

Incidence of Maxillofacial Trauma and Its Management - A Retrospective Study

Research Article

Subhashini R¹, Abdul Wahab PU², Santhosh Kumar MP³¹ Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India.² Professor, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, 600077, India.³ Reader, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, 600077, India.

Abstract

Maxillofacial trauma occurs in a significant proportion worldwide. It can occur as an isolated injury or in combination with other injuries like Cranial, Spinal, Extremities and Abdomen. The aim of this study was to evaluate the pattern, incidence, etiology and the treatment modalities for maxillofacial injuries. The medical records of all patients from July 2019 to March 2020 from hospital were retrieved, data extracted, tabulated and analysed. Statistical analysis was done for demographic data, pattern, site of injury and management with the SPSS software (version 20.0; SPSS, Chicago, IL, USA) and results obtained. Our study revealed that the main etiology of the maxillofacial injuries was found to be road traffic accidents ($p < 0.03$) followed by assault. Males sustained more injuries (85.9%) than females. Mandible was the most commonly injured site (53.8%) followed by dentoalveolar fractures (23%), Zygomaticomaxillary complex (ZMC) fractures (10%), Naso-orbitoethmoid fractures (NOE) (2%), and Panfacial fracture (1%). In our study 33% of maxillary and condylar fractures were managed by Closed reduction and 67% of fractures were managed by Open reduction. Open reduction and internal fixation was the preferred treatment modality and the results were statistically significant ($p < 0.01$) From our study we can conclude that road traffic accidents were the most common cause for maxillofacial injuries, males were more affected and mandible was the commonly fractured site. Although the majority of cases were treated successfully by Open reduction and internal fixation, closed reduction can be done wherever indicated.

Keywords: Maxillofacial Trauma; Mandibular Fractures; Midface Fractures; Facial Injuries; Fixation.

Introduction

Injury to the facial structures is disastrous and it affects the quality of life; which increases the demand for esthetics [1, 2]. Management of injuries in this region presents one of the most challenging procedures, as fractures are invariably associated with morbidity, disfigurement, functional problem and expensive treatment [3, 4].

Maxillofacial injury can be an isolated injury or can occur in combination with other injuries as well [5, 6]. Road traffic accidents (RTA) are the common cause for the injury [7, 8]. The aim of this retrospective study was to evaluate the incidence, gender prevalence, etiology, site of maxillofacial fractures and their management.

Face being the basic foundation of identity of an individual and it

plays an important role in social approach-reception-appreciation. In fact the whole perspective of life turns dynamic with an esthetic face while facial deformity caused by trauma, congenital disabilities, and postsurgical sequelae produce a negative impact on perceptions of social functionality.

Maxillofacial injury is one of the most commonly involved components in the medical emergency and is the major cause of death [9, 10]. It can affect both skeletal and soft tissue components of the facial structures and proper management is necessary to meet their functional needs [11, 12]. Management of the injuries requires skill and experience [13, 14].

Materials and Methods

In this retrospective study, records of all the trauma patients reported and treated in the Department of oral and maxillofacial

*Corresponding Author:

Abdul Wahab PU,
Professor, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, 600077, India.
E-mail: abdulwahab@saveetha.com

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surgery, saveetha dental college and hospital, saveetha university, chennai between July 2019 and March 2020 were retrieved from hospital records. All patients with maxillofacial injuries were included in our study. Got Ethical clearance from the college ethical committee and the ethical clearance number is SDC/SIHEC/2020/DIASDATA/0619-0320.

The records of 78 patients were retrieved. Data including demographic data, etiology of trauma, site of fracture and their management were extracted. Fractures were grouped as Mandibular fractures, midface fractures, zygomaticomaxillary fractures, naso-orbitoethmoid fractures, and Dentoalveolar fractures. Data was retrieved, tabulated and statistical analysis was performed using the SPSS software (version 20.0; SPSS, Chicago, IL, USA) and results obtained. Categorical variables were expressed as frequency and percentage; continuous variables as mean and Standard deviation. The chi-square test was used to test the association between the categorical variables. P values < 0.05 were considered statistically significant.

Results and Discussion

In our study, out of 78 patients, 67 were males (85.9%) and 11 were females (14.1%) who were affected by trauma. (Figure 1); Mean Age and SD of the patients was 30.45 ± 11.95 with the age range of 4 - 67 years. Our study revealed that main etiology of the maxillofacial injuries was found to be RTA (p < 0.03) followed by assault. Mandible was the most commonly injured site (53.8%) (Figure 2), followed by dentoalveolar fractures (23%), Zygomaticomaxillary complex (ZMC) fractures (10%), Naso-orbitoethmoid fractures (NOE) (2%), and Panfacial fracture (1%). In our study 33% of maxillary and condylar fractures were managed by Closed reduction and 67% of fractures were managed by Open reduction and the results were statistically significant

(p < 0.01). (Figure 2). In our study we found that Open reduction and Internal Fixation (ORIF) was the preferred method for treating these injuries except for dentoalveolar fractures and few isolated condylar fractures for which closed reduction with Intermaxillary fixation (IMF) was done.

