CANALICULAR LACERATIONS: A STUDY OF ITS DEMOGRAPHY AND EPIDEMIOLOGICAL CHARACTERISTICS IN A TERTIARY CARE CENTER OF WESTERN INDIA

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ABSTRACT

PURPOSE

To analyse the demography, epidemiological data and clinical profile of canalicular lacerations in a Western Regional Institute of India.

METHODS

It was a prospective study of 220 patients from July 1, 2014 to May 30, 2016, who presented with varying eyelid lacerations and repair.

RESULTS

Two hundred and twenty patients underwent eyelid laceration repairs, of which 43 (19.5%) had involvement of the canalicular system. Of these, the mean age at presentation was 25 years. There were 35 men (81.4%) and 8 women (18.6 %). In this study, the most common cause of injury was industrial accidents in 32.6% followed by 25.6% of road traffic accidents. Among children, the most common mechanism of injury was blouse-hook injury. Lower canaliculus was involved in 26 patients (60.5%), upper in 12 patients (27.9%) and both in 5 patients (11.6%). Thirty canalicular lacerations underwent stenting (Angiocatheter tube).

CONCLUSION

The results of this study provide a series of high-risk conditions causing eye injuries, which would be better avoided and we also emphasise the use of protective eye equipment.

KEYWORDS

Lid Tear, Canalicular Laceration, Canalicular Stent, Industrial Hazards.

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INTRODUCTION

Ocular trauma is an important cause of visual impairment worldwide. Protective mechanisms against ocular trauma are reflex closure of eyelids in response to trauma. The upward rotation of eye in response to sudden stimulus and also the cushioning effect of retrobulbar fat are also protective. Although many forms and settings of ocular trauma are preventable, ocular trauma will continue to represent a significant problem in the foreseeable future.

Eyelid lacerations are an important subtype of ocular trauma. Lesions of the lacrimal drainage system occur in up to 16% of all eyelid injuries.^[1] Canalicular lacerations are the most common form of injury of lacrimal drainage system, because of their exposed position in the upper and lower lid.^[2]

In children dog bites, handlebar injuries and collisions with sharp objects while running (e.g. sticks, thorns, protruding nail) comprise the most common aetiologies.^[3,4,5] In adolescents and adults, blunt trauma (e.g. motor vehicle collision, fist fight, sports, injury at workplace) is most frequent.^[6] Males are affected more commonly than females.

Proper management of canalicular lacerations require thorough knowledge of the anatomy of the lacrimal drainage system, eyelids and periorbital structures, careful examination for associated ocular injury and prompt referral to a team of subspecialists when complicated lacerations are encountered. Use of angiocatheter tubes as against mini monoka stents in the repair of canalicular laceration is a safe, economical and feasible alternative, especially since majority of patients presenting with such injuries are of lower socio-economic strata. The results obtained by stenting with angiocatheter tube are comparable with those obtained by stenting with mini monoka stent.^[7] Improper repair leads to lifelong epiphora and also often becomes an issue of cosmetic concern.

In spite of this being one of the preventable health issues commonly seen around the world, unfortunately limited literature is available on the demography and epidemiological aspects of canalicular involvement in eyelid trauma.^[8] Further, understanding the consequences of a maltreated tear, it becomes extremely important to address this issue in order to reduce its impact on the socioeconomics of the community.^[9]

MATERIALS AND METHODS

This is a prospective study carried out from July 1, 2014 to May 30, 2016 in a Tertiary Referral Care Center of Western India in 220 eyes having eyelid lacerations. All ethical aspects have been taken due care of.

This study included all patients presenting to the emergency clinic with eyelid tears and canalicular lacerations. Those patients having profound tissue loss and primarily operated elsewhere for eyelid injury were excluded.

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History and Examination included the Following

- Age and Sex of the patient.
- Cause and mechanism of the injury.
- Snellen's best corrected visual acuity.
- Detailed ocular examination.
- Fundus examination by indirect ophthalmoscopy.
- Imaging studies: X-Ray of skull with orbit.

After thorough evaluation, meticulous microscopic repair was done under local anaesthesia or general anaesthesia as required. The superior canaliculus was probed with lacrimal probe. A 24-G angiocatheter tube was used to cannulate the torn canaliculus. After repairing the laceration, fixation suture with 6-0 Vicryl was passed through the tube to prevent its extrusion.

Canalicular repair was usually done within 6 hours of injury, i.e. before the oedema set in or later after the oedema subsided.

Postoperative care included local antibiotic ointment application and broad-spectrum systemic antibiotics for 5 days. Patients were counselled to avoid rubbing the eyes in order to prevent extrusion of the angiocatheter tube. Angiocatheter tube was left in situ for 12 weeks.

