

ORIGINAL RESEARCH ARTICLE

ANALYSIS OF CASES OF MANDIBULAR FRACTURES AT A TERTIARY CARE CENTER IN WESTERN RAJASTHAN

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ABSTRACT

Objective: To determine the pattern of presentation and management outcomes of mandibular fractures in our patients.

Study Design: Retrospective Descriptive study

Place and Duration: This study was conducted in the Department of Dental Surgery, of the Government Medical College of western Rajasthan from May 2013 to December 2016.

Materials and Methods: Adult patients (chronological age >12yrs) of either sex having only mandibular fractures were included. In all the cases, Maxillo-Mandibular Fixation (MMF) was achieved using Stainless steel Intermaxillary fixation screws (IMF Screws) and 26 gauge stainless steel wires. These patients were operated either under general anaesthesia with nasal intubation or local anaesthesia (lignocaine hydrochloride 2% with 1: 100000adrenalin).

RESULTS:

In N=157 patients (114 in males and 43 in females), 293 fractures were noted. Majority of the patients were males (72.61%) with a male to female ratio of 2.65:1. The age ranged from 13-79 years (Mean 32.4 years in males and 36.3 years in females). Road traffic accidents (67.9%) were the most common cause. Parasymphysial fractures (36.9%) were most frequently found followed by the fractures of subcondyle region (25.3%). Various methods of fixation employed included Maxillo-Mandibular Fixation (n=17), miniplates plates (n=135), reconstruction plate (n=4)& Lag screws(n=1). The most frequent complication observed in these patients was the pain ± lower lip paresthesia.

CONCLUSION:

Early intervention including reduction and fixation of mandibular fractures definitely decreases the morbidity and healing period. Open reduction and internal fixation of mandibular fractures should be undertaken wherever possible.

Key Words: Mandibular fractures; Maxillomandibular fixation; Maxillofacial trauma

Analysis of Cases of Mandibular Fractures at a Tertiary care center in Western Rajasthan

INTRODUCTION

Contemporary management of mandibular fractures have a lower infection rates, use of rigid fixation over fractured segments results in improved bony union and decreased need of maxillomandibular fixation, thus leading to decrease in overall morbidity [1]

The mandible is the second most commonly fractured part of the maxillofacial skeleton due to its position and prominence. The treatment is usually needed because of the potential functional deformities. [2, 3]

The location and pattern of the fractures are determined by the mechanism of injury and the direction of the vector of the force. In addition to this, the patient's age, the presence of teeth, and the physical properties of the causing agent also have a direct effect on the characteristics of the resulting injury [4]

The pattern of the mandibular fractures has been reported in literature from several countries and these vary from country to country and it is clear that some of the variations can be attributed to social, cultural and environmental factors.[5-7]

Very few published studies are available on the patterns of mandibular fractures in various regions of India although the variables associated with mandibular fractures are enormous. The purpose of this study was to evaluate the demographic details of the mandibular fractures, age and sex related etiology, types of the fractures and various treatment options most suited within given resources due to constraints of poor socioeconomic standard while providing state of the art postsurgical results to bulk of these patients for these fractures in Western part of Rajasthan comprising of 5 largest districts of the state.

MATERIALS AND METHODS

This retrospective descriptive study was conducted in the Department of Dental Surgery Dr SN Medical College Jodhpur Rajasthan from May 2013 to December 2016. Adult patients of either sex having mandibular fractures were included in this study. Age, sex, etiology, associated injuries anatomic classification of fractures and treatment modalities undertaken in these patients were recorded. Almost all the patients reported initially in casualty and trauma department. The management was started with the maintenance of airway, control of bleeding, antibiotic coverage, analgesics and head elevation.

Direct wiring was applied to achieve immobilization prior to the definitive treatment in majority of the case barring a few cases of complex mandibular fractures or where patient

was initially intubated as part of life saving measures or preliminary resuscitation especially in case of head injuries with **GCS <8-9** with multiple mandibular fractures.. Regular mouth washes and liquid/semi solid diet were prescribed .In all cases, plain Radiographs, OPG (Orthopantomogram), or CT scan were obtained. Majority of the patients were operated as planned surgical cases. These patients were operated under general anaesthesia with nasal intubation or local anaesthesia (lignocaine hydrochloride 2% with; 100000adrenalin) by the same operator.

