

PATTERN OF MANDIBULAR FRACTURES — A STUDY

¹AHMAD KHAN, BDS

²ABDUS SALAM, BDS, MDS, FCPS

³UMAR KHITAB, BDS, MSC

¹MOHAMMAD TARIQ KHAN, BDS

ABSTRACT

This descriptive study was conducted to evaluate and analyze the pattern of mandibular fractures in 150 patients treated in the Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar from 1st Sep 2004 to 31st Dec 2005. These patients were examined both clinically and radiologically for mandibular fractures. Data concerning age, gender, causes of fracture and sites of fracture were evaluated and reviewed. The age range was 2-78 years (mean 24 years) with high frequency occurring in 21-30 years age group. The male to female ratio was 4.1:1. The leading cause of mandibular fracture was road traffic accident [RTA (n=64; 42.6%)], followed by accidental fall (n=42; 28%), firearm injury [FAI (N=25; 16.6%)], assault (n=7; 4.6%), sports (n=5; 3.3%), industrial accidents (n=3; 2%) while 4 cases were associated with other causes such as bomb blasts and animal injury. The most common site was parasymphysis (n=47; 27.4 %) followed by angle (n=40; 23.3%) and body (n=38; 22.2%). This study can guide us to formulate strategies and policies to prevent and treat mandibular fractures.

Key words: Mandibular fractures, road traffic accidents, etiology, seat belts

INTRODUCTION

Mandible is the only mobile bone of the facial skeleton which plays an important role in mastication, speech, and deglutition. Being a prominent bone of the facial skeleton, it is fractured most commonly among maxillofacial injuries.¹ Its fracture causes severe loss of function and disfigurement.¹

Mandibular fracture may occur alone or in combination with other facial bone fractures.² In maxillofacial injuries the ratio of mandible to zygomatic to maxillary fracture is 9:4:1.³ Fracture site depends upon the mechanism of injury, magnitude and direction of impact force, prominence of the mandible and anatomy of site.⁴ Facial bones have low tolerance to impact forces. Its resistance to compression is greater but tends to fracture at the site of tensile strain. In addition, it is more sensitive to lateral impact especially the body and ramus.⁵

The common etiological factors of mandibular fractures are road traffic accident, interpersonal violence, falls, firearm injuries, sporting injuries and industrial accidents.^{1,6,7} These etiological factors depend upon the geographic conditions, socioeconomic status and cultural characteristics of people.⁸ Road traffic accident is the leading cause of mandibular fracture in third world countries,⁹ while interpersonal violence is the leading cause in developed countries.¹⁰ The most common causative factor in adults is the road traffic accident and fall in the younger population.¹¹ Age and sex have been cited as important factors that influence the occurrence of mandibular fractures. The highest incidence is seen in the age group 21-30 years. The lowest incidence is observed in the age group above 60 years and below 5 years.¹² Recent data indicates 3:1 male: female ratio worldwide.¹³ The most commonly fractured site is the angle followed by the body and parasymphysis.¹⁴ In adults the most common site of fracture is the man-

¹ Former Postgraduate Resident Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar

² Professor, Sardar Begum Dental College, University Town, Peshawar

³ Assistant Professor, Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar.

Correspondence: Dr. Ahmad Khan c/o Mr Mohammad Amin, Shop No; 01 Aslam Market, Baghdada, Mardan.
E-mail: ahmad_surgeon@yahoo.com, Cell: 0300-5721773

dibular body, whereas the condyle predominates in young children.¹¹Recent trends in the management of mandibular fractures are, firstly, intermaxillary fixation (IMF) alone by dental wiring, arch bars and Gunning splints. Secondly, IMF with osteosynthesis by transosseous wiring, circumferential wiring and external pin fixation. Thirdly, osteosynthesis without intermaxillary fixation by miniplates, non-compression plates, compression plates and lag screws.^{15, 16, 17}

The purpose of this study is to evaluate various epidemiological features of mandibular fractures, as the etiology of mandibular fractures is a direct reflection of the social status of the society and the level of education of the public. This study also highlights the measures to be taken in the prevention of mandibular fractures.

MATERIALS AND METHODS

This descriptive study had been carried out on 150 consecutive patients of any sex and age group presenting with the features of mandibular fractures at oral and maxillofacial unit, Khyber College of Dentistry, Peshawar from 1st Sep 2004 to 31st Dec 2005.

With the consent of the patients, a detailed history was taken and thorough clinical examination was carried out. An Orthopantomogram (OPG) was the standard radiograph and if required was supplemented with postero-anterior (PA) view of face or any other imaging of face. Based on history, clinical examination and imaging studies the definitive diagnosis of mandibular fractures was established. The data concerning the study was obtained on preformed proforma and evaluated and analyzed by applying descriptive statistics.

RESULTS

The age of patients at the time of injury ranged from 2-78 years, with a mean age 24.92 ± 15.45 years. In most cases the patients were between 21-30 years ($n=43$; 28.6%). Only 15.3% of patients were less than 10 years of age, and 1.3% were more than 60 years of age (Table 1).

Regarding gender distribution male ($n=121$; 81%) pre-dominated the female ($n=29$; 19%) with male to female ratio 4.1:1 (Fig 1).

The most common cause of mandibular fractures was RTA ($n=64$; 42.6%) followed by accidental fall ($n=42$; 28%), while the least involved group was industrial accidents ($n=3$; 2%), (Table 2).

