



# Study of Pattern of Soft-tissue Lacerations of Maxillofacial Region in Relation to Etiology of Injury and Its Management

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## ABSTRACT

Laceration to the facial skin is commonly encountered in the care of the traumatized patient. They could occur in isolation, extend deep to involve the deeper soft-tissues and even deeper to involve the facial skeleton. The injury could be in association with other more pressing systemic injury. While attention is devoted to the bony injuries, there could be less attention to details in handling these facial lacerations leading to unsatisfactory scar.

**Keywords:** Laceration pattern, Soft-tissue injury, Management.

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## INTRODUCTION

Laceration to the facial skin is commonly encountered in the care of the traumatized patient. They could occur in isolation, extend deep to involve the deeper soft-tissues and even deeper to involve the facial skeleton. The injury could be in association with other more pressing systemic injury. While attention is devoted to the bony injuries, there could be less attention to details in handling these facial lacerations leading to unsatisfactory scar. This study seeks to know those who are affected by facial lacerations, their common causes and the distribution in relation to the facial bone injuries and the esthetic features of the face. The management of facial laceration is common for surgeons, who take trauma call at their local hospitals and for emergency room physicians. In fact, we have more calls to emergency rooms for treatment

of soft-tissue injuries at our hospital than we do for bony injuries. Because of visibility of face, it should not be surprising that much attention has been given to the techniques for closure of traumatic facial laceration.<sup>1</sup>

## AIM OF THE STUDY

To assess relation between distribution and pattern of facial lacerations and etiology of injury and management of soft-tissue lacerations among the patients attending casualty from December 2012 to August 2014.

## MATERIALS AND METHODS

Case history form, gloves, swab holder, antiseptic solution and saline, gauze, surgical drapes, local anesthetic solution and syringes, straight artery forceps/curved artery forceps, tissue holding forceps. Blade handle no. 3 and blade no. 15, needle holder, scissors. Suture materials—Vicryl (3–0), Mersilk (3–0), Ethilon (5–0 or 6–0) or Prolene (5–0 or 6–0).

## Inclusion Criteria

Patients of all age group were included. All cases with positive medical history of diabetes, hypertension or any other medical condition were included. All cases having soft-tissue injuries of facial region and laceration of face extending to submandibular region were included. All cases with soft-tissue laceration with associated injuries of facial bone or other bone were included.

## Exclusion Criteria

Patient having soft-tissue laceration of facial region, but brought dead to the casualty. Patients with head injury and in comatose condition and case history of injury cannot be obtained. Isolated laceration of soft-tissue of scalp, neck and intraoral region was excluded in this study.

## Methodology

Once, life threatening issues, such as airway compromise and uncontrolled bleeding had been addressed, other multisystem trauma excluded, attention was given to define and definitive treatment of patient's facial soft-tissue lacerations. Patient was given tetanus immunization if required. Detailed case history of injury was

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documented in the predesigned format for each patient with soft-tissue laceration. Clinical examination was included inspection and palpation in detail. Radiological examination was done to see if any underlying bony fractures and to see if any metallic foreign body, radiological investigation was carried out.

The type of wound is determined by following factors—type of insult and area of contact, force applied direction of force, area of face affected. Wound contamination, general physical condition of the patient. A combination of these factors produced different type wounds. Types of force can be sharp or pointed, blunt, shearing, crushing and thermal. Type of injury could be stab wound, contusion, laceration, degloving, avulsion, abrasion, bites, gunshot injuries, crush injuries and burns.

## RESULTS

Out of 100 cases, torn laceration were mostly seen in RTA, i.e. 62 cases, in split laceration out 20 cases, 16 cases were due to fall and two cases due to sports injury, one case due to animal attack one case due to miscellaneous, in cut laceration out of six cases, three cases were due to assault injury, one case due to fall, one case due to fit and one case was miscellaneous. Out of six cases of stretched laceration, three cases were due to fall, two cases were due to non fall incident and one case was due sports injury. Three cases of degloving injury were due to RTA and two cases perforated laceration was due to assault.

## STATISTICAL ANALYSIS

Table 1 indicates significance of association between pattern of laceration and etiology of injury. The Chi-square value was 15.79 ( $p < 0.01$ ) which indicates a significant association.

In our study, out of 100 cases in the pattern of laceration, 63 cases were of torn laceration, followed by 20 cases of split laceration, six cases of stretch laceration, six cases of cut laceration, three cases of degloving laceration, two cases of perforated laceration (Table 1).

Torn lacerations were mostly seen in road traffic accident (RTA), i.e. 62 cases, in split laceration out of 20 cases,

16 cases were due to fall and two cases due to sports injury, one case due to animal attack, one case due to miscellaneous, in cut laceration out of six cases, three cases were due to assault injury, one case due to fall, one case due to fit and one case was miscellaneous. Out of six cases of stretched laceration, three cases were due to fall, two cases were due to NFA and one case was due sports injury. Three cases of degloving injury were due to RTA and two cases perforated laceration was due to assault (Graph 1).