RESULTS: In **N= 157** patients (114 in males and 43 in females), 293 fractures were observed.

Majority of the patients were males (72.61%) with a predominant male to female ratio of 2.65:1 **Chart I**

The chronologic age ranged from 13-79 years (Mean 32.4 years in males and 36.3 years in females) **Table I**

Road traffic accidents (67.9%) were the most common cause followed by assaults and domestic incidents such as falls. **Table II**

Parasymphysial fractures (36.9%) were most frequently observed followed by the fractures of subcondyle region (25.3%), body (15%) angle (13%) Ramus (8%) and coronoid (1%). **Chart II**

FIGURE I :COMMON FRACTURE SITES IN MANDIBLE

The various associated injuries found are shown in **table III**. Head injury being in higher side.

In 69.5% of the patients, intra-oral surgical approaches were used and only in 19.68% patients, extraoral approach were used including cases of existing extraoral lacerations and subcondylar fractures .10.9% patients underwent non surgical approach(IMF Only) .100% patients Intermaxillary fixation screws(Cortical) were used for Maxillomandibular fixation. Various methods of fixation employed were Maxillo-Mandibular Fixation (n=17), miniplates plates (n=135), reconstruction plate (n=4)& lag screws (n=1). (**Table IV**).

There were very few complications.2.8%patients had palpable plates. There was plate infection in 2 cases and breakage of the plates in none. 15.5% patients had lower lip paraesthesia which was attributed to the initial injury.

DISCUSSION

Mandibular fractures account for 35%-45% of pan facial fractures.[8] The incidence of mandibular fractures varies with age, region, a period of time, climatic conditions, socio-economic differences, traffic volume, road traffic accidents and preventive measures adopted by government and society in different countries. [9-11]

Mandibular fractures are not uncommon in Rajasthan in general and western Rajasthan in particular. Still being a male dominant region, the males work outside and hence are more susceptible to accidents. This observation is in conformity with what is reported by other studies. [7]

The most common etiology of mandibular fractures was road traffic accidents, which is similar to studies carried out various part of India . Accidents reporting in our set up are due to socio-economic conditions and violations of traffic rules and due to the alcoholic intoxication as reported in various developing regions [11,16] but in contrast to the observations in other regions (developed countries) Interpersonal violence is the most common cause for mandibular fractures in North-American countries and Europe[2,19]

Our finding of the highest frequency of mandibular fractures in the 20-39 years age group are in agreement with that reported from other countries.[7,13] Similarly, mandibular fractures have been reported to be more common in males. In a study by Sakr et al[6] carried out in Egypt also revealed that male to female ratio was 3.6:1 and most fractures were sustained by men in the age group 21-40 years .

Majority of the patients in present study had the associated injuries. General surgeon and orthopedician managed chest and limb injuries whereas Head injuries were managed by Neurosurgeons of the institute. Intra-oral approach for reduction was preferred leaving no residual facial scar. Most of the studies carried out do not mention the route of approach (intra-oral or external). Though a few have mentioned [20] We used, intra-oral surgical approaches in 69.5% of the patients and only in 19.68% patients, extraoral approach were used including cases of existing extraoral lacerations and subcondylar fractures. 10.9% patients underwent non-surgical approach (IMF Only). This approach were used for only undisplaced mandibular fractures or when patient did not gave consent for Surgery . We used maxillomandibular fixation (MMF) in only 10.9% of the fractures (2.3% condylar/subcondylar, 0.6% ramus, 6.8% parasymphyseal, 0.6% angle). Open reduction and internal fixation were done by using lag screws (n=1)(0.6%), mini-plates & reconstruction plates made of medical grade Titanium alloy . MMF was also done in these patients but the duration of MMF was shorter as compared to the MMF alone (1-2 weeks Vs 6-8 weeks).

