

ORIGINAL RESEARCH

Evaluation of etiology and pattern of maxillofacial fractures: A retrospective study

Sandeep Vaidya¹, Santosh Kumar²

¹MDS (Oral and maxillofacial surgery), Private Practitioner, Himachal Pradesh;

²MDS (Oral and Maxillofacial Surgery), Medical Officer (Dental), Himachal Pradesh

ABSTRACT:

Background: Maxillofacial fractures occur in a significant proportion worldwide. Hence, the present study was undertaken for assessing the etiology and pattern of maxillofacial fractures. **Materials and methods:** This study was conducted to assess the incidence and pattern of maxillofacial fractures. A total of 60 patients were selected for this study who presented with maxillofacial fractures. Facial trauma was evaluated from history taking, clinical and maxillofacial records. The age and gender of patients were ascertained. Information was also collected regarding the cause and timing of trauma. SPSS software was used for statistical analysis of the collected data. **Results:** It was observed in the study that majority of patients with fracture belonged to young age group of 20-40 years (56.67%). Number of case of fracture in the age group of <20 and > 40 were 12 (20%) and 14(23.33%) respectively.. On observing the site of fractures, it was observed that mandibular fractures were most common of facial fractures. Of the mandibular fractures, parasymphysis was the most common fracture site (n =16). This was followed by the mandibular body (n=9). **Conclusion:** The study concluded that road traffic accidents were the main cause of maxillofacial trauma and fractures. In general males presented with greater number of cases as compared to females. Mandibular fractures were the most common of all the facial fractures.

Key words: Maxillofacial fracture, Mandible, Road traffic accident.

Received: 12 July, 2019

Accepted: 25 July, 2019

Corresponding author: Dr. Santosh Kumar, MDS (Oral and Maxillofacial Surgery), Medical Officer (Dental), Himachal Pradesh, India

This article may be cited as: Vaidya S, Kumar S. Evaluation of etiology and pattern of maxillofacial fractures: A retrospective study. Int J Res Health Allied Sci 2019; 5(5):171-175.

INTRODUCTION

The face is aesthetically crucial, as it is the most visible area in the human body. It also controls important functions such as mastication and pronunciation. Fracture of the facial bone, if severe, can lead to emergency situations such as difficulty in maintaining a clear airway. Depending on the characteristics and treatment outcomes, facial bone fractures can cause aesthetic and functional disabilities. These can have a significant negative impact on social activities.¹The past few decades has witnessed the increased in frequency of motor accidents and violence. The most common causes of injury for the young people up to the fourth decade of life include motor vehicle accidents, physical aggression and sports trauma.²⁻⁴ Facial fractures are the result of various types of trauma to the face, and may occur in isolation or

combined with other injuries. The epidemiological assessment of maxillofacial fractures represents a special interest to identify the potential trend of their frequency, age, gender, and anatomic distribution especially when comparison of these patterns is done over time periods.³Facial injuries occur in a significant proportion of trauma patients requiring prompt diagnosis of fractures and soft tissue injuries, with possible emergency interventions. Each year, increasing numbers of patients are admitted to the hospital with facial trauma. There are many studies in the literature that have analysed the demographic factors associated with facial trauma according to various criteria. The epidemiology of facial fractures varies with regard to injury type, severity and cause, depending on the population studied. The differences in the populations with regard to the causes of facial fractures may be the result of differences in culture

and a variety of risk factors. However, the reports on patients studied, use the severity of the injury as the major selection criteria for epidemiological investigation.¹⁻³

These fractures might give rise to socioeconomic burden and deleterious effects on both the community and health system. These injuries are among the major health concerns worldwide. Furthermore, treatment and rehabilitation of maxillofacial fractures are associated with psychological and esthetic concerns, severe morbidity and disabilities. In addition, these traumas would impose a significant financial burden on individuals and societies. Therefore it is necessary to pay more attention to their epidemiology and details.^{4,5} The purpose of this study was to assess the incidence and pattern of maxillofacial fractures.