## DISCUSSION

No studies were found on the pattern of laceration in relation to its etiology, however, study done by department of forensic medicine has classified laceration as torn laceration, split laceration, cut laceration, stretched laceration, degloving laceration. There is one single study conducted by Mukesh Sharma et al at Jaipur on 'forensic interpretation of injuries/wounds found on the human body' where they classified laceration in similar fashion and but no statistical data has been studied.<sup>2</sup>

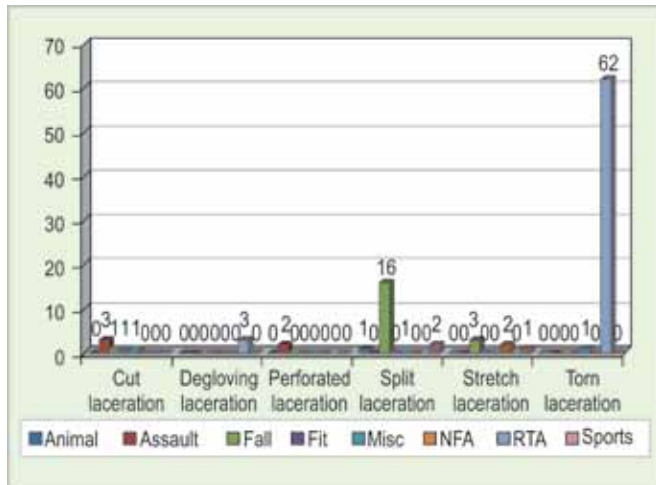
In our study, out of total 100 cases wound closure in 78 cases done with more than one layer with help of 3–0 vicryl and 3–0 ethilon. Twenty-two cases closed in single layer, i.e. (skin-skin) with help of 3–0 ethilon.

In a study, management of soft-tissue trauma to the face by Krishna G Patel, MD, PhD, Jonathan M Sykes, MD, they advocated the management of acute soft-tissue trauma can be very challenging for the surgeon. The goals of management of facial trauma are the preservation of form and function. Before any repair, the wound must be thoroughly cleansed. The best means for cleansing the wound and removing foreign body material is high-pressure irrigation. Techniques for wound closure depend on the location, depth, and characteristics of the injury. Abrasions should be kept clean and moist with application of a thin layer of antibiotic ointment, such as bacitracin, meticulous realignment of skin edges is important, especially along the borders of esthetic subunits. In closing the skin edges special attention should be paid to realign the vermilion-cutaneous border, eyelid

**Table 1:** Association between pattern of laceration and etiology of injury

Pattern of laceration	Etiology of injury								Total
	Animal	Assault	Fall	Fit	Misc	NFA	RTA	Sports	
Cut laceration	0	3	1	1	1	0	0	0	6
Degloving laceration	0	0	0	0	0	0	3	0	3
Perforated laceration	0	2	0	0	0	0	0	0	2
Split laceration	1	0	16	0	1	0	0	2	20
Stretch laceration	0	0	3	0	0	2	0	1	6
Torn laceration	0	0	0	0	1	0	62	0	63
Total	1	5	20	1	3	2	65	3	100

Chi-square = 215.79,  $p < 0.01$ , significant at 1% level



**Graph 1:** Association between pattern of laceration and etiology of injury

margin, nasal rim, brow or any hair-bearing borders. Using vertical mattress suture technique is excellent for the realignment of esthetic borders, such as the eyelid margin and vermilion-cutaneous border of the lip.<sup>1</sup>

**CONCLUSION**

As per aims and objective stated in the present study, the following conclusions were made. Males are more commonly affected than females for maxillofacial lacerations. Males are more into outdoor activities, like driving vehicles, working outdoors hence, more prone to accidents. The incidence of maxillofacial lacerations is increased during 6 pm to 12 am. The reason for the same is thought to be that when most of working population

is rushing home tired and drowsy, road traffic accidents are more likely. An increased number of maxillofacial lacerations are seen on weekends, those patients are usually associated with alcohol consumption. The incidence of maxillofacial lacerations was maximum in the range of 21 to 30 years. Etiology of laceration were mostly due RTA followed by fall. In RTA mostly prominent areas of face are involved is eyebrow region followed by zygomatic complex region. Two wheeler riders, driving without helmet are more often involved in RTA with associated maxillofacial injuries. In RTA, the pattern of laceration most commonly seen was torn lacerations followed by degloving laceration and margins were usually irregular and the depth of laceration up to muscle. In fall, the pattern of laceration most commonly seen was split laceration. In assault the pattern of laceration most commonly seen was cut laceration and margins were usually regular. The depth of injury up to the muscle had more incidence than skin bone and nerve involvement. As most of the lacerations were muscle deep, closure of wound was mostly done in multilayer with suture material, like ethilon and vicryl. Layerwise suturing gives a very good esthetic result.

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