

Management of Facial Fractures in a Teaching Hospital North-west Nigeria: Our Methods and Challenges.

Olatunde Oluleke Omisakin*

Dental/Maxillofacial unit, Department of Surgery, Kaduna State University, Kaduna.
Email: omisakinolatunde@gmail.com, +2348039553854

ABSTRACT

Background: Oral and maxillofacial region are made of several bones which are connected to each other and are affected by direct or indirect impact to the facial structures causing diverse types of facial bone fractures. There are several challenges that are encountered in the management of these fractures. This study reviewed etiology, demography, fracture patterns and management of facial bone fractures. **Materials and Methods:** This was a retrospective study of facial fractures that were treated at the Barau Dikko Teaching hospital, Nigeria. The study period span from January, 2010 to December, 2023. Information was collected from the theatre register, clinic register, accident and emergency register and radiology register. The information collected includes patient demography, etiology of fracture, fracture patterns, treatment received, complications of the fractures and challenges in the management. **Results:** Patients with facial bones fracture that received treatment in our Centre were 114 during the period of study. Males were more affected than females by a ratio of 5.3: 1. The age ranged from 6 years to 70 years, the mean age is 38 years SD ± 18.76 . Most injuries were due to road traffic accidents (n= 62, 54.39%), then missiles (gunshot & bomb blast) (n=20, 17.55%), fall from height (n=13, 11.40%), interpersonal violence (n=11, 9.65%), sport injuries (n=6, 5.26%), industrial accident (n= 2, 1.75%). The commonest site of fracture was the mandible, other common sites were maxillae (Leforte 1, 11 and 11I), zygomatic arch, nasal and frontal bone. Reduction and immobilization were the treatment for facial bone fractures. Limitation of mouth opening, gag occlusion, anterior and lateral overbites, loss of teeth, altered arch and weight loss were some of the complications encountered. **Conclusion:** The commonest cause of facial bones fractures was road traffic accident, therefore all efforts must be made to reduce this trend, by obeying traffic rules and regulations. Adult males were the most affected. Most of the maxillofacial fractures in this study were treated by closed reduction and immobilization.

Keywords: Facial, Fracture, Management, Mandible, Trauma.

INTRODUCTION

The oral and maxillofacial region is a complex structure which is prone to trauma because of its location.¹ Trauma in this region affects both the hard and soft tissues and could precipitate a life-threatening bleeding and airway challenges.¹ These fractures affects the mandible, maxilla, zygomatic complex, nasal bone most often naso-orbito-ethmoid (NOE) and frontal bone. They are commonly accompanied with various forms of malocclusion, facial disfigurement, diplopia, enophthalmos, soft tissue injuries and loss of

bone anatomical relations.² Severe facial fractures if not managed properly can lead to complicated functional problems and facial deformities.³ Abnormal occlusion and facial injuries can impact negatively on the quality of life of the affected individuals.⁴

However, the etiology of facial fractures includes road traffic accidents which could be motor vehicle accidents or motorcycle; interpersonal violence, fall from a height, sport injuries and missiles such as gunshot injuries and bomb blasts. The incidence of maxillofacial trauma in general is rapidly increasing especially in developing countries.³ This could be attributed to bad road networks, the use of motorcycles for commercial purposes and poor attitudes of drivers to obeying traffic regulations.⁵ The incidence of interpersonal violence continue to rise

Correspondence*:

Email: omisakinolatunde@gmail.com,
+2348039553854

while vehicular accidents are reducing in developed economies.⁴ Some cases of facial fractures are associated with head injuries.² The diagnosis of facial fractures is based on history of the trauma, clinical assessment of facial bones, radiological investigation, computed tomography scan, and 3-dimensional imaging system.

Furthermore, treatment of facial fractures can be challenging when it involves several bones of the face at a time. The treatments could be classified into resuscitation of the patient: which involves securing the airway, arrest of bleeding sites, maintaining of adequate circulation and definitive management of the fractures, which is majorly reduction and immobilization.

Surgical approaches to the fracture sites have greatly enhanced the exposure of fracture, and immediate fixation with rigid fixation systems.⁵ The surgeon's challenges are restoration of the face to near pre-injury period, acceptable aesthetics, anatomical and functional repair of the facial skeleton.⁶

Persistent facial deformity could occur due to failure of direct exposure of all fracture lines, or due to unstable fixation.⁶ Few times there may be persistent residual post-traumatic facial deformity after the first surgery which may necessitate second corrective surgery.⁶

However, this study serves to present our methods in the management of facial fractures and the challenges we encountered while treating victims in our Centre. The study provides the basis for planning preventive strategies toward reducing vehicular accidents.

