

# A Prospective Study on Evaluation and Management of Periocular Injuries

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**Abstract:** ***Purpose:** To study the causes, epidemiological aspects clinical presentation and management of periocular injuries in a tertiary hospital. **Materials and methods:** A prospective study involving 60 subjects with periocular trauma from November 2019 to May 2021 in KIMS. **Results:** In this study male to female ratio was found to be 4:1. Maximum of the subjects belong the age group between 21-30 with mean age 29.31 years. RTA was the most common mode of injury among the study group. Among RTA 2-wheeler was highest with 72.73%. Eighty percent of the 33 subjects who were injured in an RTA were under the influence of alcohol. In RTA, only 20% of the subjects wore protective equipment. RE was 1.07 times more likely to be involved. The most common location was the upper lid (51.7 percent). Maximum (38.3 percent) of patients had partial thickness injury with no tissue loss. 86.7 percent of cases had periorbital edema. **Conclusion:** As seen in this study, RTA is the most common cause of injury, demanding the development of various preventive and protective strategies.*

**Keywords:** RTA; ocular injury; eyelid laceration; lidedema; 5FU

## 1. Introduction

Eyelids are protective curtains of the eyeball which play important role in protecting the globe from trauma, brightness, in maintaining integrity of the tear films and in moving tears towards the lacrimal drainage system<sup>11</sup>.

The eyeball is well protected by the bony orbit as well as the nose, lids, brows, eyelashes, and a good cushion of fat behind the eyeball.

Periocular trauma involving the eyelids and adjacent structures has recently been found to be on the rise as a result of the fast pace of life and machinery. The rise in the incidence of eyelid injuries can be attributed to the advancement of industrialization, faster modes of transportation, and an increase in intentional assaults on people. Assaults, work-related injuries, sports, and recreational activities are the most common causes of eye injuries<sup>11</sup>.

Each case of eyelid and adnexal injuries are different and unique and thorough knowledge of the structural anatomy is needed to achieve good outcomes. Overlooked injured structures in periorbital trauma could lead to aesthetic and functional deformity<sup>7</sup>.

The goal of orbital trauma treatment is to restore the original bony and soft tissue contours. This will improve function while also restoring appearance. Eyelid injuries are frequently linked to vision-threatening ocular injuries. Eyelid deformities can be avoided with proper examination and management of eyelid injuries.

It is critical for public health to identify risk factors and develop a strategy for preventing and managing such injuries. As a result, the current study aims to provide information on the pattern of ocular trauma, the most common risk factors, the

magnitude of ocular injuries, and to assess the final visual outcome following road traffic accidents.

## 2. Materials and Methods

### Inclusion criteria:

- All age group (since birth) and both gender
- Unilateral and bilateral
- Presenting for the first time
- All periocular injuries (eyebrows, eyelid and adnexa, canaliculi, lid margins, medial and lateral canthus and lacrimal apparatus)

### Exclusion criteria:

- Orbital fracture alone
- Globe injuries alone
- Congenital deformity
- Those who are not willing to give consent

This is prospective study of 60 patients who attended ophthalmology outpatient department in Kempegowda institute of medical sciences, Bangalore. Patients with periocular injury due to different causes were enrolled in this study which was conducted between November 2019 to May 2021. Visual acuity, anterior segment and pupils were examined. Posterior segment was evaluated using indirect ophthalmoscopy. CT of orbits was done in patients with movement restriction. External examination was performed to note the site, type, extent and depth of injury. Superficial lacerations and partial thickness injuries without tissue loss were repaired by primary closure. Subjects with eyelid margin involvement, canalicular involvement and full thickness injuries were admitted for repair next day with well-equipped operation theatre. All subjects were followed up to look for any complications. Patients with hypertrophic scar were given 5FU+steroid injection intralesional on weekly basis. All data

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was entered in excel and statistical analysis was done using SPSS (Statistical Package for Social Sciences) version 20.

### 3. Results

Age and sex distribution of the patients with periocular injuries are in table 1 and 2. RTA involving two wheeler was found to be most common cause of injury. In our study right eye was 1.07 times more involved than left. Periorbital edema was seen in 86.7 percent of the subjects, which is the most common of all the associated ocular findings. Partial thickness laceration without tissue loss was seen among 38.3% of subjects. Primary opposition of skin and orbicularis in layers was the most common type of suturing in our study.