MATERIALS AND METHODS

This study was conducted to assess the incidence and pattern of maxillofacial fractures. A total of 60 patients were selected for this study who presented with maxillofacial fractures. Facial trauma was evaluated from history taking, clinical and maxillofacial records. The age and gender of patients

were ascertained. Information was also collected regarding the cause and timing of trauma. The patients were divided into three groups depending upon age:

1. <20 years
2. 20-40 years
3. >40 years

Entire data was assembled and analysed to check the incidence of fractures in relation to the age and gender of patient. The pattern of maxillofacial injuries was also analysed. SPSS software was used for statistical analysis of the collected data. A value of less than 0.05 was considered significant.

RESULTS

It was observed in the study that majority of patients with fracture belonged to young age group of 20-40 years (56.67%). Number of case of fracture in the age group of <20 and > 40 were 12 (20%) and 14(23.33%) respectively. It was also seen that most of the patients with fractures were males with a number of 43(71.67%) out of 60 patients. Only 17 out of 60 patients (28.33%) were females.

Table 1: Incidence of facial fractures in relation to the age of patient

Age	No of cases	Percentage
<20 years	12	20%
20-40 years	34	56.7%
>40 years	14	23.33%

Table 2: Incidence of facial fractures in relation to the gender of patient

Gender	No of cases	Percentage
Male	43	71.67%
Female	17	28.33%

The study observed that main cause of trauma was road traffic accidents comprising of 31 out of 60 patients. Assaults and sports were other main causes. Details of etiology are given in table 3.

Table 3: Causes of fractures

Etiology	No of cases	Percentage
1. Road traffic accidents (RTA)	31	51.66%
2. Assaults	9	15%
3. Falls	3	5%
4. Family dispute	4	6.67%
5. Sports	7	11.67%
6. Work related	5	8.33%
7. Others	1	1.67%

On observing the site of fractures, it was observed that mandibular fractures were most common of facial fractures. Of the mandibular fractures, parasymphysis was the most common fracture site (n =16). This was followed by the mandibular body (n=9). The detailed description of fracture sites is given in table 4.

Table 4: Pattern of maxillofacial fractures

Site	No of cases	Percentage
Madibular		
• Parasymphysis	16	26.67%
• Symphysis	4	6.67%
• Body	9	15%
• Angle	4	6.67%
• Ramus	1	1.67%
• Condyle		
Unilateral	4	6.67%
Bilateral	1	1.67%
• Mandibular body and angle	2	3.33%
• Parasymphysis and angle	7	11.67%
• Parasymphysis and condyle	5	8.33%
Parasymphysis and Zygomaticomaxillary complex	2	3.33%
Zygomaticomaxillary complex	4	6.67%
Frontozygomatic suture+le Fort 1+mandibular angle	1	1.67%

A co-relation was made between the gender of the patient and the fracture sites. It was observed that though the majority of patients with fractures were male, but their co-relation with the fracture sites was not significant statistically (p=.074).

Table 5: Correlation between gender and site facial fractures

Site	Gender		P-value
	Males	Females	
Madibular			0.074
• Parasymphysis	13	3	
• Symphysis	3	1	
• Body	7	2	
• Angle	3	1	
• Ramus	0	1	
• Condyle			
Unilateral	2	2	
Bilateral	1	0	
• Mandibular body and angle	1	1	
• Parasymphysis and angle	5	2	
• Parasymphysis and condyle	4	1	
Parasymphysis and Zygomaticomaxillary complex	1	1	
Zygomaticomaxillary complex	2	2	
Frontozygomatic suture+le Fort 1+mandibular angle	1	0	

