The European Research Journal 2026;12(1):76-85 Original Article

DOI: https://doi.org/10.18621/eurj.1792589 *Ophthalmology*

Evaluation of the Epidemiological and Clinical Features of Childhood Open Globe Injuries

Ülkü Demir[1]

[1]*Department of Ophthalmology, Faculty of Medicine, İnönü University, Malatya, Türkiye*

ABSTRACT

Objectives: To determine the epidemiological and clinical characteristics of open globe injuries causing permanent visual loss in children.

Methods: In our study, the files of 45 pediatric patients aged 1-18 years who were followed up in the ophthalmology clinic due to open globe injuries were retrospectively scanned. Patients' age, gender, traumatized eye, localization of the incision, initial and final visual acuity, place of the trauma, tools causing the trauma, pathologies accompanying the trauma, surgeries after the trauma, time between the trauma and repair, and follow-up period were recorded.

Results: Fifteen (33.3%) patients were female and 30 (66.6%) were male. The mean age was 10.4±4.4 years. The mean time between trauma and hospitalisation was 3.84±2.88 hours, and the mean follow-up period was 8.24±6.47 months. The right eye was traumatised in 25 (55.6%) patients and the left eye in 20 (44.4%) patients. Twenty (44.4%) patients had corneal, 18 (40%) corneascleral, and 7 (15.6%) scleral injuries. Trauma occurred at home in 31 (68.9%) patients. Penetrating injuries were detected in 39 (86.7%) patients. No rupture was observed in any patient. The most common instrument causing trauma was a knife in 14 (31.1%) patients.

Conclusions: Open globe injuries were mostly observed in boys. Corneal and penetrating injuries were observed, mainly in the right eye. It was noted that most of the injuries occurred at home and with sharp objects. Our findings highlight the importance of preventive education and parental awareness to reduce the risk of ocular trauma in children.

Keywords: Open Globe Injury, Pediatric, Penetrating Eye Injury, Ocular Trauma

Open globe injury is a full-thickness damage to the cornea or sclera. It is the most common cause of acquired unilateral blindness in children [1, 2]. Eye injuries are divided into two as: open globe injuries and closed globe injuries. Open globe injuries are classified as penetrating injuries, perforating injuries, ruptured globe, and intraocular foreign body injuries [1-3]. Visual outcomes in open globe injuries in children are worse than closed globe injuries. Studies reported that 27-48% of all open globe injuries are seen in children. The incidence of open globe injuries in pediatric patients is estimated to be 7.93 per 1,000,000 people [1, 2, 4, 5]. Although studies have been conducted on eye injuries in developed countries, information on the incidence of eye injuries in developing countries is insufficient.

Received: September 28, 2025 **Accepted:** November 8, 2025 **Available Online:** November 28, 2025 **Published:** January 4, 2026

How to cite this article: Demir Ü. Evaluation of the Epidemiological and Clinical Features of Childhood Open Globe Injuries. Eur Res J. 2026;12(1):76-85. doi: 10.18621/eurj.1792589

Corresponding author: Ülkü Demir, MD., Assist. Prof., Phone: +90 422 341 06 60, E-mail: ulkukohle@hotmail.com

This is an **open-access** article distributed under the terms of a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it.

Available Online at https://dergipark.org.tr/en/pub/eurj

Data on the outcomes of open globe injuries are also limited [5-7].

After ocular traumas, visual outcome is worse in children compared with adults because visual development is incomplete in children, the risk of amblyopia increases and due to poor communication and cooperation with children, diagnosis may be difficult [7, 8].

The diagnosis of ocular injuries is usually made only by history and clinical examination. If possible, the initial visual acuity of the patient is evaluated. Anterior segment examination is performed with a slit lamp. Infants and patients with poor communication and cooperation may need to be examined under general anaesthesia. If the diagnosis of open globe injury is definite, scleral depression, eye pressure measurement, and pupil dilatation, which will cause the intraocular contents to come out, should be avoided [9, 10]. Diagnostic imaging is performed especially in the presence of an intraocular foreign body. The main imaging modalities are B-scan ultrasonography and computed tomography. X-ray and magnetic resonance imaging are sometimes used. Computed tomography has been reported to be 90-100% sensitive for intraocular foreign bodies. While metal and glass appear hyperdense on computerised tomography, wood fragments give a hypodense image [10-12].

