FREQUENCY OF MANDIBULAR FRACTURES AT THE ANGLE AS A RESULT OF MAXILLOFACIAL TRAUMA

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ABSTRACT

The aim of this study was to determine the vulnerability of the angle of mandible to fracture in maxillofacial injuries. The etiological factors, distribution of age and gender of the patients with mandibular fracture were investigated.

750 patients were seen for maxillofacial trauma during the period 1991-97 at Khyber College of Dentistry, Peshawar. Out of 750, 546 suffered from mandibular fracture. 412 were males and 134 females. Regarding etiology of the fracture of the mandible road traffic accident (RTA) was the most common cause accounting 356 followed by fall 78,inter personal violence (IPV) 47,firearm injuries (FAI) 29, sports 23 and industrial injuries 13. Fracture of the body of mandible came out to be the frequent site (185 patients) suffered. Angle of the mandible was second most common site and accounted for 125 injuries. Other sites were symphysis (97), condyle (82), dentoalveolar process (38), ramus 16 while coronoid was the rare site (3) patients. Out of the 125 fractures cases at the angle 3rd molar were present in108 cases. Among the total fractures at the angle 102 were favorable while 23 were unfavorable.

Key words: *Maxillofacial trauma, Mandible fracture, angle.*

INTRODUCTION

The mandible occupies a very prominent and vulnerable position on the face since the projected chin is a favored target of adversary. The incidence of lower jaw fracture is twice as compared to mid facial fracture and second only to nasal fractures in frequency. Road traffic accidents, assaults, falls, sports events and pathological fracture are among the major causes[1]. It has been compared to an archery bow, which is strongest at its center and weakest at the end where it breaks often[2].

Anatomically mandible is one of the largest and strongest facial bones but there are some areas, which are physically weak and fracture easily due to trauma, ,i.e., angle and condyle[3]. Angle region is the commonest site of mandibular fracture [4,5].

Various statistical studies have emphasized that the angle of the mandible forms an area of weakness and is the common site at which fractures occur [6]. The higher prevalence is among the males with 4:1 ratio and peak age incidence to be in 20 to 29 years[7].

In a survey of maxillofacial injuries, it was discovered that twice as many fractures occurring at the angles of the mandible in dentate patients as in those that were edentulous[8]. The point, direction and force of an impact are factors, which influence the subsequent fracture of the mandible. Natural anatomic areas of weakness such as the presence of deeply buried teeth

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may modify the process. The angle of mandible is susceptible to trauma due to abrupt change in direction of trabeculae from horizontal to vertical and the cause of mandibular fractures would vary with geographic locations, physical activity, and predisposing weakness within the bone[9]. In addition to above, masticatory muscles also play role in fracture displacement of angle of mandible [2,10].Incompletely erupted mandibular third molars close to the inferior border of the mandible have high risk of angle fracture[11]

MATERIALS AND METHODS

The study was conducted in the department of oral and maxillofacial surgery at Khyber College of Dentistry, Peshawar during the period 1991-1997.750 patients who suffered maxillofacial trauma due to various causes were included. Out of these 546 patients with fracture of mandible were selected to determine the incidence of fracture at the angle of mandible along with age, sex and causes of trauma.

RESULTS

Out of 750 patients seen for maxillofacial trauma during the period1991-97, 546 were selected with mandibular fracture. Among them 412 were male and 134 females (Fig. 1). Patients with age ranged 21-30 suffered more and accounted for 46%. Regarding the etiology of the fracture of the mandible RTA was the most common cause for the fracture accounting 356 cases followed by fall 78,IPV 47,FAI 29,sports 23 and industrial cases accounted 13 patients (Fig. 2). Body of the mandible turned out to be the frequent site and 185 fractures were at this site. Angle of the mandible with 125 injuries was second most common site. Other sites were symphysis (97), condyle (82), dentoalveolar process (38), ramus (16) and coronoid was the rare site, which showed 3 patients only (Fig. 3). Out of the 125 fractures at the angle 108 cases had 3rd molar present in the line of fracture while in 17 cases there was no 3rd molar (Fig. 4). Among the total fractures at the angle 102 were favorable while 23 were unfavorable (Fig.5). Radiological picture of the fracture mandible angle has been shown in Fig; 6 and Fig; 7.

