

Clinical Study of Eyelid and Periorbital injuries and their Management

Dr. Jitendra Kumar¹, Dr. Shailendra Batham²

1. Associate Professor & Head, Dept. of ophthalmology, MLB Medical College Jhansi, India.
 2. Junior Resident, Dept. of ophthalmology, MLB Medical College Jhansi, India.
- Corresponding author: Dr. Jitendra Kumar
-

Abstract

Aim: To explain the aetiology and management of eyelid and Periorbital injuries and their management in a tertiary care hospital.

Methods: A prospective interventional study was conducted at the Department of Ophthalmology at Maharani Laxmi Bai Medical College, Jhansi affiliated to Bundelkhand university, Jhansi. A Sample of 110 patients with eyelid and Periorbital injuries fulfilling the inclusion criteria were examined and treated and results analyzed.

Results: Out of 110 cases, majority of the patients were males (69.09%) in age group of 31-40 years age group comprising of 40.9% case. Commonest mode of injuries was Road traffic Accident (59.09%), commonest kind of injury was partial thickness lid laceration (55.45%), and lid notching was the foremost common complication (6.36%).

Discussion: In our study males outnumbered females with RTA being the most common mode of injury and most of the eyelid injuries being partial thickness lacerations.

Conclusion: Because the injury occur more commonly due to road traffic accidents showing 65 (59.09%) of cases in our study, preventive measures are to be taken.

Keywords: *Eyelid injury and Periorbital injuries, road traffic accident, partial thickness laceration*

Date of Submission: 15-04-2020

Date of Acceptance: 30-04-2020

I. Introduction

Our eyes act as a window to foray into the outer world, and therefore aesthetics of vision is closely bound with the structural organisation of the eyelid and Periorbital structures.

Eye lid injuries are on the increase primarily due to increasing incidence of road traffic accidents, industrial mishaps and intentional assaults on human body [2] Overlooked injured structures in Periorbital trauma may lead to aesthetic and functional deficits. As trauma may affect superficial, middle, and deep components, meticulous survey guided by a structured Periorbital trauma classification is required for adequate management [1] Anatomical categorization of Periorbital injuries included periocular, frontal, temporal, and malar regions. Injuries/deficits were categorized into simple, composite, complex, and isolated bony injuries in keeping with depth and involved tissues.[1] Restoration of normal anatomic relationships of the eyelids and periocular structures is essential for optimum functional and aesthetic outcome after trauma.[3] The management of eyelid trauma presents some frustrating challenges to the ophthalmologist. Because each case is exclusive in its own respect, adaptation of general-principles is important for optimal ophthalmic treatment.[4] It is important to appreciate that some complications may arise in multiple time periods postoperatively. Early recognition and appropriate treatment is essential; but the most appropriate therapeutic option often differs based upon the timing from surgery.[5]

II. Materials and Methods

The present study was a prospective interventional study conducted within the Department of Ophthalmology at M.L.B. Medical College, Jhansi affiliated to Bundelkhand University, Jhansi. 110 patients with eyelid injuries attending Out-Patient Department of Ophthalmology as well as Emergency Department from June 2018 to December 2018 in M.L.B. Medical College were selected for the study.

The study was conducted to study the types of eyelid and Periorbital injuries, mode of injuries, role of RTA, classification and the management of these injuries.

The subjects were selected consequently as and when they present and the data was categorized into aetiology, age, sex, modus operandi of injury, time elapsed, type of injury, surroundings structures involved, short term and long term complications surgical procedures used for the treatment and analyzed..

Study Design : prospective interventional study

Study Location : This was a tertiary care teaching hospital based study done in department of Ophthalmology at M.L.B. Medical College, Jhansi affiliated to Bundelkhand University, Jhansi, Uttar Pradesh.

Study Duration: June 2018 to December 2018

Sample Size : 110 patients

Subjects and selection method: Study population was drawn from the patients attending the outpatient and emergency medical unit at Maharani Laxmi Bai Medical College, Jhansi affiliated to Bundelkhand university, Jhansi with lid and Periorbital trauma from various causes.