This study aims to determine the etiology, epidemiology and clinical characteristics of open globe injuries that cause permanent visual loss in children. The occurrence of open globe injuries can be reduced by investigating this issue in detail and informing the family and the community.

METHODS

In our study, the files of 45 pediatric patients aged 1-18 years who were followed up in the ophthalmology clinic for open globe injury between January 2018 and January 2023 were retrospectively reviewed. This study was conducted in accordance with the Declaration of Helsinki. Ethics committee approval (number: 5358, date: 26 December 2023) was obtained from the Instutional Review Board of İnönü University. Consent was obtained from the parents of the patients in a signed form.

A detailed history of trauma was obtained from the parents. Visual acuity was measured with Snellen's chart, and visual acuity was recorded with the logMAR scale in all children. Ocular motility, slit-lamp biomicroscopy, anterior segment examination, and fundus examination were performed. During the initial examination, any pressure on the eye was avoided as it might expel intraocular contents, and no intraocular pressure measurement was performed. Further investigations such as orbital and cranial computed tomography and magnetic resonance imaging were performed in selected patients when necessary.

The Ocular Trauma Score (OTS), proposed by Kuhn *et al*. [13] and colleagues, is a simple system incorporating several variables to predict the final visual outcome of an injured eye following ocular trauma. The OTS variables were (initial visual acuity, globe rupture, endophthalmitis, penetrating injury, retinal detachment, and afferent pupillary defect). Each of these variables is assigned a specific numerical value (raw number). The sum of the raw scores constitutes the OTS score. The OTS score ranges from 1 (more serious injury and poorer prognosis) to 5 (less serious injury and better prognosis). Acar *et al*. [14] reported the prognostic value of a new OTS in pediatric penetrating injuries. The Pediatric Ocular Trauma Score (POTS) variables (initial visual acuity, age, wound localisation, iris prolapse, hyphaema, organic/unclean injury, delay of surgery (>48h), traumatic cataract, vitreous haemorrhage, retinal detachment, endophthalmitis). As afferent pupillary defects could not be assessed in children, they were not included in the scoring. Patient variables such as age and wound location were evaluated as important parameters and included in the scoring. Patients were divided into five groups based on their trauma assessment score, with higher scores indicating a better prognosis [14].

The variables specified in this study have been determined by taking into account OTS and POTS variables. Afferent pupillary defect examination was not included in this study because it is very difficult in children. Age, gender, traumatised eye, localisation of the incision, initial and final visual acuity, place of trauma, vehicles causing trauma, pathologies accompanying trauma, post-traumatic operations, time between trauma and repair, and follow-up period were recorded.

The localization of the trauma was divided into zones as corneal, corneascleral, and scleral injury according to the standardised international classification of ocular trauma [2, 3, 15]. The site of injury was classified as home, outdoor, and school. Patients with open globe injury and under the age of 18 were included in the present study. Patients without open globe injury, over the age of 18, and with missing data were excluded from the study. Initial and final visual acuities were categorized as ≤0.05, 0.05-0.5, ≥ 0.5 [13-15]. Initial and final visual acuity levels of the patients whose visual acuity could not be analysed were not evaluated statistically.

Primary repair was performed under general anaesthesia in all patients participating in this study. Necrotic and infected tissues at the wound site were excised. If there was vitreous prolapse at the wound site, a vitrectomy was performed. Lensectomy was performed in eyes with capsular rupture. Enucleation was not performed in any patient. After surgery, broad-spectrum intravenous antibiotics were administered for seven days, topical antibiotics every hour and cyclopentolate twice a day. After one week, systemic antibiotics and cyclopentolate were discontinued. The topical antibiotic was decreased and continued for a month. Postoperative ocular ultrasound was performed in all patients.

Statistical Analysis

Statistical analysis of the data was performed with SPSS 26.0 programme (SPSS Inc., Chicago, IL). Power analysis was performed with G-Power v.3.1.9.7 software (Franz Faul, Universität Kiel, Germany). For this study, an alpha error of 5% was accepted, and P<0.05 was considered statistically significant. A power analysis was performed before the study. Due to similar studies in the literature, the statistical power (1-β) was accepted as 80% and the total sample size was determined as 45 pediatric patients. Descriptive statistics were expressed as mean ± standard deviation for continuous variables and as number of cases and (%) for categorical variables. Frequency analyses, chi-square test, and Pearson correlation analyses were used in this study. Binary logistic regression analyses were used to evaluate the relationships between variables. Results were considered statistically significant for P<0.05.