METHODOLOGY

This was a retrospective study of facial fractures that were treated at the Barau Dikko Teaching hospital, Nigeria. The study period spans from January, 2010 to December, 2023. Information was collected from the theatre register, patients' folder, clinic register, accident and emergency register and radiology register. The information collected includes patient demography, etiology of the fracture, fracture patterns, treatment received, complications of the fractures and challenges in the management. Data obtained were analyzed using the SPSS for window (version 11.0; SPSS Inc Chicago) using simple percentage.

RESULTS

Patients with facial bones fracture that were treated were 114. Males were more affected than females by a ratio of 5.3: 1. The age ranged from 6-years to 70-years. Age group 21 – 30 years were most affected (n=41, 35.96) (Table 1). Most injuries were due to road traffic accidents (n= 62, 54.39%), then missiles (n=20, 17.55%), fall from height (n=13, 11.40%), interpersonal violence (n=11, 9.65%), sport injuries (n=6, 5.26%), industrial accident (n= 2, 1.75%) (Table

2). The commonest site of fracture was the mandible, other common sites were maxillae (Leforte 1, 11 and Table 1: Demography of patients treated.

Age/Yrs	Sex		Total	Percentage/ %
	Male	Female		
≤10	8	3	11	9.67
11 – 20	12	4	16	14.03
21 – 30	36	5	41	35.96
31 – 40	21	3	24	21.15
41 – 50	11	2	13	11.40
51 – 60	6	1	7	6.14
61 – 70	2	0	2	1.75
Total	96	18	114	100.0

Table 2: Aetiology of Facial Fractures

S/N	Aetiology	No. of cases	Percentage /%
1	Road traffic accident	62	54.39
2	Gunshot (missiles)	20	17.55
3	Fall from height	13	11.40
4	Interpersonal violence	11	9.70
5	Sport injuries	6	5.26
6	Industrial accident	2	1.75
	Total	114	100.0

11), zygomatic arch, nasal and frontal bone (Figure 1). Close reduction and immobilization was done for majority 82 (71.92%) of the patients, open reduction and rigid fixation (IMF) with plates and screws was done in 15 (13.16%), open reduction and trans-osseous wiring was done in 12 (10.53%), no surgery was done in 5 (4.39%) zygomatic fracture cases as there was no displacement of the fracture (Figure 2). Intermaxillary fixation (IMF) was done in 85 (74.56%) of the cases with either arch bars or eyelet wiring methods (Figure 5). Near pre-injury occlusion was achieved for all our patients.

Bleeding from fracture sites, limitation of mouth opening, gag occlusion, anterior and lateral overbites, loss of teeth, altered arch and weight loss were the complications encountered. 15 (13.16%) had facial fractures with associated head trauma and 20 (17.54%) with orthopaedic injuries.

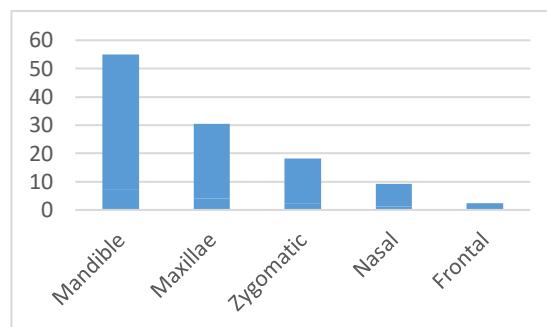


Figure 1: Site of facial fractures

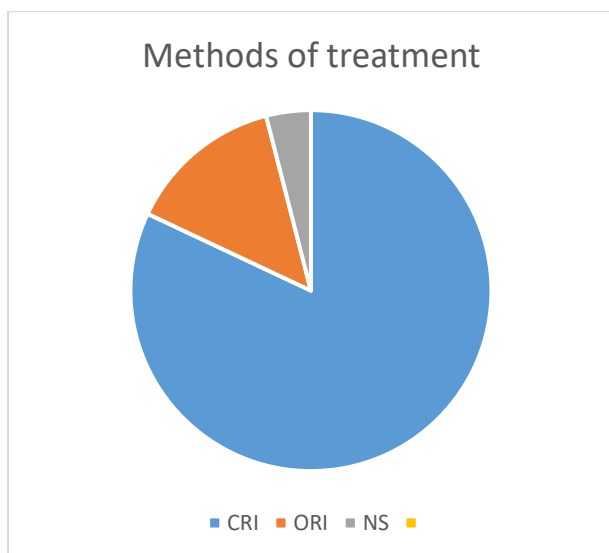


Figure 2: Methods of Treatment

Note: CRI= Close reduction and immobilization
ORI= Open reduction and immobilization
NS= No surgery done



