• Clinical Research •

Visual prognosis following open globe injury: clinical characteristics and risk factors from Vietnam National Eye Hospital

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Abstract
● **AIM:** To evaluate the clinical characteristics and risk factors associated with visual prognosis in patients with open globe injuries (OGIs) treated at Vietnam National Eye Hospital.
● **METHODS:** A prospective observational study included patients with OGIs treated between June 2023 and June 2024. Data on demographics, injury features, and clinical findings were extracted from medical records. Poor visual outcome was defined as final best-corrected visual acuity (BCVA) worse than 20/400 or no light perception. Multivariable logistic regression was performed to identify independent risk factors.
● **RESULTS:** Among 509 patients (636 eyes), the mean age was 35.13y (range 20–51y), and 67.6% were male. After treatment, the proportion of eyes achieving ≥20/40 increased from 12.6% to 42.1%, while no light perception decreased from 29.1% to 9.4%. Independent predictors of poor visual outcomes included delayed admission [>4h, odds ratio (OR)=3.33, 95% confidence intervals (CI): 1.76–6.33, P<0.001], Zone III injury (OR=5.90, 95%CI: 2.85–12.24, P<0.001), wound length >10 mm (OR=2.59, 95%CI: 1.60–4.18, P<0.001), relative afferent pupillary defect (RAPD, OR=1.65, 95%CI: 1.03–2.64, P=0.039), endophthalmitis (OR=1.75, 95%CI: 1.01–3.03, P=0.047), retinal detachment (OR=3.32, 95%CI: 2.02–5.45, P<0.001), and eyelid lacerations (OR=1.94, 95%CI: 1.13–3.33, P=0.016) associated with OGIs. Vitreous hemorrhage (OR=0.44, 95%CI: 0.22–0.89, P=0.023) was associated with better outcomes, and female gender appeared protective.
● **CONCLUSION:** Poor visual outcomes remain common after OGIs, despite improve visual acuity in many cases. Several clinical and injury-related factors are strongly associated with prognosis. Early recognition of these predictors can support risk stratification and improve trauma care in similar settings.
● **KEYWORDS:** open globe injury; visual outcome; prognostic factors; ocular trauma; Vietnam
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INTRODUCTION

Ocular trauma is a major global health concern and one of the leading causes of preventable visual impairment[1]. According to the Global Burden of Disease Study, approximately 60 million eye injuries occurred globally in 2019, resulting in over 1.6 million cases of blindness and 19 million cases of unilateral visual loss[2]. Among these, open globe injuries (OGIs) are among the most severe forms, frequently requiring surgical intervention and often leading to long-term visual disability[3]. OGI refers to a full-thickness wound of the cornea and/or sclera and represents one of the most severe forms of ocular trauma. OGIs are associated with high risk of permanent visual loss, need for complex surgical management, and substantial socioeconomic impact worldwide. Reported incidence varies globally, but OGIs remain a major cause of unilateral blindness, particularly in developing countries. Alarmingly, an estimated 90% of ocular trauma is considered preventable, underscoring the importance of early identification and risk mitigation[4].

The clinical presentation and outcomes of OGIs vary widely depending on the mechanism, severity, and zone of injury. Common causes include penetrating trauma, intraocular foreign bodies (IOFBs), blunt ruptures, and perforating injuries[5].

These injuries can occur in individuals of all ages and are associated with diverse risk factors[6]. Notably, young adult males are disproportionately affected due to their involvement in high-risk occupations and environments. In a hospital-based study, work-related injuries accounted for 29.1% of OGIs, while traffic accidents contributed 14.5%[7]. Other common injury settings include domestic and recreational activities. The final visual outcome after trauma ranges from full recovery to irreversible blindness, depending on various clinical factors such as initial visual acuity, relative afferent pupillary defect (RAPD), retinal detachment, and zone III involvement[1,8-9].

Although numerous international studies have explored the epidemiology of ocular trauma, there remains a lack of comprehensive data from Southeast Asia, a region facing increased industrialization and road traffic burden. While some research has described the clinical profile of OGI cases, few have conducted in-depth multivariable analysis to identify independent predictors of poor visual outcomes. Furthermore, the specific role of modifiable and preoperative factors—such as time to admission or surgical delay—has not been well established in regional studies[9].