DISCUSSION

Face establishes the foundation of all human interactions which naturally makes man a social animal, and thus injuries to the facial structures may have a disastrous and lasting influence on the quality

of life of the victims with the current social scenario witnessing an increased demand for Esthetics. For these reasons, management of injuries in the maxillofacial region presents one of the most difficult challenges for health care professionals worldwide, as

fractures are invariably associated with substantial morbidity, disfigurement, functional deficit, and expensive treatment.⁶ Maxillofacial trauma is a common presentation following injury to the face. Periodic evaluation of trauma patients helps us understand the demographics and epidemiology to increase awareness and strengthening the legislation to prevent such fractures⁷. The care of the facial trauma patient continues to evolve in the ever-changing face of medicine. Patients can be reassured that their care is managed by a variety of specialists knowledgeable in the assessment and management of complex facial injuries.⁸

In the present study, it was observed in the study that majority of patients with fracture belonged to young age group of 20-40 years (56.67%). Number of case of fracture in the age group of <20 and > 40 were 12 (20%) and 14(23.33%) respectively. It was also seen that most of the patients with fractures were males with a number of 43(71.67%) out of 60 patients. Only 17 out of 60 patients(28.33%) were females. Klenk G et al conducted a retrospective study on facial fractures in the Department of Oral and Maxillofacial Surgery at Tawam Hospital. The study included 144 patients with a mean age of 26.5 years; the most frequently injured patients belonged to the 16- to 20-year-old age group. The male predilection was 83%. Road traffic accident was the most common causative factor (59%), followed by falls (21.5%), accidents where camels were involved (5.5%), work- and sport-related accidents (4.8% and 4.8%, respectively), and assault (4.1%). A total of 53.4% of the patients suffered isolated mandibular fractures, 32.6% had isolated midface fractures, and 13.8% had combined midface and mandibular fractures. Associated injuries were noted in 22.2% of the patients. The number of patients treated increased from 28.3 (1990-1995) to 36 (1998-2001) on an annual average; a reduction in isolated nasal fractures and associated injuries, including facial lacerations, was noted with no change in age or etiology predilection.⁹

In the present study, main cause of trauma was road traffic accidents comprising of 31 out of 60 patients. Assaults and sports were other main causes. Mohammed S. Elarabi et al conducted a study to evaluate changing pattern in characteristics of maxillofacial fractures and concomitant injuries in Western Libya During revolution and to assess the association between mechanism of injury and fracture patterns. A retrospective review of medical records and radiographs of 187 patients treated for maxillofacial fractures from January 2010 to December 2012 was performed; there were 326 fractures in 187 patients. The male: female ratio was 6:1. Most fractures occurred in patients aged 11 to 40 years, and few injuries occurred in patients aged > 50 years. Most fractures occurred from motor vehicle accidents, and other most frequent causes included assault, gunshot, and fall injuries. Most maxillofacial

fractures involved the mandible, zygomatic complex, or maxilla. Most mandibular fractures occurred at the parasymphysis, angle, or condyle.¹⁰

In the present study, on observing the site of fractures, it was observed that mandibular fractures were most common of facial fractures. Of the mandibular fractures, parasymphysis was the most common fracture site(n =16). This was followed by the mandibular body(n=9). The detailed description of fracture sites is given in table 4. A co-relation was made between the gender of the patient and the fracture sites. It was observed that though the majority of patients with fractures were male, but their co-relation with the fracture sites was not significant statistically(p=.074). Hyman DA et al evaluated the incidence of facial fractures and assessed the influence of protective device use in motor vehicle collisions in patients treated at trauma centers in the United States. They concluded that a total of 518 106 patients required assessment at a trauma center after a motor vehicle collision, with 56 422 (10.9%) experiencing at least 1 facial fracture. Nasal fracture was the most common facial fracture (5.6%), followed by midface (3.8%), other (3.2%), orbital (2.6%), mandible (2.2%), and panfacial fractures (0.8%).¹¹

CONCLUSION

The study concluded that road traffic accidents were the main cause of maxillofacial trauma and fractures. In general males presented with greater number of cases as compared to females. Mandibular fractures were the most common of all the facial fractures. However, further studies are recommended.

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