Figure 3. A plain radiograph from a 27-year-old man showing bilateral fracture of the mandible

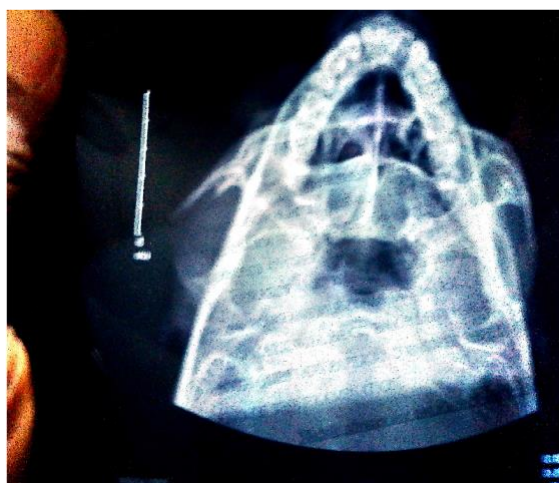


Figure 4: Plain submentovertical view of the face which shows right zygomatic arch fracture.



Figure 5. A photograph showing intermaxillary fixation and good occlusion achieved.

DISCUSSION

Facial fracture is a term to define those fractures involving the upper, middle and lower facial skeleton.⁷ The aims of treatment of facial fractures are: to restore facial aesthetics and masticatory functions, prevent facial deformities and malocclusion. Some cases of facial fractures also have other systems injuries like orthopaedic, neurosurgery and cardiothoracic. Therefore, multidisciplinary approach with other specialties is very important to achieve ideal management of those polytraumatized patients.^{8,9}

However, in this study the causes of facial fractures were vehicular and motorcycle accident, interpersonal violence, gunshot and bomb blast, fall from the height, sport injuries and industrial accident. It was observed in this study that most of the comminuted fractures were caused by gunshots and bomb blasts, and bilateral facial fractures were due to vehicular accidents. Also, most fractures that involved children and adolescents were caused by vehicular accidents and fall from trees from failed attempts to pluck fruits. In this present study we found that the commonest cause of facial injuries was road traffic accidents, which agreed with other studies¹⁰⁻¹⁶ in but in contrast to some other studies¹⁸⁻²⁰ done in developed countries which reported interpersonal violence as the commonest cause of facial fractures.

The present study agrees with many literatures¹¹⁻¹⁴ as the majorities of patients affected were young adults in their third decade of life. The observation of the increased incidence of facial fractures in young adults in present study may be due to the fact that in this period of life they are more active regarding sports, hard activities, industry works, driving vehicles at its top speed and riding motorbike carelessly. Oftentimes, these young adults break traffic rules such as speed limit, traffic lights and not driving against traffic. In our environment of study, motorcycles are one the common commercial transportation with high risk of accidents. The low

incidence reported in the young and old age groups was due to the low activities of these age groups.

Moreover, our study showed that facial fractures affected males more than females. This agrees with several previous studies⁴⁻⁹ that males were more affected with facial fractures. This has been attributed to greater exposure to trauma risk factors like driving vehicles, sports injuries and interpersonal violence. The mandible was the commonest site of facial fractures as reported in this study. This support several reports⁹⁻¹¹ that mandible was the most affected by trauma of all the facial bones. This dominance could be due to the prominence of the mandible and being the only mobile facial bone. While some studies^{4,8} reported maxillary fractures as the commonest site of injury. This difference in pattern of injury may be due to variations in the mechanism of injury and anatomical site of the fractured bone.

In our management of facial fractures early intervention greatly reduces postoperative facial deformity, malocclusion and limitation of mouth opening. Zygomatic fractures were most difficult to reduce after 10- days of injuries.

