



Spectrum of Maxillary and Mandibular Fractures Among Patient Visiting Dental Hospital

Vivek Babu B¹, Herald J Sherlin*², Samuel Raj Srinivasan³

¹Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Science (SIMATS), Saveetha University, Chennai-600077, Tamil Nadu, India

²Department of Oral Pathology, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Science (SIMATS), Saveetha University, Chennai-600077, Tamil Nadu, India

³Department of Public Health Dentistry, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Science (SIMATS), Saveetha University, Chennai-600077, Tamil Nadu, India

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ABSTRACT

Fracture is defined as a break in continuity in the bone. The most common affected bone in the facial region is the mandible. Maxillofacial injuries present as one of the most important health problems worldwide. The aim of the present study is to evaluate the spectrum of mandibular and maxillary practice among patients visiting dental hospital. The study was a cross sectional retrospective study done under hospital setting. The population considered in this study was 64 individuals with maxillofacial fractures. This is an institutional retrospective study and data was collected from 86000 patients visiting Saveetha Dental College And Hospital, during the time period of June 2019 to March 2020 were reviewed and collected data were statistically analysed with the help of SPSS by IBM and tables and graphs well plotted. This retrospective clinical study with the population of 64 patients reveals the increased prevalence maxillofacial fracture in males and that is found to be 62.8% and the most commonly affected age group is a third decade (32.8%). The most common site of fracture is mandible and the prevalence of mandibular fracture was found to be 64.1 percentage. Out of many causes of fracture, the most common factor is due to road traffic accidents and the prevalence was found to be 48.4%. There is a high prevalence of maxillofacial fracture in the population under study and males were the most commonly affected age group in the third decade and common aetiology is road traffic accidents in Chennai city, India.



*Corresponding Author

Name: Herald J Sherlin

Phone:

Email: sherlin@saveetha.com

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INTRODUCTION

Injuries of the maxillofacial complex represent one of the most important health problems worldwide. At present, in developing India, due to improper traffic sense, maxillofacial trauma and fractures are most epidemiological diseases prevalent (Chaurasia and Katheriya, 2018; Sridharan *et al.*, 2017).

The strenuous pace of modern life with speed travel as well as an increasingly violent and dictatorial society has made facial trauma a form of the social disease from which no one is immune (Natu *et al.*, 2012; Jayaraj *et al.*, 2015b; Sivaramkrishnan and

Ramani, 2015; Gupta and Ramani, 2016; Thangaraj *et al.*, 2016). There are changes in patterns of facial injuries, extent, clinical features and so on. This results in mild to massive disfigurement of the maxillofacial skeleton along with functional loss of the part. Besides (RTA) road traffic accidents and violence director/indirect trauma may also occur due to sports activities, Falls, Falls at work, sports, fireman (Thangaraj *et al.*, 2016; Jayaraj, 2015). Occasionally, It may also be secondary to certain diseases either such as cystic lesions, neoplasm and metabolic diseases (Natu *et al.*, 2012; Gupta and Ramani, 2016).

The fracture is defined as the break in the continuity of the bone (Kruger and Tennant, 2016). According to the study conducted by Edward TG facial area is one of the most frequently injured areas of the body, accounting for 23% of all facial fractures (Edwards *et al.*, 1994; Sridharan *et al.*, 2017).

Fracture of the lower jaw that is a mandible suspect in patients with post-traumatic swelling tenderness over the segment of the mandible is also indicative of a mandibular fracture (Lee, 2012; Jayaraj *et al.*, 2015a). The treatment of maxillofacial fractures varies from different types of fracture to the extent of fractures. There are two major types of fracture that are open fracture and closed fracture (Babhulkar and Raza, 2008; Gupta and Ramani, 2016; Shree *et al.*, 2019). There are common types of treatment of fracture that are open reduction and internal fixation and the other type is close reduction (Abramo *et al.*, 2009; Viveka *et al.*, 2016). Open reduction and internal fixation is a type of treatment to fix a broken bone. It puts pieces of a broken bone back together so they can heal. Close reduction is a procedure to set or reduce a broken bone without cutting the skin open. The aim of the study is to evaluate the spectrum of mandibular and maxillary fractures among patients visiting the dental hospital (Viveka *et al.*, 2016; Sridharan *et al.*, 2019).