This study aimed to describe the demographic, clinical, and injury-related characteristics of patients with OGIs at a tertiary referral hospital in Southeast Asia. In addition, it sought to identify independent prognostic factors associated with poor visual outcomes, with the goal of supporting early risk stratification and informing targeted clinical and preventive strategies.

PARTICIPANTS AND METHODS

Ethical Approval This study was approved by the Institutional Review Board of Hanoi Medical University (Approval No.683/GCN-HĐĐĐNCYSH-ĐHYHN, issued September 12, 2022). All procedures adhered to the principles of the Declaration of Helsinki. Informed consent was obtained from all participants prior to enrollment.

Study Design and Setting This prospective observational study was conducted at the Vietnam National Eye Hospital, a national tertiary referral center for ocular trauma. Patients presenting with ocular injuries between June 2023 and June 2024. At admission, all patients underwent standardized evaluation using a case report form. This ensured uniform collection of demographics, injury characteristics according to the Birmingham Eye Trauma Terminology (BETT) classification, zone of injury, wound parameters, presenting visual acuity, RAPD, and ocular findings. Details of initial interventions at lower-level hospitals (suturing, antibiotics, referral information) were documented when available.

Inclusion and Exclusion Criteria Patients were eligible for inclusion if they were diagnosed with ocular trauma and required treatment at the Vietnam National Eye Hospital during the study period. Eligible cases comprised those who underwent emergency surgical treatment at the hospital, those receiving treatment for the first time at the hospital after unsuccessful or incomplete management at lower-level hospitals, and those initially managed as outpatients but subsequently requiring first-time inpatient admission due to treatment failure. Patients who had previously been treated at the Vietnam National Eye Hospital for any cause were also included if they were readmitted due to a new ocular trauma event. Written informed consent was obtained from all participants. Patients were excluded if key clinical information was missing, if the diagnosis did not meet the criteria for OGI, or if they had severe systemic comorbidities requiring systemic management prior to ocular treatment. In cases of bilateral injuries, only the more severely injured eye was included in the analysis.

Data Collection Demographic and clinical data were extracted from patient charts using a standardized data abstraction form. Demographic variables included age, sex, residence (urban or rural), and occupation. Occupation was categorized into four groups: white-collar, blue-collar, pink-collar, and no-collar, based on the nature of work. Clinical characteristics recorded at the time of admission included the mechanism of injury (*e.g.*, blunt trauma, penetrating injury, or IOFB), type of injury (rupture, laceration, or IOFB), injury zone (Zone I, II, or III), and time from injury to hospital admission. Ocular findings at presentation included initial visual acuity, the presence of RAPD, and ocular complications such as vitreous hemorrhage, retinal detachment, lens injury, eyelid lacerations associated with OGIs, post-traumatic glaucoma, and endophthalmitis. The wound length and presence of IOFB were also recorded. In addition, information regarding the type and number of surgical procedures was collected, including primary globe repair, vitrectomy, lensectomy, combined pars plana vitrectomy (PPV) with scleral buckle and silicone oil tamponade, and secondary post-surgical glaucoma.

Patients were followed until their last documented outpatient visit. The median follow-up was 6.5mo [interquartile range (IQR) 3.0–12.0; range 1–24mo]. Final best-corrected visual acuity (BCVA) was defined as the BCVA at the last available visit.

Outcome Definition The primary outcome was the final BCVA, assessed at the last follow-up visit. Visual outcomes were dichotomized into two categories: good visual outcome (defined as BCVA of 20/400 or better) and poor visual outcome (defined as BCVA worse than 20/400 or no light perception)[10].

Statistical Analysis Descriptive statistics were used to summarize demographic and clinical characteristics of the study population. Categorical variables were expressed as frequencies and percentages, while continuous variables

Table 1 Baseline characteristics of patients at admission *n*=509

Variable	Number of patients	%
Age, mean±SD, y	35.13±8.87 (min: 20; max: 51)	
Age group (y)		
<30	163	32.0
30-40	162	31.8
41-50	166	32.6
>50	18	3.5
Gender		
Male	344	67.6
Female	165	32.4
Occupation		
Blue-collar (farmer, factory workers, electricians, mechanics…)	233	45.8
Pink-collar (nurses, secretaries, retail workers…)	119	23.4
White-collar (office workers, lawyers, teachers…)	77	15.1
No-collar (freelancers, retired…)	80	15.7
Residence		
Rural	200	39.3
Urban	309	60.7
Time from injury to hospital admission (min)	158.27±143.13 (min: 30; max: 539)	
Immediately (under 1h)	188	29.6
1-2h	144	22.6
2-4h	145	22.8
>4h	159	25.0
History of ocular disease		
No	449	88.2
Yes	60	11.8
History of prior ocular surgery		
No	437	85.9
Yes	72	14.1