RESULTS

In our study, 45 eyes of 45 pediatric patients who were followed up for open globe injury in our clinic were evaluated retrospectively. Fifteen (33.3%) patients were girls, and 30 (66.6%) were boys. The number of male patients was twice the number of female patients. The mean age was 10.4±4.4 years (1-18 years). Children were divided into three groups according to their ages. Six (13.3%) were 0-6 years old, 24 (53.3%) were 7-12 years old, and 15 (33.3%) were 13-18 years old (Table 1). There was no statistically significant difference between the ages and genders of the patients (P=0.407). The mean time between trauma and hospitalisation was 3.84±2.88 hours, and the mean follow-up period was 8.24±6.47 months. A statistically significant negative correlation was found between the time to hospitalisation and the duration of the follow-up period (P=0.014).

The right eye was traumatised in 25 (55.6%) patients and the left eye in 20 (44.4%) patients. No patient had involvement of both eyes. Corneal injury was detected in 20 (44.4%), corneascleral injury in 18 (40%), and scleral injury in 7 (15.6%) patients. Thirty-one (68.9%) patients were exposed to trauma at home,

TABLE 1. Distribution of Patients According to Age and Gender

	Female		Male		
Age (years)	**n**	**(%)**	**n**	**(%)**	**P-value***
0-6	3	10.0	3	20.0	0.407
7-12	18	60.0	6	40.0	
13-18	9	30.0	6	40.0	
Total	30	100.0	15	100.0	

*Chi-square analysis

TABLE 2. Characteristics of Patients According to Gender and age Groups

Characteristics	0-6 years		7-12 years		13-18 years		
	M	F	M	F	M	F	P-value*
Traumatized eye							
Right eye	2	2	11	3	4	3	0.977
Left eye	1	1	7	3	5	3	
Localization of trauma							
Corneal	3	2	8	2	3	2	0.088
Corneascleral			9	4	3	2	
Scleral		1	1		3	2	
Place of trauma							
Home	3	3	12	4	4	5	0.712
Outdoor			5	1	5		
School			1	1	1		
Type of trauma							
Penetrating	2	3	16	6	6	6	0.261
Perforating	1		2	-	1	-	
Foreign body	-				2		
Rupture	-						
Total	6		24		15		

Data are shown as number (frequency). M, Male; F, Female.
*Chi-square analysis

11 (24.4%) patients were exposed to trauma outdoors and 3 (6.7%) patients were exposed to trauma at school. Most of the injuries occurred at home Penetrating injuries were detected in 39 (86.7%) patients, perforating injuries in 4 (8.9%) patients, and intraocular foreign bodies in 2 (4.4%) patients. No rupture was observed in any patient. No statistically significant correlation was found between the eye in which the trauma occurred, the localisation of the trauma, the place where the trauma occurred, the type of trauma and the age and gender of the patients (Table 2). Trauma was most commonly seen in boys aged 7-12 years and in the cornea.

The most common tools causing trauma in this study were a knife in 14 (31.1%) patients, glass in 7 (15.5%) patients, and stone in 3 (6.6%) patients. The other tools causing trauma were 2 (4.4%) scissors, 2 (4.4%) pieces of wood, 2 (4.4%) toys, 2 (4.4%) pens, 1 (2.2%) spectacle lenses, 2 (4.4%) gun bullets, 2 (4.4%) fork, 2 (4.4%) tree branches, 2 (4.4%) dart darts, 1 (2.2%) wooden kite stick, 1 (2.2%) wire, 1 (2.2%) nail, and 1 (2.2%) thorn.

Initial and final best visual acuity could not be determined in three female patients aged 0-6 years because they were too young and could not cooperate during the examination. Initial visual acuity was ≤ 0.05 in 27 (64.3%) patients, between 0.05-0.5 in 11 (26.2%) patients and ≥ 0.5 in 4 (9.5%) patients. The best final visual acuity was ≤ 0.05 in 11 (26.2%) patients, between 0.05-0.5 in 13 (30.9%) patients, and ≥ 0.5 in 18 (42.9%) patients. There was a statistically significant difference between initial visual acuity and final corrected best visual acuity according to the patients' age and gender (P<0.001) (Table 3).