This shorter duration resulted in early mobilization of the jaws. Furthermore, we used orthodontic yellow elastic rubber bands for 1-2 weeks in some patients to continue active mouth opening exercises to avoid any postoperative temporomandibular ankylosis(Subcondylar fractures). The complications were few, mostly attributed to the initial injury, including postoperative pain (13.9%),mal-occlusion (1.8%). In two cases, infection of plates(periimplantitis) occurred secondary to poor post-operative oral hygiene which were removed surgically. Plates were palpable in 4 cases. In 15.5% patients, lower lip paresthesia/anesthesia was noted due to the fact that mental nerve was severed pre-operatively.However 76% of these case had positive tinnel sign observed within 2 months. Titanium implants were used in all cases Bio-absorbable plate system could not be used due to financial constraints.[21]

Being a developing region of the country, the socio-economic status of majority of the patients was low. As Patients came to a single medical college catering to 5 major districts, from far flung areas, these factors contributed to the irregular follow-up of these patients.

CONCLUSION

Very few published studies are available on the pattern of mandibular fractures in western Rajasthan(India) although the variables associated with mandibular fractures are enormous and common.Early intervention including reduction and stabilization(fixation) of mandibular fractures decreases the morbidity and healing period along with post traumatic complications. It is recommend that open reduction and internal fixation of mandibular fractures should be undertaken wherever possible even in developing countries as it leads to improvement of quality of life after trauma. Also strict road safety measures should be taken by authorities to decrease the incidence of mandibular fractures.

Conflict of interest: NONE

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FIGURE 1 : Common Fracture sites of Mandible

