

Open Distal Radioulnar Shaft Fractures from Camel Bite: A Case Report from Northeast of Nigeria

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ABSTRACT

Camel bite injuries occur world-wide and it is well documented. In the North-Eastern region of Nigeria, injuries from camel bite are rarely reported. Severe injuries from camel attack require multidisciplinary management approach as it can result in limb or life-threatening conditions. To mitigate against these types of severe injuries from camel bites, there is need to report the incidents of camel attacks in order to provide enlightenment about the nature of the camels and their mechanism of causing injuries. Hence, we report a case of Gustilo-Anderson type 3B (GA type 3B) distal radioulnar shaft fractures in a young male camel rearer.

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INTRODUCTION

Camels are common domestic animals which serve as a means of transportation, source of milk and meat in the desert regions of Asia and Africa including Northern Nigeria. Naturally, camels are quiet and obedient animals. But, their threshold of tolerance and obedience reduces drastically during mating season (Zaki et al., 2021). Thus, majority of camel bites are by male camels and occur during the mating season, which is usually from December to March (Al-Bouki et al., 1989). Also, camels are more likely to bite handlers with prior offence or those who do not have experience with camel handling (Vincent et al., 2018). Camel bites can cause life or limb threatening injuries because they may result in extensive crush injuries to the affected body organ or system (Ogunbodede & Arotiba 1997; Abu-Zidan et al., 2012). The strength and anatomy of camel mouth structure are responsible for the severe and extensive tissues injuries during camel attack (Al-Bouki et al., 1989).

A mature camel has 34 teeth including four sharp and long canines (Al-Bouki et al., 1989). In addition, the mechanisms involved in the camel attack injuries are complex. While the strong jaws with sharp and long teeth are responsible for the penetrating and crushing injuries, the picking up, shaking and throwing of the victims by the camels account for the blunt injuries following camel attack (Al-Bouki et al., 1989; Lazarus et al., 2001).

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Thus, depending on the mechanism of the camel attack, the victims may sustain wide range of injuries such as wounds of varying sizes, fractures, dislocation, neurovascular injury, maxillofacial injury and head injury (Abu-Zidan et al., 2012). Worldwide, majority of camel bites occurred in the

upper limbs. A study conducted in northern Nigeria revealed that out of 108 cases of camel bites injuries recorded over a period of eight (8) years: 38 bites on the forearm, 15 bites on the arm, 20 bites on the hand & wrist, 13 bites on the elbow, 5 bites on thorax, 7 bites on head & neck and 10 bites on the leg (Musa, 2002). Globally, the incidence of camel bites is poorly documented. The geographical distribution of camel accounts for wide variation of the incidence of camel bites worldwide. In countries where camels are well domesticated like Saudi Arabia, the incidence is as high as 2.9 per 100,000 population per year. In Iran the incidence is 7.3 per 100,000 population per year (Elsadig & Mustafa, 2023). While in the western world, the incidence of camel bites is rare with paucity of documented cases (Elsadig & Mustafa, 2023). Wounds from camel bites are prone to infection which is usually polymicrobial. Commonly implicated pathogens are *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Aeromonas*, *Actinobacillus*, *Pasteurella aerogenes*, *Escherichia coli*, *Klebsiella ozaenas*, *Pseudomonas aeruginosa* and *Clostridium tetani* (Dendle & Looke, 2008). The infection rate from camel bite wound is as high as 86% (Vincent et al., 2018). Also, infections such as tetanus and rabies are likely to complicate camel bite wounds especially if the victims and the camel are not vaccinated (Dendle & Looke, 2008; Vincent et al., 2018). We report a case of a 20-year-old male camel handler who sustained Gustillo-Anderson type 3B (GA type 3B) distal radioulnar shaft fractures with significant soft tissue injury from camel bite. First of its kind to be reported from Northeastern region of Nigeria to the best of our knowledge.

CASE DESCRIPTION

A 20-year-old male camel rearer presented to our Accident and Emergency department with a day history of open injuries on his right forearm and hand following provoked camel bite. He sustained the aforementioned injuries while he was separating a fight between two male camels that were fighting over the right to copulate with a female camel. The patient got bitten on his right forearm from the rear while forcefully pulling on the rope hung on the index camel's neck in an attempt to take it away from the scene. He immediately released the rope and ran for safety. There were associated histories of pain, bleeding, deformity and inability to use the right hand. No other injury was sustained. Bleeding was controlled with firm dressing at the nearby primary health centre before referral to our hospital. No significant past medical history.