The findings revealed that the most common ocular pathologies were iris prolapse in 19 (42.22%) patients, traumatic cataract in 12 (26.67%) patients, and hyphaema in 5 (11.11%) patients. There was no statistically significant correlation between ocular pathologies accompanying globe injuries and the age

TABLE 3. Visual Acuity According to Age Groups and Gender

		Age (years)			
		0-6	7-12	13-18	P-value*
Gender	**Initial visual acuity**				
Female	≤0.05	-	5	4	**<0.001**
	0.05-0.5	-	-	1	
	≥0.5	-	1	1	
Male	≤0.05	2	13	3	
	0.05-0.5	-	4	6	
	≥0.5	1	1	-	
Gender	**Final best corrected visual acuity**				
Female	≤0.05	-	3	1	**<0.001**
	0.05-0.5	-	2	2	
	≥0.5	-	1	3	
Male	≤0.05	-	6	1	
	0.05-0.5	1	4	4	
	≥0.5	2	8	4	

Data are shown as number (frequency). (-) patient whose visual acuity cannot be analyzed.
*Chi-square analysis. Statistically significant P-values are shown in bold.

and gender of the patients (P=0.475) (Table 4).

Outcome visual acuity was categorised as ≤0.05 and >0.05. Both univariate and binary logistic regression analyses were performed with outcome visual acuity ≤0.05 and >0.05 as the dependent variable. There was a statistically significant difference in age between the two visual acuity groups (Table 5).

TABLE 4. Ocular Pathologies Associated with Open Eye İnjuries According to Gender and Age Groups

Factors	0-6 years		7-12 years		13-18 years		P-value*
	M	F	M	F	M	F	
Aphakia		1	1		1		0.475
Endophthalmitis					1		
Hyphema			3	1	1		
Iris prolapse	1		9	3	3	3	
Choroidal detachment		1					
Optik nerve damage			1				
Retinal detachment	1			1			
Retinal haemorrhage			1			1	
Traumatic cataract		1	4	2	4	1	
Vitreous haemorrhage	1		1			1	

Data are shown as number (frequency).
*Chi- square analysis.

TABLE 5. Variables Affecting Visual Prognosis

Factors	Final best visual acuity ≤0.05%	Final best visual acuity >0.05%	P-value	OR (regression analysis)
Gender				
Male	7 (23.3)	23 (76.6)	0.085	0.251
Female	4 (33.3)	8 (66.6)		
Age				
0-6		3 (100)	**0.049**	3.958
7-12	9 (37.5)	15 (62.5)		
13-18	2 (13.3)	13 (86.7)		
Traumatized eye				
Right eye	5 (22.7)	17 (77.3)	0.409	1.989
Left eye	6 (30)	14 (70)		
Localization of trauma				
Corneal	2 (11.1)	16 (88.9)	0.458	0.715
Corneascleral	8 (44.4)	10 (55.6)		
Scleral	1 (16.7)	5 (83.3)		
Place of trauma				
Home	8 (28.6)	20 (71.4)	0.284	0.500
Outdoor	3 (27.3)	8 (72.7)		
School		3 (100)		
Type of trauma				
Perforating	1 (25)	3 (75)	0.379	0.296
Penetrating	8 (22.2)	28 (77.8)		
Foreign body	1 (50)	1 (50)		
Rupture				
Iris prolapse	2 (10.5)	17(89.5)	0.498	0.915
Hyphema	2 (40)	3 (60)		
Vitreous haemorrhage	1 (33.3)	2 (66.7)		
Retinal haemorrhage	1 (50)	1 (50)		
Choroidal detachment	1 (100)			
Retinal detachment	2 (100)			
Traumatic cataract	4 (33.3)	8 (66.7)		
Aphakia		3 (100)		
Optic nerve damage	1 (100)			
Endophthalmitis	1 (100)			
Initial vision ≤0.05	27 (64.3)	15 (35.7)		
Presence of intraocular foreign body	1 (50)	1 (50)		

Data are shown as number (%).
Statistically significant P-value is shown in bold.

Primary repair was performed in all patients. 8-0 vicryl suture was used for scleral repair, and 10-0 nylon suture was used for corneal repair. After the first operation, 15 (44.11%) patients had lensectomy, 12 (35.29%) patients had intraocular lens (IOL) implantation, 5 (14.70%) patients had pars plana vitrectomy, and 2 (5.88%) patients had pupilloplasty.

