

Mandibular Fractures: A 10 Years Retrospective Study

B. C. Sikkerimath¹, Girish V. Chour¹ and Anu Jose^{1*}

¹Department of Oral and Maxillofacial Surgery, PMNM Dental College and Hospital, Bagalkot, Karnataka, India.

Authors' contributions

This work was carried out in collaboration among all authors. Author BCS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors GVC and AJ managed the analyses of the study. Author AJ managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Purpose: The purpose of the study is to evaluate changing trends in mandibular fractures over the last 10 year period. Mandible the largest and strongest bone is the second most commonly involved bone in trauma. Also there is association between etiology and site of fracture. With the advent of high speed machineries and well developed roads, multiple fractures become more prevalent. Also there is association between the multiple fracture sites. This study helps to evaluate common fracture site, age and sex prevalence, etiology etc.

Methods: A retrospective analysis of patients operated for maxillofacial trauma over a period of last 10 years was done. Detailed information regarding their age, sex, etiology, site of fracture etc are collected and analysed.

Results: Most commonly affected are males of age 21 to 30 years. Parasymphysis is the most commonly involved single site and in multiple fracture, most common combination is parasymphysis and condyle.

Conclusion: Epidemiological studies are important to know the prevalence, to identify particular etiology and to formulate ideal preventive measures. Also multiple fractures are becoming more prevalent, so it is important for the clinician to do thorough examination not to miss out multiple findings and to provide appropriate care.

*Corresponding author: Email: josejo100@gmail.com;

Keywords: Mandibular fracture; epidemiology; parasymphysis fracture; condylar fracture.

1. INTRODUCTION

Mandible is the only movable cranial bone and is the largest & strongest facial bone. It is the second most commonly involved bone in maxillofacial trauma after nasal bone [1]. Mandible is an integral part, both functionally and aesthetically. Its role in maintaining health, nutrition and psychological well being can never be disregarded.

In the modern era, there is a dramatic change in the pattern of maxillofacial trauma with the introduction of high efficiency machines, high speed motor vehicles etc. Multiple fractures are becoming more common these days due to the high impact produced by the same. Thus it is important to evaluate the changing trends in the pattern of fractures for diagnosing them appropriately and to approach them in the most precise manner.

In this article, our aim is to evaluate the age, gender, side & site distribution, etiology and common patterns of the mandibular fractures treated in our institution over the last ten years.

2. MATERIALS AND METHODS

A systematic retrospective analysis of all patients who had undergone surgery for maxillofacial trauma over the past ten years in our department of oral and maxillofacial surgery was included in this study.

Detailed information consisting of age, sex, socioeconomic status, chief complaint, history of present illness, past medical history, etiology & associated injuries were collected and analysed. Also radiographs were analysed to rule out multiple fractures and to confirm the clinical diagnosis.

The data collected was analysed to determine the prevalence of mandibular fracture with respect to particular age group, sex, etiology, commonest fracture site etc.

3. RESULTS

A total number of 305 patients with 480 fractures of mandible were analysed from 1st Jan 2009 to 31st Dec 2019.

3.1 Age Predilection

The age range of the patients included in the study is 2–74 years. The most commonly affected age group is between 21 and 30 years.

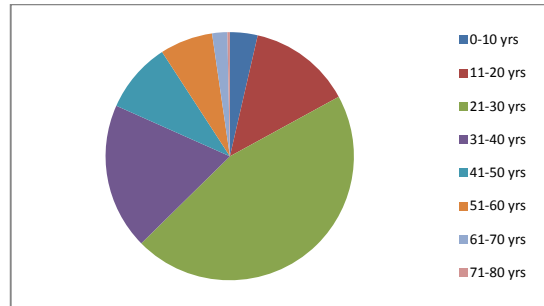


Fig. 1. Age predilection

3.2 Sex Predilection

Among 305 patients, 267 (87.54%) were male patients and 38 (12.45%) female patients.

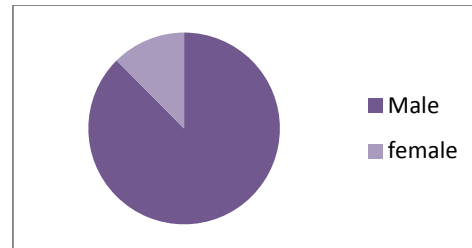


Fig. 2. Sex predilection

In males, peak age group is 21-30 years followed by 31-40 years.

In females, peak age group is 21 to 30 years followed by 11 to 20 years.

3.3 Etiology

Road traffic accident (RTA) was the most common etiology (81.6%) followed by self-fall (10.05%), assault (5.3%), occupational injury (2.05%), and sports-related injury (1%).

