

# Pattern of referred middle third fractures to the Maxillofacial Unit of Ahmadu Bello University Teaching Hospital, Zaria Nigeria

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## ABSTRACT

**Introduction:** There is an increasing recognition that many patients who had middle third facial fractures were polytraumatized and would benefit immensely from early multi-disciplinary care provided by specialists. Therefore, the early referral to a specialist is the most appropriate because, it saves cost and also provide better care for the traumatized persons. This study is aimed at presenting the pattern of referral of middle third facial fractures to the Maxillofacial Unit of the Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State.

**Methods and Patients:** A descriptive prospective study of patients with middle face fractures referred to the Maxillofacial Unit of the Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State over a 48-month period.

**Results:** The male to female ratio of 2.4:1, was seen. The mean age was  $23.2 \pm 3.4$ . RTA was the main cause of injuries with 76% and 42.1% had no written referral. There are 41 patients referred from various centers but excluded from this study because the diagnoses were not confirmed before the patients died.

**Conclusion:** Dental Surgeons had the highest number of referrals followed by surgeons in the head and neck region.

**Keywords:** Pattern, middle third Fracture, referral

## Introduction

Middle third facial fractures traverse the anatomical boundaries of several surgical specialties (Dawson and Fordyce, 1953; Hovinga, 1975; Muftah, 1994; Tung *et al.*, 2000; Koike *et al.*, 2002; James *et al.*, 2009) and these fractures occur in a significant proportion of patients admitted with multiple trauma (Williams *et al.*, 1972; Lizuka *et al.*, 1995; Cook *et al.*, 1980). The importance of early involvement of the oral maxillofacial surgeon in the assessment and treatment of these patients has been well emphasized by several authorities in the

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field (Abiose,1991; Bach *et al.*, 1998; Fasola *et al.*, 2001).

There is an increasing recognition that many patients who had middle third fractures from road traffic crashes were multiply injured and would benefit from early multidisciplinary care provided within a specialized unit or trauma center (Down *et al.*, 1993; Lim *et al.*, 1993;). Therefore, early referral of the middle third facial fractures to the maxillofacial surgeon would be necessary to sort out diagnostic and/or therapeutic challenges in the management of these somewhat rare fractures that fell outside the scope of other specialists (Bach *et al.*, 1998; Saheeb and Etetafia, 2003).

Referral for expert evaluation and management is a universally accepted practice and appropriate norm

of medical practice. Prompt, proper and appropriate referrals would lead to efficient provision of medical services to the multiply injured (Bach et al., 1998; Klenk and Kovacs, 2013). Whereas it is becoming increasingly recognized that the services provided by the oral and maxillofacial surgeons is expanding, and so ought to be the referral pattern of middle third facial fractures to the maxillofacial surgeon, but the contrary is the case (Abiose, 1991; Haug et al., 1994). The paucity of referrals of isolated complex middle third facial fractures to the maxillofacial surgeon may be attributed to the low index of identification and existing protocol of treating facial fractures among the different specialists in different institution between plastic surgeons, maxillofacial surgeons and otorhinolaryngologists (Abiose, 1991; ; Bach et al., 1998; Fasola et al., 2001; Saheeb and Etetafia, 2003). It is however noted that maxillofacial surgeons in trauma centers that have a full complement of trauma team received more referral of middle third facial fractures due to the strict adherence to good ethical standards and established treatment protocols (Ioannides et al., 1993; Lim et al., 1993; Gassner et al., 2003; Goodisson et al., 2004; Nwoku and Oluyadi, 2004).

Prompt referral is accepted practice globally but late referral of middle third facial fractures have become the rule rather than the exception in many cases in the developing countries (Ssentongo, 1999; Fasola et al., 2001; Kamulegeya et al., 2009). Delays in referring middle third facial fractures from other hospitals have been known to occur when the referring hospitals is either too far or they are unable to identify who would take charge or responsibility of the patient who may also have other severe concomitant injuries (Abiose, 1991; Saheeb and Etetafia, 2003; Adebayo and Ajike, 2003). It is equally recognized that many medical officers who are in charge of the accident and emergency units have low index of recognition because some never had rotations in maxillofacial unit during undergraduate and post graduate trainings (Kisum et al., 1998; Saheeb and Etetafia, 2003). Therefore, their examination is poor and the choice of radiographs ordered for in pan facial fractures may be inadequate, as a result of this, many middle third facial

fractures are missed and undiagnosed (Kisum et al., 1998; Saheeb and Etetafia, 2003).

