



## Ophthalmology Research: An International Journal

14(3): 18-22, 2021; Article no.OR.69570  
ISSN: 2321-7227

# Assessment and Management of Eyelid Injury

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### Authors' contributions

*This work was carried out in collaboration between both authors. All authors read and approved the final manuscript.*

### Article Information

DOI: 10.9734/OR/2021/v14i330194

#### Editor(s):

(1) Dr. Ahmad M Mansour, American University of Beirut, Lebanon.

#### Reviewers:

(1) Yan Wang, Guangzhou University of Chinese Medicine, China.

(2) Gaurav Dubey, Uttar Pradesh University of Medical Sciences Saifai Etawah, India.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/69570>

Original Research Article

Received 20 April 2021  
Accepted 24 June 2021  
Published 26 June 2021

## ABSTRACT

**Background and aim:** Among all sites of injury, eyelid laceration seems to be neglected in terms of sufficient epidemiological investigations. With a thorough understanding of the causes of eye lid lacerations, it is possible to develop a better preventive strategy and hence improve the public health policy in this respect. Hence the aim of the study was to understand the type of eyelid injury and study management of the injuries.

**Materials and methods:** A total of 100 cases that were reported to the hospital department opd with the chief complain of blunt as well as penetrating eye lid injuries were included in the study. Evaluation by a physician was done for all cases to note the presence of any systemic diseases and for opinion regarding fitness for surgery. In cases where General Anaesthesia (GA) was used, Anaesthetist examined the patient and opined regarding status of the patient towards GA.

**Results:** The results of the present study showed that 3rd and 4th decade were more prone to the eyelid injuries. Majority of the 58 cases showed involvement of left eye whereas the involvement of right eye was seen in 42 cases. In the present study, Minimonoka stent was used for 8 cases of canalicular lacerations and 8 cases of canalicular tear that were not affordable were repaired with 24G Venflon tube.

**Conclusion:** As the injuries occur more commonly due to road traffic accidents showing 54 cases in our study, preventive measures are to be taken while riding such as controlling speed. Domestic injuries are more common in females. This study showed that Minimonoka stent is an effective and easy tool in reconstructing canalicular tear, with successful anatomical and functional integrity.

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*Keywords: Canalicular lacerations; domestic injuries; eyelid injury; minimonoka stent.*

## 1. INTRODUCTION

The eyelids are complex structures designed to protect the globe from a variety of traumatic conditions. The eyelids help to keep the corneas moist and protect against injury and excessive light, regulating the amount of light reaching the retina. When they are closed, stimulation of visual cortex ceases. The lids are essential for distribution and drainage of the tears [1,2].

Eyelids are not only protective curtains in front of eyes but also give shape and beauty to the face. Beauty of eyes lies in the perfectly contoured and aligned lids. The eyelid structures have the important role to protect the globe from various external injuries, besides help significantly to the sights appearance [3,4].

Ocular trauma is a major cause of worldwide visual impairment. Annually, there are in excess of 2.4 million case of ocular trauma, with more than 40,000 individuals sustaining significant visual impairment on a permanent basis. Canalicular lacerations are encountered in 16-26% of all lid tears. The lifetime prevalence of sustaining any type of ocular trauma approaches 19.8% [4].

Injuries that involve the eyelids and periorbital area are common after blunt or penetrating facial trauma. This type of injuries can differ from uncomplicated skin abrasions to additional compound cases that have wide tissue loss and underlying fracture of the facial skeleton [5].

Eyelid trauma frequently emerges trivial except can have deep effects on injury linked morbidity. Revival of full eyelid function and preservation of the lacrimal apparatus are significant deliberations when resembling lid trauma. Canalicular lacerations are encountered in about 16-26% of all lid tears which results from direct or indirect injury to the canalicular system [6].

Amid all sites of injury, eyelid laceration appears to be deserted in terms of adequate epidemiological investigations. With a thorough understanding of the causes of eye lid lacerations, it is possible to develop a better preventive strategy and hence improve the public health policy in this respect [7]. Hence the aim of the study was to understand the type of eyelid injury and study management of the injuries.

## 2. MATERIALS AND METHODS

The present study was done in the department of the ophthalmology at the tertiary care institute of Gujarat. It was done in the patients attending the outpatient department of ophthalmology and also the emergency department of the hospital. The ethical review committee of the institute was informed about the study and the ethical clearance was obtained prior to the start of the study. A total of 100 cases that were reported to the hospital department opd with the chief complain of blunt as well as penetrating eye lid injuries were included in the study by random sampling method.

The included patients were explained in detail about type and nature of injury, importance of timely treatment of the injury for better prognosis. The benefit and the risk factor of the general anaesthesia and the surgery were explained in detail to the included patients. The information related to the visual rehabilitation, possibility of requirement of secondary treatment and also the visual prognosis were also explained to the relatives of the patients. The signed informed consent was obtained from the patients before the start of the treatment.

Exclusion criteria were: Penetrating injuries of the globe not involving eyelids, Perforating injuries of the orbit not involving lids, Globe rupture with intact eyelids and Retained intraocular foreign body.

Careful and detailed examination of both eyes was conducted along with the general physical examination for any other associated injury over any other part of the body; pulse rate and B.P were recorded.

Evaluation by a physician was done for all cases to note the presence of any systemic diseases and for opinion regarding fitness for surgery. In cases where GA was used, Anaesthetist examined the patient and opined regarding status of the patient towards GA.

