



ORIGINAL RESEARCH PAPER

Maxillofacial Surgery

PREVALENCE OF MAXILLOFACIAL FRACTURES REPORTED AT ADHIPARASAKTHI DENTAL COLLEGE AND HOSPITAL, MELMARUVATHUR, TAMILNADU, INDIA

KEY WORDS: Maxillofacial fractures, prevalence, RTA, trauma, injuries

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ABSTRACT

Background: This retrospective study reviews the maxillofacial fractures over a 2 year period at Adhiparasakthi dental college and hospital Melmaruvathur, tamilnadu, India **Introduction:** To analyze the most frequent causes, sites, treatment modalities, age and gender wise distribution of maxillofacial fractures. **Study design:** Over a two-year period (from Jan2020 to Dec 2021), the medical records and radiographs (OPG, PA mandible, occipitontental and submentovertex view) of 223 patients treated for maxillofacial fractures at Adhiparasakthi dental college and Hospital were reviewed. A variety of parameters were assessed and recorded, including the patient's age, gender, race, occupation, and mechanism of injury, type of facial injuries, treatment modality, and postoperative complications. **Results:** Medical records of 223 patients with maxillofacial fractures were reviewed. Among them 184 (82.5%) had mandibular fractures whereas 39 (17.5%) had midface fractures. Most patients with mandibular fractures had fractures of the symphysis and parasymphysis 62(27.8%) while fractures of the zygomaticomaxillary complex (ZMC) were more common in the midface 15 (6.7%). Most patients were in the 21-30 year old age group, and the male: female ratio was 2.8:1. Road traffic collision was the most common cause that accounted for 127 (57%) of cases. Maxillomandibular fixation (MMF) was the most common type of treatment modality used, 129 (58%) cases were treated with this method and 42% were treated by ORIF+IMF. **Conclusion:** The most common etiology of maxillofacial injury was road traffic accidents (RTA) followed by falls and assaults, the sports injuries seem to be very less. The majority of victims of RTA were young adult males between the ages of 21 to 30 years. Mandible was the most common sites of fracture, followed by the maxilla. Majority of mandibular fracture occurred at symphysis and parasymphysis region, In Maxilla, majority of the fracture occurred at zygomatic complex region. Majority of cases were treated with maxillomandibular fixation (MMF). Open reduction and internal fixation were performed for indicated fracture patients. **Clinical Significance:** This research has essential significance in the specialty of maxillofacial surgery. It presents the occurrence of maxillofacial fractures in a particular population and also the ability of a dental surgeon in treating and restoring normal function in the maxillofacial region

INTRODUCTION

Fracture is known as any break in the anatomic structure of a bone [1]. Maxillofacial fractures are caused by severe forms of trauma. They are a common health problem accounting for 20-60% of trauma patients [2]. These fractures alter the appearance and functions of facial skeleton. Several physiological functions such as the ocular, olfactory, masticatory and respiratory systems are compromised due to such facial fractures [3]. Trauma is one of the leading causes of death among people under 40 years of age. [4] Occurrence of maxillofacial fractures depends upon several variables; these include the socioeconomic status, culture, environmental and life activities of a given population [4].

One of the hardest challenges confronted by medical professionals worldwide is injury to the maxilla and facial area. In general, skeletal fractures are associated with long-term morbidity, deformity, functional deficits, and high treatment costs. [10] Over the previous three to four decades, the causes of maxillofacial injuries have evolved and are still changing. The majority of facial injuries are attributed to road accidents, although interpersonal violence continues to be the dominant etiological cause in the developed countries. Regarding the anatomical areas, the majority of facial fractures occur in the mandibular and zygomatic complexes, and their frequency varies depending on the method of injury and demographic parameters, particularly gender and age. Medical professionals may be helped by the planned and sequential gathering of data on demographic trends in maxillofacial injuries by keeping detailed and consistent records of facial trauma. Mandible and bones of the middle third of the face are the most common sites of maxillofacial trauma [5]. It has been reported that male gender, road traffic accidents (RTAs), and third decade of life are the main risk factors for maxillofacial fractures [6, 7]. According to the National Crime Record Bureau (2010), the number of vehicular accidents was 430600 resulting in 133938 deaths

and 470600 injuries, thereby accounting for 37.2% of all accidental deaths due to unnatural causes.