The best final visual examination revealed corneal scarring in 5 (11.11%) patients, aphakia in 3 (6.66%) patients, optic atrophy in 1 (2.22%) patient, retinal scarring in 1 (2.22%) patient, and retinal detachment in 2 (4.44%) patients.

DISCUSSION

In our study, trauma was most commonly seen in boys aged 7-12 years and in the cornea. Penetrating injury was the most common and most injuries occurred at home with sharp objects. There was no significant difference in the frequency of right and left eye involvement, bilateral eye involvement was 0%. Initial visual acuity was ≤ 0.05 in 64.3% of patients, while final best visual acuity was ≥ 0.5 in 42.9% of patients.

It has been reported that most of the open globe injuries (53.1%) occur during play because children spend more of their time playing and are exposed to potentially dangerous substances in their environment and are vulnerable during play. Socioeconomic and sociocultural conditions are important factors in eye injuries occurring during play. The incidence rate is higher among families who are poor, less educated, and live in rural areas. It is observed twice more in boys than in girls. The higher prevalence in boys is attributed to boys being more aggressive than girls [8,16]. In our study, similarly, open globe injuries were observed twice more in boys than in girls.

Eye injuries have been reported to occur with sharp objects such as scissors, glass, nails, knives and keys. Young children, whose motor skills are not yet fully developed, are prone to bumping into hard objects and falling while walking or running. In some cases, it is not known how the child was injured because the child could not express himself/herself [1, 8, 11, 15, 17]. In our study, it was recorded that open globe injuries occurred mostly with knife (31.1%), scissors (15.5%) and stone (6.6%).

The most common type of open globe injury in children worldwide is penetrating injury (48.4%-83%). The most common injury localisation is corneal incision, followed by corneascleral incision [1, 8, 11, 15, 17-20]. Similar to other studies, the most common type of injury in our study was penetrating injury (86.7%). Corneal incision (44.4%) and corneascleral incision (40%) were the most common injury localisation.

In their study, Guo *et al*. [15] reported that the rate of open globe injuries was higher in children aged 0-6 years for both sexes than in children in other age groups and that injuries were more common in boys than in girls and in the right eye than in the left eye. In the same study, it was reported that injuries occurred due to glass, scissors and fireworks in pre-school children and most injuries occurred with pencils in primary school age. Since children are protected from the working environment, unlike adults, perforation with an intraocular foreign body is less common. In their study, the rate of perforation with intraocular foreign body in children was 6.4% [15].

Tok *et al*. [21] reported that 54 of 82 patients were boys, and 37.8% were between the ages of 3-6 years. They reported that the most common tool causing trauma was pointed metallic objects, and injuries occurred most frequently in the street [21]. Gupta *et al*. [22] reported that open globe injuries were observed in (85%) of males and (15%) of females, and the mean age of traumatised patients was 9.8 years. In our study, the mean age of the traumatised patients was 10.4±4.4 years.

The findings accompanying open globe injuries in children include hyphema, vitreous haemorrhage, uveal prolapse, cataract, lens subluxation, iridodialysis, retinal detachment and endophthalmitis [11, 23]. In studies, it has been reported that poor visual prognosis is related to poor initial visual acuity, presence of an afferent pupillary defect, posterior location and long wound, scleral injury, lens involvement, retinal detachment, vitreous and uveal prolapse, hyphema and endophthalmitis [9, 11, 15, 21, 24]. The most common findings in our study were iris prolapse (42.22%), traumatic cataract (26.67%) and hyphaema (11.11%). There was no statistically significant relationship between the findings recorded in the study and final visual acuity. Since retinal detachment, endophthalmitis, optic nerve damage and choroidal detachment are rarely seen, it is thought that there is no significant relationship with visual acuity.

Traumatic cataract is the most common

complication after open globe injuries. Other complications observed are endophthalmitis, retinal detachment, vitreous haemorrhage, sympathetic ophthalmia, chronic intraocular foreign body toxicity, amblyopia, corneal scar and astigmatism [8, 11, 15]. In our study, cataract (26.67%) and corneal scar (11.11%) were observed most frequently.

Azimi *et al*. [2] reported that 33.6% of the cases were operated twice, and 12.7% were operated three times in their study. They reported that lensectomy and deep vitrectomy were performed most frequently after the first operation [2]. In open globe injuries, vitrectomy provides a reconstruction of the posterior segment, clears vitreous opacity and prevents phakisis. A vitrectomy should be performed within the first 14 days after ocular trauma [23]. In our study, lensectomy (44.11%), intraocular lens implantation (35.29%), pars plana vitrectomy (14.70%) and pupilloplasty (5.88%) were performed after the first operation.

