

Updates on the Aetiology, Pattern and Management of Mandibular Fractures at a Tertiary Hospital: A Three Year Retrospective Review

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Abstract

Objective: Mandibular fractures are one of the most frequent facial injuries treated in trauma centres, and its resultant functional and cosmetic deformities affecting the victims of such maxillo-facial injuries, has continued to generate a lot of discussion among researchers all over the world. The present study aims at describing the, etiology and pattern of mandibular fractures and its treatment at Lagos State University Teaching Hospital. **Methodology:** This is a retrospective study conducted at Lagos State university teaching Hospital Of medicine between January 2016 to December 2018. The current study included one hundred and eighteen (118) patients who were diagnosed with mandibular fractures. Data were collected regarding patient's age, gender, etiology, site of fracture, patterns and treatment modalities and analyzed using SPSS version 20. **Result:** A total of 142 cases of mandibular fractures were diagnosed in 118 patients. The patients' ages ranges between 2 to 83 years (Mean±SD=31.25±12.5). The majority of fractures occurred amongst the 21-30 years of age group (33.9%). There were 91males and 27 females with male to female ratio of 1:5.6. The major causes of fracture were RTA (Road Traffic Accidents) representing 79 (66.9%), followed by Assault 27 (22.9%), then Fall 8 (6.8%), and Sports injury respectively. The most injured sites were in decreasing order body 40 (28.2) followed by angle of mandible 26 (18.3), then parasymphysis 25 (17.6), condyle, symphysis, dentoalveolar, coronoid process and ramus of mandible (Figure-2). Majority (72.0%) of the cases were treated by closed reduction. **Conclusion:** This study revealed Road traffic accidents (RTA) as the major etiological factor of maxillo-facial injuries, with young adult males as the main victims. The most frequent technique used was closed reduction. It is therefore recommended that there should be improved enforcement of traffic laws on motorist particularly among the young population so as to curb reckless driving and over-speeding. There should also be provision of better roads and affordable health care by the various layers of government

Keywords: Updates, Mandibular fractures, Etiology, Open reduction and close reduction.

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INTRODUCTION

Mandibular fractures are one of the most frequent facial injuries treated in a trauma centre, accounting for 36 to 59% of all facial fractures [1, 2]. The Mandible, though the largest and the strongest facial bone still ranks the second most commonly fractured bone after nasal bone [3].

The aetiology of mandibular injuries varies from country to country and usually attributed to socio-economic, demographic, cultural, technological and environmental factors [4, 5]. Road traffic accident (RTA) has been reported as the leading aetiology in the developing nations, while incidence due to personal violence is more in developed countries [6, 7].

The epidemiology of maxillofacial injuries differs from one country to the other and are constantly evolving [8]. Hence the need for a constant appraisal of these fractures injuries in order to keep abreast with recent developments and changing pattern of their management [9].

Treatment of mandibular fractures has changed over the last few years, particularly in the Western societies, where there has been increase in the use of open reduction and internal fixation with mini plates. This form of treatment has reduced malocclusion and non-union. and has improved speech ,oral hygiene, decreased weight loss and increased the ability for the patients to return to work earlier [9, 10].

This study is aimed at identifying the aetiology and patterns of mandibular fractures and to compare these variables to previous studies done within and outside this region. This may in turn, help in health planning, governmental policy formulation and provision of preventive measures aimed at reducing maxillofacial injuries.

METHODOLOGY

A retrospective review of patients with craniofacial injuries who sustained mandibular fracture was conducted by the authors after securing clearance from the ethical committee. It was a three year study conducted at the Lagos State University Teaching Hospital (LASUTH) between January 2016 to December 2018. LASUTH is a major referral center for trauma cases in the region. The data contains all the patients who had been diagnosed and treated for mandibular fracture at the oral and maxillofacial department of the hospital. These patients had been referred from the Oral diagnosis and Accident and emergency units of the same hospital.

Relevant data were obtained by reviewing records from clinical case notes and radiological findings noting patient gender and age, aetiological factors, anatomic site of injury, and definite management with different treatment modalities.

Aetiological factors were classified into Road traffic accident, Assault, Sport, and Fall. Anatomic location was classified as Symphysis, Parasymphysis, body, angle, condyle, ramus, Dentoalveolar, or coronoid.

Treatment methods were classified into closed reduction. Open reduction and internal fixation (ORIF) under general anesthesia (GA) and conservative management.

The data collected were analyzed by SPSS version 20 by using various descriptive statistical tools. Mean and standard deviation were calculated for quantitative variable like age while frequency and percentage were calculated for qualitative variables like gender and site of mandible fracture.

RESULTS

In the studied period, 142 cases of mandibular fractures were diagnosed in 118 patients who were managed at the oral and maxillofacial surgery department of LASUTH.