MATERIAL AND METHODS

The records and radiographs of all patients presenting with maxillofacial fracture to the Department of oral maxillofacial surgery at Adhiparasakthi Dental College and hospital, Melmaruvathur, from January 2020 to December 2021 were reviewed. The characteristics of these fracture were analyzed. Patient information was collected by means of a medical data form specifically designed for this study. Data regarding age, sex, cause of injury, site, type of treatment and postoperative complications were gathered from pertinent hospital inpatient and outpatient records, as were orthopantomographic radiographs. Causes were grouped into six categories: road traffic collisions, fall, fight and assault, work related injuries, sports related, associated injuries were recorded. According to site(s) fractures were classified as mandible fractures (parasymphysis and symphysis, body of mandible, condyle and subcondyle, angle, dentoalveolar, coronoid) and midface (zygomatic, left I, II, III, zygomatic arch).

Treatments were divided into maxillomandibular fixation (MMF) and open reduction and internal fixation (ORIF + IMF)

Inclusion Criteria:

1. Patients with maxillofacial fractures
2. Both male and female patients
3. Patients of all age groups.

Exclusion Criteria:

1. Nasal fractures were eliminated from the recorded data as this fracture is treated by ENT surgeons
2. Patients with systemic illnesses were also excluded.

RESULTS

Demographic Data

Gender:

During the study period, 223 patients between the ages of 3 and 84 received treatment for maxillofacial injuries, with the majority of patients being male 165(74%) and female 58 (26%) in fact, the prevalence of injury was higher in males across all age groups, with an average male to female ratio of 2.8:1. *figure 1*

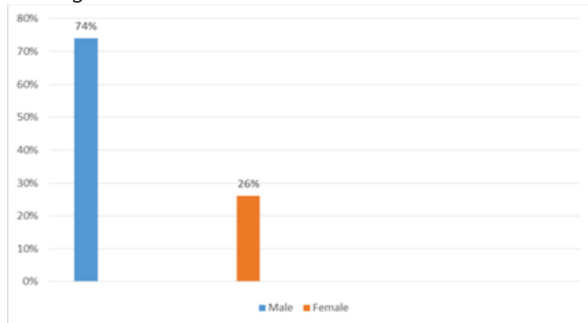


Figure 1: genderwise distribution of maxillofacial fractures, the findings showed that ,from 223 studied subjects were included in the current investigation ,165(74%) individuals were male, also 58(26%) individuals were female

Age:

The patient's age at the time of injury ranged from 3-84years (mean 28.3+/-16.3years.) The peak incidence was found in patients with 21-30years of age. The age wise distribution of patients is shown in *figure 2*

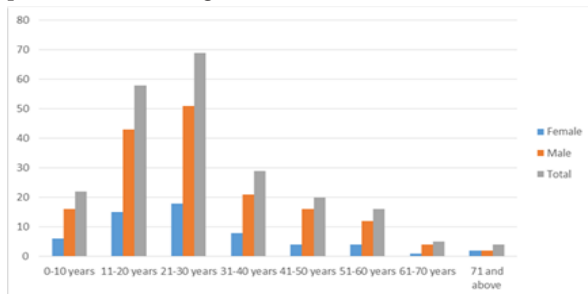


Figure 2. Age-wise distribution of maxillofacial fractures.

Etiology

Many factors can lead to maxillofacial fracture, however RTA (127cases,57%) were the main contributing factors, falls (49cases,22%). fights and assault accounted for 20cases (9%).9cases (4%) of work related accidents and 7cases (3%) of sports injuries *figure 3*

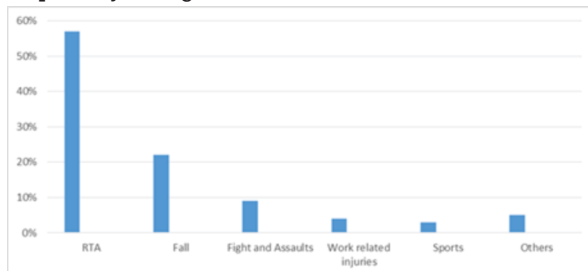


Figure 3: Etiology of Maxillofacial Fracture

The finding is suggestive of road traffic accidents accounted for majority of traumas

The sites of maxillofacial fractures were divided into mandibular and midface fractures. In these patients, Mandibular fractures were the most common accounted for (184 cases; 82.5%) of the maxilla facial fractures. Among the mandibular fractures parasymphysis and symphysis were the most frequent injured site accounting for (62cases;27.8%) .Body of the mandible was the second

most common site accounting for (42 cases; 18.9%), Followed by the fractures of condyle and subcondyle (35cases; 15.7%). Other frequent sites were the angle (22 cases; 9.9%) and dentoalveolar fractures (16 cases; 7.2%). Fractures of the coronoid were the least common (3 cases; 1.3%) among the mandibular fractures.

