

# Management of Maxillofacial Trauma due to Road Traffic Accident: A Case Study

Dr. Abhinav Phillips,<sup>1</sup> Dr. Arundeeep,<sup>2</sup> Dr. Anurag Amin,<sup>3</sup> Dr. Darshna Bothra,<sup>4</sup>  
Dr. Nancy Srivastava,<sup>5</sup> Dr. Dhvani Bhandari<sup>6</sup>

**1. Dr. Abhinav Phillips**

MBBS, House Doctor, Department of General Surgery, Frances Newton Mission Hospital, Ferozpur, Punjab.

**2. Dr. Arundeeep**

MDS, Department of Pedodontics & Preventive Dentistry, Deputy Director, Frances Newton Mission Hospital, Ferozpur, Punjab

**3. Dr. Anurag Amin**

MBBS, MS, Director, Frances Newton Mission Hospital, Ferozpur, Punjab.

**4. Dr. Darshna Bothra**

Asst. Professor, Dept. of Periodontics, NIMS Dental College & Hospital, Jaipur, Rajasthan

**5. Dr. Nancy Srivastava**

Associate Professor, Dept. of Periodontics, NIMS Dental College & Hospital, Jaipur, Rajasthan

**6. Dr. Dhvani Bhandari**

BDS - Private Practitioner, General Dentistry, Jaipur, Rajasthan

## CORRESPONDING AUTHOR

**Dr. Rajeev Soangra**

Senior Demonstrator

Dept. of Periodontics & Implantology

RUHS College of Dental Sciences

Jaipur, Rajasthan

**Email** - rajeevsoangra@gmail.com

## Abstract

**Background:** Being the most exposed part of the body, the face is particularly prone to trauma. Trauma to the facial region causes injuries to skeleton components, dentitions as well as soft tissues of the face. The incidence and pattern of maxillofacial fractures vary from country to country depending upon prevailing geographical, social, cultural and environmental factors

**Case report:** A 19-year-old male was brought to the Frances Newton Mission Hospital, Ferozpur with severe facial injury following a road traffic accident. Patient was conscious, oriented, GCS E4 V5 M6. Patient's relatives provided the history of road traffic accident injury on his face and Rt. hand and leg region. The patient was riding a bike when the incident occurred, was not under the influence of alcohol.

**Results:** Excellent results were obtained with primary suturing, as these types of injuries are prone to infection secondarily.

**Conclusion:** Maxillo-facial injuries even though causes severe damage, due to abundant blood supply of the facial region; healing is usually satisfactory and does not necessitate the need for removal of any soft/hard tissue unless it is non-vital.

**Keywords:** Maxillofacial injury, primary suturing, road traffic accident, trauma

## INTRODUCTION

Being the most exposed part of the body, the face is particularly prone to trauma.<sup>1</sup> Trauma to the facial region causes injuries to skeleton components, dentitions as well as soft tissues of the face. The incidence and pattern of maxillofacial fractures vary from country to country depending upon prevailing geographical, social, cultural and environmental factors.<sup>2</sup> In developed countries increased incidence of trauma were reported due to road traffic accidents, however in developing countries and western world inter personal violence is the most causative factor.<sup>2</sup> The contributory factors in road traffic accidents include excessive speeding, use of alcohol, drugs, road conditions, poor light.

Road traffic accident (RTA) is a leading cause of morbidity and mortality in adults below the age of 50 years and the greatest numbers of cases are males in the 21–30 year age group.<sup>3–5</sup> The treatment of trauma is more costly than of any other major disease.<sup>5</sup> Annually, more than 1 million deaths are recorded worldwide annually, while non-fatal road traffic accidents are a major problem causing hospitalization and permanent disability to thousands of person each year.<sup>6</sup>

The causes of maxillofacial trauma vary and include road traffic accidents (RTAs), interpersonal violence, falls, sports and missile injuries.<sup>3,7,8</sup> The relative contribution of each cause depends on such factors as geographical location, socio-economic factors and the seasons of the year.<sup>9,10</sup> The contributory factors in road traffic accidents include reckless driving, excessive speeding, use of alcohol and other drugs, natural disease as well as road conditions.<sup>7,11,12</sup>

