

A Prospective Study on Clinical Features and Visual Outcome of Penetrating Eye Injury at Preah Ang Duong Hospital, Cambodia

Sivlang BY¹, Piseth KONG², Meng NGY³, Amarin MAR⁴, Ponndara ITH⁵, Saly SAINT⁶

Abstract: ***Purpose:** The study is conducted to evaluate the clinical features and visual outcomes of penetrating eye injury at Preah Ang Duong Hospital. **Methods:** A prospective review of one hundred patients who underwent surgical repair of a penetrating eye injury was conducted at the ophthalmology department of the Preah Ang Duong Hospital from September 2021 to August 2022. Age, gender, place, cause and visual acuity (VA) were evaluated. **Results:** The injuries are common in 2nd and 3rd decades of life with significantly in male. Majority of trauma is caused by metallic objects which predominantly occur at work and home. Corneal laceration is the most frequently injured responsible for 72% of the total cases. Fifty seven percent patients were blind at the time of presentation whereas at discharge one percent were blind. **Conclusions:** Penetrating eye injury is one of the common causes attending Ophthalmology Department. Prevention is recommended to reduce visual disabilities due to ocular trauma.*

Keywords: Penetrating eye injury, visual acuity (VA)

1. Introduction

Eye injury is a leading cause of monocular blindness. Penetrating eye injury is one of the most common causes that can result in severe vision loss or loss of eye. Penetrating eye injury refers to the injury of the eyeball that has an entrance, but no exit, accompanied by the foreign body retained in the globe. Penetrating trauma is caused by sharp objects and results in simple and complex lacerations and puncture wounds, depending on the object and mechanism of injury. Moreover, the incidence of ocular trauma may be higher in developing countries. Therefore, the prospective study of clinical features and visual outcome of penetrating eye injury will be conducted in Cambodia.

2. Materials and Methods

This prospective study was conducted at the Ophthalmology Department of Preah Ang Duong Hospital over a period of one year from September 2021 to August 2022. All patients of penetrating eye injuries were included in the study. Information collection included age, sex, eye injured, cause of injury, place, visual acuity at the presentation, and visual acuity at the last follow-up visit. This study was approved by National Ethics Committee for Health Research (NECHR), Cambodia. Patients of penetrating eye injuries and receiving proper treatment with follow up three months were included. Exclusion criteria included patients removed embedded corneal and/or conjunctival foreign body and lost follow-up within three months. Data analysis was performed using

Microsoft Excel Version 2016 (Ms. Excel 2016) for Windows 10.

3. Results

Among 100 patients, 17 patients are female and the other 83 patients are male. Regarding to the laterality of eye, we can see that left eye is more common than right eye, left eye 55% and right eye 45%. Talking about the age group, we divided into 6 groups. There are 13 patients below 10 years old, 9 patients between 10-19 years old, 29 patients between 20-29 years old, 27 patients between 30-39 years old, 10 patients between 40-49 years old and 12 patients above 50 years old (Figure 1).

The most common place of injury was workplace 42% followed by home 40%. Fourteen (14%) patients had injury at the other place while four (4%) happened on the road (Figure 2). The majority of patients were traumatized by metallic agent 55%. The rest cases were caused by non-metallic 19% and other non-specific agents 26% (Table 1).

The highest proportion of baseline visual acuity was <3/60-NPL: 57%, followed by <6/18-6/60: 16%. There were similarly reported 13% cases in 6/6-6/18 group and 14% cases in <6/60-3/60 group (Table 3). After treatment, the majority of patients had visual acuity in between 6/18 to 6/60 and between 6/6 to 6/18, 47% and 42% respectively (Table 4). Wounds were predominantly corneal in 72% cases, corneoscleral laceration in 17% cases and scleral laceration in 5% cases. Six cases were in unclassified group (Table 2).