MATERIALS AND METHODS

This is a cross sectional retrospective study where the study population are patients reported with maxillofacial fracture visited saveetha dental college and hospital from june 2019 to march 2020. The data was collected from 86000 patients visiting Saveetha Dental College And Hospital, during the time period of June 2019 to March 2020 were reviewed and collected data were statistically analysed with the help of SPSS by IBM and tables and graphs well plotted. The collected data was age, gender, site, symptoms with which the patient visited the dental College, type of fracture, cause of

the trauma was elicited through history from DIAS software due to which the fracture had occurred, the treatment suggestion that the doctors suggested and what treatment was provided to the patient. The collected data was statistically analysed with the statistics software called statistical package for social sciences, SPSS by IBM, V 23, IL, CH and statistics test used was chi-square test. $P < 0.05$ is considered significant. The results were tabulated and represented in the form of graphs.

RESULTS AND DISCUSSION

Table 1: Frequency of Age of the patients with maxillofacial fractures

Age	Frequency	Percentage
Below 20	13	20.3%
21-30	19	29.7%
31-40	21	32.8%
41-50	6	9.4%
51-60	4	6.3%
Above 60	1	1.6%

There is a high prevalence of maxillofacial fracture in 31-40 years of age with 32.8%

Table 2: Frequency of Gender of patients with maxillofacial fractures

Gender	Frequency	Percentage
Male	53	82.8%
Female	11	17.2%

There was more prevalence of male in maxillofacial fractures, i.e., 82.8%

Table 3: Frequency of Sub Site of fracture in patients with maxillofacial fractures

Sub Site	Frequency	Percentage
Parasymphysis	19	29.7%
Angle	9	14.2%
Dentoalveolar Fracture	8	12.5%
LeForte 1	8	12.5%
Body	6	9.4%
Condyle	2	3.1%
LeForte 2	1	1.6%

The most common area affected in maxillary fracture LeForte Class 1 with 12.5%, and mandibular prevalence with 29.7% of parasymphysis fracture

In the present population with maxillofacial fractures, the following results were elucidated. The

Table 4: Frequency of Systemic Illnesses Related to Fracture patients

Systemic Illness	Frequency	Percentage
Nil	54	84.4%
Hypertension	5	7.8%
Diabetes	3	4.7%
Asthma	2	3.1%

The patient visiting with fracture has mostly had no systemic illness

Table 5: Frequency of Causes of fracture in patients with maxillofacial fractures

Cause	Frequency	Percentage
Road Traffic Accidents	31	48.4%
Trauma-Work	12	18.8%
Trauma-Fell	12	18.8%
Assault	9	14.1%

The most common reason for maxillofacial fracture was RTA with 48.4%

Table 6: Frequency of Laterality of fracture in patients with maxillofacial fractures

Laterality	Frequency	Percentage
Unilateral Fracture	62	96.9%
Bilateral Multiple Fracture	2	3.1%

Unilateral Fracture was the most common laterality found with 96.9%

Table 7: Frequency of Site of fracture in patients with maxillofacial fractures

Site	Frequency	Percentage
Mandibular Fracture	41	64.1%
Maxillary Fracture	13	20.3%
ZMC	7	10.9%
NOE	2	3.1%

Mandibular fracture is the common fracture involved with 64.1%

total number of Fracture patients who were taken into consideration were 64 patients. The most affected age group was 31 to 40 years of age, with a prevalence of 32.8% and the least affected age group was above 60 years, that is 1.6% (Table 1).