The risk of endophthalmitis after open globe injuries in children is 4.9-54.2%. The risk of endophthalmitis increases in the presence of an intraocular foreign body, injury in a rural area, contact with organic material in the wound and if more than 24 hours have passed since the injury. The agents of endophthalmitis after trauma are frequently streptococcus, staphylococcus epidermis, bacillus sp., fungal infection may occur in injuries caused by tree branches [2, 11]. Sul *et al*. [9] found endophthalmitis in 22 patients (12.1%) in their study. In 16 of 22 patients, primary surgical intervention was performed after 24 hours. This shows the importance of primary surgical intervention in less than 24 hours in terms of endophthalmitis development. Final visual acuity was also worse. Retinal detachment was observed in 11 patients who developed endophthalmitis [9]. Narang *et al*. [25] reported that endophthalmitis developed in 39 (54.16%) of 72 patients after open globe injuries in children. They reported that delayed repair for more than 24 hours, injury with arrow and domestic injuries were associated with a high risk of endophthalmitis, while the size and location of the wound, injury of the lens, iris, vitreous prolapse and presence of intraocular foreign body were not associated with endophthalmitis [25]. In another study by Ghadeer *et al*. [26], it was reported that endophthalmitis developed in 23 eyes. Zheng *et al*. [27] reported that most of the open globe injuries were observed in pre-school children and boys, frequently occurred with sharp objects, such as knives, scissors and broken glasses, and the risk of endophthalmitis increased in primary repairs performed over 24 hours. In our study, endophthalmitis occurred in one patient who was injured in the street by a gunshot.

Gursoy *et al*. found that pars plana vitrectomy, iris, ciliary body and choroidal damage, posttraumatic aphakia were associated with poor prognosis. It was reported that traumatic cataract was not associated with poor prognosis in children with appropriate intervention. Incisions of the prolapsed vitreous and penetrating injuries were associated with better visual prognosis compared to other injuries [28]. Wen *et al*. [29] found that severe intraocular haemorrhage, retinal detachment and choroidal damage occurred in pediatric patients with no light sensation in the first vision.

In our study, there was no statistically significant correlation between pathologies accompanying open globe injury, initial visual acuity ≤0.05, presence of the intraocular foreign body, type of trauma, place of trauma, traumatised eye and localisation of trauma in the eye and final visual acuity (P>0.05). There was a statistically significant difference between initial visual acuity and final corrected best visual acuity according to the patients' age and gender (P<0.001). There was no difference between the pathologies accompanying trauma (P=0.475), traumatised eye (P=0.977), place of trauma (P=0.712), localisation of trauma (P=0.088), type of trauma (P=0.261), age and gender.

Jandeck *et al*. [4] reported that the average follow-up period for perforating globe injuries was 15.5 months. Tabatabaei *et al*. [20] reported that in 66.6% of patients, the time between the occurrence of eye trauma and hospital admission was less than 12 hours. In our study, the mean time between trauma and hospitalisation was 3.84±2.88 hours, and the mean follow-up period was 8.24± 6.47 months. A statistically significant negative correlation was found between the time to hospitalisation and the duration of follow-up period. As there is a high risk of blindness in perforating eye injuries, follow-up periods may be lengthy even if patients arrive at the hospital early.

Strengths and Limitations

Since this study was retrospective, it has limitations. The single-centre nature of the study. The

small number of patients, the fact that patient information is limited to data recorded during the patient's hospital stay, the absence of standardised long-term visual follow-up, and the data obtained during follow-up after the patient's discharge limit this study. This study supports the findings of previous studies. Understanding the epidemiological and clinical characteristics of open globe injuries in children can raise awareness among families and the community, and these injuries, which can lead to amblyopia and blindness, can be prevented by taking simple precautions.

CONCLUSION

As a result, open globe injuries cause more surgical procedures and complications, patients are hospitalised longer and the visual prognosis is worse compared to closed globe injuries. It is important to ensure that children stay away from sharp-edged, pointed, explosive objects. Our findings highlight the importance of preventive education and parental awareness to reduce the risk of ocular trauma in children. To determine the prognostic factors and treatment of the disease, multicentre, prospective studies involving a larger number of cases are required.

