

Case Study.

AN UNUSUAL FRACTURE OF THE MANDIBLE SEEN IN ZARIA, NIGERIA.

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A rare case of horizontal fracture of the mandibular symphysis and body bilaterally, transecting the roots of the involved teeth, resulting from a matchet-cut injury in a 30years old man is presented.

Under general anesthesia, the fractured fragments were exposed, mobilized and debrided through the full thickness laceration sustained at the time of injury. The fracture was reduced and immobilized with two strategically placed circum-mandibular wires. The soft tissues were subsequently closed in layers.

There was wound breakdown in the anterior region which was managed conservatively. The patient was discharged on the seventeenth post-operative day. Complete healing of the soft tissue was seen when he presented for review two months after discharge.

Keywords; Unusual, Mandibular, Bilateral, Horizontal, Matchet injury, Transecting roots, Zaria.

INTRODUCTION.

The mandible constitutes the bony structure of the lower third of the face. Although it is a strong dense bone, it is frequently fractured because of its prominence and presence of several areas of inherent weakness. The mechanically weak portions include the angle, condylar process and both sides of the mentum. These areas are frequently fractured when an external force which exceeds the ultimate strength of the bone in those regions is applied to the mandible. In a review of 101 cases of fracture from motor-bike accidents seen in a tertiary center in Nigeria, mandibular fractures constituted 63.3% of them.

Most simple, civilian, non-comminuted mandibular fractures usually follow a pattern. They usually run a vertical course extending from the crest of the alveolus to the lower border for the horizontal ramus; and from the anterior border to the posterior for the vertical ramus of the mandible. Also the fractures typically

occur at sites resulting in symphyseal, body, angle, rami or condylar fractures as the case may be. Our patient presented with a rare type of fracture which though simple in nature, cut across parts of the mandible in an unusual manner.

Matchets are tools readily employed for farming purposes and in some cases, dedicated to domestic use as long knives in the kitchen. In Nigeria, there is no legislation guiding their acquisition, so they are readily obtainable from the market on demand (Plate 1).

In military conflicts and communal clashes, in some parts of Africa, matchets are often used as a close range weapon. Farmers in rural areas use matchets for warding off trespassers from their farms. Fulani cattle rearers from the northern parts of Nigeria usually move their herds of cattle to the southern parts for pasturage. Communal clashes occasionally arise between them either in self-defense or when crops are damaged by their cattle.



Plate 1: A Matchet

In our environment, cases of matchet cut injuries commonly arise from such communal clashes. Injuries sustained from matchets depend on the mode in which they are used (for cutting or stabbing); the part of the blade used (the sharp edge or the dull back) and whether the injury was accidental or intentional.

Reports of studies on mandibular fractures abound in the literature. However there are very few articles on bilateral horizontal mandibular fracture and this informed our decision to write up the present case.

CASE REPORT.

A 30years old male Fulani herdsman, who was assaulted by some armed robbers in the bush at night while keeping watch over his cattle was brought to our accident and emergency department, about 36hours after the incident. He was said to have been cut with a matchet by the assailants. There was history of loss of consciousness and profuse bleeding from the injury.

He was initially taken to a general hospital where the wound was sutured and patient transfused with two units of blood. He was subsequently referred to a specialist hospital for review and management of the soft and hard tissue injuries. However due to lack of adequate facilities and or experience in handling such a case, he was referred finally to our center, the Maxillofacial Unit, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria.

Patient had sutured laceration (that was through and through in the symphysial and right body region) that

extended from about 1.0cm inferior to the left corner of the mouth to the angle of the mandible on the right side. There was another sutured laceration on the neck from the midline about the level of C₆C₇ to the sternomastoid on the right. There was tenderness over the lower border of the mandible from the mental region on the left to the angle on the right with a step deformity around the angle. There was no paraesthesia or anesthesia of the lower lip.

Intraorally, there was poor oral hygiene with a loosely hanging dentoalveolar segment carrying lower central incisors and right lateral incisor. X-ray findings included a horizontal fracture of the mandible affecting the symphysis and right mandibular body up to the angle with transection of roots of the lower anteriors, premolars, right 1st and 2nd molars (Plate 2). Patient had a respiratory rate of 24 cycles per minute, BP of 100/60mmHg, a pulse of 128 per minute and a PCV of 30%. Due to contaminated nature of the wound, patient was given TT and placed on Clindamycin, Metronidazole; dietary and oral hygiene advice was given.

Surgery was carried out nine days later. Circum-mandibular wires were placed at between lower right canine and first premolar; and between the lower right 1st and 2nd molar teeth. An arch bar was placed from the lower right 1st molar tooth to the left 1st premolar tooth to immobilize the mobile anterior dentoalveolar segment. Eye-let wires were placed in the maxillary teeth and inter-maxillary fixation done. The soft tissue wound was closed in layers with vicryl sutures.