The patients' ages were between 2 to 83 years (Mean±SD=31.25±12.5). The majority of fractures occurred amongst the 21-30 years of age group (33.9%) followed by the age group of 31-40 (28.8%). There were 91 males and 27 females with male to female ratio of 1:5.6 (Table-1).

The major cause of fracture in this study was RTA (Road Traffic Accidents) representing 79 (66.9%), followed by Assault 27 (22.9%), then Fall 8 (6.8%), and Sports injury respectively (Figure-1).

The most prominent sites of mandibular fractures was body of the Mandible 40(28.2%) followed by angle of mandible 26(18.3%), parasymphysis 25(17.6%), condyle 16(11.3%), symphysis 15(10.6%), dentoalveolar 16 (11.3%), coronoid process 2(1.4%) and ramus of mandible 2(1.4%) (Table-2). There was significant difference in body and angle fracture between male and female gender $p=0.047$ and $p=0.039$ respectively.

Out of the 118 patients, the technique of closed reduction (Figure 3 & 4) were used in 85(72.0%) of cases and 26(22.0%) of patients were treated with open reduction. Only 7(6.0%) patients were managed by conservative approach (Figure-2).

Table-1: Age and gender distribution

Age(years)	Male 91(%)	Female 27(%)	Total n(%)	p-value
1-10	3(3.3)	2(7.4)	5(4.2)	0.461
11-20	9(9.9)	6(22.2)	15(12.7)	
21-30	34(3.4)	6(22.2)	40(33.9)	
31-40	27(29.7)	7(25.9)	34(28.8)	
41-50	11(12.1)	4(14.8)	15(12.7)	
51-60	5(5.5)	2(7.4)	7(5.9)	
≥61	2(2.2)	0(0.0)	2(1.7)	
Mean±SD	31.75±12.1	29.57±13.9		0.0430

Mean±SD=31.25±12.5

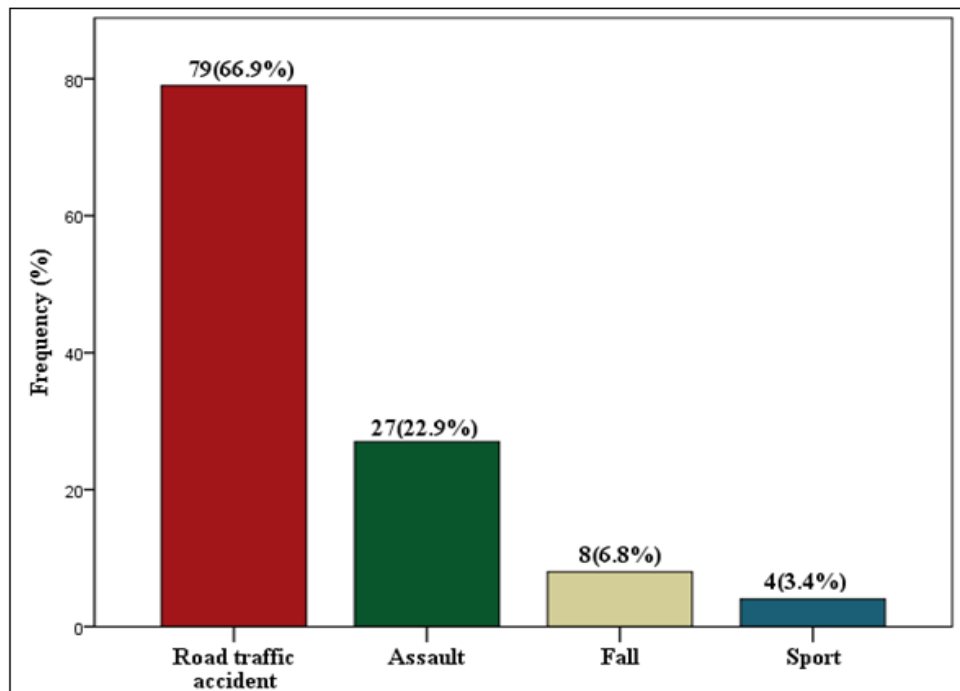


Fig-1: Etiology of Mandibular Fracture

Table-2: Distribution according to anatomic site

Site of fracture	Male n(%)	Female n(%)	Total n(%)	p-value
Body	26 (25.7)	14 (34.1)	40 (28.2)	0.047*
Angle	21 (20.8)	5 (12.2)	26 (18.3)	0.039*
Parasymphysial	19 (19.8)	6 (14.6)	25 (17.6)	0.391
Condylar	10 (9.9)	6 (14.6)	16 (11.3)	0.316
Symphysial	11 (10.9)	4 (9.8)	15 (10.6)	0.843
Dentoalveolar	12 (11.9)	4 (9.8)	16 (11.3)	0.951
Coronoid	0(0.0)	2 (4.9)	2 (1.4)	0.715
Ramus	2 (2.0)	0(0.0)	2 (1.4)	0.621
Total	101 (100.0)	41(100.0)	142(100.0)	

