

Analysis of Mandibular Fractures: A Retrospective Study

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ABSTRACT

Aim: The aim of the study was to analyse the incidence, etiology, and localization of mandibular fractures treated in a private Dental college of Bihar.

Materials and Methods: The medical records of 50 patients with mandibular fractures, treated between July 2014 to August 2015, were reviewed and the following data were analysed: age, gender, etiology, fracture area and treatment.

Results: The male: female ratio was 4: 1. The majority of patients (82%) were young people, aged 11-40 years. The main cause of mandibular fractures was Road traffic accidents (RTAs) (76%) followed by falls (12%) and assaults (8%). The most common fracture area was parasymphysis (36%) followed by mandibular angle (20%) and condylar process fractures (20%). Closed reduction was done in 24% of patients, open reduction and internal fixation was performed in 74% of cases, while 2% of them were treated conservatively.

Conclusions: The presented results are in line with other studies. The present study highlights the importance of strict

enforcement of traffic regulations, assessment and development of preventive schemes to reduce the incidence of Road traffic accidents.

Keywords: Maxillofacial Trauma, Road Traffic Accidents, Mandibular Fractures.

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INTRODUCTION

The Mandible is particularly more prone for maxillofacial trauma and fractures due to its unique mobility, shape and chin prominence in the facial skeleton. Mandibular fracture is the second most common facial injury after nasal bone fractures.¹ It is the 10th most fractured bone in the whole body² and accounts for 15.5% to 59% of all facial fractures.^{3,4} Surveys have shown that the etiology of mandibular fractures varies from one country to another and even within the same country depending on the prevailing socioeconomic, cultural and environmental factors.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.⁵ Purpose of our study was to evaluate the incidence, etiology and pattern of fractures of the Mandible over a retrospective period of three years from 2015–2017.

MATERIALS AND METHODS

This study is based on the data pertaining to patients who suffered trauma and attended a private Dental college of Bihar from July 2014 to August 2015. Data was collected from patients medical records, which are standardized. The variables analyzed included

age, sex, etiology of injury, anatomic site of fracture, associated maxillofacial trauma, and treatment. The cause of injury is divided into 1) Road traffic accidents, which included accidents involving automobiles, motorcycles, and bicycles; (2) falls (3) interpersonal violence, (4) assault; (5) sporting injuries; and (6) others.

RESULTS

In three years of retrospective study 50 patients had sustained mandibular fractures.

Mandibular Fractures Distribution by Gender

Of the total 50 patients; males accounted for 40 and females accounted for 10 resulting in male to female ratio of 4:1. (Table 1)

Mandibular Fractures Distribution by Age

Patients with mandibular fractures ranged from a 6 yr old girl to a 77yrs old male. The age group 21-30yrs revealed the highest incidence of mandibular fractures 38%, this was followed by age group 31-40yrs 18%. Age distribution in patients with fractures 2 occurred in first decade, 10 occurred in second, 22 in third, 7 in fourth, 4 in fifth, 3 in sixth, 1 in seventh and 1 in eighth. Of all injuries 81% occurred in first four decades of life. (Table 2)

Mandibular Fractures Distribution by Etiology

In this study the major cause of mandibular fractures was Road traffic accidents consisting of 38 of entire sample the second most

common cause was falls 6 followed by assault 4. Sports 1 and others 1. (Table 3)

Anatomical Distribution of Fractures

Of 50 patients who had mandibular fractures 33 patients this was the only facial bone involved, the other 17 were found to have associated with other fractures, in this study single parasymphysis fractures were the most common constituting 36% of the total followed by angle fractures accounted for 20% and condyle 20%, remainder of the fractures were distributed as follows dentoalveolar 10%, body fractures 10%, symphysis 4%. (Table 4)

Treatment

Of 50 patients, open reduction was performed on (37) fractures; closed reduction was the treatment in (12) cases and treatment was limited to observation and soft diet in (1) cases. (Table 5)

Table 1: Distribution of mandibular fractures by gender

S. No	Gender	n	%
1	M	40	80
2	F	10	20
	Total	50	100.00

Table 2: Distribution of mandibular fractures within each age group

S. No	Age Group (Years)	n	%
1	0 - 10	2	4
2	11 -20	10	20
3	21 - 30	22	44
4	31 - 40	7	14
5	41 - 50	4	8
6	51 - 60	3	6
7	61 - 70	1	2
8	71 - 80	1	2
	Total	50	100.00