Plate 2: Horizontal fracture of the mandible

Postoperatively, PCV on the 3rd day was 24%. He was transfused with one unit of packed cell and the nutrition department was called in and they placed him on high protein fluid diet, 250mls 4hourly. On the 10th postoperative day, the lower mobile dentoalveolar segment was denuded of its mucosal covering. We believe this was as a result of inter-play of factors like wound contamination; poor blood supply, low PCV and poor oral hygiene. He was managed conservatively and discharged on the 17th postoperative day.

During a review one month later, there was a developing hypertrophic scar and the immobilized dentoalveolar bone was necrotic and separated from the basal bone. The arch bar and wires were removed along with the necrotic tissue. At a subsequent review two months later, the hypertrophic scar was less pronounced following steroid crème application, and intra-oral wound has completely healed. He was advised to visit a general dental practitioner for further evaluation of the involved

teeth and for prosthetic replacement of the missing anterior teeth.

DISCUSSION.

Matchet cut injuries with their attendant morbidity and mortality are not uncommon in Nigeria, a developing country. The case presented here is a male and it supports previous studies; Omoke and Madubueze, 2010 and Ladeinde *et al.*, 2009, where male victims predominated. Males are generally more exposed to violence and interpersonal violence was the most common aetiological factor in the studies.

Youths and adolescents are the predominant age group affected, while students involved in secret cult activities were the predominant occupational group, Wiedman *et al.*, 2001. About 50% of the students affected in Omoke and Madubueze, 2010, had secret cultism related activities (intentional injury) as the aetiological factor.

Our patient reached the hospital within 36 hours of injury having been to two other centers previously. This possibly could be related to the aetiological factor (interpersonal violence) where most victims will usually report to the Police, who in turn encourage early medical treatment and report. At presentation, patient had a full thickness laceration of soft and hard tissues of the anterior two-thirds of the lower third of the face. This is characteristic of homicidal wounds and injuries arising from assaults, Memchombi *et al.*, 2004.

Blows with the sharp edge of the matchet result in lacerations, transection of nerves, vessels and tendons, and may be powerful enough to slice through bone, resulting in open fracture, subtotal decapitation or traumatic amputation, Nadjen *et al.*, 1999.

There are few mechanically weak points in the mandible which include the angle, condylar process and sides of the mentum (Garza, 2002; Mitsukawa *et al.*, 2004). The locations and directions of mandibular fractures are nearly constant, although the impacts and directions of the external forces are variable. Generally the lower part of the condylar process is likely to be fractured by a horizontal external force applied to the mentum, while the lateral and median portions of the mentum are easily fractured by a vertical force, Huelke and Patric, 1964. An isolated horizontal fracture of the lower border of the mandible is rare. Only an object approaching at high speed could produce enough of an impact force to fracture the bone in a non-biomechanical pattern, Ladeinde *et al.*, 2009. The object would have to have a horizontal orientation with a sharp edge when striking the mandible and at such an acute loading would act like a high powered osteotome, Eppley, 2004. This explains the mechanism of the rare type of mandibular fracture seen in our patient.

The duration of admission was 17 days due to lack of funds and wound breakdown. This is at variance with 6.2 and 7.8 days reported by Yip *et al.*, 1997; and Omoke and Madubueze, 2010, respectively. During the period of admission, patient was transfused with one unit of blood and was managed for wound breakdown. This was not surprising because of the contaminated nature of the wound, the intra-oral communication and the prevailing poor oral hygiene. It however differs significantly from the lower rate of infection reported by Claude *et al.*, 2005, in their study of matchet cut injuries.

The use of titanium miniplates in fracture immobilization provides a strong fixation, but this form of rigid fixation is not available in most centers including ours. The patient came to us both for reason of affordability of the cost of treatment and the expertise available in our center. Thus he had fixation of the

segments secured by strategically placed 0.5mm stainless steel circum- mandibular wires. The fractured segments healed without any displacement. Since our center is purely a maxillofacial surgery unit, patient was advised to see a general dental practitioner for further evaluation and rehabilitation. There was however no complaint of sensitivity or ache from any of the teeth nor anaesthesia of the lower lip.

Although our patient recovered completely, the morbidity and mortality associated with matchet cut injuries is a cause for concern and calls for injury prevention strategies. There is a great need for re-orientation and education of the youth, teaching them to eschew violence as a means of settling disputes. There is need for emphasis on the art of communication in our educational curriculum to arm our youths with enough conflict resolution skills to prevent interpersonal violence.

CONCLUSION.

Morbidity and mortality trail matchet-cut related injuries and affect mainly the youths. Our case demonstrated clearly that mortality could have resulted from severe blood loss and possible tetanus from wound contamination. The employment of wires in the management of this rare mandibular fracture was an attempt to make the best out of the limited facilities available.

We conclude that injury prevention mechanisms like reorientation form an important aspect of trauma care and will greatly checkmate this type of injury.

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