RESULTS

Two hundred and twenty patients had eyelid lacerations, of which 43 (19.5%) had involvement of the canalicular system. The age of patients varied from 3 to 75 years (Mean age - 25 years) (Table 1). There were 35 men (81.4%) and 8 women (18.6%) (Figure 1).

Considering the characteristics of the lacerations, the right eye was involved in 25 patients (58.1%); the left eye was involved in 18 patients (41.9%). Both upper and lower canalicular laceration were implicated in 5 patients (11.6%) (Table 2).

Thus, in this study lower canaliculus was involved in 26 patients (60.5%), upper in 12 patients (27.9%) and both in 5 patients (11.6%) (Figure 2, Figure 3 and Figure 4).

Among the study participants 19 worked in factories, 7 were housekeepers, 6 were farmers and the remaining 5 patients were either unemployed or retired at the time of the injury. Six patients were children.

In this study, the most common mechanism of injury was due to industrial accidents (32.6 %), mostly metallic industry followed by road traffic accidents (25.6%). Among children, the most common mechanism of injury was blouse-hook injury during breast-feeding (Table 3 and Table 4).

Visual Acuity at presentation ranged from 6/6 – counting fingers at 3 meter with similar vision postoperatively, indicating that the lid tears did not affect the visual acuity.

Age Group (Years)	No. of Patients (%)
1-09	4 (9.3%)
10-19	6 (13.9%)
20-29	11 (25.6%)
30-39	6 (13.9%)
40-49	7 (16.3%)
50-59	4 (9.3%)
60-69	3 (7%)
70-79	2 (4.7%)
Total	43

Table 1: Demographical Data

Right Eye	Upper Canaliculus	7 (16.3%)
	Lower Canaliculus	15 (34.9%)
	Both	3 (6.9%)
Left Eye	Upper Canaliculus	5 (11.6%)
	Lower Canaliculus	11 (25.6%)
	Both	2 (4.7%)
Total		43

Table 2: Characteristics of the Lacerations

Mechanism of Injury	No. of Patients
Road Traffic Accidents	11 (25.6%)
Industrial Accidents	14 (32.6%)
Household Accidents	6 (13.9%)
Assault	5 (11.6%)
Blouse-Hook Injury	3 (7%)
Dog Bites	1 (2.3%)
Unknown	3 (7%)
Total	43

Table 3: Mechanism of Injury

Type of Objects	No. of Patients (%)
Sharp Metallic Objects	25 (58.1%)
Wooden Stick	6 (14%)
Glass	2 (4.6%)
Fan Blades	1 (2.3%)
Blouse-Hook	3 (7%)
Dog Bites	1 (2.3%)
Others	5 (11.7%)
Total	43

Table 4: Type of Objects causing Injury

Fig. 1: Gender Distribution

Fig. 2: Characteristics of the Lacerations

Fig. 3: Upper Canalicular Laceration

Fig. 4: Lower Canalicular Laceration

DISCUSSION

Lid trauma is a common emergency faced by ophthalmologists and lesions of the lacrimal drainage system occur in up to 16% of all eyelid injuries.^[1]

Several reports described the management of canalicular lacerations with different procedures, but there is limited literature available on the demography and epidemiological aspects of canalicular involvement in eyelid trauma.^[10]

In a study conducted at Iran, the results showed a greater prevalence for eyelid lacerations among male patients (75.3%) of active age (i.e. 29 years), most of who were occupied at factories, workshops or were just workers in one form or another. This is totally consistent with other reports and also in our series ocular trauma was shown to be more prevalent among younger adults, men and even of higher incidence in less skilled workers.^[11,12,13,14]

Kennedy and Associates, in an 11-year epidemiologic and clinical study have noted that two-thirds of canalicular injuries have occurred in children or young adults below 30 years of age with a median age of 20 years at the time of injury.^[3] In our study, 48.8% of patients were below 30 years of age.

Kennedy and Associates have also reported lower eyelid involvement in 66.2% of cases. Our study has also shown a similar trend with the lower canaliculus being most commonly involved in 60.5% of patients.^[3] The same study reported dog bites and scratches as the most common cause of injury in children, whereas blouse-hook was the most common mode of injury among children in our series.^[3]

Among victims of motor vehicle accidents, motorcycles were responsible for more than half of the reported cases. This is because people do not tend to use safety apparatus, such as a helmet while riding.^[14]

CONCLUSION

This study highlights the demography of canalicular lacerations. The results of this study also provide a series of high-risk conditions, which could be easily avoided and it emphasises the use of protective glasses at workplace and safety equipment while driving. Education also needs to be given to breast-feeding mothers to avoid trivial traumas to the child, which can lead to grave lifelong consequences.

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