Ethics Approval and Consent to Participate

This study was approved by the İnönü University Health Sciences Non-Interventional Clinical Research Ethics Committee (Decision No: 2023/5358-19; date: 26.12.2023). All procedures were conducted in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments. Written informed consent was obtained from the parents of the patients included in the study.

Data Availability

All data generated or analyzed during this study are included in this published article. The data that support the findings of this study are available on request from the corresponding author, upon reasonable request.

Authors' Contribution

Study Conception: ÜD; Study Design: ÜD; Supervision: ÜD; Funding: ÜD; Materials: ÜD; Data Collection and/or Processing: ÜD; Statistical Analysis and/or Data Interpretation: ÜD; Literature Review: ÜD; Manuscript Preparation: ÜD; and Critical Review: ÜD.

Conflict of Interest

The author(s) disclosed no conflict of interest during the preparation or publication of this manuscript.

Financing

The author(s) disclosed that they did not receive any grant during the conduction or writing of this study.

Acknowledgments

The authors have no acknowledgments to declare.

Generative Artificial Intelligence Statement

The author(s) declare that no artificial intelligence-based tools or applications were used during the preparation process of this manuscript. The all content of the study was produced by the author(s) in accordance with scientific research methods and academic ethical principles.

Editor's Note

All statements made in this article are solely those of the authors and do not represent the views of their affiliates or the publisher, editors, or reviewers. Any claims made by any product or manufacturer that may be evaluated in this article are not guaranteed or endorsed by the publisher.

REFERENCES

1. Ava S, Erdem S, Karahan M, Dursun ME, Hazar L, Keklikçi U. Epidemiology and demography of open globe injury in children. Dicle Med J. 2021;48(3):416-424. doi: 10.5798/dicletip.987880.

2. Azimi A, Abdollahi F, Sadeghi E, Reza Farsiani A, Moshksar S, Nadi M. Epidemiological and clinical features of pediatric open globe injuries: a report from Southern Iran. J Ophthalmic Vis Res. 2023;18(1):88-96. doi: 10.18502/jovr.v18i1.12729.

3. Schörkhuber MM, Wackernagel W, Riedl R, Schneider MR, Wedrich A. Ocular trauma scores in paediatric open globe injuries. Br J Ophthalmol. 2014;98(5):664-668. doi: 10.1136/bjophthalmol-2013-304469.