Midface fractures accounted for only 17.5% of the maxillofacial fractures. Among them zygomaticomaxillary complex (ZMC) fractures were the most common (15 cases; 6.7%) followed by lefortII (10cases; 4.5%).Fractures of the zygomaticarch and lefort I were the other most frequent sites. Both of them accounted for (6 cases; 2.7%). Lefort III was the least common fractured site.

Table 1. Distribution of maxillofacial fractures by location (N=22). This table describes the pattern of maxillofacial fractures among patient visited Adhiparasakthi dental College and hospital (n=223)

Mandibular Fractures		
Location	No. of Patients	Percentage
Parasymphysis and symphysis	62	27.8%
Body	42	18.9%
Condyle and Sub condyle	35	15.7%
Angle	22	9.9%
Dentoalveolar	16	7.2%
Ramus	4	1.8%
Coronoid	3	1.3%
Total	184	82.5%
Midface Fractures		
Zygomaticomaxillary complex (ZMC)	15	6.7%
Lefort II	10	4.5%
Zygomatic arch	6	2.7%
Lefort I	6	2.7%
Lefort III	2	0.9%
Total	39	17.5%

Table 2. Treatment modalities used for maxillofacial fractures

Operative Modality	Patients	Percentage
MMF	129	58%
ORIF+IMF	94	42%
IMF with miniplates	67	71.3%
IMF with microplates	19	20.2%
ORIF	8	8.5%

MMF: Maxillo mandibular fixation,

IMF: Inter maxillary fixation,

ORIF: Open Reduction Internal Fixation.

The finding of the study showed that, the predominant maxillofacial treatment plan was MMF (58%). this table describes total number of MMF, ORIF and IMF carried out. MMF were carried out in 129 (58%) of patients while ORIF with IMF were carried out in 94(42%) of patients ,IMF were classified with mini plates and micro plates and only ORIF. Among this IMF with mini plates was frequently used procedure.

DISCUSSION

Trauma, the main cause of death in the first 40 years of life, may be more responsible for productivity loss owing to lost working hours than cancer and heart disease put together. Maxillofacial injuries frequently accompany other injuries brought on by assault, sports, falls, and traffic accidents. Due to cultural, environmental, and social reasons, this cause varies by nation. [16, 17] According to this study's findings, geographic region, social class, culture, and religion all have an impact on the occurrence of fractures.[8] The most frequently acknowledged and reported etiological variables include RTA, falls, fights or assaults, job, and sports. It is consistent with the findings of earlier published study that

injured men make up the majority of patients in the 21–30 age range. Maxillofacial fracture incidence in females has similarly been demonstrated in prior research to be lower, with a male to female ratio of 2.8:1; although, it has been reported that the ratio can reach 32:1 [10]. Like many other studies, occurrence of maxillofacial fractures is found to be at its peak during the third decade of life as the people at this age are more energetic and involved in outdoor activities [11]. In our study, age group ranging from 21–30 years was the most common for maxillofacial fractures and this trend is consistent with many other studies.

Prevalence of Maxillofacial Fractures Reported at Adhiparasakthi Dental College

DISCUSSION

In our series, mandible was the most commonly fractured bone accounting for 82.5% (N=184) of maxillofacial fractures. Parasympphysis and symphysis together were the most common sites of fracture followed by the body of mandible. Whereas another study conducted by Khan et al., reported that body and angle of the mandible are the most common sites [12]. Nasal bone fractures have been excluded from this study as they are managed separately by the ENT department in our set up.

There are many treatment procedures for maxillofacial fractures that mainly depend on the location and type of fracture. Every patient and fracture has specific properties hence standardization is not possible. The common treatment modalities are internal fixation using miniplates or intermaxillary fixation using archbars. Reconstruction plates are rarely used to correct severe bone defects [13]. Treatment and principles vary in every case.

Ethical compliance

The authors have stated all possible conflicts of interest within this work. The authors have stated all sources of funding for this work. If this work involved human participants, informed consent was received from each individual. If this work involved human participants, it was conducted in accordance with the 1964 Declaration of Helsinki. If this work involved experiments with humans or animals, it was conducted in accordance with the related institutions' research ethics guidelines.

CONCLUSION

The present study revealed that maxillofacial fractures are more prevalent in males than in females and RTA is the most common cause followed by fall and assaults. Mandibular fracture was the most common among maxillofacial fractures. The incidence of such injuries can be reduced by taking several precautions such as wearing helmets while riding a bike, fastening seat belts while driving a car and abiding by the traffic rules. Targeted safety rule awareness initiatives for high-risk groups and road improvement programs. The majority of those participating in economically productive age groups need urgent public policy responses, particularly in the areas of education, engineering, the environment, and emergency care for those injured in traffic accidents.

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