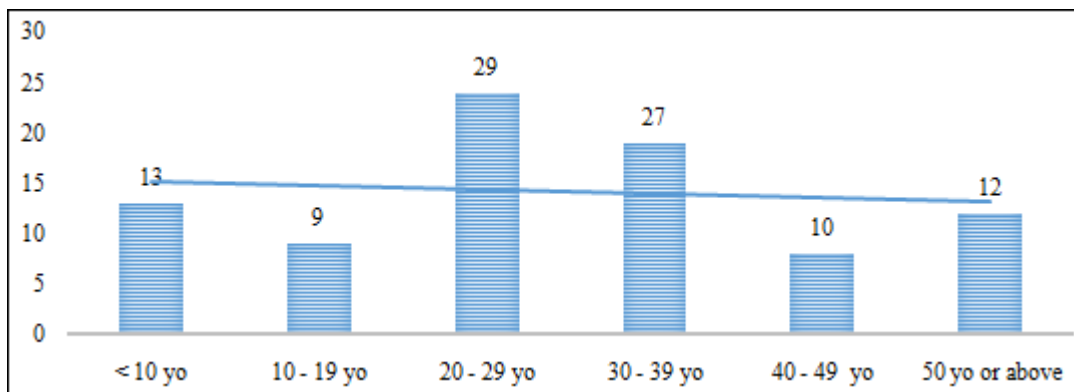


Figure 1: Age group distribution of the patients with penetrating eye injury

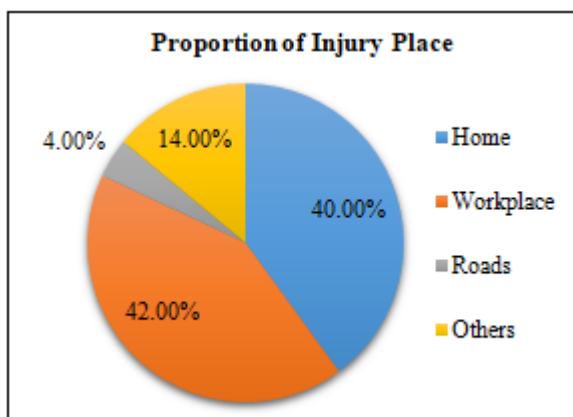


Figure 2: Injured place distribution

Table 1: Causative agents causing penetrating eye injury

Agents	Frequency	Percentage
Metallic	55	55%
Non-metallic	19	19%
Others	26	26%

Table 2: Site of laceration

Site of laceration	Frequency
Cornea laceration	72
Corneoscleral laceration	17
Scleral laceration	5
Unclassified	6
Total	100

Table 3: Visual acuity at presentation

Visual acuity	Frequency
6/6-6/18	13
<6/18-6/60	16
<6/60-3/60	14
<3/60-NPL	57

NPL: No perception of light

Table 4: Visual acuity at discharge

Visual acuity	Frequency
6/6-6/18	42
<6/18-6/60	47
<6/60-3/60	10
<3/60-NPL	1

4. Discussion

In this study, there was a higher incidence of penetrating eye injury among males compared to females which is consistent

with findings from the similar studies (1)(2)(3)(4)(5). Males are most commonly involved in outdoor and risky activities.

All cases presented with unilateral involvement. Involvement of left eye was higher than right eye in our study 55% which was similar found in a few studies (6)(7). However, involvement of right eye also showed higher in some studies (1)(4)(8).

It was reported that young adult was the most injured in penetrating eye injury in this study which shared the same result with many studies (2)(4)(7).

In this study showed that workplace and home were responsible for the majority of the injuries. Similar finding was reported in the previous studies (2)(3)(4).

This study showed that 55% of the injury was caused by metallic object which found consistent with previous studies(6)(9).

The cornea was the most common site of injury due to the greater exposure of the structure to impact. It was followed by injury of corneoscleral site. Study done by Bajracharya K et al: a profile of penetrating eye injuries showed cornea was involved in 80.31%,corneoscleral in 11.81% and scleral in 7.88% of cases. It was also reported in other similar studies (4)(6)(8)(9).

