**ORIGINAL ARTICLE**

**CHARACTERISTICS OF PATIENTS WITH EYELID LACERATION IN KARIADI GENERAL HOSPITAL SEMARANG**

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# **ABSTRACT**

***Introduction and Objective:*** *Eyelid laceration is one of the most common ocular injuries with complications. This study examines patient characteristics with eyelid lacerations at Kariadi General Hospital Semarang.*

***Methods:*** *An observational study used medical records data from April 2019 to January 2023. Age, gender, eyelids, grading, area of laceration, mechanism of trauma and injury, canthal and canalicular involvement, associated injury, and surgery were recorded.*

***Results:*** *From 75 patients, lacerations were more common in men (56, 75%) and ages 16-<50 years (43, 57%). Lacerations occurred in right lower (21, 28%), right upper (17, 23%), right upper and lower (16, 21%), left lower (9, 12%), left upper (8, 11%), and left upper and lower (4, 5%) eyelids. They were mainly medial (52, 69%), lateral (12, 16%), and central (7, 9%). Full-thickness lacerations (58, 77%) outnumbered lamellar thickness (17, 23%). Blunt trauma (63, 84%) was the main mechanism, with motor vehicle accidents leading 30 (40%). Canthal involvement was absent in 41 cases (55%), medial in 29 (39%), and lateral in 5 (7%). Canalicular involvement was absent in 39 cases (52%) and present in 36 (48%). The three most frequent of associated injury of the patients was 16 (21%) subconjunctival bleeding, 12 (16%) orbital hematom, 9 (12%) conjunctival laceration. All patients underwent surgery, with eyelid repair most common (32, 43%).*

***Conclusion:*** *Eyelid lacerations mainly involved right lower eyelid, medial region, and are full-thickness. Blunt trauma, particularly motor vehicle accidents, was the main cause. Most cases lack canthal or canalicular involvement. Eyelid repair was the most frequent choice of surgery.*

***Keywords****: Eyelid Laceration, Characteristic, Repair Surgery*

**INTRODUCTION**

Each year an estimated 2.4 million ocular trauma occur in the United States, and 50.000 people permanently lose part or all of their vision each year.1 While in Korea, the incidence rate of ocular trauma associated with major trauma was within 1.49/100,000–1.57/100,000 per year, it is said that ocular trauma is a major cause of morbidity and its socioeconomic impact on the younger population of working age can be significant.2 Eyelid laceration is one of the most common ocular trauma with complications of eyelid malposition and disruption to lacrimal outflow.3

Most primary eyelid laceration occur in males (69%) and children-young adults (10-44 years).4 Motor vehicle accident is the most common causes of eyelid laceration follow by fall accident.2 Blunt trauma (62%) occur more frequent than penetrating trauma (37.5%), the skin and subcutaneous tissue are affected in 90 cases (93.8%), and there are no cases of upper and lower canalicular injuries.5

Chiang E et all, said that from 143 patients coming to Ophthalmology service at the Medical Collage of Winsconsin, most of eyelid laceration cases (75.5%) has repaired in an operating room, with 53.8% has canalicular system involvement.6 Ocular trauma is one of the preventable health issues around the world, so it is important to address this issue in order to reduce its impact on sosioeconomics of the community.5 The aim of this study is to provide data on the characteristics of patient with eyelid laceration in Kariadi General Hospital Semarang.

**METHODS**

This study is a retrospective study. Data is taken from medical records of Kariadi General Hospital Semarang. Inclusion criteria includes all patients with eyelid laceration coming into outpatient and inpatient ophthalmology clinic from period of April 2019 to January 2023 who underwent surgery. Deceased patients, refuse surgery, and incomplete medical records are excluded from this study. Age, sex, eyelids, mechanism of trauma and injury, laceration regio, grading, canthal and canalicular involvement, associated injury, and surgery are recorded and processed using Windows Microsoft Excel 2019 and discribed in tabular form.

**RESULTS**

**Demographics**

The patient’s demographics and characteristics are summarized in **Table** 1. Over 56 (75%) male patients and 19 (25%) female patients were enrolled in this study. Single site of eyelid laceration at 55 (73%) is more frequent than concurrent upper and lower eyelid laceration at 20 (27%), with right lower eyelid laceration at 17 (21%) being the most frequent site, whereas left lower eyelid laceration at 9 (12%) is the least frequent. Medial regio is found in as many as 52 (69%), Lateral regio in 12 (16%), Central regio in 7 (9%), and all regio in 4 (5%).