The non-participation in hospital clinical meetings by dental and maxillofacial surgeons have not helped paucity of referrals of middle third facial fractures to the maxillofacial surgeons is noted in some earlier studies (Kisumu et al., 1998; Ssentongo, 1999; Fasola et al., 2001). Many medical doctors were only passively educated by being in centers that offered oral and maxillofacial surgery services in a maxillofacial department and this has related in the little influence on referral practice (Down et al., 1993; Kisumu et al., 1998; Saheeb and Etetafia, 2003). Increased referral of middle third facial fractures to the maxillofacial surgeon would improve if the casualty officer has a wider and improved knowledge of the services provided by the surgical specialists in the trauma team (Kisum et al., 1998; Saheeb and Etetafia, 2003).

The inclusion of maxillofacial trauma in the curriculum of medical students as well as increased dental surgeons' participation in hospital clinical meetings and presentation of cases to illustrate the range and complexity of cases they manage may encourage prompt referral of middle third facial fractures (Kisum et al., 1998). This article is aimed to present the pattern of referral of middle third facial fractures to a foremost maxillofacial surgical unit in Nigeria- the Maxillofacial Unit of the Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State.

#### **Patients and Methods**

A prospective descriptive study of the pattern of referral of middle third facial fractures, to the Maxillofacial Unit of the Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State over a 48-month period (October, 2006 to September, 2010). A structured proforma which contains information on bio-data, source of referral, aetiology of the fractures and associated injuries was used to collect the data. Data for this study was entered into a computer with microsoft excel 2007 and analysed. The results were presented in pie and bar charts and tables.

#### **Results**

A total of 345 patients were referred to the center, 41 of this died before arrival at the hospital leaving 304

patients that were further evaluated and managed. Out of the 304, 128 (42.1%) were not referred

appropriately whereas 172 (57.9%) had well written referral letters to the Maxillofacial Unit Figure 1.

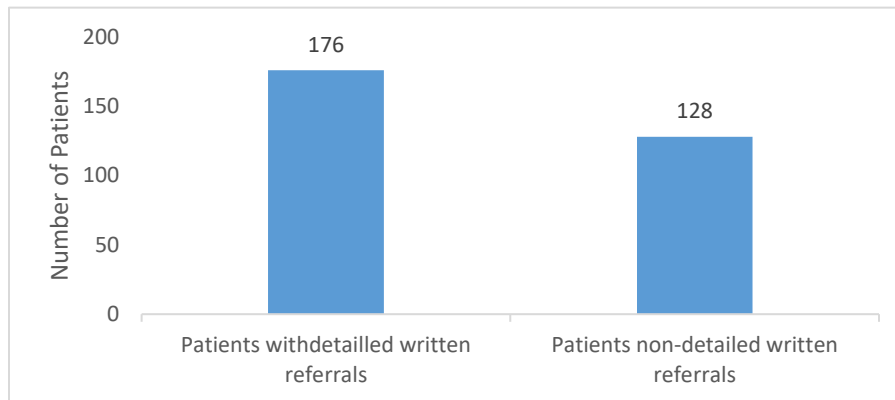


Figure 3: Nature of written referrals for patients with midfacial fracture

Some details of the referred patients who died on before management in the Maxillofacial Unit are given in Table 1. Most (9, 22.0%) of the referrals came from Usumanu Dan

Fodiyo University Teaching Hospital, Sokoto and the least (1, 2.4%) came from Federal Medical Center Keffi, Nasarawa State.

Table 1: Some details of referred cases the Maxillofacial Unit.

Source of referrals	Working diagnosis	Associated injuries	Referring specialist	Frequency n (%)
General Hospital, Katsina	Le Fort fractures	Head injury	Medical officers	6 (14.6)
IBB Specialist Hospital, Minna	Le Fort fractures	Fracture of extremities	Medical officers	4 (9.8%)
Federal Medical Center, Katsina	Le Fort, mandibular and nasal fractures	Head injury, CSF rhinorrhea	Dental surgeon	8 (19.5%)
Federal Medical Center, Keffi	Le Fort, mandibular and nasal fractures	Head injury, fractured ribs	Medical officer	1 (2.4%)
Jos University Teaching Hospital	Le Fort, mandibular and nasal fractures	Head injury, CSF rhinorrhea	Neurosurgeon	4 (9.8%)
National Orthopaedic Hospital Dala	Le Fort, mandibular and nasal fractures	Head injury, fractured pelvis and femur	Orthopaedic surgeon	3 (7.3%)
Usumanu Dan Fodiyo University Teaching Hospital, Sokoto	Le Fort and mandibular fractures	Head injury, CSF rhinorrhea	Neurosurgeon	9 (22.0%)
<b>Federal Medical Center, Lokoja</b>	<b>Le Fort and mandibular fractures</b>	<b>Head injury, CSF rhinorrhea</b>	<b>Dental Surgeon</b>	<b>6 (14.6%)</b>