Most of the patients in present study was treated with close reduction and immobilization, which is in variants with the other studies^{7,15,17} that reported open reduction and internal fixation. This could be attributed to our low income setting of a developing economy. Achieving maximal intercuspal digitation between the lower and upper teeth was our guide to good reduction of the fractures. Intermaxillary fixation was our method of securing the occlusion for 4 to 6 weeks for better bone healing. We observed that treatment for bilaterally fractured mandible would need open reduction and rigid internal fixation. This study equally observed long hospital stay in patients with associated head and orthopaedic injuries. Therefore, there is need for constructive interaction with neurosurgeons and orthopaedic surgeons to reduce the period of hospital stay of our patients.

CONCLUSION

Road traffic accident was the most common cause of facial injuries in our Centre and the young adults mostly males were the most affected. Most facial fractures were treated by close reduction and immobilization. Open reduction and internal fixation were done in few cases. Our overall results after treatments were satisfactory.

Recommendations

Emphasis should be on preventive strategies to reduce cases of facial fractures through awareness of safe driving and good road maintenance culture. Facial fractures should be treated as soon as possible to reduce morbidity resulting in facial disfigurement.

Conflict of interest: none

Ethical approval: The study was approved by our hospital ethics committee

REFERENCES

1. Vujcich N, Gebauer C. Current and evolving trends in the management of facial fractures. *Aust Dent J* 2018; 63: S35-S47.
2. He D, Zhang Y, Ellis E. Panfacial fractures: analysis of 33 cases treated late. *J Oral Maxillofac Surg* 2007; 65: 2459-2465.
3. Grover R, Antonyshyn O. Care of maxilla facial injuries in multiple trauma. *Cur Orthopaed* 2003; 17: 274-286.
4. Elusoji SO, Osime OC. Pattern and outcome of management of fractures in a Nigeria Community. *Port Hart Medical Journal* 2006; 1:14-16.
5. Oginni FO, Oladejo T, Alake DP, Oguntola JO, Adebayo FO. Facial bone fractures in Ile – Ife, Nigeria; An update on pattern of presentation and care. *J Maxillofac Oral Surg* 2016; 15(2): 184 -190.
6. Davidoff G. The spectrum of closed-head injuries in facial trauma victims' incidence and impact. *Ann Emerg Med*. 1988; 17(1): 6-9.
7. McGowan R. Killey's fractures of the middle third of the facial skeleton. *Br J Oral Maxillofac Surg* 1989; 27(3); 262-264.
8. Leles JLR. Risk factors for maxilla facial injuries in a Brazillian emergency hospital sample. *J App Oral Sci* 2010; 18(1): 23-29.
9. Abdulrahman TEF, Abdulmaboud A, Hamody A. Challenge and management outcome of panfacial fractures in Sohag university hospital Egypt. *Int Surg J* 2018; 5: 126-131.
10. Shah AA, Salam AF. Maxillofacial fractures; analysis of demographic distribution in 320 patients, *Park Oral Dent J*. 2006; 26; 235-237.
11. Al-Ahmad HE. The pattern of maxillofacial fractures in Sharjah, United Arab Emirates: a review of 230cases. *Oral Surg Med Pathol Radiol Endodon* 2004; 98(2):166-170.
12. Lee KH. Comparison between interpersonal violence and motor vehicle accidents in the aetiology of maxillofacial fractures. *Anz J Surg* 2007; 77: 695-698.
13. Ogbeifun JO, Fomete B, Olaitan AA, Ajike SO, Ononiwu NC. The pattern of middle third facial fractures presently at a Nigeria Tertiary Health Care f facility. *Nig J Dent Res* 2021; 6(1): 91-97.
14. Lee KH. Global trends in maxillofacial fractures. *Craniofac T Recon* 2012; 5: 213-222.
15. Dimitroulis G, Eyre J. A 7year review of maxillofacial trauma in a central London hospital. *Br Dent J* 1991;170(8): 300-302.
16. Down K, Boot D, Gorman D. Maxillofacial and associated injures in severely traumatized patients: implicated of a regional survey. *Int J Oral Maxillofac Surg* 1995; 24(6): 409-12.
17. Ceallaigh PO. Diagnosis and management of common maxillofacial injuries in the emergency department. Part 1: Advanced trauma life support. *Emerg Med J* 2006; 23: 796-797.