A total of 171 fractures sustained by 150 patients at different sites. The most common site of mandibular

TABLE 1: AGE DISTRIBUTION OF MANDIBULAR FRACTURES

Age groups (years)	No. of patients	%age
1-10	23	15.3
11-20	35	23.3
21-30	43	28.6
31-40	25	16.6
41-50	15	10
51-60	7	4.6
Over 60 years	2	1.3
Total	150	100

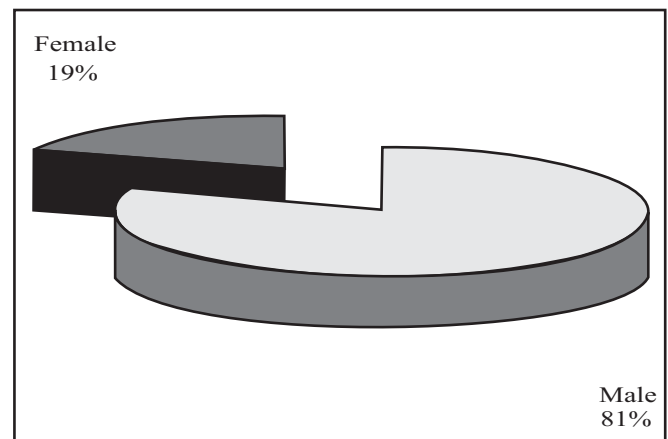


Fig 1: Gender Distribution of Mandibular Fractures

TABLE 2: DISTRIBUTION OF MANDIBULAR FRACTURES ACCORDING TO ETIOLOGY

Etiology	No. of patients	%age
RTA	64	42.6
Fall	42	28
FAI	25	16.6
Assault	7	4.6
Sport	5	3.3
Industrial	3	2
Other causes	4	2.6
Total	150	100.0

TABLE 3: DISTRIBUTION OF MANDIBULAR FRACTURES ACCORDING TO SITE

Site	No. of fractures	%age
Symphysis	19	11.1
Parasymphysis	47	27.4
Body	38	22.2
Angle	40	23.3
Ramus	4	2.3
Condyle	22	12.8
Coronoid	1	0.5
Total	171	100.0

fractures was parasymphysis (n= 47; 27.4 %) followed by angle (n=40; 23.3%) and body (n=38; 22.2%), (Table 3).

DISCUSSION

The results of epidemiological surveys on the causes and incidence of mandibular fractures tend to vary with geographic region, socioeconomic condition, cultural characteristics and era.¹⁸ In the present study the predominant age group having mandibular fractures was 21-30 years, these findings are consistence with the results of previous studies^{1,3,7,19,20,21,22} but contrast with the study of Karyouti SM²³ who reported that the age group 0-5 are mostly affected. The possible explanation for the higher frequency of fractures in age group 21-30 years is that the second and third decades of human life are the most active decades in life and thus people in these decades are vulnerable to trauma. These age groups show more activity in sports, fights, violent activities, industry and high speed transportation. In developing countries the old aged people are economically dependent on the young for their livelihood. The low frequencies of very young and old age groups are due to the low activities of these age groups.

The male to female ratio shows (4.1:1) that the fracture mandible is predominantly common in the male population in this part of the world. This finding is consistence with results of previous studies conducted all over the world^{1,6,8,10,12}. The relatively high number of male to female is due to the fact that male are engaged more in outdoor activities while the female are confined to indoor activities.

Previous epidemiological studies reported road traffic accident followed by fall as the leading cause of

mandibular fractures in developing countries^{1,7,8,12,24}. However, in developed countries, assaults and interpersonal violence are the leading etiological factors.^{3,4,6,13,25} This changing trend of etiology in western countries is attributed to the abuse of alcohol and use of illicit drugs in these societies.^{5,8,25} After the seat belt legislation in these countries there is a striking reduction of mandibular fractures resulting from RTA.⁵ The high number of mandibular fractures attributed to RTA in our country is due to lack of seat belt law obligation, over speeding, overloading, underage driving and poor conditions of roads and vehicles.^{1,8} Fairly high numbers of firearm injuries, recoded in this study, are due to the tribal quarrels and mode of life in North West Frontier Province of Pakistan, where possession of arms is a part of their cultural life.

The most common site of mandibular fracture was the parasymphysis (27.4%) followed by the angle. The correlation between the cause and the anatomic site of the mandible fracture had been discussed in the literature.^{25,26,27} The findings of these studies have given correlations between RTA and parasymphysis fractures, gunshot injuries with body fractures, fall from height with condylar fracture, whereas assault victims have higher frequency of angle and fewer parasymphyseal fractures.^{4,25,26,27,28} In this study parasymphysis pre-dominates other sites of the mandible and may be due to the fact that majority of these fractures are caused by road traffic accidents. The results of the present study correlate with the study of Abbas I et al¹ where parasymphysis was the common site of fracture accounting for 29.40%. Similar results are given by Renton TF et al (1996)²⁹ and Moreno JC et al (2000)³⁰ where parasymphysis predominated other sites of mandible.

CONCLUSION

The results of present study reveal that the majority of the patients were young adult male. The most common etiological factor was road traffic accident followed by fall, while the most commonly fractured site was the parasymphysis. In the light of this study the following recommendations are given;

- 1 To reduce the incidence of road traffic accidents, the laws regarding the precautions like seat belts, speed limits and traffic rules must be strictly enforced.

2 An awareness campaign to educate the public especially the drivers about the importance of restraints and protective measures in motor vehicles should be started. 3 Education of parents about the consequences of fall in children will reduce the incidence of injury in pediatric population. 4 Further research work is needed on a large population.

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