Maxillofacial Injuries are associated with other injuries like brain, airway and cervical spine. Severity of injury, emergency and definitive treatment decides the outcome. Definitive treatment varies from simple suturing of wound to fracture reduction like for nasal bone fracture close reduction, for mandible fracture by inter-maxillary fixation by arch-bar or wiring with or without plating, for zygoma and maxilla fracture includes conservative and plating by ORIF.<sup>13</sup> The goal of treatment in facial fractures is to achieve

anatomic reduction and restore function while increasing patient comfort and making postoperative care easier.<sup>14</sup>

The anatomical location of the maxillofacial bones poses a serious clinical problem once fractured. Thus, the knowledge of the distribution and treatment of maxillofacial fractures can be supportive of its adequate prevention.<sup>15</sup>

In the article, we presented a case report of management of maxillofacial trauma due to road traffic accident in the Frances Newton Hospital, Ferozepur, Punjab (India).

## CASE REPORT

A 19-year-old male was brought to the Frances Newton Mission Hospital, Ferozepur with severe facial injury following a road traffic accident. Patient was conscious, oriented, GCS E4 V5 M6. Patient's relatives provided the history of road traffic accident injury on his face and Rt. hand and leg region. The patient was riding a bike when the incident occurred, was not under the influence of alcohol. His Vitals recorded were stable. Patient had an injury to both sides of the face causing a lacerated wound approx. 5 x 3 cm extending from lateral half of the upper and lower lip to the cheek region. Patient did not have any fracture of dento-alveolar segment involving the maxillary anterior and posterior region also. Vision in both eyes was normal. NCCT head and face showed normal study.

Prophylactic injectable antibiotics (cefoperazone + sulbactam & metronidazole) were started and primary closure was planned under local anesthesia. Patient was shifted to Operation Theater immediately; wound was irrigated thoroughly with normal saline and betadine solution with debridement of the exposed tissue. The surgery was done under the upper (Infraorbital and posterior superior nerve block and lower bilateral (inferior alveolar nerve block and buccal nerve block) local anesthesia block. A local anesthetic solution of 30 ml of 2% lignocaine with 0.1 ml of sodium bicarbonate was made. After aseptic precautions, with the patient sitting, the condylar notch was identified. The needle was inserted into the space below the midpoint of the zygomatic process till the needle hits the lateral pterygoid plate. After that, it was

inserted posterior and superior to get paresthesia of the mandibular region, and 3 ml was deposited. The needle then was withdrawn till subcutaneous plane to go back and hit the pterygoid plate. Then for accessing maxillary nerve, the needle was inserted anterior and lower to deposit around 3-4 ml. The infraorbital foramen, a thumb (or middle finger) was placed in the notch formed by the nasal bone and premaxilla, and the middle finger (or thumb) is placed on the rostral aspect of the facial crest. The foramen was located with the index finger halfway between and 1 to 3 cm caudal to an imaginary line connecting the thumb and middle finger. The ridge of the foramen is palpated beneath the ventral margin of the levator labii superioris muscle. The point of the needle is advanced along the surface of the maxilla and inserted about 1 inch (2.5 cm) into the canal. 4 ml of local anesthetic solution is deposited within the canal. Anesthesia was complete of full mouth on both sides in around 10 min.

The injured site contained multiple pieces of

foreign body such as wood and sand. After thorough debridement and removal of the foreign bodies, haemostasis was achieved over the lacerated wound margins.

Primary suturing of the wound was done using Polyglactin (Vicryl) & Nylon. Injury to the parotid duct was assessed and was found to be atraumatic. The laceration did not involve the parotid gland and hence facial nerve involvement was also ruled out. An initial approximation suture was placed at the upper lip junction for proper orientation of the soft tissue injury. Suturing was done in layers starting from the mucosa intraorally to the extra oral skin layer.