The gender based prevalence is reported in (Table 2), high prevalence of maxillofacial fracture was found among male as compared to females and

Table 8: Frequency of Symptoms in patients with maxillofacial fractures

Symptoms	Frequency	Percentage
Pain	29	45.3%
Swelling and pain	10	15.6%
Difficulty in Mastication	9	14.1%
Inability to open mouth	6	9.4%
Mobile teeth	4	6.3%
Bleeding	4	6.3%
ENT Bleeding	2	3.1%

The most common symptom with which the patient came for was pain with 45.3%

Table 9: Frequency of Type of Fracture in patients with maxillofacial fractures

Type of Fracture	Frequency	Percentage
Closed	41	64.1%
Open	23	35.9%

64.1% was a closed fracture

Table 10: Frequency of Post-operative Complication in patients with maxillofacial fractures

Complications	Frequency	Percentage
Nil	62	96.9%
Ulcer	1	1.6%
Poor Oral Hygiene	1	1.6%

There were no postoperative complications, i.e., 96.9%

the prevalence in males was 82.8% and in females, it was found to be 17.2%. Further, parasymphysis (30%) was the most common site of fracture and mandible was the most affected as compared to maxilla because the major reason for fracture was trauma. The second most common fracture was angle (14%) followed by the body of the mandible (9%); in the maxilla, the most common fracture was Lefort 1 (12%) followed by dentoalveolar fracture (12%) and Lefort II (2%) (Table 3). The general health of the patients was normal (84%) and only-few suffered from illnesses such as hypertension (7.8%), diabetes (4.7%) and asthma (3.1%) (Table 4).

The most common cause for trauma was found to be RTA (48%), followed by trauma at work and fall

(18%) and least was assault (14%,) (Table 5). Unilateral fracture was found in 96.9% of cases and only 3.1% had bilateral multiple fractures of all those reported to the institute (Table 6).

Mandibular fracture is a common fracture involved with a population of 64.1%. Followed by maxillary fracture of 20.3% of the population and then ZMC fractures of 10.9% population (Table 7).

With regard to the frequency of symptoms with which the patient came. Pain was the most common symptom (45.3%) and swelling with pain was reported by (15.6%), followed by difficulty in mastication (14%) and inability to open mouth was 9.4% (Table 8).

With regard to prevalence mandible fracture was 64.1%, followed by maxilla (20.3%), zygoma involved (10.9%) and least was (3.1%). 64.1% of the fractures were closed and only 35.9% were open fractures (Table 9), and 97% of the patients treated did not report any complications in our institute (Table 10). With regard to treatment performed, open reduction with internal fixation was the most common (71.9%) followed by closed reduction (18.8%) and other minorities involved in conservative management, closed reduction with intramedullary fixation and 3.1% were not treated (Table 11).

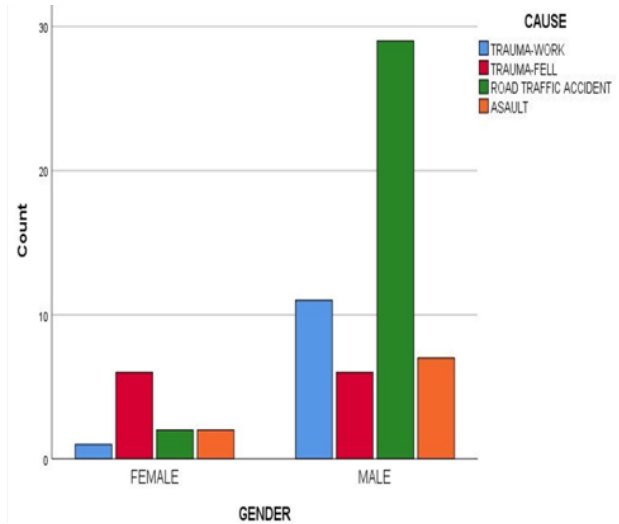


Figure 2: Bar diagram showing correlation of gender and cause of trauma in fracture patients

