

PATTERN OF MANDIBULAR FRACTURES RESULTING FROM FALL

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ABSTRACT

Fall is the third commonest cause of mandibular fracture throughout the world while in Pakistan and India it is considered to be the second most common cause. Mandible fracture resulting from fall is of great concern particularly in children because it has been found that in children majority of cases of joint fracture has resulted from fall, and found to have temporomandibular joint (TMJ) ankylosis.

The purpose of this study was to evaluate the pattern of mandibular fractures resulting from fall. This will help in the prevention of subsequent complications particularly in children like TMJ ankylosis and aesthetic problems.

This is a descriptive (cross sectional) study which was carried out on 60 patients presenting with mandibular fractures resulting from fall to the Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar, Khyber Pakhtunkhwa Province of Pakistan from 4th April 2009 to 3rd October 2009. Each patient was thoroughly examined both clinically and radiologically for the site of mandible fracture. The age, gender and site distribution of patients were determined.

Majority of the fall injury patients presenting with mandibular fractures were in the 1st decade of life followed by 2nd and 6th decade. In the first three decades of life, males were predominantly involved while the 5th and 6th decade was dominated by female patients with overall male preponderance. The most common pattern of mandibular fracture resulting from fall was combination bony trauma (i.e., more than one mandibular fracture site) and the para-symphysis and condyle were the most frequent mandibular fracture sites both in combination and isolation.

Key Words: Mandibular fracture, fall, mandibular trauma in children.

INTRODUCTION

Facial injuries were common since time immemorial¹. Facial trauma is one of the major cause of mortality and morbidity all over the world.² It not only effects function but also produces serious psychological and esthetic problems.³ The incidence of maxillofacial injuries varies with age, period of time, geographic conditions,

socioeconomic differences, culture, traffic volume and preventive measures taken in different countries.⁴ Maxillofacial trauma is a frequent occurrence in Pakistan and is associated with a high incidence of mandibular fractures.²

Mandible is the only mobile bone of the facial skeleton and there is significant increase in mandibular fractures in recent years.⁵ Mandible fractures more frequently as compared to other facial bones, even though it is considered the strongest and most rigid bone in the facial skeleton.^{5,6} Mandible is the second most common facial bone to be fractured, while it is the tenth most frequently fractured bone in the whole body.⁷

Fall is a frequent cause of injury in man. The frequency of fall related facial fractures have been

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reported as ranging from 9% to 25%.⁸ Fall is among the three commonest causes of mandibular fracture throughout the world^{9,10} while in Pakistan and India it is considered to be the second most common cause.^{1,11,12} The other etiological factors of mandibular fractures are road traffic accidents (RTA), firearm injuries, assaults, sport injuries and industrial trauma.¹ The prevalence of mandible fracture resulting from fall is 20%.¹¹ Mandible fracture resulting from fall is of great concern particularly in children as compared to adults because in many cases joint fracture ultimately leads to TMJ ankylosis.¹³

The purpose of this study was to evaluate the frequency and pattern of mandibular fractures resulting from fall among different age groups. This will provide a circumstantial evidence for the education of patients to observe protective measures while climbing on altitudes.

METHODOLOGY

This was a descriptive (cross sectional) study, carried out on 60 patients suffering from mandibular fractures resulting from fall. It was conducted at the Oral and Maxillofacial Surgery unit of Khyber College of Dentistry, Peshawar. A comprehensive history and thorough clinical examination was carried out extra orally and intra orally. Conventional radiographs like orthopantomogram (OPG) and posteroanterior view of the face were taken of every patient to confirm the bony injury and site of fracture. While CT scan was carried out in selected cases of suspected intracapsular condylar fractures. With the informed consent of patient, the especially designed proforma was filled and signed by the patient. Mandible fractures resulting from causes

other than fall like road traffic accidents, assault, fire arm injury, sport injuries, industrial trauma and pathological conditions were excluded. The data so collected were analyzed by SPSS version 10 by using various descriptive statistical tools. Mean and standard deviation were calculated for quantitative variable like age while frequency and percentage were calculated for qualitative variables like gender and site of mandible fracture.

RESULTS

A total of 60 patients were recruited in the study. Among these, 40 patients (66.7%) were male while 20 patients (33.3%) were female. The male to female ratio was 2:1 (Table 1).

The age range of the patients at the time of presentation was 3-68 years with mean age of 19.28 years \pm 19.47 S.D. Majority of patients were in 1st and 2nd decade of life i.e., 51.7% and 21.7% respectively. Males were more frequently injured in their 1st and 2nd decade of life (35% and 20% respectively) while females were commonly injured in their 6th decade of life (8.3%). Detailed description is given in Table 1.

Mandible was fractured at multiple sites in most of the fall injured patients. In 34 patients (56.7%) the mandible was fractured at multiple sites while 26 patients (43.3%) suffered from isolated mandible fracture (Fig 1). Parasymphysis (34.6%) and condyle (30.8%) was the most common site when the mandible was fractured at a single site. The rest of the detail is given in Table 2. Amongst the multiple fractures, the most common combination of fracture site was parasymphysis with condyle (35.3%) followed by symphysis with condyle

TABLE 1: AGE AND GENDER DISTRIBUTION OF PATIENTS

Age in years	Frequency		Gender		Percent of total	
	Female		Male			
	Count	Percent	Count	Percent		
3-10	31	10	16.7%	21	35.0%	51.7%
11-20	13	1	1.7%	12	20.0%	21.7%
21-30	2	—	—	2	3.3%	3.3%
31-40	2	1	1.7%	1	1.7%	3.3%
41-50	4	3	5.0%	1	1.7%	6.7%
51-60	7	5	8.3%	2	3.3%	11.7%
61-68	1	—	—	1	1.7%	1.7%
Total	60	20	33.3%	40	66.7%	100.0%