Age	No; of Patients	Percentage
12-20	162	29.67
21-30	252	46.15
31-40	58	10.62
41-50	41	7.51
51-60	33	6.05
	546	100

TABLE 1: AGE DISTRIBUTION AMONG PATIENTS SUFFERING FROM FRACTURE AT ANGLE OF MANDIBLE

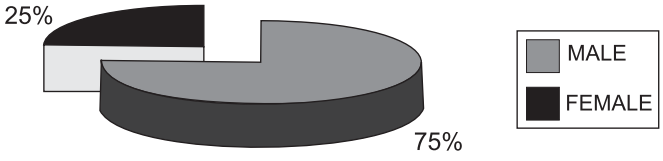

Fig. 1: Sex distribution in fracture mandible (angle)

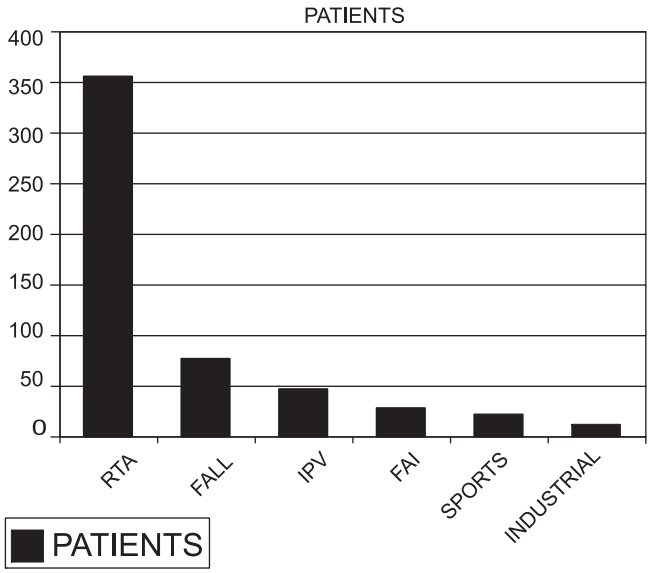

Fig. 2: Etiological factors fracture mandible.

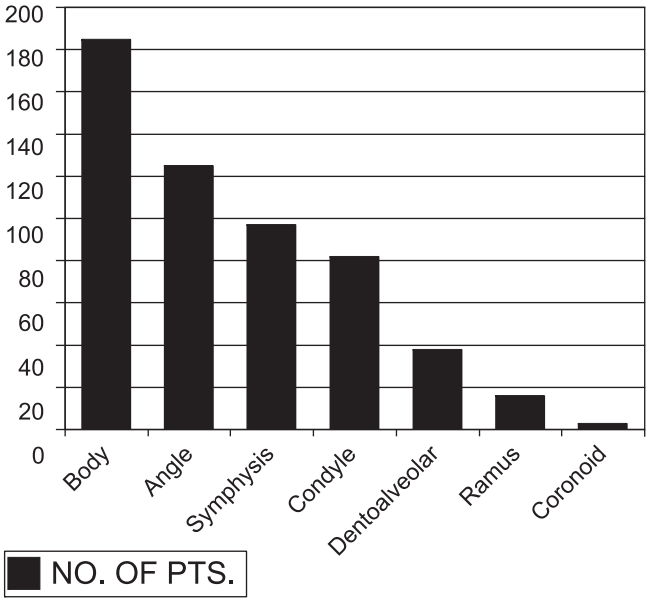

Fig. 3: Distribution of Sites of fracture mandible.

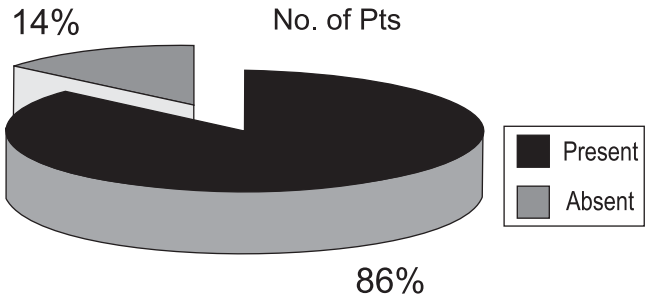

Fig. 4: 3rd Molar at the fracture site.

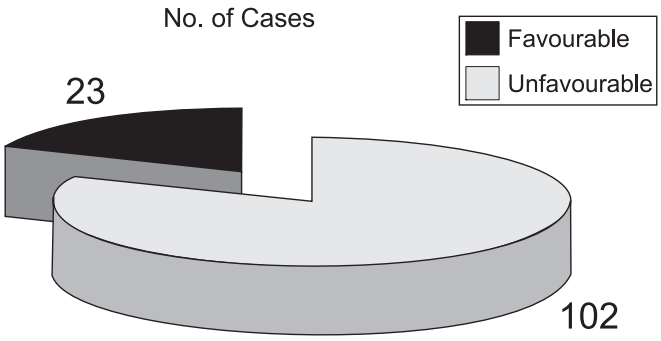

Fig. 5: Distribution of favorable and unfavorable fractures of mandible.