SD: Standard deviation.

were reported as means and standard deviations. Associations between clinical variables and poor visual outcomes were initially examined using Chi-square tests or Fisher's exact tests for categorical data, and *t*-tests for continuous variables. Variables with a *P*-value less than 0.1 in univariate analyses were included in a multivariable logistic regression model to identify independent predictors of poor visual outcome. Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were calculated. A $P<0.05$ was considered statistically significant. All statistical analyses were conducted using Stata 17 (StataCorp, College Station, TX, USA).

RESULTS

As shown in Table 1, a total of 509 patients were enrolled, with a mean age of 35.13±8.87y (range 20–51y). Most patients were between 20 and 50 years old, and only 3.5% were older than 50. Males comprised 67.6% of the cohort. Blue-collar workers accounted for 45.8%, followed by pink-collar (23.4%), white-collar (15.1%), and no-collar occupations (15.7%). The majority (60.7%) resided in urban areas. The mean time from injury to hospital admission was 158.27±143.13min, with 29.6% presenting within 1h and 25.0% after 4h. A history of ocular disease and previous ocular surgery was reported in 11.8% and 14.1% of patients, respectively.

As shown in Table 2, among 636 injured eyes, penetrating injuries were the most common mechanism (62.3%), followed by IOFBs (22.0%) and blunt injuries (15.7%). Lacerations and perforating accounted for 43.2% of injuries, while ruptures and IOFB represented 34.7% and 22.0%, respectively. Most injuries involved Zone II (53.9%), with 23.3% and 22.8% affecting Zone I and Zone III, respectively. Wound length exceeded 10 mm in 33.2% of cases. Regarding ocular findings, RAPD was present in 36.0% of eyes, and 21.7% had endophthalmitis. Retinal detachment occurred in 25.5%, vitreous hemorrhage in 18.2%, and lens injury in 20.1%. Eyelid lacerations associated with OGIs were observed in 22.2%, and secondary post-surgical glaucoma developed in 20.8% of eyes. Bilateral injuries were identified in 23 patients (4.5%).

Table 3 summarizes the surgical interventions performed among the 636 affected eyes. Primary globe repair was the most frequent procedure, performed in 225 eyes (35.4%). Vitrectomy was conducted in 209 eyes (32.9%), with different techniques including PPV alone in 30 eyes (4.7%), PPV

Table 2 Injury characteristics and ocular findings at presentation *n*=636

Variable	Eyes	%
Mechanism of injury		
Blunt	100	15.7
Penetrating	396	62.3
IOFB	140	22.0
Type of injury		
Rupture	221	34.7
Laceration	260	40.9
IOFB	140	22.0
Perforating	15	2.4
Zone of injury		
Zone I	148	23.3
Zone II	343	53.9
Zone III	145	22.8
Wound length		
≤10 mm	425	66.8
>10 mm	211	33.2
Presence of RAPD		
No	407	64.0
Yes	229	36.0
Presence of endophthalmitis		
No	498	78.3
Yes	138	21.7
Presence of retinal detachment		
No	474	74.5
Yes	162	25.5
Presence of vitreous hemorrhage		
No	520	81.8
Yes	116	18.2
Lens injury		
No	508	79.9
Yes	128	20.1
Eyelid laceration		
No	495	77.8
Yes	141	22.2
Secondary post-surgical glaucoma		
No	504	79.3
Yes	132	20.8
Bilateral injuries		
No	613	95.5
Yes	23	4.5

RAPD: Relative afferent pupillary defect; IOFB: Intraocular foreign body.

with silicone oil tamponade in 115 eyes (18.1%), PPV with gas tamponade in 57 eyes (9.0%), and combined PPV with scleral buckle and silicone oil tamponade in 81 eyes (12.7%). Lensectomy was carried out in 205 eyes (32.2%). Enucleation or evisceration was performed in 190 eyes (29.9%). Secondary post-surgical glaucoma surgery was required in 214 eyes (33.7%). Overall, 406 eyes (63.8%) underwent two or more surgical interventions. Among the 209 eyes undergoing vitrectomy, the median time from injury to surgery was 9d (IQR 5–14; range 1–28d). Early vitrectomy (≤7d) was performed in 92 eyes (44.0%), while delayed vitrectomy (>7d) was performed in 117 eyes (56.0%).