Trauma to maxillofacial regions requires special attention because of their proximity to the vital structures. So thorough evaluation is mandatory during primary stages of treatment. Etiology of trauma varies from one region to another along with various age groups. RTA is the leading cause of maxillofacial injury in developing countries and Assault in developed countries [15, 16]. The common reason for RTA includes improper or no licensing, not wearing helmets, violating traffic rules, poor road facilities and so on [17, 18]. Other causes include fall from height, domestic violence, animal bite etc. Our study showed significant association with RTA. In our study data, we have not encountered fall from height or animal bites as the etiology of maxillofacial injuries in this duration of nine months.

Several studies have shown male predominance in maxillofacial injuries as they are most commonly involved in outdoor activities, traveling, sports, driving and alcohol addiction [19-22]. In our study also males were affected more (85.9%) than females (14.1%). According to our study, the most common distribution of occurrence of trauma was between the 2nd and 4th decade of life which is in accordance with the previous literatures [23-26].

In our study gross distribution of facial injury showed, mandibular fractures were more common (53.8%) followed by Dentoalveolar fractures (23%), ZMC (10%), NOE (2%) Panfacial trauma (1%). Similar results were shown by previous studies [27, 28]. However in a study it was observed that midface fractures were more common, especially ZMC fractures [24]. Several studies [29, 30] stated

Figure 1. Pie Chart diagram showing gender wise distribution of maxillofacial traumas. There is a male predominance with 85.7% than females with 14.29%.

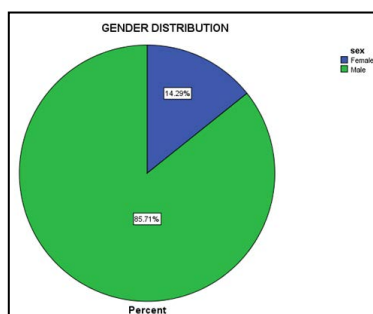
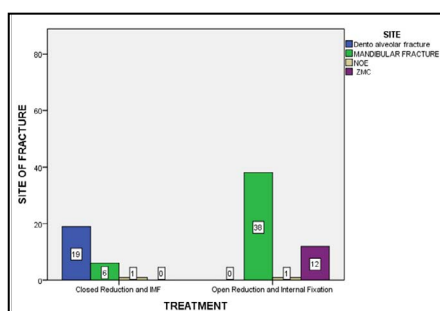


Figure 2. Bar graph depicting association between site of fracture and method of treatment where Green colour represents Mandibular fracture, X-Axis represents the Treatment done and Y-Axis represents the site of fracture. Mandible is the commonly involved Site and ORIF is the preferred treatment modality. Chi square value- 51.595 p=0.01 and hence it is statistically significant.



that trends and patterns in maxillofacial trauma are changing and it is increasing with RTA and assault.

In our study, following mandibular fractures, ZMC is the next common fracture which involves Zygomatic buttress, Zygomatic arch (10%) and the results were in accordance with other studies [31].

Management of maxillofacial injuries is a real challenge to the surgeons and it needs skill and experience. The injury may vary from nasal fracture to comminution of facial bones. Management is challenging because of the high vascularity and it is complicated by the vital structures like upper airway, cranial structures and cervical spine. Initial assessment includes [14] Airway, breathing, circulation, bleeding were done. Upper airway [32, 33] can be obstructed by severe midface, nasal complex and bilateral parasymphysis fracture. Assessment of cervical spine is important in initial evaluation in maxillofacial trauma patients.

Various treatment modalities for fracture management are conservative management, closed reduction with intermaxillary fixation (IMF) or open reduction and internal fixation (ORIF). Conservative management is done for undisplaced midface without any functional or neurological involvement. It includes advising on a soft diet, analgesics, restricted mouth opening etc. Closed reduction is done for condylar fractures, single linear fractures with mild occlusal disturbance. It is done by using an arch bar and manual reduction followed by the IMF for 4-6 weeks. Problems with closed reduction with the IMF include difficulty in eating, and social inconvenience. Open reduction and Internal fixation is done for severe displacement of fractures, severe occlusal disturbances, and unstable ZMC fractures under general or local anaesthesia. It is accomplished with 1.5mm or 2mm Titanium or Stainless plates. Disadvantages include hospital stay, nerve injury, surgical complications, and cost. In our study 33% of maxillary and condylar fractures were treated by Closed reduction and majority (67%) of fractures were treated by Open reduction and internal fixation (ORIF).

Conclusion

From our study we can conclude that road traffic accidents were the most common cause for maxillofacial injuries, males were more affected and mandible was the commonly fractured site. Although the majority of cases were treated successfully by Open reduction and internal fixation, closed reduction can be done wherever indicated.

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