**Table 1.** **Patient demographics and characteristics**

|  |  |
| --- | --- |
| **Characteristic** | **Total = 75**  **Value (%)** |
| **Sex**  Male  Female | 56 (75)  19 (25) |
| **Age (years old)**  <2  2-6  7-10  11-15  16-<50  >50 | 3 (4)  6 (8)  3 (4)  6 (8)  43 (57)  14 (19) |
| **Eyelids**  **Single site**  Right upper  Right lower  Left upper  Left lower  **Concurrent upper and lower**  Right upper and lower  Left upper and lower | **55 (73)**  17 (23)  21 (28)  8 (11)  9 (12)  **20 (27)**  16 (21)  4 (5) |
| **Laceration regio**  Medial  Central  Lateral  All regio | 52 (69)  7 (9)  12 (16)  4 (5) |

**Mechanism of Injury**

Majority of lacerations are caused by motor vehicle accident at 30 (40%); motorbike accidents, car traffic accidents, pedestrian accidents are included in this category (**Table 2**). The second most frequent mechanism of injury is caused by accident at home in 24 (32%); it includes falling while doing work, falling while doing work at home, injury when exercising at home, slipping, or hitting a sharp or blunt household object. Assault at 17 (22.7%) and falling at 4 (5.3%) are the third and the fourth causes of eyelid laceration, respectively.

**Table 2. Mechanism of injury on this study**

|  |  |
| --- | --- |
| Characteristic | Value (%) |
| Motor vehicle accident | 30 (40) |
| Home | 24 (32) |
| Assault | 17 (22,7) |
| Fall | 4 (5,3) |

**Associated Injury**

Associated injuries with eyelid laceration are shown in **Table 3.** A total of 62 (83%) patients have associated injuries; 20 (26.7%) patients have ocular surface laceration, 15 (20%) patients have subconjunctival hemorrhage, 13 (17.3%) patients have orbital hematoma, 7 (9.3%) patients have hyphema, 5 (6.7%) patients have orbital fracture, and 2 (2.7%) patients have hemophtalmus.

**Table 3**. **Characteristic of associated injury on this study**

|  |  |
| --- | --- |
| **Characteristic** | **Value (%)** |
| Ocular surface laceration | 20 (26.7) |
| Conjunctiva laseration | 9 |
| Cornea laseration | 6 |
| Sclera laseration | 5 |
| Subconjunctival hemorrhage | 15 (20) |
| Orbital hematoma | 13 (17.3) |
| No | 13 (17.3) |
| Hyphema | 7 (9.3) |
| Orbital fracture | 5 (6.7) |
| Hemophtalmus | 2 (2.7) |

**Canthal and Canalicular Involvement**

Further analysis was done by comparing the trauma mechanism and involvement of nearby structure such as canthus and canalicular. Presented in **Table 4-5**, data showed that 33.3% and 6.7% patient with blunt trauma were having medial and lateral canthal involvement, respectively. While, in penetrating trauma patient, canthal involvement are less likely to be found (medial 5.3%). Chi-square test result showed that there is no significant difference between trauma mechanism in terms of canthal involvement. Meanwhile, 30% of blunt trauma patients and 8% patient with penetrating trauma have canalicular involvement. Chi-square test result showed there is no significant difference between trauma mechanism in terms of canalicular involvement (p > 0.05).

**Table 4. Characteristic of canthal involvement based on the mechanism of trauma**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Mechanism of trauma** | **Canthal Involvement** | | | **p§** | |
| **Medial (%)** | **Lateral (%)** | **No (%)** | |  | |
| Blunt trauma [63 (84%)] | 25 (33,3) | 5 (6,7) | 33 (44) | | 0.488 | |
| Penetrating trauma [12 (16%)] | 4 (5,3) | 0 | 8 (10,7) | |  | |

§Chi-Square

**Table 5. Characteristic of canthus involvement based on the mechanism of trauma**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mechanism of trauma** | **Canalicular Involvement** | | **p§** |
| **Yes (%)** | **No (%)** |  |
| Blunt trauma [63 (84%)] | 30 (40) | 33 (44) | 0.88 |
| Penetrating trauma [12 (16%)] | 6 (8) | 6 (8) |  |

§Chi-Square

**Eyelid laceration surgery**

All of patients in this study were undergoing eyelid surgery. There are five types of surgery: repair at 32 (43%), repair plus recanalization at 16 (35%), canthopexy at 11 (14%), repair plus flap at 3 (4%) and repair plus graft at 3 (4%), respectively.

Almost all the full-thickness lacerations (23 (40%)) underwent repair surgery, followed by repair plus recanalization surgery at 22 (38%). Same with lamellar laceration, with as many as 9 (53%) patients undergoing repair surgery and 4 (24%) patients undergoing repair plus recanalization surgery.