**Table 1:** Sex Distribution among the study group

Sex	Frequency	Percent
Female	12	20.0
Male	48	80.0
Total	60	100.0

**Table 2:** Age Distribution among study group

Age group	Frequency	Percent
<=10	4	6.7
10-20	9	15
21-30	23	38.3
31-40	12	20
41-50	7	11.7
51-60	4	6.7
>60	1	1.7
Total	60	100

**Table 3:** Mode of Injury Distribution among subjects

Mode of injury	Frequency	Percent
RTA	33	55
Assault	9	15
Dog bite	6	10
House hold injury	9	15
Others	3	5
Total	60	100

**Table 4:** Distribution of type of Vehicle used among RTA

Vehicle	Frequency	Percent
2W	24	72.73
4W	8	24.24
OTH	1	3.03
Total	33	100

**Table 5:** Laterality of the eye

Eye	Frequency	Percent
BE	4	6.7
LE	27	45.0
RE	29	48.3
Total	60	100.0

**Table 6:** Distribution of associated ocular findings among subjects

OCULAR FINDINGS	Frequency	Percent
Periorbital edema	52	86.7
Periorbital ecchymosis	41	68.3
PTOSIS	27	45.0
Extraocular movement restriction	6	10.0
Sub conjunctival hemorrhage	29	48.3
Chemosis	11	18.3
Orbital margin tenderness	13	21.7

**Table 7:** Distribution of Depth of injury

Depth of laceration	Frequency	Percent
Superficial	10	16.7
Partial thickness without tissue loss	23	38.3
Partial thickness with tissue loss	13	21.7
Full thickness without tissue loss	11	18.3
Full thickness with tissue loss	2	3.3
Total	60	100

### 4. Discussion

Ocular trauma has been a problem that has gone unnoticed. Any structure of the eye can be affected by blunt trauma. Blunt ocular trauma can damage the eye structurally as well as functionally. Every year, approximately 2.5 million new eye injuries occur in the United States, and the figure in India is even higher. Ocular trauma is still a preventable public health issue with significant socioeconomic consequences around the world. Our study, which includes 60 tertiary care patients, aims to gain a better understanding of the pattern of injuries and treatment modalities.

**Gender Distribution:** In our study, 80% were males and 20% were females; male to female ratio was 4:1. In India men are more involved in outdoor activities hence are more prone to injuries. Females are confined to home and do less risky jobs than males. Men predominance was also seen in study conducted Gotekar et al where 83.33% of male and 16.67% of female which is similar to our study.

	Male	Female
Our study	80%	20%
Gotekar et al	83.33%	16.67%
Shetgar et al	77.7%	22.2%
Das et al	79.6%	20.3%

**Age distribution:** In our study, periocular injuries were most commonly found in age group of 21-30 years (38.3%). In Dubey et al study most of the patients belong to the age group 21-30 (36.80%)<sup>19</sup> very close to our study.

	Age (years)
Our study	29.32 years
Guly et al	31 years
Yiltok et al	24.8+13.4 years
Bharthi et al	31.2 years

**Mode of Injury:** In our study, 55% of the cause of injury was found to be RTA followed by 15% due to assault. According to Study of eyelid injuries -Nine year review of management by ST Yiltok, PD et al (2004), road traffic accident was the most

common cause in 27.3% and assault was the caused in 21.2%.<sup>25</sup>

**Type of Vehicle:** Most of the RTA cases causing ocular trauma in this study were two wheeler riders (72.73%) who are more prone to ocular injuries when compared to persons travelling in auto or four wheeler (24.24%) and pedestrians. Because of the low cost and easy availability of loans/EMI, two-wheelers are popular in our country. Because of the increased exposure

**Protective Equipment:** In the current study, the majority of RTA cases resulting in ocular trauma (72.73 percent) were caused by two wheelers, which contradicts the findings of Panagiotidis et al, who discovered that (86.56 percent) of ocular trauma occurred following car accidents while (11.95 percent) occurred following two wheeler accidents.<sup>32</sup>, area of contact, and direct impact, two-wheelers caused more ocular trauma.

**Laterality**

	Our study	Krishna et al	Dubey et al	Bharthi et al
RE	48.3%	54.71%	52.77%	62.5%
LE	45%	45.29%	37.50%	30.9%

**ASSOCIATED OCULAR INJURY:** In our study, Periorbital edema was the most common finding seen in 86.7% followed by ecchymosis seen in 68.3% and subconjunctival hemorrhage in 48.3%. In Shetgar et al study eyelid edema was seen in 68.25%, eyelid bruising was seen in 55.55% and subconjunctival hemorrhage seen in 61.9%<sup>21</sup>. In study done by

Dubey et al Subconjunctival hemorrhage was maximum (87.5%) followed by eyelid edema and ecchymosis(75%).<sup>19</sup>

**FRACTURES:** In our study, 23.3 percent of the patients had associated orbital fractures as seen on CT. Floor fractures were found to be the most common in 9 subjects (64.29 percent). Shetgar et al<sup>21</sup> discovered orbital fractures in 17.46 percent of their patients in their study. In bharathi et al<sup>20</sup>, orbital fracture was present in 24.13 percent of the cases, which is similar to ours