Exclusion Criteria :

All patients with Eye lid and Periorbital injuries, who attended Out Patient Department and Emergency Department of M.L.B. Medical College, Jhansi.

- All age groups from < 10 years to >50 years old
- All sex groups
- Trauma limited to lid and adnexa

Exclusion Criteria :

- All patients not willing to participate within the study.
- All patients with severe intracranial contusion.
- Patients with head injury with comatose condition i.e. GCS \geq 8
- Intraocular penetrative injuries and/or globe rupture.
- Previously existing ocular pathology.

Procedure Methodology

After Proper and informed consent, and after obtaining proper history and thorough examination, all patients were immunized with tetanus toxoid 0.5 ml.

Components of examination include:

- Complete eye and physical examination
- Presence and absence of foreign bodies
- Tissue loss: eyelash and eyebrow
- Lid margin / canalicular laceration
- Prolapsed fat / septal involvement
- Injury to surrounding adnexa
- Levator function
- Canthal angle integrity
- Lagophthalmos (if any)

Patients with minor injuries were treated on outpatient basis with due procedure. All patients with major injuries like injury to canthal tendon, canalicular laceration, with or without tissue loss, and major ocular injuries were institutionalised for proper management, taking appropriate steps to forestall infections, including proper debridement, meticulous irrigation and cleaning with normal saline and prophylactic antibiotics.

Involving surgical management, partial eyelid injury was treated by simple skin suturing and margin sutured in layers using 5-0 mersilk suture. In full thickness lid laceration involving no tissue loss or with minimal tissue loss layers are sutured in 3 layers by direct closure and lid margin approximated. In full thickness lid laceration involving tissue loss greater than 30% lid is mobilized by lateral canthotomy and lateral cantholysis and lid margin approximated and sutured in 3 layers using 5-0 or 6-0 vicryl sutures and 5-0 mersilk suture for closing skin. According to Christine C. Nelson, MD, if the wound is unduly tight, a lateral canthotomy with cantholysis may be needed; semicircular flaps are usually required only if a large portion of the lid is missing. It is important to choose the approach carefully because the horizontal canthotomy incision precludes the semicircular flap incision.[6]

Immediate surgical intervention is not required in cases of canalicular trauma.[7] A retrospective review of patients undergoing mono-canalicular repair at Moor fields Eye Hospital demonstrated that delayed surgery (up to ~72 hours) did not negatively affect outcomes.[8] Another study demonstrated successful repair after as long as 5 days following injury.[9] .The Mini Monoka mono-canalicular stent has become a popular method to repair simple mono-canalicular lacerations. Bi-canalicular lacerations may be repaired using two Mini Monoka stents, or a bi-canalicular stent. The Crawford and Ritleng are two of the most popular bi-canalicular stents.[10][11][12].

In canalicular injury, stent is placed if needed for recanalization and canalicular lacrimal suture placed. Systemic NSAIDS were used to reduce pain and swelling involved with the injury, along with topical antibiotics, lubricants, and topical NSAIDS as drops and ointment as needed.

Post operative follow up:

Patients were examined everyday initially for first few days, with post-operative follow up examinations were done at 1 week, 2 weeks and reviewed at the end of 3 months, including removal of canalicular stents at the end of 3 months.

III. Result

The present study consisted of 110 cases of all type of eyelid and and Periorbital injuries who attended out-patient and emergency department of Maharani Laxmi Bai Medical College, Jhansi affiliated to Bundelkhand university, Jhansi from the day of approval of ethical committee.

AGE INCIDENCE:

The present study showed that the incidence of eyelid injuries is more common among 31-40 years of age which accounts for 40.9 % of total cases in the study, with a mean age of 38.75± 13.91 years.

Table 1. Age Incidence

Age in years	No. Of cases	Percentage
< 10 years	5	4.54 %
10-18 years	5	4.54%
19-30 years	31	28.18%
31-40 years	45	40.9 %
41- 49 years	10	9.09%
> 50 years	14	12.72%
Total	110	100%

SEX INCIDENCE:

This study shows that incidence of eyelid and Periorbital injuries in males 69.92% (76 cases) in comparison to females 30.9 % (24 cases).