Table 3 Surgical interventions performed *n*=636

Surgical Intervention	Number of eyes	%
Primary globe repair	225	35.4
Vitrectomy	209	32.9
Lensectomy	205	32.2
PPV alone	30	4.7
PPV with silicone oil tamponade	115	18.1
PPV with gas tamponade	57	9.0
Combined PPV with scleral buckle and silicone oil tamponade	81	12.7
Enucleation/evisceration	190	29.9
Secondary post-surgical glaucoma	214	33.7
Number of surgeries (1/≥2)	406	63.8

PPV: Pars plana vitrectomy.

Table 4 Visual acuity outcomes before and after treatment *n*=636

Visual acuity	At admission	At last follow-up	*P*
20/40 or better	80 (12.6%)	268 (42.1%)	0.0001
20/50 to 20/400	190 (29.9%)	257 (40.4%)	
Worse than 20/400	181 (28.5%)	51 (8%)	
No light perception	185 (29.1%)	60 (9.4%)	

Definition of poor visual outcome: Final visual acuity worse than 20/400 or no light perception.

Table 4 presents visual acuity outcomes before and after treatment among 636 eyes. At baseline, a large proportion of eyes had severe impairment, with 29.1% having no light perception and 28.5% worse than 20/400. Only 12.6% of eyes had a visual acuity of 20/40 or better. Following treatment, the proportion achieving 20/40 or better increased markedly to 42.1%, while the rate of no light perception decreased to 9.4%. Eyes with a final visual acuity worse than 20/400 accounted for only 8.0% at last follow-up, compared to 28.5% at baseline. These findings highlight a substantial overall improvement in visual outcomes following intervention ($P<0.0001$).

Multivariable logistic regression (Table 5) identified several factors significantly associated with poor visual outcomes, including female gender, delayed hospital admission beyond 4h, Zone III injuries, wound length greater than 10 mm, presence of RAPD, endophthalmitis, retinal detachment, vitreous hemorrhage, and eyelid lacerations associated with OGIs. Female patients had a significantly lower risk compared to males (OR=0.39, 95%CI: 0.22–0.69, P=0.001). Delay in hospital admission for more than 4h was associated with increased odds of poor outcomes (OR=3.33, 95%CI: 1.76–6.33, $P<0.001$). Zone III injuries markedly increased the risk (OR=5.90, 95%CI: 2.85–12.24, $P<0.001$), as did wound lengths greater than 10 mm (OR=2.59, 95%CI: 1.60–4.18, $P<0.001$). The presence of RAPD (OR=1.65, 95%CI: 1.03–2.64, P=0.039), endophthalmitis (OR=1.75, 95%CI: 1.01–3.03, P=0.047), and retinal detachment (OR=3.32, 95%CI: 2.02–