**5. Conclusion**

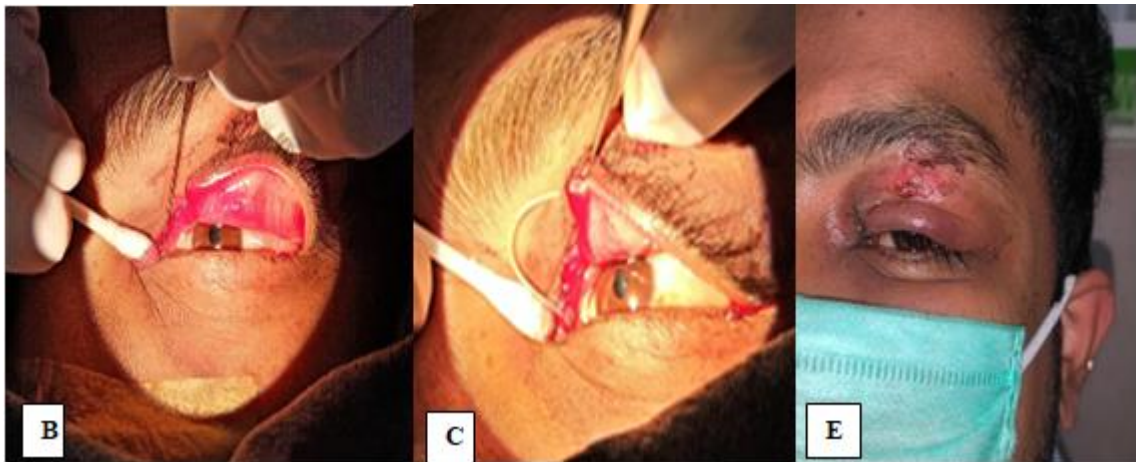
Eyelid and adnexal injuries are on the rise as a result of an increase in traffic accidents. Because the periocular region has a highly complex structure, all ophthalmologists must be well-versed in its anatomy. The management of ocular trauma is unique in that we consider the success of two different aspects: full function and aesthetic appeal. To achieve the best results, both aspects must be given equal weight. Because of the complex anatomy of the periocular region, managing periocular injury is difficult; therefore, a multidisciplinary approach must be developed for better functional and cosmetic outcomes. As a result, raising public awareness about the dangers of rash driving and drunk driving is critical. Strict traffic regulations must be established. In hazardous environments, the general public should be encouraged to use eye protection equipment.





**Figure 1:** A: Irregular defect of eyebrow with tissue loss B: Undermining done at 2 borders C:Two depressions sutured around the central D:Central depression was noted immediate post E:4weeks after surgery F:After 4 weekly dose of peri-lesion 5FU+steroid





**Figure 2:** A: Patient with upper canalicular injury following RTA b:Bowmans probe pointing fullthickness laceration involving the eyelid margin and upper canaliculus C:Monocanalicular silicon stent in place D:Post operative day 7 with stent InSite E:Postop day 7 margin repaired and stent in place