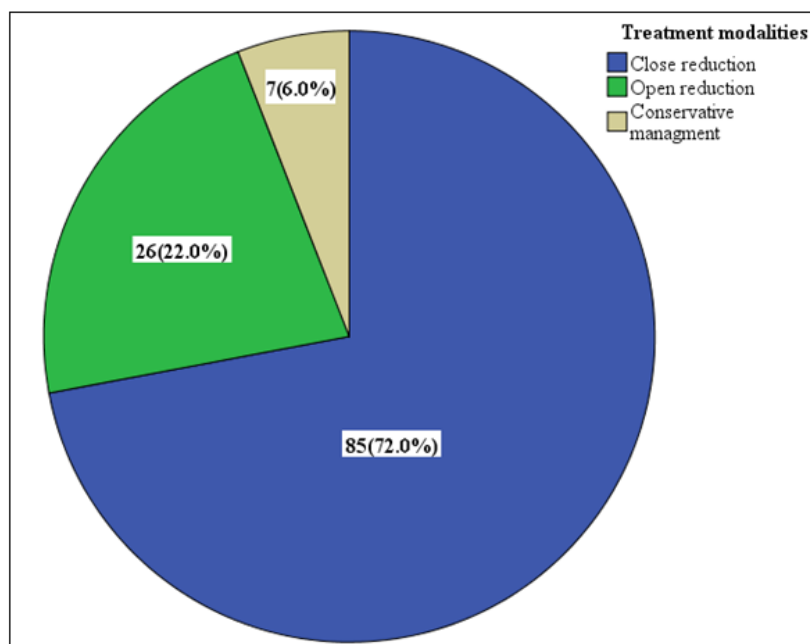


Fig-2: Treatment Modalities for Mandibular Fractures



Fig-3: Showing orthopanthomogram of (L) Mandibular parasymphyseal fracture



Fig-4: Close reduction of Left Mandibular parasymphyseal fracture with arch bars

DISCUSSION

Owing to the frequent involvement of the mandible in maxillo-facial injuries and the resultant functional and cosmetic deformities affecting the victims of maxillo-facial injuries, there is continued discussion among researchers all over the world [11].

The predominance of mandibular fracture in 21-30 years age group in this study coincides with studies in Nigeria [12-14] and studies in other countries [15, 16]. The individuals in this age group are more prone to careless driving of motor vehicle and motor cycles, contact sports, and other violent practices, hence the predisposition to mandibular fracture [16, 17]. This study also reported a higher frequency of the mandibular fractures in males than females which is similar to previous studies [15, 18]. This is due to the fact that more males engage in high risk outdoor activities like driving, sporting, fighting and habits like drug use and alcohol ingestion [19].

The commonest cause of fracture in this study is Road Traffic Accident, followed by assault, this is similar to studies, carried out in Nigeria [20, 21] and other developing countries [22-24]. However, Olasoji *et al.*, [14] in their studies conducted in the Northern Nigeria noted assault as a primary cause of mandibular fracture. In a similar manner Rix *et al.*, in Sydney, Australia [25] and Asadi *et al.*, in Manchester, United Kingdom reported assault as the leading cause of mandibular fractures [26]. These variations in etiological factors have been attributed to the socioeconomic factors, status of roadways, traffic laws and regulations and its enforcement that varies from one country to the other [11].

The most affected site as highlighted by this study is the body of the mandible, followed by the angle. Which is at variance with the findings of Ahmed [16] and Malik [27]. However it is consistent with the result of Nair [28] and Adebayo [29]. Other researchers have observed the condyle [30] or the angle [31] region as most frequent sites of fracture. The diverse

etiological factors is often given as a reason for the variation in the site of fracture.

Majority (72%) of the patients in this study were treated with closed reduction. This is consistent with the studies of Kamulegeya *et al.*, [22], Chandra [32], and Sunita Malik *et al.*, [11]. However open reduction has been advocated to be the “gold standard” for the treatment of mandibular fractures. The use of open reduction has resulted in improved oral hygiene, mouth opening, better speech and patient’s earlier return to function [19]. However, despite these qualities, the cost of treatment has been a reason why only few patients were treated with open reduction in our center.

CONCLUSION

Road traffic accidents (RTA) represented the major etiological factor of maxillo-facial injuries, with young adult males as they are main victims. The most common site involved was the body followed by angle region. The most frequent technique used was closed reduction. It is therefore recommended that there should be improved implementation of traffic laws on motorist particularly the young population so as to curb reckless driving and over-speeding. And provision of better roads and affordable health care by the various layers of government.

Conflict of interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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