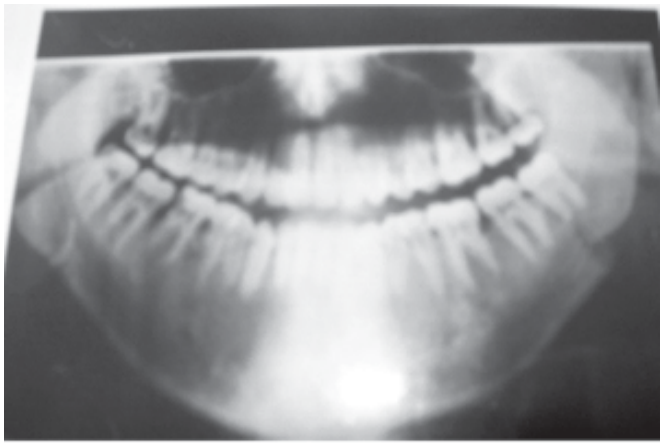

Fig. 6: OPG shows angle fracture having third molar

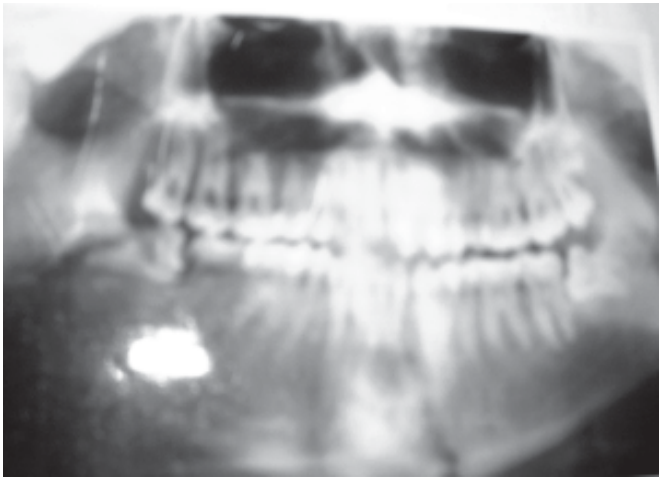

Fig. 7: OPG shows Right angle fracture having impacted third molar.

DISCUSSION

The causes of the mandibular fracture are influenced by socioeconomic factors and the way the people are transported in a given country. Some studies have reported that most facial fractures occur in road traffic accidents (RTA)[1,5,7];whereas other show that brawls is the most frequent cause[12]. In our study the major cause of facial injury is RTA. This is due to the increase in number of vehicles and bad roads in the areas of study. The drivers are usually illiterate and have no regard for speed and traffic laws. The relationship between the mandibular fractures with age and sex in our study is similar to the results reported by different investigators. They found that the mandibular fractures were most common in young adult males as compared to female. They also reported that 99.2% of the patients were males and more than 70% were of the age 30 or younger at the time of injury [13,14,15,16,17,18,19,20]. In our study this is highly prevalent in young males with age group 20-29 year with male to female ratio of 3:1 that coincides with their results. Regarding age the results by James et al and Ellis et al are same as ours. They reported the high incidence at the age of 30 years. Tanaka et al and Batanneh found high incidence in males than female with a ratio 3.2:1 that corresponds to that of ours 3:1[21]. They reported the high incidence in age group 30 years at the time of injury [13,15].The reason for domination young males in our society is due to the factors that males are more involved in earning to support their families than woman who do not move out of their houses and even the parents are also being supported by their young children. The movements of the parents become limited.

Many researchers have given their observations regarding the angle fracture as the most common site for fracture. The magnitude and direction of the impact force and anatomy of the site influence the site of the fracture[10, 22]. The joint between the thin ramus and the strong body of the mandible is a weak point making the Angle of the mandible vulnerable to trauma[23]. The deeply buried impacted third molar teeth as an impetus to the fracture at angle of the mandible[11]. Retzik et al did the experiment on the monkey mandible and compared the forces necessary to fracture the angle region where the third molar was unerupted with those

that caused a fracture where the tooth was erupted.[24] They illustrated that the presence of a lower third molar significantly weakened the angle region. Our studies also favor their study that is why the young men are more prone to angle fracture due the fact that in this age third molar are impacted, and prone to fracture. Another reason has been suggested in this regard is that the angle of the mandible is susceptible to trauma due to abrupt change in direction of trabeculae from horizontal to vertical[9]. Sinn et al reported that the mandibular angle is predisposed to fracture due to bilateral impacted 3rd molars and the point of application of blow. The impacted or partially submerged tooth decreases the amount of osseous support and weakens the mandible so that fractures commonly occur along the socket of the impacted tooth and extend inferiorly through the mandibular angle. He also described the mandibular angle the most commonly fractured area of the mandible and also noted the angle involved in 35 percent of the total injuries leading to fracture of the mandible in the review of 137 cases at Park Land Memorial Hospital [11],[25]. Wolujeweiz study shows same results that are similar by our study[6]

CONCLUSION AND RECOMMENDATIONS

Mandibular fracture is very common among maxillofacial injuries. The major cause is road traffic accident. Angle of the mandible is the most common area prone to fracture. As our study and other researches show deeply buried third molars make the angle more vulnerable to fractures. To avoid such risks the following recommendations are given.

Traffic regulation including over speeding must be enforced. Quality of roads should be improved. Third molar assessment at the early age, i.e., 17-25 year must be made a routine in dental practice like in developed countries and its early extraction may be encouraged.

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