The age range of patients in this study were between 5 and 69 years with a mean age of 23.2 ±3.4 years. Majority were males 214 (70.4%) while the remaining 90 (29.6%) were females; a male to female ratio 2:4:1

was recorded (P-value = 0.02). (Figure 2). The major cause of middle third fractures was road traffic crashes accounting for 76% of the cases referred. Falls from heights and interpersonal violence

contributed about the same proportions, 10.5% and 10.2% respectively.

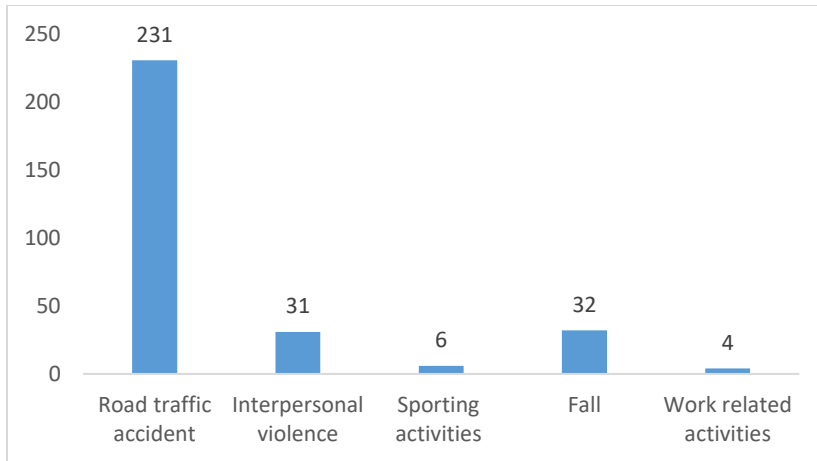


Figure 3: Major causes of middle third facial fractures

The nature of referral of middle third facial fractures to the Maxillofacial Unit

In all, 128 (42.1%) patients had no written referrals while 176 (57.9) others (P-value = 0.02) had appropriate written referrals with 66 (21.7%) cases to Maxillofacial unit. In this study.

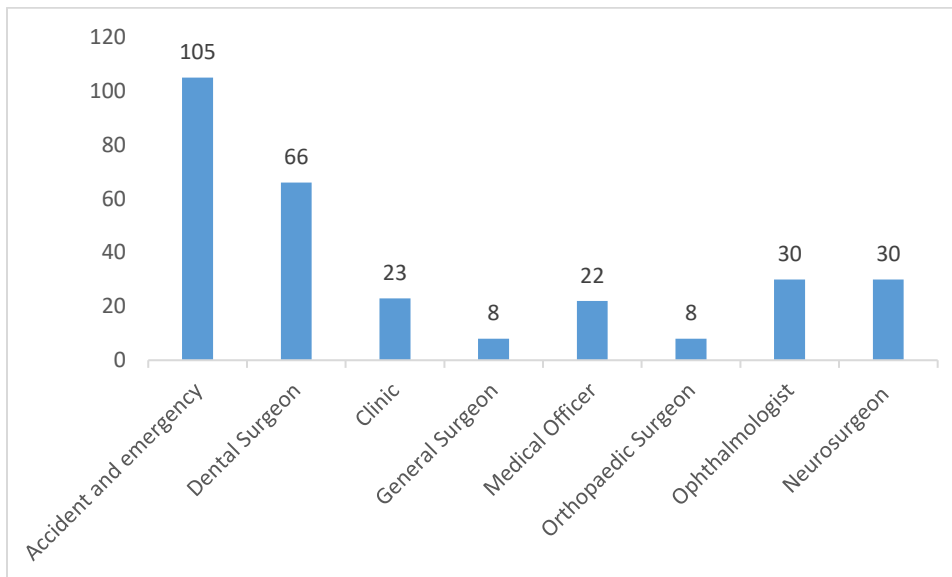


Figure 4: Categories of specialists referring patients with middle third injuries

## Discussion

The paucity of referrals of middle third facial fractures in previous studies, have been attributed to

increased mortality from concomitant injuries during traffic crashes and the non-existence of an appropriate treatment protocol for treating facial fractures in many hospitals (Abiose,1991; Fasola *et al.*, 2001; Bach *et al.*, 2003; Saheeb and Etetafia, 2003; Adebayo and Ajike, 2003).