Table 5 Multivariable logistic regression: predictors of poor visual outcomes

Variable	Poor visual outcomes		OR (95%CI)	*P*
	Yes	No		
Age group				
<30y	38 (18.6%)	166 (81.4%)	-	-
30–40y	36 (17.7%)	167 (82.3%)	1.01 (0.57–1.79)	0.980
41–50y	35 (16.9%)	172 (83.1%)	0.79 (0.44–1.41)	0.422
>50y	2 (9.1%)	20 (90.9%)	0.2 (0.04–1.05)	0.057
Gender				
Male	89 (20.7%)	341 (79.3%)	-	-
Female	22 (10.7%)	184 (89.3%)	0.39 (0.22–0.69)	0.001[a]
Occupation				
Blue-collar (farmer, factory workers, electricians, mechanics…)	46 (15.8%)	245 (84.2%)	-	-
Pink-collar (nurses, secretaries, retail workers…)	32 (21.5%)	117 (78.5%)	1.52 (0.85–2.71)	0.161
White-collar (office workers, lawyers, teachers…)	19 (19.8%)	77 (80.2%)	1.36 (0.69–2.66)	0.375
No-collar (freelancers, retired…)	14 (14%)	86 (86%)	0.82 (0.4–1.71)	0.603
Time from injury to hospital admission				
Immediately (under 1h)	21 (11.2%)	167 (88.8%)	-	-
1–2h	26 (18.1%)	118 (81.9%)	1.48 (0.74–2.95)	0.264
2–4h	19 (13.1%)	126 (86.9%)	1.09 (0.53–2.26)	0.810
>4h	45 (28.3%)	114 (71.7%)	3.33 (1.76–6.33)	0.000[a]
History of ocular disease				
No	101 (18%)	460 (82%)	-	-
Yes	10 (13.3%)	65 (86.7%)	0.8 (0.37–1.74)	0.574
History of prior ocular surgery				
No	99 (18.1%)	447 (81.9%)	-	-
Yes	12 (13.3%)	78 (86.7%)	0.67 (0.32–1.4)	0.285
Zone of injury				
Zone I	15 (10.1%)	133 (89.9%)	-	-
Zone II	51 (14.9%)	292 (85.1%)	1.87 (0.95–3.69)	0.070
Zone III	45 (31%)	100 (69%)	5.9 (2.85–12.24)	0.000[a]
Wound length				
≤10 mm	56 (13.2%)	369 (86.8%)	-	-
>10 mm	55 (26.1%)	156 (73.9%)	2.59 (1.6–4.18)	0.000[a]
Presence of RAPD				
No	58 (14.3%)	349 (85.8%)	-	-
Yes	53 (23.1%)	176 (76.9%)	1.65 (1.03–2.64)	0.039[a]
Presence of IOFB				
No	83 (16.7%)	413 (83.3%)	-	-
Yes	28 (20%)	112 (80%)	1.21 (0.7–2.1)	0.486
Presence of endophthalmitis				
No	82 (16.5%)	416 (83.5%)	-	-
Yes	29 (21%)	109 (79%)	1.75 (1.01–3.03)	0.047[a]
Presence of retinal detachment				
No	64 (13.5%)	410 (86.5%)	-	-
Yes	47 (29%)	115 (71%)	3.32 (2.02–5.45)	0.000[a]
Presence of vitreous hemorrhage				
No	99 (19%)	421 (81%)	-	-
Yes	12 (10.3%)	104 (89.7%)	0.44 (0.22–0.89)	0.023[a]
Lens injury				
No	88 (17.3%)	420 (82.7%)	-	-
Yes	23 (18%)	105 (82%)	0.83 (0.46–1.47)	0.517
Eyelid lacerations associated with OGIs				
No	80 (16.2%)	415 (83.8%)	-	-
Yes	31 (22%)	110 (78%)	1.94 (1.13–3.33)	0.016[a]
Secondary post-surgical glaucoma				
No	92 (18.3%)	412 (81.8%)	-	-
Yes	19 (14.4%)	113 (85.6%)	0.7 (0.38–1.29)	0.251

[a]$P<0.05$. OR: Odds ratio; RAPD: Relative afferent pupillary defect; IOFB: Intraocular foreign body; OGI: Open globe injury; CI: Confidence intervals.

5.45, P<0.001) were significant predictors of poor outcomes. Interestingly, the presence of vitreous hemorrhage appeared to be protective (OR=0.44, 95%CI: 0.22–0.89, P=0.023). Eyelid lacerations associated with OGIs were also independently associated with worse outcomes (OR=1.94, 95%CI: 1.13–3.33, P=0.016).

DISCUSSION

This prospective study investigated the clinical characteristics and prognostic factors associated with poor visual outcomes in patients with OGIs treated at a national tertiary referral center in Vietnam. By collecting data over the course of treatment, the study captured real-time insights into how various clinical features influenced final visual outcomes[11]. Notably, multiple independent predictors of poor visual outcome were identified through multivariable logistic regression analysis, including delayed hospital admission, posterior segment injury (Zone III), longer wound length, the presence of RAPD, retinal detachment, endophthalmitis, and eyelid lacerations associated with OGIs[12]. These findings provide important insights into the factors most closely associated with poor visual prognosis in ocular trauma cases in Southeast Asia.

Several of the predictors identified in this study are well aligned with previous research worldwide[3]. RAPD is widely acknowledged as a strong marker of severe ocular damage and poor prognosis. Its presence generally indicates optic nerve or extensive retinal injury, both of which significantly reduce the likelihood of visual recovery. Similarly, injuries involving Zone III are known to affect the posterior segment, where structural damage is more difficult to repair and often results in irreversible vision loss[7,13]. Larger wound size, particularly those greater than 10 mm, is another consistent indicator of severe trauma, with numerous studies reporting a clear association between wound extent and poor visual outcomes. These findings emphasized that the anatomical location and severity of the initial injury are key determinants of final vision, regardless of the interventions applied[5,14-15].

