

Research Article



Mandibular Fracture-Etiology, Site and Common Treatment Modality-A Pilot Study

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ABSTRACT

The objective of this study was to do a retrospective study on the etiology, site of Mandibular fracture and type of treatment done based on the case records from 5 trauma care centre in Salem city, Tamil Nadu, India. We identified around 140 cases of isolated mandibular fracture. The etiology of mandible fracture and the site of fracture may influence the treatment modality. By analysing the case records the etiology, age, gender, site of fracture and treatment done by the surgeons are highlighted. Mandibular fracture data were collected from 5 hospitals in Salem city, during the past 5 years (2008-2013). Information included the etiology, age, gender, site of fracture and treatment done. The data yielded 140 mandibular fracture cases from 2008-2013. Based on retrospective analysis, results were obtained for etiology, age, gender, site of fracture and treatment done. Most injuries (92.86%) occurred due to road traffic accidents. Majority of the patients were between the age group 31-40 (37.14%). An overwhelming majority of patients were men (86.43%) with only 13.57% consisting of women. The anatomic distribution of fracture evaluated was Parasymphysis (28.57), angle (20%), symphysis (18.57%), condyle (15.71%) and body (17.41%). Epidemiological studies on mandibular fracture are useful to analyse the pattern of fracture and common treatment modality. Our study revealed major etiological factor for mandibular fractures is road traffic accident in Salem city. Moreover open reduction and internal fixation is common treatment modality. Both the findings give valuable information to Government agencies and health care professionals to plan future programs in the prevention of road traffic accidents and treatment.

Keywords: Mandibular fracture, etiology, parasymphysis.

INTRODUCTION

Mandible is the only mobile bone of the facial skeleton which plays an important role in mastication, speech and deglutition. Being a prominent bone of facial skeleton it is fractured most commonly among the maxillofacial bones.

Mandibular fracture may lead to wide range of morbidity including aesthetic and functional discrepancies.

The complexity of the mandibular injuries based on the anatomic site, functional limitations along with the mechanism of injury presents challenges even to the most experienced trauma surgeons¹.

Based on the above facts it is evident that categorising and then correlating the various mandibular injuries to etiology, site of fracture and treatment methods may give valuable information to the surgeon.

Investigators in several countries such as Jordan², Singapore³, New Zealand⁴, Denmark⁵, and Japan⁶ have found that road traffic accident is the most common cause while the investigators in Finland⁷, Scotland⁸ and Sweden⁹ have reported assault as the major cause.

The purpose of this pilot study is to retrospectively analyse the etiology, anatomical site and type of treatment done for isolated mandibular fracture.

MATERIALS AND METHODS

This study was conducted based on the records collected from five trauma care centre in Salem city.

The data were collected from the case sheets of isolated mandibular fracture patients treated during the year 2008-2013.

The information collected includes etiology, age, gender, site of fracture and treatment provided. The data were aggregated and analysed with Microsoft excel.

RESULTS

A retrospective study was done on the etiology, the site of mandible fracture and type of treatment done based on the case records from five trauma care centre in Salem city.

We identified around 140 cases of mandible fracture from 2008 -2013. Several subsets of data were subsequently identified in patients with mandibular fractures such as etiology, age, gender, site of fracture and treatment done.

Etiology

The most common cause of injury is road traffic accident for 130 cases (92.86%). Trauma resulting from assaults accounted for 10 cases (7.14%).



Table 1: Etiology of fracture

Etiology	Number of Patients	Percentage (%)
Road traffic accident	130	92.86
Assault	10	7.14

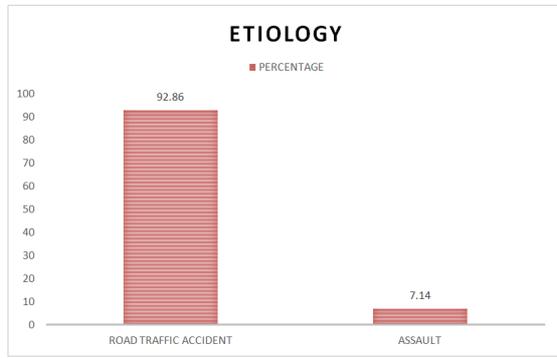


Figure 1: Etiology of Fracture

Age and Gender Distribution

The most prevalent age group is 31-40 followed by the age group 41-50. There was a male predominance of 86%. Of the 140 patients, 121 were men (86.43%) and 19 were women (13.57%).