An antibiotic ointment was applied over the sutured wound margin and a pressure dressing was applied. The surgery took around 2 h to complete and postoperative radiographs demonstrated satisfactory approximation. Regular dressing was done over the sutured wounds after cleaning with povidone iodine solution. Patient was advised follow-up for daily dressing.



**Figure 1 and Figure 2:** Pre-operative photograph demonstrating the extensive soft tissue laceration



**Figure 2:** Post-operative photograph showing approximation of the soft tissue



**Figure 3:** Post-operative photograph after two months

## DISCUSSION

Maxillofacial fractures occur in routine following RTAs. The etiology varies from country to country, even within the same country, and depends on the environmental, socioeconomic, and cultural factors. Even with the improvement of safety devices, maxillofacial fractures occur quite often with RTAs. The case report we presented, did not involve any facial bone fracture, but involved only soft tissue injuries.

RTAs are a major cause of maxillofacial trauma, Ferguson showed that 19.25 % RTA victims were 20 years and fewer than 8.75 % were 60 years and above 72 % were 20–59 years.<sup>16</sup> Beyaztas and Alagozlu observed that the most common age group was 1–25 years (44.5 %).<sup>17</sup> Kahoro observed peak incidence in the 21–30 year age group.<sup>18</sup>

The more frequent involvement of 21–50 year age group may be due to their involvement increased in travelling to work place and outdoor activities. The other causes of increased incidence of accidents in this age group may be their risk taking behavior along with lack of knowledge or in most of the cases, violation of traffic rules.

Trivedi and Seth found that 78.3 % of the fatal accidents involved males.<sup>19</sup> Souzer et al. found that males constitute 71 % and females 29 % of the total RTA victims.<sup>20</sup> According to Tavis et al. overall male to female ratio is 4:3.<sup>21</sup> The male to female ratio varied with the type of crash and differed by passenger and drivers. But in Indian society mostly males bear the burden of earning and hence are more prone to accidents due to

increased outdoor activity. Virtually all motorcyclists do not wear helmets and only a few drivers and passengers use seat belts.

The maxillofacial region is the most exposed part of the body and is more vulnerable to trauma. Facial fractures occur most commonly in males in the third decade of life.<sup>22</sup> Reports reveal that 20 to 60% of all road traffic injuries involve some form of maxillofacial injury, and 62% involve motorcycles.<sup>23</sup>

In the management of maxillo-facial injuries, irrigation is an essential component; to prevent infection since it aids in removal of debris and microorganisms. Thus, visible dirt and foreign bodies have to be removed using saline followed by rigorously washing the wound with high pressure saline irrigation. Facial wound debridement must be kept to a minimum as the blood supply to face is excellent providing an optimal healing environment. High-pressure saline irrigation can change the contaminated (or even dirty) wound into a clean- contaminated environment, making it suitable for subsequent primary closure. Saline usage is emphasized for the mechanical effect rather than any antibacterial activity.<sup>24</sup>

Hydrogen peroxide can also be used for its effervescent and presumed antimicrobial effects. The effervescence is the result of oxygen bubbles created by the breakdown of hydrogen peroxide to water and oxygen by tissue catalase. This “bubbling” action enhances mechanical cleansing of necrotic debris from wounds.

Winter’s landmark article established that the formation of a dry scab on the superficial surface

of a wound impairs epithelization and he determined that a moist environment without scab formation enhances wound healing.<sup>25</sup> The patient was under the hospital environment for a period of over 5 days even after being operated for maxilla-facial injuries.

## CONCLUSION

Maxillo-facial injuries even though causes severe damage, due to abundant blood supply of the facial region; healing is usually satisfactory and does not necessitate the need for removal of any soft/hard tissue unless it is non-vital. The youth of our country should be thoroughly and properly

exposed to the traffic rules, they should be made aware regarding safety measures to be followed while driving. Awareness programs should be arranged for the general population by the local governing bodies in order to make them aware regarding the first aid management of trauma victims. The public should be aware of utility of helmet while driving.

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