Although, the pattern of referral was apparently high, 128 of the patients were not referred. The explanation offered for this is that, medical doctors at the accident and emergency units of many peripheral hospitals had inadequate knowledge of the scope of maxillofacial surgery. This finding is similar to the British study (Kisum *et al.*, 1998) but contrasts with that of the Americans (Bach *et al.*, 2003) where the absence of a treatment protocol in some hospitals was responsible for the paucity of referrals.

Furthermore, due to severe facial edema many patients with pan facial fractures were viewed with low index of suspicion. Ability to recognize middle third facial fractures were obscured. Therefore, these were easily omitted by the medical officers. this is similar to the findings of previous studies (Saheeb and Etetafia, 2003, Adebayo and Ajike, 2003). An over reliance on plain posterior – anterior and true lateral skull radiographs which offered little degree of contrast may have been insufficient in the diagnosis of middle third facial fractures also.

In this study, 57.9% of the patients with middle third facial fractures were appropriately referred which is higher than the 29.2% reported by Saheeb and Etetafia, 2003 from a trauma center. The high frequency of referrals in this study agrees with those of Gassner *et al.*,2003 and Nwoku and Oluyadi, 2004, that were conducted in exclusive trauma centers. The ready availability of CT-scan and existing treatment protocol influenced the prompt referrals to maxillofacial surgeons in these centers. The findings in this study may be attributed to the recognition of the Maxillofacial Unit of the Ahmadu Bello University Teaching Hospital as a center of excellence in the management of maxillofacial injuries in northern Nigeria (Adebayo and Ajike, 2003; Adekeye, 1980).

For a long time, the Maxillofacial Unit was the only center in northern Nigeria, and it became the

favourite of many patients as well as the preference for many specialists (Adekeye, 1980; Adebayo and Ajike, 2003; Ajike *et al.*, 2005). Furthermore, many consultants in the hospital during their undergraduate and postgraduate training at the Ahmadu Bello Teaching Hospital had rotation in the unit. Therefore, it became possible for them to identify and properly examine patients with a high index of suspicion and recognition of middle third facial fractures. This and the aid of specific radiographs probably had influenced accurate diagnosis and appropriate referral of the middle third facial fractures to the Maxillofacial Unit.

Many referrals in this study (Fig 4) came from surgeons that are specialists in the head and neck region. These surgeons are an important part of the functional trauma team in the center and some other tertiary institutions. This result is similar to the findings of Bach *et al.*, 2003. Their knowledge of skills of the different specialists may have influenced the pattern of referral. Thirdly, it may be possible that the frequent utilization of CT-scan as a gold standard of imaging modality employed by neurosurgeons, ophthalmologists, otorhinolaryngologists could have helped immensely to reveal many fractures which increased referrals to the Maxillofacial Unit. In this study, isolated nasal bones and nasal complex fractures were low, because, many of such cases were competently managed by the team of otorhinolaryngologists in the hospital. Therefore, only combined fractures were referred and treated by the maxillofacial surgeons. This is similar to the earlier studies from Ibadan (Abiose,1991; Fasola *et al.*, 2001).

The incidence of ocular injuries and middle third facial fractures are well documented (Clyde and Charles, 2009; Al-Qurainy *et al.*, 1991; Fasola *et al.*, 1986; Aljinovic and Muteyelic 2007). In this study ophthalmologists referred more orbital out fractures with a sizeable percentage of zygomatic complex fractures. The finding is consistent with the literature (Hovinga,1975; Nagase *et al.*, 1998; Puterman *et al.*, 1974; Hawes and Dortback, 1983; Mc Gurk, 1998; Rosen, 1996). In this study, orbital blow out fractures were referred to the maxillofacial

surgeon probably because oculoplastic surgeons were not available in the hospital that would have managed these fractures.

A good proportion (34.1%) of the referrals in this study were received from dental surgeons. It is likely this is so because of their understanding of the effects of facial fractures on aesthetics, form and function, and the appropriate radiographs to order for to confirm diagnosis. Many of these referrals came from dental centers that had poor facilities for the management of complex fractures which is common in northern Nigeria.

### Conclusion

In this study, 57.9% of the patients with middle third facial fractures were referred while 42.1% of cases were not. The highest frequency of referrals came from Dental surgeons with 34.1% of the cases. Continuous education of medical officers in the accident and emergency could improve the rate of referral.

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