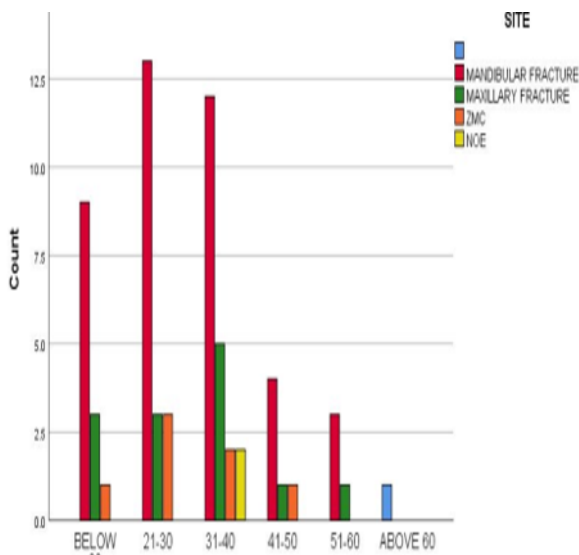


Figure 1: Bar diagram representing correlation between Site of the fracture and age distribution

Chi square comparison between various parameters and the consolidated depiction of the p values were shown in Table 12. Correlation between Age vs Site (Figure 1), Gender vs Cause (Figure 2). Site vs Treatment (Figure 3), and Systemic Illness vs Complication (Figure 4) found to show a significant correla-

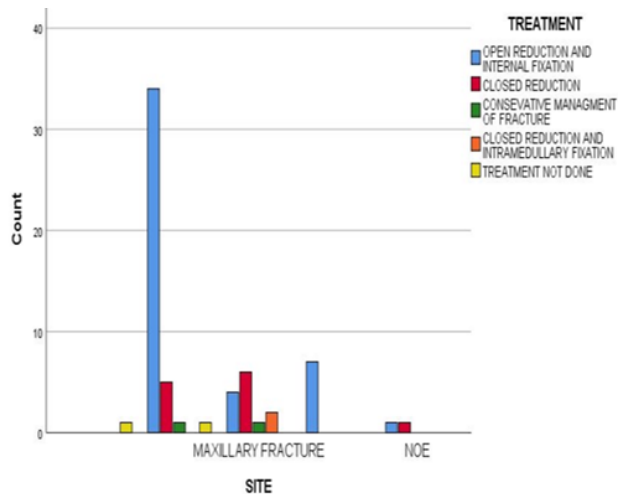


Figure 3: Bar diagram showing Correlation between treatment method and site of fracture

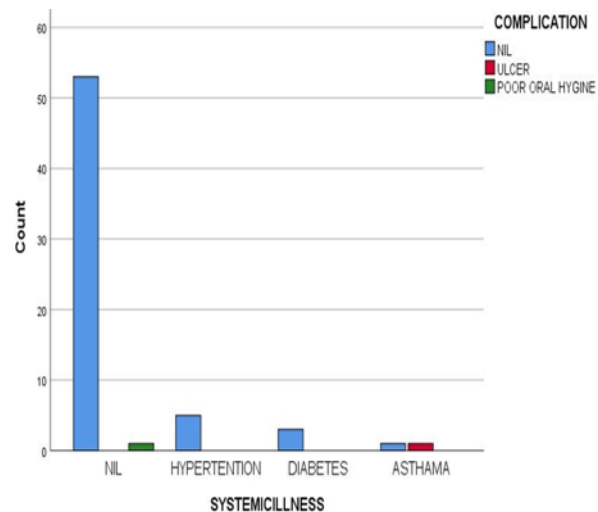


Figure 4: Bar diagram showing correlation between fracture complications and systemic illness

Table 11: Frequency of Treatment for fracture in patients with maxillofacial fractures

Treatment	Frequency	Percentage
Open Reduction And Internal Reduction	46	71.9%
Closed Reduction	12	18.8%
Conservative Management of Fracture	2	3.1%
Closed reduction And Intramedullary Fixation	2	3.1%
Treatment Not Done	2	3.1%

Open Reduction and Internal Fracture was the treatment used in 71.9% of the population

Table 12: Table representing chi-square test with p values of maxillary and mandibular fractures with comparison of various parameters

Correlation	P Value	Significance
Age vs Site	0.000	p<0.05 (Significant)
Gender vs Site	0.086	p>0.05 (Not Significant)
Age vs Cause	0.485	p>0.05 (Not Significant)
Gender vs Cause	0.006	p<0.05 (Significant)
Symptom vs Type of fracture	0.417	p>0.05 (Not Significant)
Site vs Treatment	0.000	p<0.05 (Significant)
Type of Fracture vs Treatment	0.160	p>0.05 (Not Significant)
Systemic Illness vs Complications	0.000	p<0.05 (Significant)
Cause vs Laterality	0.625	p>0.05 (Not Significant)
Type of Fracture vs Laterality	0.674	p>0.05 (Not Significant)

tion between the parameters compared.