In this study, the visual acuity at presentation in 57% of cases was in blindness group (<3/60-NPL) and the final visual acuity significantly improved to 47% in between 6/18 to 6/60 and 42% in between 6/6 to 6/18. Only 1% that remained in blindness group. A study done by Bajracharya K et al showed that 73% patients were blind at the time of presentation whereas at discharge 37.63% were blind and 11.43% of patients had visual acuity better than 6/18 at presentation whereas 35.48% had visual acuity better than 6/18 after treatment. Similar finding was reported in other studies (7)(8).

5. Limitations of this study

We studied only penetrating ocular injuries. We had excluded blunt trauma that could also cause severe visual impairment and did not include minor ocular trauma such as corneal abrasions, corneal foreign bodies and eyelid laceration that are also frequently encounter.

6. Conclusion

Vision is our primary contact with our environment. Loss of vision is the most feared of all disabilities. Approximately 30% to 40% of ocular blindness cases in the world is due to ocular trauma, and of these, between 80% and 90% of events are preventable. Thus, prevention is the goal in the management of penetrating eye injury. Majority of the injuries, from our study, happened at workplace and home. Therefore, we recommend wearing protective eye gear while engaged in potentially dangerous tasks, not only at work but also at home.

Acknowledgments

I would like to thank University of Health Sciences (UHS) and The Fred Hollows Foundation for assisting and providing grant in doing this research.

References

- [1] Bajracharya K, Rai SK, Bhari AM, Thapa HB, Hirachan A, Pandey S, et al. Penetrating eye injuries in pediatric population: An epidemiological study and visual outcome. *Asian J Med Sci.* 2016;7(4):84–7.
- [2] Bhogal G, Tomlins PJ, Murray PI. Penetrating ocular injuries in the home. *J Public Health (Bangkok).* 2007;29(1):72–4.
- [3] Dehghani A, Rezaei L, Kianersi F, Azadi M, Mahbobui M. Epidemiological evaluation of penetrating ocular trauma in patients under the age of sixteen. *J Biol Today's World.* 2014;3(3):62–6.
- [4] Oluyemi F. Epidemiology of penetrating eye injury in Ibadan: A 10-year hospital-based review. *Middle East Afr J Ophthalmol.* 2011;18(2):159–63.
- [5] Hunt L. Penetrating ocular trauma and visual outcome. *Insight - J Am Soc Ophthalmic Regist Nurses.* 1996;21(4):133–4.
- [6] Chabbar I, Berraho A. Ocular penetrating injuries in children. *Ophthalmol J.* 2020;5(0):120–4.
- [7] Zamal MM, Jana D, Eye MS, Resident S, Medical MGM, Author JC. “ PENETRATING OCULAR TRAUMA – A CLINICAL STUDY ” *Ophthalmology Dr . Nishit Kumar.* 2020;(5):33–5.
- [8] Hospital SEYE. penetrating ocular trauma : hospital based study Dr Deepak Mishra * * Corresponding Author. 2021;(April).
- [9] Qayyum Malik I, Ali Z, Rehman A, Moin M, Hussain Pak MJ. Epidemiology of Penetrating Ocular Trauma. *Pakistan J Ophthalmol.* 2012;28(1):14–6.
- [10] Hoil AS-, GarcíaUribe PA, Lara M, Canton VM. Repair of penetrating ocular trauma with anterior and posterior pole involvement. *Int J Fam Community Med.* 2022;6(1):26–8.
- [11] Shock JP, Adams D. Long-term visual acuity results after penetrating and perforating ocular injuries. *Am J Ophthalmol [Internet].* 1985;100(5):714–8. Available from: [http://dx.doi.org/10.1016/0002-9394\(85\)90628-2](http://dx.doi.org/10.1016/0002-9394(85)90628-2)
- [12] Kaufman SC, Lazzaro DR. *Textbook of Ocular Trauma.* Textbook of Ocular Trauma. 2017.