4. Jandeck C, Kellner U, Bornfeld N, Foerster MH. Open globe

injuries in children. Graefes Arch Clin Exp Ophthalmol. 2000;238(5):420-426. doi: 10.1007/s004170050373.
5. Wong JCY, Yonekawa Y. Pediatric open-globe injury: Current perspectives, surgical principles, and literature review. Taiwan J Ophthalmol. 2024;15(2):225-235. doi: 10.4103/tjo.TJO-D-24-00061.
6. Kaçer EÖ, Kaçer İ. Ocular trauma in the pediatric age group: a systematic review. Egypt Pediatr Assoc Gaz. 2022;70:28. doi: 10.1186/s43054-022-00125-y.
7. Jacobson A, Liles N, Besirli CG, Bohnsack BL. Predictors of visual outcomes in pediatric open globe injuries. J AAPOS. 2020;24(6):360.e1-360.e8. doi: 10.1016/j.jaapos.2020.08.010.
8. Abdelazeem K, Al-Hussaini AK, El-Sebaity DM, Kedwany SM. Epidemiology, etiologies, and complications of playtime open globe injuries in children. J Pediatr Ophthalmol Strabismus. 2021;58(6):385-389. doi: 10.3928/01913913-20210426-01.
9. Sul S, Gurelik G, Korkmaz S, Ozdek S, Hasanreisoglu B. Pediatric open-globe injuries: clinical characteristics and factors associated with poor visual and anatomical success. Graefes Arch Clin Exp Ophthalmol. 2016;254(7):1405-10. doi: 10.1007/s00417-015-3087-y.
10. Zhou Y, DiSclafani M, Jeang L, Shah AA. Open Globe Injuries: Review of evaluation, management, and surgical pearls. Clin Ophthalmol. 2022;16:2545-2559. doi: 10.2147/OPTH.S372011.
11. Li X, Zarbin MA, Bhagat N. Pediatric open globe injury: A review of the literature. J Emerg Trauma Shock. 2015;8(4):216-223. doi: 10.4103/0974-2700.166663.
12. Sung EK, Nadgir RN, Fujita A, et al. Injuries of the globe: what can the radiologist offer? Radiographics. 2014;34(3):764-776. doi: 10.1148/rg.343135120.
13. Kuhn F, Maisiak R, Mann L, Mester V, Morris R, Witherspoon CD. The ocular trauma score (OTS). Ophthalmol Clin North Am. 2002;15(2):163-165, vi. doi: 10.1016/s0896-1549(02)00007-x.
14. Acar U, Tok OY, Acar DE, Burcu A, Ornek F. A new ocular trauma score in pediatric penetrating eye injuries. Eye (Lond). 2011;25(3):370-374. doi: 10.1038/eye.2010.211.
15. Guo Y, Guo Y, Gu R, et al. Characteristics and visual prognosis of pediatric open globe injury in Shanghai, China. Ophthalmic Res. 2022;65(3):328-334. doi: 10.1159/000523814.
16. Grieshaber MC, Stegmann R. Penetrating eye injuries in South African children: aetiology and visual outcome. Eye (Lond). 2006;20(7):789-795. doi: 10.1038/sj.eye.6702003.
17. Batur M, Seven E, Akaltun MN, Tekin S, Yasar T. Epidemiology of open globe injury in children. J Craniofac Surg. 2017;28(8):1976-1981. doi: 10.1097/SCS.0000000000004033.
18. Aksu-Ceylan N, Özbilen KT, Karakiraz A. Characteristics of pediatric open globe injuries in preschool-aged and school-aged children. Can J Ophthalmol. 2023;58(6):559-564. doi: 10.1016/j.jcjo.2022.10.013.
19. Gunes A, Kalayc M, Genc O, Ozerturk Y. Characteristics of open globe injuries in preschool children. Pediatr Emerg Care. 2015;31(10):701-703. doi: 10.1097/PEC.0000000000000433.
20. Tabatabaei SA, Khameneh EA, Soleimani M, Baramaki A. Open globe injuries in children under 7 years referred to a tertiary center in Iran from 2006 to 2016. Eye (Lond). 2021;35(4):1235-1239. doi: 10.1038/s41433-020-1023-9.
21. Tok O, Tok L, Ozkaya D, Eraslan E, Ornek F, Bardak Y. Epidemiological characteristics and visual outcome after open globe injuries in children. J AAPOS. 2011;15(6):556-561. doi: 10.1016/j.jaapos.2011.06.012.
22. Gupta A, Rahman I, Leatherbarrow B. Open globe injuries in children: factors predictive of a poor final visual acuity. Eye (Lond). 2009;23(3):621-625. doi: 10.1038/eye.2008.32.
23. Lee CH, Lee L, Kao LY, Lin KK, Yang ML. Prognostic indicators of open globe injuries in children. Am J Emerg Med. 2009;27(5):530-535. doi: 10.1016/j.ajem.2008.04.004.
24. Globocnik Petrovic M, Lumi X, Drnovsek Olup B. Prognostic factors in open eye injury managed with vitrectomy: retrospective study. Croat Med J. 2004;45(3):299-303.
25. Narang S, Gupta V, Simalandhi P, Gupta A, Raj S, Dogra MR. Paediatric open globe injuries. Visual outcome and risk factors for endophthalmitis. Indian J Ophthalmol. 2004;52(1):29-34.
26. Al Ghadeer H, Khandekar R. Characteristics, etiological factors, and visual outcomes of pediatric open globe injuries in central Saudi Arabia: a 22-year retrospective study. Clin Ophthalmol. 2023;17:2909-2917. doi: 10.2147/OPTH.S430394.
27. Zheng L, Tan J, Liu R, et al. The impact of primary treatment on post-traumatic endophthalmitis in children with open globe injuries: A Study in China. Int J Environ Res Public Health. 2019;16(16):2956. doi: 10.3390/ijerph16162956.
28. Gursoy H, Bilgec MD, Sahin A, Colak E. A possible regression equation for predicting visual outcomes after surgical repair of open globe injuries. J Ophthalmol. 2017;2017:1320457. doi: 10.1155/2017/1320457.
29. Wen X, Yuan M, Li C, et al. Risk factors and prognosis of pediatric open globe injuries without initial light perception. Ophthalmologica. 2021;244(2):165-172. doi: 10.1159/000513337.