All the included patients were treated with emergency protocol. The patients were administered with broad spectrum antibiotics. Based on the type of injury and the financial status of the patients the type of the surgery was planned. The adult patients were operated with local anaesthesia and the paediatric patients were operated under general anaesthesia. Firstly

the wound was washed with normal saline for five minutes and then with 5% povidone iodine solution for 5 minutes. Type A injuries were treated by suturing the wound in layers with 6-0 Vicryl under Local Anaesthesia (LA). Type B injuries: 6-0 vicryl was placed in the plane of the meibomian glands at the lid margin, approximately 2mm from the wound edges and 2mm deep. Type C injuries: these injuries were sutured in layers with 6-0 vicryl. Full thickness laceration with tissue loss cases were also treated by suturing with 6-0 vicryl. Canalicular tear patients who were affordable for the stent were treated with Minimionoka stent and others were treated with 24G Venflon stent. In cases of lid injuries with globe rupture, Evisceration was done following lid suturing.

### 3. RESULTS

The present study included total of 100 patients of all types of injury of eyelid, who attended outpatient department, attached to the medical college and hospital. The cases history of trauma involving eyelids, canthal injury, canalicular tear and globe injury with involvement of eyelid were included in the study. The retained intra-ocular foreign body have been excluded from the study. Penetrating injuries of the globe, perforating injury of the orbit as well as globe rupture with intact eyelids were also excluded from this study.

The results of the present study showed that 3rd and 4th decade were more prone to the eyelid injuries. In the present study the total of 60 cases were accounted. The reason for this can be people in the involved age group are more active and more occupationally vulnerable for the eyelid injury. In the present study males outnumber the females in the occurrence of eyelid injuries. This is because of the preponderance of males in outdoor works including occupational work. This study shows that the incidence of eyelid injuries in males 88 cases in comparison to females 12 cases.

None of the cases showed bilateral eye involvement. Majority of the 58 cases showed involvement of left eye whereas the involvement of right eye was seen in 42 cases. The owing to the cause of injury, the major reason was found to be road side accident followed by occupational and domestic causes. The least number of cases were because of sports and other activities.

In the present study, Minimionoka stent was used for 8 cases of canalicular lacerations and 8 cases of canalicular tear that were not affordable were repaired with 24G Venflon tube. Four cases underwent Evisceration as they had associated bad open globe injury.

**Table 1. Eye affected**

Sr. No.	Eye affected	No. of cases
1.	Left eye	58
2.	Right eye	42
3.	Bilateral eye	0

**Table 2. Etiological pattern**

Sr. No.	Activity for injury	No. of cases
1.	Road side accident	54
2.	Domestic reason	16
3.	Occupational	16
4.	Sports and other activities	14

### 4. DISCUSSION

In the present study, maximum cases were in 3<sup>rd</sup> decade of life followed by 4<sup>th</sup> decade. The median age of the patients included in the study was 31.64 years. The reason for the majority of the cases in the age groups is that people are most active, occupationally occupied and vulnerable to trauma. In our study Males outnumbered females with 88% incidence, as males are commonly involved in outdoor activities. Study done by Ali Tabatabaei et al. [7] showed that 24 (24.7%) were female and 73(75.3%) were male among 98 patients. Study done by Milind N.Naik et al. [8] found that 83.3% patients were male.

In the present study the left eye was more commonly involved in 56 cases as compared to 44 cases with right eye involvement. Left eye upper eyelid was the most commonly involved with 24% cases followed by right eye combined injuries. Sendul SY et al. [9] reported that the lower canaliculus was involved in 33 patients (78.57%) followed by upper in 7 patients(16.6%) and 2 patients had bicanalicular involvement (4.76%).

**Table 3. Type of treatment given to patients**

<b>Sr. No.</b>	<b>Treatment</b>	<b>No. of cases</b>
1.	Lid repair with 6-0 Vicryl	76
2.	Combined with Canalicular tear repair with Minimionoka stent	16
3.	Combined with Evisceration	8
4.	Lid Repair with conservative management of ocular trauma	4
5.	Canalicuar tear repair with 24G Venflon stent	8
6.	Combined with globe repair	4

In our study road side accident was the most common etiology for the injury which accounted for 54 cases, followed by 16% each due to occupational and domestic causes. Sports and other causes accounted for 14 cases). As there is global increase in incidence of Road Traffic Accidents (RTA), it is the most common cause for eyelid injuries. The most common age group in the study is actively involved in occupation, which accounts for 2nd most common cause. Study done by Ali Tabatabaei et al. [7] showed eyelid injuries following Accidents (RTA) in 57 Cases.

Results achieved following surgical repair vary among the previous study and these depends on several factors such as the type of injury, duration of injury, amount of tissue loss. In the present study 76% patients required suturing in layers, we used 6-0 vicryl for suturing under LA. Among 20 cases of Canalicular tear, 8 cases underwent Minimionoka stenting, which was placed for 3 months. In 8 cases with canalicular tear who were not affordable for Minimionoka stent we used 24G Venflon stent (paediatric i v cannula), in 4 patients who were not willing for stenting, suturing was done with 6- 0 vicryl. Evisceration was done for both the globe rupture cases, so that an appropriate orbital implant can be placed at later date, which accounted for 4% cases. For corneal tear case suturing of corneal tear with 10-0 nylon was done along with lid suturing. A case of closed globe injury was treated with conservative therapy with antibiotic and cycloplegic eye drops along with lid repair.

## 5. CONCLUSION

As the injuries occur more commonly due to road traffic accidents showing 54 cases in our study, preventive measures are to be taken while riding such as controlling speed. Domestic injuries are more common in females. This study showed that Minimionoka stent is an effective and easy tool in reconstructing canalicular tear, with successful anatomical and functional integrity.

## CONSENT

The signed informed consent was obtained from the patients before the start of the treatment.

## ETHICAL APPROVAL

The ethical review committee of the institute was informed about the study and the ethical clearance was obtained prior to the start of the study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<http://www.sdiarticle4.com/review-history/69570>