Age is the most common factor in consideration to Fracture the age and the most common age group affected with a maxillofacial fracture is 31 to 40 years of age, that is the third decade of life with a population of 37.8%. According to the study conducted by Akhilanad C (Chaurasia and Katheriya, 2018; Swathy et al., 2015), Majority of the patients were between the age group of 18 to 35 years of age this correlates with our current study (Patrocínio et al., 2005; Kamulegeya et al., 2009). The reason behind that might be in this period of life, people were more engaged in a sporting, fights, violent activities, industry, and high-speed transportation and also there was an adrenaline rush which urged them to indulge in dangerous physical activities (Hannah et al., 2018; Jangid et al., 2015). The low frequencies in the very young and old age groups were due to reduced physical activities (Kamulegeya et al., 2009; Ahmed et al., 2004).

In the present study, the most common gender affected is the male population with 62.8% that relates with the previous study of Kamulegeya et al., al. shows affected male population with 82% (Jayaraj et al., 2015b; Jangid et al., 2015). The study reveals that most common site affected in the facial region

is the mandibular bone with 64.1% which correlates with the previous study that the mandibular fracture may lead to deformities caused by displacement (Patrocínio et al., 2005; Kamulegeya et al., 2009). The reason for male predominance was due to their more frequent participation in high-risk activities, such as driving vehicles, sports that involve physical contact, an active social life, and drug and alcohol habits, whereas on contrary females most often were confined to housework. They drove vehicles less frequently and carefully and were less exposed to accidents, fights, industrial works, and sports and less participated in trading or farming (Shekar and Reddy, 2008; Kamulegeya et al., 2009).

In the current study, the most common sight affected is the parasymphysis (28%) followed by the angle of mandible with 14.1%; this is supported by the previous study that confirms the number of mandibular fractures was in tandem with the next track just confirming national and international finding. Study conducted by the common subsidence affected parasymphysis 40.8%. As it is proved that mandible is the only facial bone that has mobility and the remaining portion is part of the fixed facial axis, the fracture of mandible is never neglected because it is very arduous pain that aggravates on mastication.

tion and phonation movements and even respiratory movements (Kruger and Tennant, 2016; Sridharan et al., 2019).

The most common cause of facial fractures according to the current study was by road traffic accidents which accounted for 48.4% which is supported by the study by Estie.k et al (Swathy et al., 2015; Sridharan et al., 2019). The high number of maxillofacial injuries attributed to RTA in our study is attributed to recklessness and negligence of the driver, often driving under the influence of alcohol or drugs and complete disregard of traffic laws, over speeding, overloading, underage driving and poor conditions of roads and vehicles (Chalya et al., 2011; Gheena and Ezhilarasan, 2019). The current study shows the most common complaint with which a patient came to the dental hospital and diagnosed with a fracture was with the pain (King et al., 2004; Sherlin et al., 2015). The present study demonstrated that there is a high prevalence of maxillofacial fracture in the population under study and males were the most commonly affected age group in the third decade and common aetiology is road traffic accidents in Chennai city, India. Understanding the spectrum of maxillofacial fractures and identification of their causes is essential for emulating plans for primary prevention of trauma and also for the efficient allocation of health-care resources.

CONCLUSION

The study underscores a High percentage of mandibular fractures due to road traffic accidents or RTA, which is a growing concern in India. The group most commonly affected the middle age knees as they are the ones frequent involved in RTA or road traffic accidents. Most of the causes have been treated with an open reduction to enhance better approximation and healing. Awareness of the road measures, implementations of the patience good over this traumatic injury.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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