**Table 6. Characteristic of eyelid laceration grade based on eyelid laceration surgery**

|  |  |  |
| --- | --- | --- |
| **Surgery** | **Grading** | |
| **Full-thickness (%) N=58** | **Lamellar (%)**  **N=17** |
| Repair [32 (43%)] | 23 (40) | 9 (52) |
| Repair, recanalization [26 (35%)] | 22 (38) | 4(24) |
| Canthopexy [11 (14%)] | 9(15) | 2 (12) |
| Repair, graft [3 (4%)] | 1(3) | 2(12) |
| Repair, flap [3 (4%)] | 3(4) | 0(0) |

**Complication of surgery**

In our study, the most common complications one month after surgery were lagophthalmos, cantholysis, and ptosis. Three patients (9.5%) who underwent surgery for repair had lagophthalmos. One patient (9%) who underwent canthopexy surgery had cantholysis. Two patients (6%) who underwent repair surgery had ptosis.

**CONCLUSION**

Eyelid lacerations mainly involved right lower eyelid, medial region, and are full-thickness. Blunt trauma, particularly motor vehicle accidents, was the main cause. Most cases lack canthal or canalicular involvement. Eyelid repair was the most frequent choice of surgery, and successful rate is high. Longer period with greater sample for further research is warranted.

**REFERENCES**

1. American Academy of Ophthalmology and American Society of Ocular Trauma. Annual Eye Injury Snapshot Survey Data Summary. 2004-2008. https://www.aao.org (accessed May 2023)
2. Park J, et all. Epidemiologi and Clinical Patterns of Ocular Trauma at a Level 1 Trauma Center in Korea. J Korean Med Sci. 2021 Jan 4;36(1):e5. https://doi.org/10.3346/jkms.2021.36.e5
3. Rishor-Olney CR, Hinson JW. Canalicular laceration. In: StatPearls. StatPearls Publishing; 2021.
4. Cade KL, et all. Incidence, Characteristics, and Cost of Eyelid Laceation in the United States from 2006-2014. Ophthalmol Ther (2023) 12:263–279 <https://doi.org/10.1007/s40123-022-00605-9>
5. Tabatabaei A, et al. Climical Characteristics and Causality of Eye Lid Laceration in Iran. Oman Medical Journal (2013) Vol. 28, No. 2:97-101 DOI 10. 5001/omj.2013.26
6. Chiang E, et al, Does delayed repair of eyelid lacerations compromise outcome?. American Journal of Emergency Medicine (2017).<http://dx.doi.org/10.1016/j.ajem.2017.04.062>
7. Sendul SY, et al. Reconstructions of traumatic lacrimal canalicunar laceration: a 5 years experience. AgiAI Jourbal science and technologi. Vol 3 (2015). 101121; 1-6. DOI 10.11131/2015/101121
8. Wong TY, Klein BE, Klein R. The prevalence and 5-year incidence of ocular trauma. The Beaver Dam Eye Study. Ophthalmology 2000 Dec;107(12):2196- 2202.
9. Glynn RJ, Seddon JM, Berlin BM. The incidence of eye injuries in New England adults. Arch Ophthalmol 1988 Jun;106(6):785-789.
10. Dandona L, Dandona R, Srinivas M, John RK, McCarty CA, Rao GN. Ocular trauma in an urban population in southern India: the Andhra Pradesh Eye Disease Study. Clin Experiment Ophthalmology 2000 Oct;28(5):350-356.
11. Huang J et al., Pediatric eyelid and canalicular lacerations: epidemiology and outcomes. Journal of pediatric ophthalmology & strabismus. Vol. 60(1) 2023; 33-8.
12. Lee H, Chi M, Park M, et al. Effectiveness of canalicular laceration repair using monocanalicular intubation with Monoka tubes. Acta Ophthalmol 2009;87:793-6.
13. Han J et al., A case series study of lacrimal canalicular laceration repair with the bi-canalicular stent. Gland Surg 2022;11(11):1801-1807 | <https://dx.doi.org/10.21037/gs-22-556>
14. Chaudary A et al., Eye lid trauma and their management. International Journal of Ocular Oncology and Oculoplasty, October-December, 2016;2(4):240-243
15. A .A . Gordon, L.T. Tran and P.O. Phelps, Eyelid and orbital trauma for the primary care physi- cian, Disease-a-Month, https://doi.org/10.1016/j.disamonth.2020.101045.
16. Jordan DR , Ziai S , Gilberg SM , et al. Pathogenesis of canalicular lacerations. *Ophthalmic Plast Reconstr Surg* . 2008;24(5):394–398 .