The occurrence of retinal detachment and endophthalmitis in our cohort also significantly worsened the visual prognosis. Retinal detachment at presentation often reflects profound intraocular disruption, and despite advances in vitreoretinal surgery, visual outcomes remain guarded in such cases[16]. Endophthalmitis, as a severe infectious complication, can rapidly deteriorate retinal architecture and function even with prompt treatment[17]. The presence of endophthalmitis in this study was strongly associated with poor outcomes, reinforcing the importance of early globe closure and prophylactic antibiotics in high-risk injuries[18-19].

An unexpected finding was the association between vitreous hemorrhage and a more favorable visual outcome. While vitreous hemorrhage often signals significant trauma, in some cases it may reflect a closed but hemorrhagic system rather than complete globe rupture. This protective effect may also relate to earlier clinical recognition and intervention due to visible hemorrhage. Another noteworthy finding was the lower likelihood of poor outcomes among female patients. Although not commonly reported, this could reflect differences in exposure patterns, injury mechanisms, or initial severity at presentation, and warrants further exploration[20-21].

Time from injury to hospital admission was a particularly relevant variable in this setting. Our data showed that patients presenting more than four hours after injury had significantly worse outcomes than those who arrived earlier. While some international studies have questioned the impact of moderate delays on final vision, there is consistent agreement that prolonged time to care increases the risk of complications, particularly infection[22-23]. In our cohort, a substantial proportion of delayed cases were the result of prolonged management at lower-level hospitals, where the severity of the ocular injury was sometimes underestimated. Patients were kept at local facilities for extended periods before referral, which contributed to late surgical intervention and poorer final vision. This finding underscores the need to strengthen clinical knowledge and triage skills among healthcare providers at lower-level hospitals, enabling earlier recognition of severe ocular trauma and more timely referral to tertiary centers. In resource-limited or decentralized healthcare systems, timely referral and access to ophthalmic trauma services remain critical components of outcome improvement[24-25].

The findings of this study have important clinical implications. The identified risk factors can help clinicians stratify patients based on prognosis from the time of admission. Recognizing high-risk features such as RAPD, Zone III injury, or large wound size enables earlier surgical prioritization, more targeted counseling, and potentially more aggressive intervention when indicated. From a public health perspective, improving workplace safety, promoting protective eyewear, and enhancing trauma referral systems may help reduce the incidence and severity of these injuries, particularly in labor-intensive and high-traffic environments common in many developing regions.

In addition to its clinical severity, OGI imposes a considerable socio-economic burden. Many patients are of working age, and visual loss leads to loss of productivity, prolonged treatment costs, and reduced quality of life. This underscores the importance of prevention strategies and workplace safety policies.

This study has several limitations. First, as a single-center tertiary hospital study, referral bias is possible, with more severe or complicated cases being overrepresented. Second, the variable follow-up period introduces potential bias.

Patients with shorter follow-up may not have manifested late complications, whereas those with longer follow-up may have had additional interventions improving vision. Loss to follow-up in 5% of cases may also have introduced attrition bias. Third, some information regarding initial management at lower-level hospitals was extracted from referral notes and may be incomplete, introducing information bias. Fourth, clinical classifications such as eyelid lacerations were specifically defined as eyelid lacerations associated with OGIs; however, some degree of misclassification bias cannot be excluded. Finally, surgical decisions such as the timing of vitrectomy (early versus delayed) were influenced by clinical condition, which may confound the association between surgical timing and outcomes.

In conclusion, this prospective observational study identified key prognostic factors associated with poor visual outcomes among patients with OGIs treated at a national tertiary eye hospital in Vietnam. Although many patients achieved improved visual acuity after intervention, a considerable proportion still experienced severe vision loss. Multivariable analysis revealed that delayed admission, Zone III injuries, wound length >10 mm, RAPD, retinal detachment, endophthalmitis, and eyelid lacerations associated with OGIs were independently associated with poor final vision. Conversely, vitreous hemorrhage and female sex were associated with lower odds of poor outcome. Early recognition of these risk factors can assist clinicians in stratifying patients and guiding timely, targeted interventions. These findings add to the global body of evidence and emphasize the need for rapid access to specialized trauma care in similar healthcare settings.

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