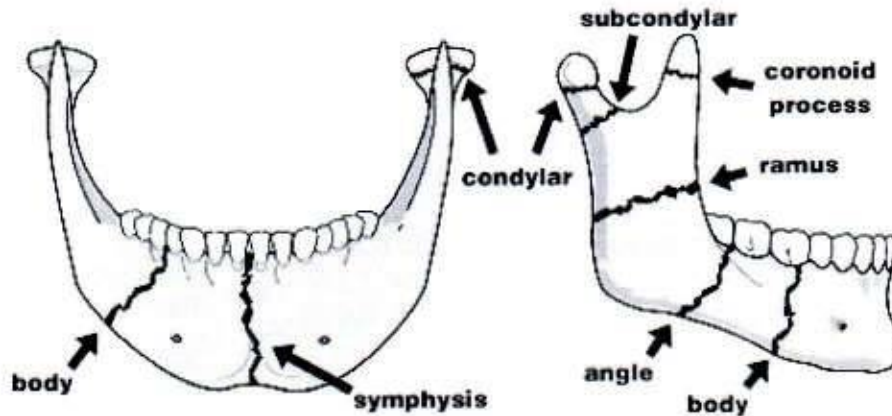


CHART 1: Gender Distribution

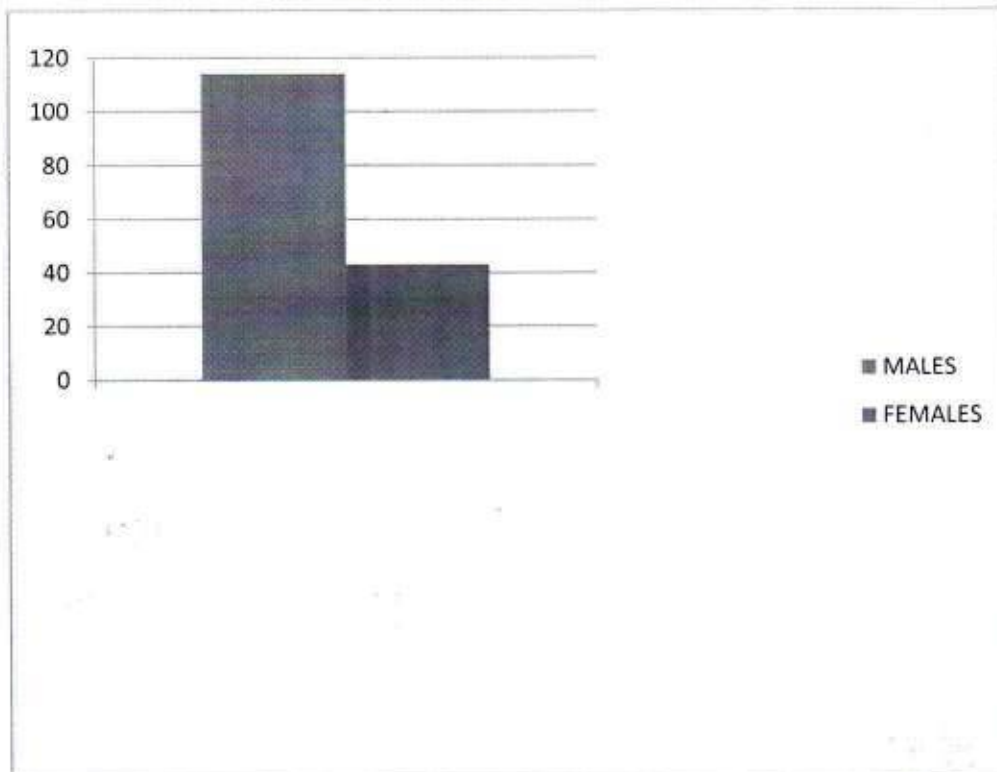


Table 1 AGE DISTRIBUTION

AGE	Males	Females
<20 Yrs	14	6
20-30Yrs	19	10
30-40 Yrs	49	22
40-50 Yrs	20	2
50-60 Yrs	8	3
60-70 Yrs	3	0
70-80 Yrs	1	0
80-90	0	0

Table 2: Causes of mandibular fractures (N=157)

CAUSE	Patients	%
Road Traffic Accidents	106	67.9
Assaults including domestic violence	22	14.00
Domestic Accidents(Fall etc)	13	8.20
Industrial Accidents	4	2.54
Sport related	8	5.80
Gunshot	2	1.27
Miscellaneous	2	1.27

REGIONS OF FRACTURE: CHART 2

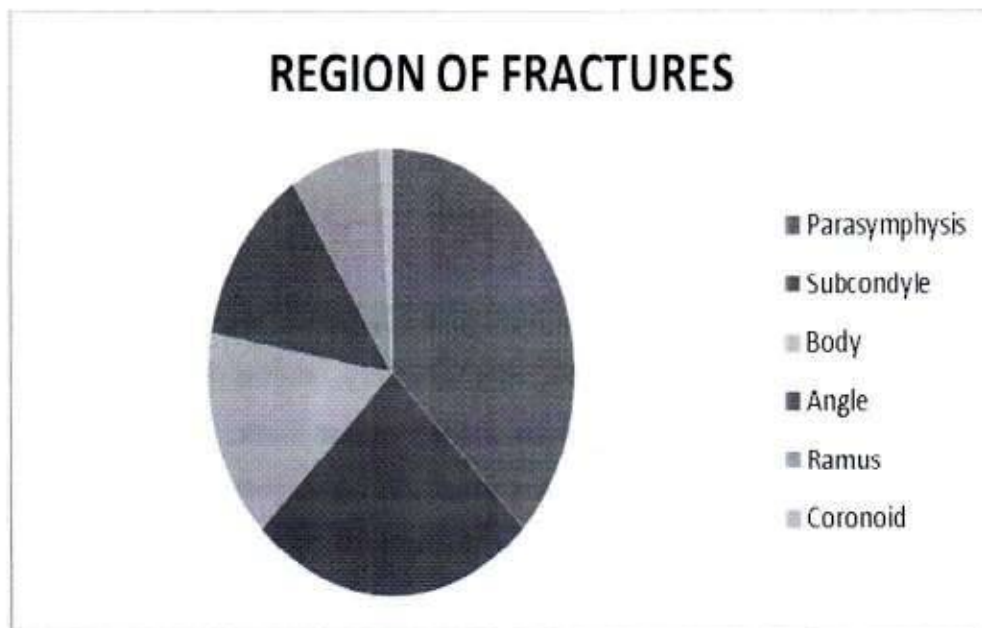


Table 3: Associated injuries observed among the patients (n=157)

Injuries	Patients	%
Facial lacerations	54	34.39
Limb injuries	19	12.01
Head injury	28	17.83
Chest/Abdomen injuries	02	01.27
Cervical injuries	01	00.63

Table 4: Methods of reduction and fixation

Operative Modality	Number	%
IMF Only	17	10.9
IMF WITH MINIPLATE	135	85.9
IMFWITH RECON PLATE	4	02.54
LAG SCREWS	1	00.63