Table 2. Sex Distribution

Sex	No. Of cases	Percentage
Male	76	69.09%
Female	34	30.90%

Eye Affected:

This study shows that in 50.9 % of cases right eye is involved in comparison to 47.27 % cases with involvement of left eye, with a margin 1.81 % of cases involving both eyes.

Table 3. Eye Affected

Eye affected	No. Of cases	Percentage
Right eye	56	50.9 %
Left eye	52	47.27%
Both eyes	2	1.81 %
Total	110	100 %

Mechanism of Injury:

This study shows that the most common mode of injury was road traffic accidents accounting for 59.09 % cases , followed by assault (13.63%) with a closely running animal attacks cases (12.72 % cases)being the third most common cause of injury.

Table 4. Mode of Injury/Cause of Injury

Mode	No. of cases	Percentage
Road traffic accidents	65	59.09 %
Spontaneous fall	6	5.45 %
Animal Attacks	14	12.72%
Assault	15	13.63%
Fall from Height	10	9.09 %
Total	110	100 %

Time Elapsed:

This study shows that the majority of the patients came to the hospital in first 24 hours of Injury accounting for 73.63% of cases, 15.45 % cases reported between 24-48 hours followed by rest after 48 hours i.e. 18.18%.

Table 5. Time since Injury

Time Since Injury	No. of Cases	Percentage
<24 hrs	83	73.63%
24-48 hrs	17	15.45%
48 hrs	20	18.18%
Total	110	100%

Type of Laceration:

Table 6. Type of Laceration

Type of Laceration	No.	Percentage
Partial thickness	61	55.45%
Full thickness without tissue loss	14	12.72%
Full thickness with tissue loss	12	10.9 %
Canalicular tear		
Monocanalicular	11	10 %
Bicanalicular	0	
Canthal injuries	12	10.9 %
Total	110	100 %

Other Structures Involved:

In this study, it shows that most of the time injured structure was Conjunctiva accounting for 17 cases (15.45%) with a closely following anterior chamber injuries with Hyphaema in 14 cases (4.54%).

Table 7. Other Structures Involved

Structure	Type of Injury	No. Of Cases	Percentage
Conjunctiva	Sub-conjunctival haemorrhage	17	15.45%
	Conjunctival Laceration	6	5.45%
Cornea	Corneal Abrasion	4	3.63%
Sclera	Laceration	5	4.54%
Anterior Chamber	Hyphaema	14	12.72%
Lens	Traumatic lenticular Opacity	6	5.45%
Posterior Chamber	Retinal Detachment	0	0
Orbit	Fractured inferior orbit	3	2.72%

Treatment of injuries :

This study shows that major part of patients presenting with trauma were and could be managed by simple skin suturing using 5-0 mersilk sutures accounting for 41 (37.27%) cases, and full thickness repair in 3 layers using 5-0 or 6-0 vicryl for deeper layers and 5-0 silk sutures for skin suturing, in 26 (32.72%) cases.

Table 8. Treatment of Eyelid Injuries

Type of Injury	No. Of cases	Percentage
Skin suturing	41	37.27%
Skin and Subcutaneous Suturing	20	18.18%
Full thickness Repair including Lid margin	36	32.72%
Canalicular Suturing	11	10%

Complications :

Complications of this study have been categorised into early and late complications

Table 9. Early Complications

Type	No. of cases	Percentage
Hematoma	8	7.27%
Chemosis/watering	23	20.9%
Diplopia	1	0.9%
Deep orbital haemorrhage	3	2.72%

Table 10. Late Complications

Type of injury	No. Of cases	Percentage
Lid margin notching	7	6.36%
Hypertrophic Scars	2	1.81%
Infections	1	0.9%
Tearing	3	2.72%