Table 2: Age in decades

Decade	n	Percentage (%)
21-30	36	25.71
31-40	52	37.14
41-50	50	35.71
51-60	2	1.43

Table 3: Gender of patients

Gender	n	Percentage (%)
Male	121	86.43
Female	19	13.57

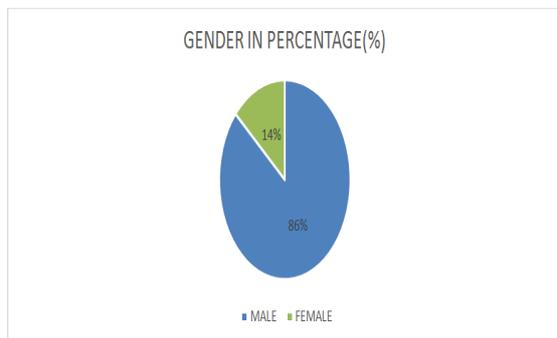


Figure 2: Gender of Patients

Site of Fracture

The locations of mandibular fractures in 140 patients are listed. The common site of fracture being the parasymphysis followed by angle of the mandible. The injury distribution by site was the parasymphysis

(28.57%), angle (20%), symphysis (18.57%), condyle (15.71%) and body (17.41%).

Table 4: Site of fracture

Site	n	Percentage (%)
Parasymphysis	40	28.57
Angle	28	20.00
Symphysis	26	18.57
Condyle	22	15.71
Body	24	17.41

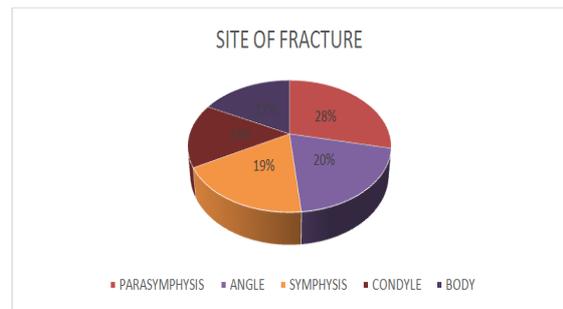


Figure 3: Number of Mandibular Fractures by Site

Treatment

Different types of treatment were administered for mandibular fractures. The majority of patients (122 cases) were treated by ORIF (87.14%). Only 12.86% of patients (18 cases) were treated by IMF.

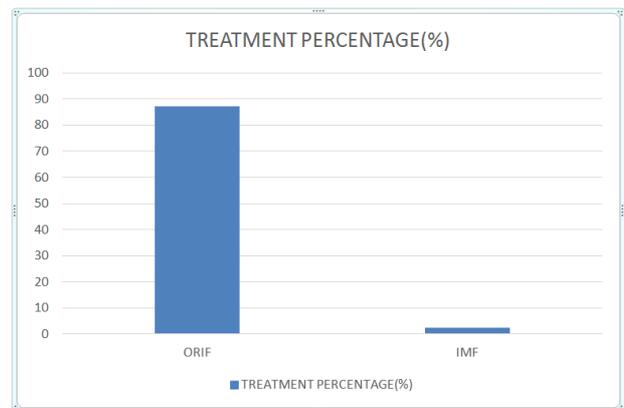


Figure 4: Treatment done for Mandibular Fracture

DISCUSSION

Mandibular fractures are common among the facial bone fractures. It can lead to significant early and late complications. The complex anatomy of the mandible which includes condyle and various muscle attachments defines the pattern of fracture.

Based on the type of fracture whether displaced or undisplaced the treatment modality varies. Apart from this age, gender and anatomical site contributes significantly to the treatment modality.

In our study the common etiological factor for mandibular fracture is road traffic accident which is around 92.86%.

These findings are consistent with the other studies reporting road traffic accident is the leading cause of mandibular fracture in developing countries¹⁰⁻¹³.

The percentage of fracture based on the age group is higher among 31-40 years (37.14%) followed by 35.71% in 41-50 years and 25.71% in 21-30 years of age.

This in contrast to most of the studies conducted by various authors who reported 21-30 years of age as the common age group for mandibular fracture^{2,6,8,14,&15} but M Czerwinski MD studied the epidemiology of mandibular fracture at a level 1 Canadian trauma centre and they reported over 50% of injuries were in 21-40 years age group which is consistent with our study reporting 63% in same age group¹⁶.

86% of the affected individuals were male and only 14% were females. This finding is consistent with various studies around the world^{10,17&18}.

The relatively high% of male population may be due to the fact that male are more engaged in driving vehicles.

The most common site of mandibular fracture in the descending order are parafymphysis (28.57%), angle of the mandible (20%), symphysis (18.5), body of the mandible (17.41%) and condyle (15.7%).

Ahmad khan BDS studied the pattern of mandibular fracture and found out the pattern of mandibular fracture and found out parasymphysis predominates other sites of mandible fracture and suggested it may be due to road traffic accidents¹⁹.

Similar results were given by Abbas¹⁰, Renton TF²⁰ and Moreno JC²¹.

Around 87% of the mandibular fractures were treated by open reduction and internal fixation and 13% of the fracture were treated with intermaxillary fixation. The higher percentage of surgical treatment may be attributed to the severity of the injury caused by road traffic accidents.

CONCLUSION

Epidemiological studies on mandibular fracture are useful to analyse the pattern of fracture and common treatment modality. Our study revealed major etiological factor for mandibular fractures is road traffic accident in Salem city, Tamil Nadu, India.

