioners or quacks, further compounding the issue. Unscientific treatments, such as herbal applications and improper eye bandaging, often resulted in infections, increased intraocular pressure, or delayed diagnosis of retinal detachments. Studies[9,10,34,35,38] have shown that prompt referral to specialized ophthalmic centres significantly improves prognosis, whereas delays caused by inappropriate treatment contribute to irreversible vision loss. Raising awareness about the dangers of seeking care from unqualified sources and ensuring better access to emergency eye care services is essential to improving patient outcomes.

Traumatic retinal detachment (TRD) is a vision-threatening complication that may arise following blunt or penetrating ocular trauma. Often accompanied by concurrent injuries like vitreous haemorrhage, macular hole, or choroidal rupture as noted in our study. The procedure typically included induction of posterior vitreous detachment, meticulous removal of cortical vitreous, perfluorocarbon liquid-assisted reattachment of the retina, internal limiting membrane (ILM) peeling, and silicone oil tamponade. The inclusion of an encircling scleral band is considered to support vitreous base traction and prevent re-detachment. Similar strategy was used by Samanta et al.[28] in a 21-year-old patient post-blunt trauma Giant retinal tear, reportedsurgical repair via pars plana vitrectomy (PPV) remains the cornerstone.Supporting this, a pivotal study by Chen et al.[27] investigated outcomes in patients with traumatic macular hole–related retinal detachment. The study found that PPV with ILM peeling significantly improved anatomical reattachment rates and visual outcomes. Their results emphasize that ILM peeling facilitates closure of the traumatic macular hole by relieving tangential traction, a key factor in preventing re-detachment. They also highlighted the role of intraocular tamponade agents, particularly long-acting gases or silicone oil, to stabilize the retina during healing. Further supporting the role of PPV in TRD, Novomiejska et al.[20] analysed outcomes in adult patients treated with primary vitrectomy alone. Their findings confirmed that early intervention with PPV provides favourable reattachment rates, especially in cases without extensive proliferative vitreoretinopathy (PVR).

The administration of corticosteroids for the treatment of traumatic optic neuropathy (TON) is primarily guided by limited retrospective studies, data drawn from spinal cord injury investigations, and individual reports. Steroid treatment plans are divided into moderate doses (60–100 mg oral prednisolone), high doses (1 g/day IVMP), and mega doses (30 mg/kg IV loading, continuing at 5.4 mg/kg/h for 24 hours). The NASCIS II trial (1990) demonstrated a slight neurological improvement in patients with spinal cord injuries who were treated with mega doses of steroids started within an 8-hour window. The CRASH trial was stopped prematurely because it found a significantly higher rate of mortality among traumatic brain injury patients given mega doses of steroids. In contrast to most studies, the International Optic Nerve Trauma Study showed that the highest improvement in visual acuity was 57%, followed by corticosteroids at 52% that natural recovery may exceed the benefits of medical intervention. In our study all patients enduring Traumatic optic neuropathy were given pulse therapy of IV Methyl Prednisolone for 5 days and showed significant visual improvement.

Of total patient who presented within 3 months of sustaining non- penetrating blunt trauma and received appropriate treatment,33 patients (77%) experienced a visual gain, indicating a significant improvement in vision post-treatment. In contrast, 10 patients (23%) showed no visual gain after management, suggesting either irreversible damage or limited effectiveness of the treatment in those cases. Further pressing on the issue of timely and just management of Posterior segment trauma. As also observed in studies such as those by Pieramici et al. (1997)[40], Choovuthayakornet al.(2020)[10] and Blanch et al. (2024)[24] have demonstrated that early intervention in cases of posterior segment trauma, particularly in retinal detachment and traumatic optic neuropathy, significantly improves visual prognosis.

Pieramici et al[15,38,40] found that surgical intervention within 72 hours of trauma led to improved anatomical success and reduced the incidence of proliferative vitreoretinopathy. Similarly, Blanch et al. reported that patients who received specialized ophthalmic care within the first week of injury had a 40% better chance of retaining functional vision compared to those with delayed referrals. These findings emphasize the importance of structured referral pathways to minimize treatment delays and optimize visual outcomes.

Overall, the data reflects a generally positive outcome, with a substantial majority benefiting from medical or surgical intervention.

The highlight of the paper is that when the posterior segment pathologies occurring due to the closed globe injuries were detected and treated early the results were very favourable, in contrast to when they were detected late due to the lack of awareness among the primary care givers to look for the same. Future public health interventions should focus on increasing awareness regarding eye protection, workplace safety, and the importance of timely medical intervention to mitigate the long-term visual impact of posterior segment trauma.[10,34]

Conclusion

This study underscores the epidemiology of non-penetrating trauma leading to posterior segment pathologies, presenting visual acuities, pre-treatments and importance of timely intervention in closed-globe injuries. The presence of Retinal detachment, Traumatic optic neuropathy, and Vitreous haemorrhage significantly influenced visual prognosis. Comparison with previous studies demonstrates a consistent trend in the epidemiology and outcomes of posterior segment trauma. Future efforts should focus on early detection, preventive strategies, and optimizing surgical interventions to improve visual outcomes in affected patients. Additionally, integrating ultrasonography as a standard diagnostic tool and promoting awareness about early and appropriate treatment options could help mitigate the long-term visual disability associated with these injuries.

Conflict of Interest: NIL

Financial Disclosures: NIL

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