3.4 Site Predilection

A total of 305 cases with 480 fractures in mandible were analysed. From which, the most common was parasymphysis fracture which account for 42.70% of cases followed by condylar fracture (20.83%). The least common

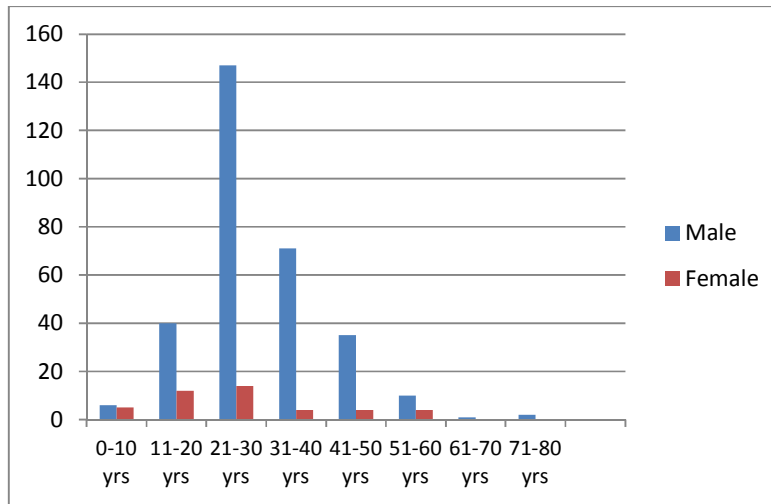


Fig. 3. Relation of gender of patients with age group

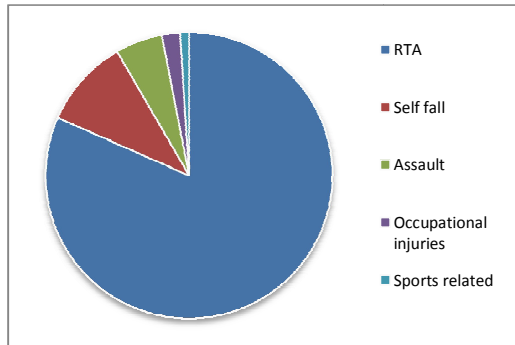


Fig. 4. Etiology

Most common combination is that of parasymphysis fracture with condylar fracture followed by parasymphysis and angle fracture.

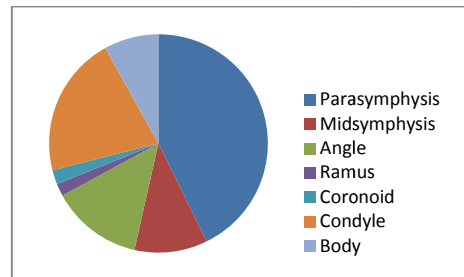


Fig. 5. Site predilection

fracture noted was ramal fracture (1.87%) and coronoid process fracture (2.08%). Other sites like midsymphysis fracture accounts for 10.83% of cases, angle 13.54% of cases, body 8.12% of cases.

Parasymphysis fracture of the left side was highest. Also the occurrence of bilateral fractures are high in condylar region of mandible. Coronoid fractures were the least followed by ramus fractures.

3.5 Single V/S Multiple Fractures

Multiple fractures (54.75%) are more common than single fractures(45.24%).

Isolated parasymphysis fractures are most common followed by midsymphysis fracture and angle fractures. Least common single fractures are ramal and coronoid process fracture.

4. DISCUSSION

Mandible is the strongest facial bone and is second most commonly involved bone in maxillofacial trauma after nasal bone [2]. It accounts for 15.5-59% of all facial bone fractures [3]. Most common age group affected with mandibular fractures is 21-30 years with male preponderance and the most common cause detected is road traffic accidents [4,5]. Reckless and impatient driving, driving under the influence of alcohol, failure to wear helmets, and poor road maintenance include some of the attributing factors [6,7]. There is variability in the pattern of mandibular fractures resulting from different causes of injury, such as road traffic accidents (RTAs), assaults and falls [8].

Parasymphysis is the most common site involved [9,7]. This is consistent with the report of

Adi et al. [10]. In multiple fractures, we found parasymphysis and condyle as the most common combination which correlates with the study of Natu et al. [11] and which is contrary to Dongas and Hall [12] in which parasymphysis and angle is the most common combination. It is also contrary to the study by Ogundare et al. [13] who reported most common combination as body and angle.

inadequately maintained roads, inadequate enforcement of road safety regulation and speed limit, reluctance to use helmets, use of illicit drugs, decreasing tolerance, and increasing personal competitions among young adults provide positive explanation towards this [14]. Multiple fractures also become more common with the introduction of high speed motor vehicles.