Moreover open reduction and internal fixation is common treatment modality. Both the findings give valuable information to Government agencies and health care professionals to plan future programs in the prevention of road traffic accident and treatment.

With our pilot study we suggest programs to improve the awareness about road traffic accidents and precautions like seat belts, speed limits and adhering to traffic rules.

Further research work with more number of patients population is recommended.

REFERENCES

1. Christopher Morris, DDS, MD, Nicolas P. Bebeau, DDS, MD Hans Brockhoff, DDS, MD, Rahul Tandon, DMD, and Paul Tiwana, DDS, MD, MS, Mandibular fractures: An analysis of the epidemiology and pattern of injury in 4143 fractures, 2015, 951.e1.
2. Bataineh AB. Etiology and incidence of maxillofacial fractures in the north of Jordan. *Oral Surg Oral Med Oral Pathol Oral Rehabil Radiol Endod*, 86(1), 1998, 31-35.
3. Tay AG, Yeow VK, Tan BK, Sng K, Huang MH, Foo CL. A review of mandibular fractures in craniomaxillofacial trauma center. *Ann Acad Med Singapore*, 28(4), 1999, 630-633.
4. Adams CD, Januszkiewicz JS, Judson J. Changing patterns of severe craniomaxillofacial trauma in Auckland over eight years. *Austr N Z J Surg*, 70(6), 2000, 401-404.
5. Marker P, Nielsen A, Bastian HL. Fractures of the mandibular condyle. Part 1: Patterns of distribution of types and causes of fractures in 348 patients. *Br J Oral Maxillofac Surg* 38(5), 2000, 417-421.
6. Tanaka N, Tomitsuka K, Shionoya K, Andou H, Kimijima Y, Tashiro T, and other. Aetiology of maxillofacial fracture. *Br J Oral Maxillofac Surg*, 32(1), 1994, 19-23.
7. Oikarinen K, Ignatius E, Kauppi H, Silvennoinen U. Mandibular fractures in Northern Finland in the 1980s — a 10-year study. *Br J Oral Maxillofac Surg*, 31(1), 1993, 23-27.
8. Adi M, Ogden GR, Chisholm DM. An analysis of mandibular fractures in Dundee, Scotland (1977 to 1985). *Br J Oral Maxillofac Surg*, 28(3), 1990, 194-199.
9. Strom C, Nordenram A, Fischer K. Jaw fractures in the county of Kopparberg and Stockholm 1979-1988. A retrospective comparative study of frequency and cause with special reference to assault. *Swed Dent J*, 15(6), 1991, 285-289.
10. Abbas I, Ali K, Mirza YB. Spectrum of mandibular fractures at a tertiary care dental hospital in Lahore. *J Ayub Med Coll Abbottabad* 15, 2003, 12-14.
11. Ellis E III, Moos KF, el-Attar A: Ten years of mandibular fractures: An analysis of 2,137 cases. *Oral Surg Oral Med Oral Pathol* 59, 120, 1985.
12. Fridrich KL, Pena-Velasco G, Olson RA: Changing trends with mandibular fractures: A review of 1,067 cases. *J Oral Maxillofac Surg* 50, 1992, 586.
13. Olson RA, Fonseca RJ, Zeitler DL: Fractures of the mandible: A review of 580 cases. *J Oral Maxillofac Surg*, 40, 1982, 23.
14. Ugboko VI, Odusanya SA, Fagade OO. Maxillofacial fractures in a semi-urban Nigerian teaching hospital. A review of 442 cases. *Int J Oral Maxillofac Surg*, 27(4), 1998, 286-289.
15. Voss R. The aetiology of jaw fractures in Norwegian patients. *J Maxillofac Surg*, 1982, 10(3), 146-148.
16. M Czerwinski MD1, WL Parker MD PhD FRCS FACS, A Chehade BSc DDS MSc, HB Williams MD FRCS FACS, Identification of mandibular fracture epidemiology in Canada: Enhancing injury prevention and patient evaluation, 16, 2008, 37-39.



17. Telfer MR, Jones GM, Shepherd JP. Trends in the aetiology of maxillofacial fractures in the United Kingdom (1977-1987). Br J Oral Maxillofac Surg, 29, 1991, 250-255.
18. Edward TJ, David DJ, Simpson DA, Abbott AA. Pattern of mandibular fractures in Adelaide, South Australia. Aust New Z J of Surg 64, 1994, 307-311.
19. Ahmad Khan, BDS, Abdus Salam, BDS, MDS, FCPS, Umar Khitab, BDS, MSC, Mohammad Tariq Khan, BDS, Pattern of Mandibular Fractures – A Study, 29, 2009, 222-223.
20. Renton TF, Wiesenfeld D. Mandibular fractures osteosynthesis: a comparison of three techniques. Br J Oral Maxillofac Surg, 34, 1996, 166-173.
21. Moreno JC, Fernandez A, Ortiz JA, Montalvo JJ. Complications rates associated with different treatments for mandibular fractures. J Oral Maxillofac Surg, 58, 2000, 273-280.

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