Age Range = 3-68 years Mean Age = 19.28 years Standard Deviation = 19.47

TABLE 2: DISTRIBUTION OF ISOLATED FRACTURE SITE

Site of Fracture	Frequency	Percentage
Parasymphysis	9	34.6
Condyle	8	30.8
Body	5	19.2
Dentoalveolar	2	7.7
Symphysis	1	3.8
Angle	1	3.8
Total	26	100.0

TABLE 3: DISTRIBUTION OF MULTIPLE FRACTURE SITES

Fracture site combinations	Frequency	Percentage
Parasymphysis + Condyle	12	35.3%
Symphysis + Condyle	4	11.8%
Dentoalveolar + Condyle	4	11.8%
Parasymphysis + Angle	4	11.8%
Parasymphysis + Body	3	8.8%
Body + Condyle	2	5.9%
Angle + Condyle	1	2.9%
Symphysis + Parasymphysis	1	2.9%
Dentoalveolar + Parasymphysis	1	2.9%
Parasymphysis + Condyle + Ramus	1	2.9%
Dentoalveolar + Symphysis + Condyle	1	2.9%
Total	34	100.0

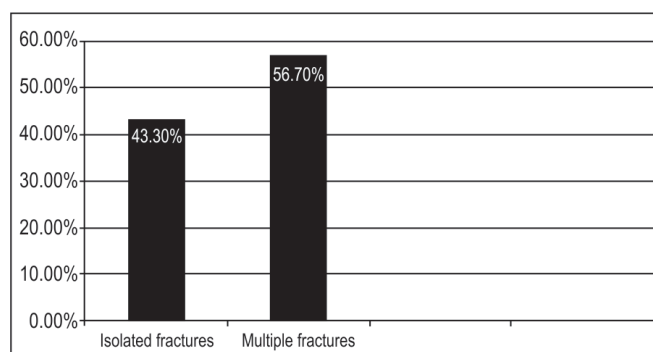


Fig 1: Frequency of bony trauma

(11.8%) respectively. The details of the site distribution are given in Table 3.

DISCUSSION

Mandibular fractures resulting from fall occur over a wide age group ranging from 3-68 years with mean age of 19.28 years. According to present study,

the most common age group involved was 1st decade (51.7%) followed by 2nd and 6th decade of life (21.7% and 11.7%). These findings are in agreement with the rest of the studies done world wide.^{14,15,16,19} Accidental fall is the most common cause of facial trauma in children because of the fact that children have underdeveloped motor skills and coordination.¹⁶ On the other hand, with increasing age the risk of domestic accidents increases due to senile changes like sensory impairment, neuromuscular disorders, unstable gait, dementia, acute illness, postural hypotension and effects of various medications.¹⁷

King et al¹⁸ stated that older individuals suffered fall and subsequent injuries at a greater rate than expected which is not in accordance with the present study. The main reason for this is the difference in religious and social background of the population. In this part of the society, the elder people are kept under strict supervision in homes and being considered as a source of blessing as compared to western civilization where they are kept in old people homes and therefore they are prone to accidental falls.¹⁹

Majority of patients involved with mandibular fracture were males as compared to females with the male to female ratio of 2:1. These results are consistent with the previously published reviews.^{16,20} The main reason described in the literature for male predominance is that men are socially more active and therefore they are more predisposed to risk factors such as road accidents, falls, physical aggressions and sport activities.²¹ Moreover cultural background in this part of the region keeps the female population restricted to their homes, hence outnumber by males.⁴

In regard to gender, males in their 1st three decades of life while females in the 5th and 6th decades of life were commonly injured in the present study. The 4th decade showed an equal distribution. The findings that in young age, male group is predominant while in old age females constitute the group with the highest frequency of mandibular fracture resulting from fall correlates well with other studies carried out by Iida et al,⁸ Kumarswamy et al¹⁴ and Subhashraj et al¹⁷. The reason for preponderance of males with pediatric injury is that boys are generally more active and spend more time outdoor as compared to the girls which are usually confined to indoor activities.¹⁴ Iida et al⁸ showed in their study that a high proportion of older females were involved in accidental falls. The majority had fallen from standing height or less and often injured indoors. These findings suggest that there is a high risk

of fall among older females during daily life activities. One of the reasons for the increase of facial fractures in old age female group is attributed to their general ill health and diseases like osteoporosis.

In the present study, the predominant fracture pattern seen was combination bony trauma (56.7%) as compared to isolated bony trauma (43.3%). This finding is in accordance with the study done by King.¹⁸ He stated that all patients with mandibular fractures should be suspected of having a second fracture site within the mandible and this holds especially true for symphyseal and parasymphyseal fractures.

Parasymphysis and condyle are the most frequent mandibular fracture sites both in combination n = 12 (35.3%) and in isolation (parasymphysis n = 9, condyle n = 8). These findings correspond to the previous reviews^{8,14,16,22} and reflect the direction of injury force on the anterior portion of the mandible. In such injury the impact is first dissipated to the condyle and then to the parasymphysis region.¹⁶

CONCLUSION

It was concluded from the study that the majority of victims were youngsters or older citizens and there was overall male predominance. Multiple fractures like parasymphyseal and condylar fractures were the most frequent pattern seen. Special precautionary measures should be adopted to prevent fall injuries in toddlers in order to avoid fall injuries.

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