## References

- [1] Functional and cosmetic outcome following eyelid and adnexal injuries- with 69th AIOC proceedings,2011;1142-1145 –by Dr Shivacharan Lal Chandra Vanshi,Dr Mk Rathore,Dr Eva Tirkey,Dr.P.C.Diuvedi,Dr.S.Agarwal
- [2] Nirmala Subramanian; Reconstructions of eyelid defects; Indian J Plast Surg. 2011 Jan-Apr; 44(1): 5–13.
- [3] Dr. Arnab Biswas ,An Improved Indigenous Monocanalicular Intubation System for Canalicular Laceration 70th AIOC Proceedings, Cochin 2012
- [4] Das S, Nagesh N, Hegde R, Pattern causes and management of eyelid and adnexal injuries in a tertiary hospital. Int J Ocul Oncol Oculoplasty 2019;5(3):112- 7
- [5] Dr. D.MuraliKrishna,Dr. C.S.Sandhya,Dr .S. Abhilash;Clinical Study Of Eyelid Injuries And Their Management; JOSR-JDMS;January 2020,Vol 19:pp 25-30
- [6] Naing LTint,PilipAlexander,Anne E Cook,BrianLeatherbarrow,Eyelid avulsion repair with bi-canalicular silicone stentin without medial canthal tendon reconstruction,JOphthalmol; 2011;95:1389-1392
- [7] Eman Yahya Sadek, Associate Professor1 Amir Elbarbary, Professor1 Ikram I. Safe, Professor, Periorbital Trauma: A New Classification, Craniomaxillofacial Trauma Reconstruction, December 15, 2018:
- [8] Jonathan M Sukes,FMarkoeDugan;Evaluation and management of Eyelid Trauma;Facial Plastic surgery;1994, Vol 10,no 2:157-169
- [9] Aparajita Chaudhary,SP Singh MimansaAgasti ,Eye lid trauma and their management,International Journal of Ocular Oncology and Oculoplasty,October-December,2016;2(4):240-243
- [10] Ho Jun Lee,Yong Ju Jang ,Recent Understandings of Biology,Prophylaxis and Treatment Strategies for Hypertrophic Scars,International Journal of Molecular sciences,2018,19,711
- [11] Devi Prasad Mohapatra, FrijjiMeethaleThiruvoth, Ravi Kumar Chittoria, S. Dinesh Kumar, Proposal of a new classification scheme for periocular injuries, Indian Journal of Plastic Surgery, January-April 2017 Volume 50 Issue 1:21-28
- [12] Dr. Jitendra Kumar,Dr.Vijay Pratap Singh,Dr. PreetiChaubey.Ocular Injuries in Road Traffic Accidents (Rtas); IOSR-JDMS;Nov 2017; Volume 16, Issue 11 Ver. VIII: PP 55-60
- [13] 13. Shilpi Dubey,Sunil Kumar, Sudhanshu Mishra ;Pattern of Ocular Trauma in Road Traffic Accidents in a Tertiary Care Hospital of Eastern India;East African Scholars of Medical Sciences;Nov-2019;Vol-2;613-615
- [14] Rama Bharathi1, B. Udaya Kumar2, V. Rajeswara Rao, EVALUATION OF OCULAR INJURIES IN POLYTRAUMA, J. Evolution Med. Dent. Sci. 16,2017,Vol 6Issue 22 :1812-1816
- [15] Anupama C Shetgar,Darshini L Mallkarjunaswamy ;Ocular injuries following road traffic accidents: A hospital based case series study;Indian Journal of Clinical and Experimental Ophthalmology 2020;6(2):266-269.
- [16] Vipin V Nair,JerryR.John,Ramesh Kumar Sharma;A prospective randomized comparative study of facial scar modulation using topical silicone gel versus coconut oil;Nigerian Journal of Plastic surgery; 2020;Vol 16 Issue 2:51-60
- [17] Neerja Puri and Ashutosh Talwar; The Efficacy of Silicone Gel for the Treatment of Hypertrophic Scars and Keloids; J CutanAesthet Surg. 2009 Jul-Dec; 2(2): 104–106.
- [18] Ibrahim A,Chalhoub R.S,5FU FOR PROBLEMATIC SCARRING:A REVIEW OF THE LITERATURE;Annals of burns and Fire Disasters;June 2018;vol XXI-n2:133-137
- [19] ST Yiltok,PDWade,CDMoyet,Sk Allis, KS Orkar;Study of Eyelid Injuries-A Nine Year Review Of Management Nigerian Journal Of Ophthalmology,Volume 3,NO 2(2004).

- [20] Bhavana Namala, K.Srinivasa Rao , V.S.Gurunadh; Road Accidents and Ocular Injuries, IP Journal of Surgery and Allied Sciences, January-March 2019;1(1): 13-16
- [21] Shreya M Shah, Mehul A Shah, Romi Singh, Chetan Rathod, Ranuq Khanna, A prospective cohort study on the epidemiology of ocular trauma associated with closed-globe injuries in pediatric age group, Indian Journal of Ophthalmology, Indian journal of ophthalmology 2020, volume 68 issue 3, pp 500-503
- [22] Rajesh Gotekar, A Clinical Study of Ocular and Periocular Injuries in Blunt Ocular Trauma in Prakash Institute of Medical Sciences and Research, Urun - Islampur (Maharashtra) International Journal of Science and Research (IJSR) June 2017 Volume 6 Issue 6 ,2248-2251
- [23] C M Guly, H R Guly, O Bouamra, R H Gray, F E Lecky, Ocular injuries in patients with major trauma Emerg Med J 2006;23:915-917
- [24] Caroline J MacEwen, Paul S Baines, Parul Desai, Eye injuries in children: the current picture Br J Ophthalmol 1999;83:933-936
- [25] Shobha G Pai, Sumana J Kamath, Susan D'Souza, LaksheyDudeja A Clinical Study of Blunt Ocular Trauma in a Tertiary Care Centre, Online Journal of Health and Allied Sciences, ; Apr-Jun 2013, Volume 12, Issue 2;1-4
- [26] D.N. Panagiotidis, P.G. Theodossiadis, C.B. Petsias, Ocular Injuries Secondary to Motor Vehicle Accidents, European journal of ophthalmology, Mar-Apr 2004;14(2):144-33. Freda Sii, Robert J Barry<sup>1</sup>, Joseph Abbott, Richard J Blanch, Caroline J MacEwen, Peter Shah, The UK Paediatric Ocular Trauma Study 2 (POTS2): demographics and mechanisms of injuries, Clinical Ophthalmology 2018;12 105-111

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