Traumatic Ptosis	3	2.72%
Wound Granulomata	3	2.72%
Lagophthalmos	1	0.9%

IV. Discussion

Out of 110 cases reported in the present study in Maharani Laxmi Bai Medical College, Jhansi affiliated to Bundelkhand university, Jhansi, incidence of eyelid injuries was commonest in 31-40 age group, with a mean age of 38.75 ± 13.91 years with a male : female ratio of 2.23. In an alternate study done by Dr. Rajendra P Maurya et al patients were aged between 2 and 70 years (mean: 26.48 ± 15.88 , median: 23 years). The most vulnerable age group was 6–15 years (24.38%) followed by 16–25 years (23.88%). [13]. According to Xi Zhang et al, a study included a total of 507 eyes from 478 patients. Mean age was 43.6 ± 18.3 years (5–95 years). The largest age group was 45–59 years old, followed by 30–44 years old [14]. Four hundred (83.7%) patients were male, with a male-to-female ratio of 5.1: 1 [14]. This can be attributed to males being more socially and occupationally active and therefore more vulnerable to be prone to injuries of any kind.

This study also shows most common mode of injury was road traffic accidents accounting for 65 cases (59.09%), followed by assault with 15 cases (13.63%), owing inherent overall increase in road traffic accidents, and insistence of the general population to avoidance of use of safety equipments such as helmet, safety goggles etc, and an predisposition to engage in disputable situations and altercations. Animal attacks and fall from height were responsible for 12.72% and 9.09% respectively, with a male preponderance of 69.09%.

In our study right eye was involved in 50.9% of cases as compared to 47.27% of left eye, and bilateral involvement in 1.81% cases, showing preponderance to right eye injuries more common than left eye injuries. The right eye is more common than left eye as studied by Govind Singh et al [15].

This study showed that maximum number of patient came to the hospital in first few hours i.e. first 24 hours accounting for 81 cases (73.63%), 17 cases (15.45%) reporting after 24-48 hours and remaining 20 cases (18.18%) came after 2 days or after 48 hours post injury. This could be due to the reason that, adjoining areas have deficient logistics support and lack of awareness.

In our study, most common type of injury incurred was partial thickness laceration accounting for 61 cases (55.45%) followed by full thickness laceration, being a total of 26 (23.62%) cases, accounting for without tissue loss and with tissue loss being 14 cases (12.72%) and 12 cases (10.9%) respectively. Canthal injuries and canalicular tears comprised of 12 (10.9%) cases and 11 cases (10%) respectively.

Conjunctiva was the most involved structure with sub-conjunctival haemorrhage involved 17 (15.45%) cases and 6 (5.45%) cases of Conjunctival Laceration, a total of 23 cases. 2nd common structure involved was anterior chamber with Hyphaema present in 14 (12.72%) cases, followed by lenticular damage and corneal laceration comprising of 6 (5.45%) cases and 5 (4.54%) cases respectively. In a study done by Kindie Desta Alem et al Corneal tear was the most frequently observed finding (39.33%) [16].

In this study, patients with complications like hematoma were 8 (7.27%) cases and deep orbital haemorrhage were 3 (2.72%) cases with majority of cases presenting with Chemosis / watering with 23 (20.9%) cases, with lid notching in 7 (6.36%) cases, 2 (1.81%) cases with hypertrophic scars, and long term complications of post traumatic Ptosis and tearing, with 3 (2.72%) cases each.

In our study, simple skin suturing was done in 41 (37.27%) cases, with skin and subcutaneous suturing done in 20 (18.18%) cases using 5-0 mersilk suture by layer by layer technique. Full thickness lid laceration including lid margin without tissue loss were sutured layer by layer using 3-layer technique using 5-0 vicryl and 5-0 mersilk sutures, with proper approximation in 14 (12.72%) cases in full thickness lid laceration with tissue loss <30%, lid laceration was closed in layer by layer technique and lid margin approximated in 7 cases, and in tissue loss >30% lid laceration was sutured in layers by direct closure after mobilisation by lateral Canthotomy and lateral cantholysis and sutured in 3-layers with layer by layer technique and lid margin approximation done, using 5-0 vicryl or 6-0 vicryl for deeper layers and 5-0 mersilk for skin suturing done in 5 cases. In Canthal injuries, tearing was repaired by direct suturing of canthal tendon to periosteum in 11 cases. In canalicular lacerations, mono-canalicular stent was placed in 11 (10%) cases. In Najim et al study, simple skin suturing was done in 85% of the cases.