Table 3: Distribution of mandibular fractures by etiology

S. No	Etiology	n	%
1	RTA	38	76
2	Fall	6	12
3	Assault	4	8
4	Sports	1	2
5	Others	1	2
	Total	50	100

Table 4: Distribution of mandibular fractures by anatomical location

S. No	Site	n	%
1	Symphysis	2	4
2	Para symphysis	18	36
3	Body	5	10
4	Angle	10	20
5	Condyle	10	20
6	Dentoalveolar	5	10
	Total	50	100

Table 5: Treatment of mandibular fractures

S. No	Treatment	n	%
1	ORIF	37	74
2	Closed Reduction	12	24
3	Conservative Management	1	2
	Total	50	100.00

DISCUSSION

Despite the fact that mandible is the largest and strongest facial bone, by virtue of its position and prominence on face, it is most commonly fractured when maxillofacial trauma has been sustained. The osteology of mandible, various muscle attachments and their influence on presence of developing or complete dentition, all play a notable role in producing inherent weaknesses. Therefore fractures are seen more frequently in certain isolated areas. This study has tabulated the percentage of occurrence of various mandibular fractures in a private Dental college of Bihar during the period of July 2014 to August 2015. The results will vary from study to study, geographic area, social conditions and time of study. The major variable responsible for different patterns in results is the etiology of fracture. A number of epidemiological studies report that RTAs are among the main etiological factors of facial trauma. In our study RTAs are the leading cause of mandibular fractures 76% (38) corresponds to the findings of different published work.⁵⁻¹¹ The reasons for this high frequency may be due to inadequate road safety awareness like failure to wear helmets, violation of speed limit and traffic rules, use of alcohol and inexperienced young drivers.

The gender distribution in our study revealed a male to female ratio 4:1, male predominance in our study agrees with the findings reported in literature.¹¹⁻¹⁶ Males are at greater risk due to their greater participation in high risk activities like driving vehicles, active social life that involve physical contact and alcohol consumption.

The majority of patients in our study were young since direct trauma is the most common cause of mandibular fractures 82% of the study were younger than 40yrs of age. The predominance of mandibular fractures in younger age group is consistent with findings of other studies¹⁷⁻²¹ with peak incidence in 21- 30 yrs age group.

In mandible the most predominant site was parasymphysis fracture 36.% in single fracture cases, similar findings were also reported in other studies.^{9,11,14,17,22-24} Most frequent combination of mandibular fracture was that of parasymphysis with condyle. This may be related to horizontally directed impact to the parasymphysis that led to the concentration of the tensile strain at the condylar neck resulting in condylar fracture., Present study illustrated that mandibular fractures can occur in combination with other injuries corresponds to the findings of other studies on mandibular fractures.

Treatment of Mandibular Fractures

Primary management of soft tissue injuries - namely suturing, pressure dressing, splinting of bony fragments - was done in the specialized department, while the final intervention in mandibular fracture with close or open reduction and follow up was performed in the Department of oral & maxillofacial surgery. Most of the patients with mandibular fractures 72.% were treated by open reduction and internal fixation (ORIF) with miniplates. Closed reduction was the treatment of choice in 28% of the patients, namely a non-surgical approach of intermaxillary fixation, application of eyelet wires or archbars or intermaxillary fixation screws and wire or elastics for four to six weeks. These patients had multiple fractures, in most cases in the condyle region.

Predictability of facial patterns is not necessarily consistent within all groups and hospital settings studied. Hospital location and community demographics play an important role in etiology and

distribution of facial trauma patterns. Despite many variables associated with the causes of mandibular fractures, motor vehicle accidents and assaults are undoubtedly the primary causes throughout the world. However it is important to note that local laws and socioeconomic conditions in developed versus developing countries create mixed results for case by case studies.

CONCLUSION

In our study motorcycle accidents were the major cause of mandible fractures. The possible reasons for high incidence in this geographic area especially among bikers may be due to lack of safety measures in the form of helmets, violation of traffic rules, excessive speed driving and improper road conditions. Preventive measures which include awareness programmes, use of helmets, lower speed limits, driver education programmes, strict enforcement of traffic rules, prohibition of driving under the influence of alcohol can significantly reduce the incidence of maxillofacial trauma in future.

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