In the recent decade it is noted that the incidence of mandibular fracture has increased. Poor traffic sense of the drivers and pedestrians,

Multiple modalities of treatment are prevalent to manage mandibular fractures. It include conservative methods with soft diet,

Table 1. Association between site and side

	Bilateral	Left	Midline	Right	Total
Symphysis			54		54
Parasymphysis	9	101		85	204
Body	2	14		21	39
Angle	2	33		30	67
Ramus		3		6	9
Condyle	20	30		30	100
Coronoid		5		2	7

Table 2. Single fractures

Site	No. of fractures
Midsymphysis	30
Parasymphysis	98
Body	13
Angle	21
Ramus	1
Condyle	5
Coronoid	1

Table 3. Multiple fractures

Site	Number of cases
Angle, Condyle	1
Body, Angle	7
Body, Condyle	8
Body, Ramus	2
Coronoid, Angle	2
Coronoid, Midsymphysis	1
Midsymphysis, Angle	4
Midsymphysis, Condyle	16
Midsymphysis, Ramus, Condyle	1
Parasymphysis, Angle	23
Parasymphysis, Angle, Condyle	1
Parasymphysis, Body	4
Parasymphysis, body, Condyle	3
Parasymphysis, Condyle	43
Parasymphysis, Coronoid	1
Parasymphysis, Midsymphysis	3
Parasymphysis, Ramus	2

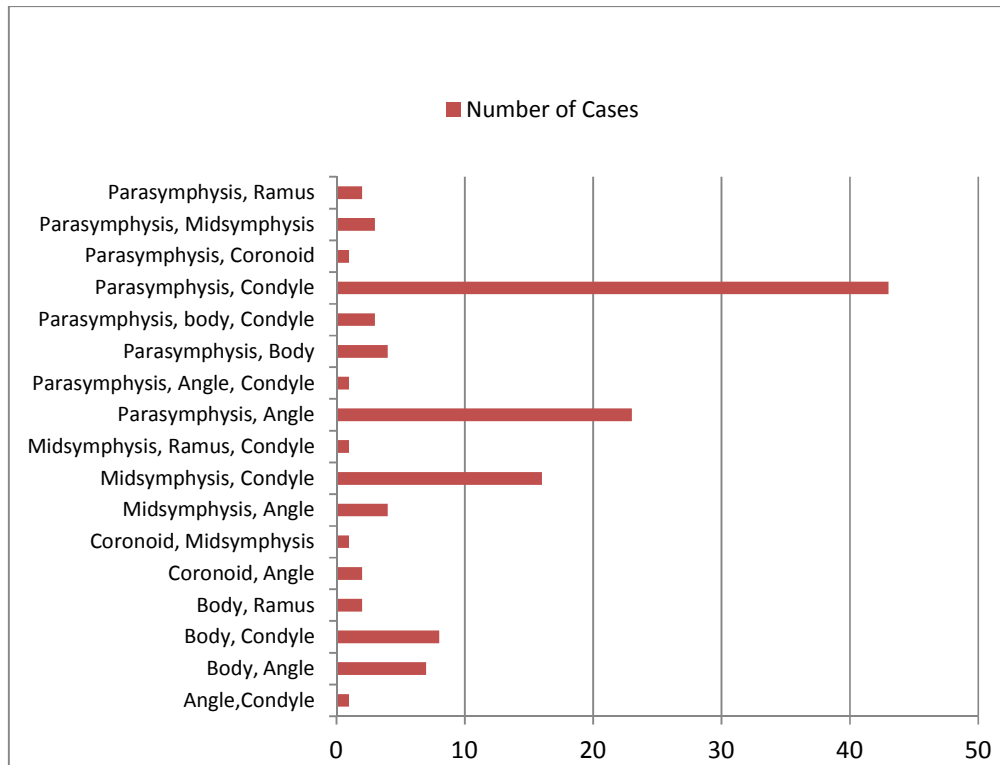


Fig. 6. Number of cases

intermaxillary fixation, open reduction and internal fixation, closed treatment with external fixation and treatment with Kirschner wire [15]. Most commonly used is open reduction and internal fixation in which the fractured fragment is anatomically reduced and fixed. Closed reduction treatment is done particularly in cases of condylar fractures and for medically compromised patients.

5. CONCLUSION

Road traffic accident is the leading cause of mandibular fractures especially in rural areas followed by assaults. Males are more commonly affected. Reckless driving and substance abuse (alcohol) are the main contributing factors. The most common site affected is parasympphysis. Also multiple fractures are more predominant than single fractures and the parasympphysis-subcondylar region is the most common combination. High impact forces produce multiple fractures combination of three or more sites, which is now evident in the recent fracture patterns. So it is important for the surgeon to do through clinical as well as radiological examination to rule out all the findings.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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