Study Limitations

- It was single-centered study.
- Study had a small sample size and of short duration
- Thermal, electrical and burn injuries were not included in the study.
- Globe rupture and perforating ocular injuries were not included in the study.

V. Conclusion

Most of the injuries according to this study occurred due to the Road traffic accidents showing 65 cases (59.09%), preventive measures are advised like use of helmets and protective glasses at workplace, apart from use of steps such as following proper traffic rules and speed limits. Male preponderance is seen in injuries as they are more predisposed to outdoor work and occupational injuries and disputes and altercations.

As shown by the outcome of the injuries which presented at the earliest i.e. within 24 hours, outcome of the interventional analysis showed favourable result and overall favourable outcome, with a lower incidence of post-operative complications like infections, stenosis of canalicular system and sequelae to prolonged exposure etc.

Conflicts of Interest

None

References

- [1]. Eman Yahya Sadek , Amir Elbarbary , Ikram Safe. Periorbital Trauma: A New Classification PMID: 31428248 PMCID: PMC6697479 DOI: 10.1055/s-0039-1677808
- [2]. Lt Col Avinash Mishra, Col V.K. Baranwal, Brig J.K.S. Parihar, SM, VSM Brig A.K. Verma. Simple laceration wound of the eyelids? Always remember to look under the lids!. Medical Journal Armed Forces India 69, 2013;301-04.
- [3]. Audrey C Ko , Kellie R Satterfield , Bobby S Korn , Don O Kikkawa Eyelid and Periorbital Soft Tissue Trauma PMID: 28941512 DOI: 10.1016/j.fsc.2017.06.011
- [5]. Management of eyelid trauma Christine C. Nelson, MD <https://deepblue.lib.umich.edu/bitstream/handle/2027.42/71612/j.1442-9071.1991.tb00686.x.pdf?sequence=1>
- [6]. Treatment of blepharoplasty complications, Richard D. Lisman, Gary J. Lelli, Jr. <https://clinicalgate.com/treatment-of-blepharoplasty-complications/>
- [7]. Management of eyelid trauma Christine C. Nelson, MD <https://deepblue.lib.umich.edu/bitstream/handle/2027.42/71612/j.1442-9071.1991.tb00686.x.pdf?sequence=1>
- [8]. Sol DB. Treatment of late traumatic eyelid problems. Trans Am Acad Ophthalmol Otolaryngol 1976;81:0P560-565
- [9]. Chowdhury HR, Rose GE, Ezra DG. Long-Term Outcomes of Monocanicular Repair of Canalicular Lacerations. Ophthalmology. 2014. 121(8):1665-1666
- [10]. Dortzbach RK, Angrist RA. Silicone intubation for lacerated lacrimal canaliculi. Ophthalmic Surg. 1985. 1:185-190
- [11]. Pan XJ, Mao A, Zhao GQ, Meng XX, Yang SS. Clinical effects of three types of silicone intubations in repairing lacerations of canaliculus. Chin J Traumatol. 2009. 12(3):173-6.
- [12]. Fountain TR. "Management of Canalicular Trauma," in Manual of Oculoplastic Surgery (4th Edition). Levine MR, Ed. 2010. pp. 33-38.
- [13]. Eo S, Park J, Cho S, Azari KK. Microsurgical Reconstruction for Canalicular Laceration Using Monostent and Mini-Monoka. Annals of Plastic Surgery. 2010. 64(4):421-427.
- [14]. Najji M, Gračner T, Gračner B, Pahor D. Types, Causes and treatment of Eyelid Trauma .SlovMedJour [Internet]. 1 [cited 28Nov.2018];73(5)



Fig.1 Corneal With Scleral Laceration



Fig.2 Bilateral Periocular Ecchymosis



Fig.3 Full Thickness Lid Laceration with Lid Margin Involvement



Fig.4 Canthal Tear with full Thickness Lid Laceration



Fig.5 Full Thickness Lid Laceration with Tissue Loss

Dr. Jitendra Kumar. "Clinical Study of Eyelid and Periorbital injuries and their Management"
IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), 19(4), 2020, pp. 54-60.