At presentation, the patient was haemodynamically stable. Examination of right forearm and hand revealed deformity at the junction between the distal one third and proximal two thirds, gross swelling and two longitudinal wounds on the posterior surface of the distal forearm. One measured about 5cm x 2cm. The other was 10cm x 4cm with irregular edges, exposed contused and lacerated extensor muscles and fractured distal ulnar segment. There was scanty foul-smelling discharge with surrounding dusky skin. (Figure 1) There was another wound on the palmar surface of the hypothenar eminence measuring 4cm x 2cm exposing contused and lacerated muscles. Distal neurovascular status was intact. Minimally extending to D1 and D2.

Patient had resuscitation, baseline investigations and right forearm radiographs done (Figure 2). The plain radiographs revealed displaced transverse distal radioulnar shaft fractures with multiple small bone fragments. The Full blood count results: Hb=10.6g/dl, PCV=31%, WBC=6.6X 10⁹/L (Neutrophil=43%, Lymphocyte= 55%). The E/U/Cr results: Potassium=3.0mmol/L, Sodium=140mmol/L, Chloride=109mmol/L, Bicarbonate=29mmol/L, Urea=18mmol/L, Creatinine=65

He had intravenous Ceftriaxone 1g, gentamycin 80mg and metronidazole 500mg administration. In addition, intravenous pentazocine 30mg, paracetamol 1g and intramuscular diclofenac 75mg were administered. The patient also had subcutaneous T.T. 0.5ml stat and intramuscular ATS 1,500 units. He had initial wound irrigation, dressing and fracture immobilization with plaster of Paris back slab while being worked up for surgery. The Intra operative findings were lacerated and contused extensor digitorum, extensor digiti minimi and extensor carpi ulnaris, exposed distal radioulnar shaft fracture segments and dusky surrounding skin. He had wound exploration, debridement and rush nails insertion for fractures stabilization. The wound was thoroughly irrigated with normal saline and dressed with saline soaked gauze over the exposed bone and 10% betadine. The decision for fractures stabilization with Rush nails as against mini external device was based on the need of flap cover for the resultant large wound with exposed bone. Postoperatively, patient was co-managed with plastic & reconstruction surgeon. He was placed on daily wound dressing with normal saline soaked gauze over the exposed bone and 10% betadine, limb elevation, and continuation of preoperative intravenous antibiotics and analgesics. Postoperative radiograph is as shown in Figure 3.

After three weeks of wound care, he had wound cover with groin flap raised from ipsilateral groin region by the Plastic & Reconstruction Surgeon (Figures 4 and 5). The choice of the site and the choice of the groin flap over skin grafting were based on the site, size and the nature of the wound. Groin flap division and inset were done three weeks post wound cover (Figures 7). Thereafter, he was

placed on alternate day wound dressing for the residual wound and hand physiotherapy. Three days post flap division and inset, the patient left against medical advice stating that he could not afford to stay any longer. He did not come for follow up visit in the Plastic or Orthopaedic outpatient clinic.



Figure 1: Picture taken at presentation showing two wounds on the dorsal surface of distal forearm



Figure 2: Pre-operative radiograph of the left forearm showing distal radioulnar shaft fractures



Figure 3: Post-operative AP view radiograph showing fractures fixation with Rush nails



Figure 4: Groin flap



Figure 5: Wound cover with groin flap



Figure 6: Picture taken during ward round showing groin flap protection with left forearm immobilization using crepe bandages



Figure 7: Post flap division and inset

DISCUSSION

Animal bite injuries are common and well documented in our region (North east of Nigeria). Camel bite injuries on the other hand are relatively rare and not commonly reported. Camel-related injuries can be very devastating with poor prognosis especially when severe and not well managed. The incidents of camel bites are common with male camels during mating season (Zaki et al., 2021) which was the period of occurrence of this index case. Two male camels were fighting over the right to copulate with a female camel when this index case occurred. Also, studies have shown that camels are more likely to bite the handler with prior offence as in this reported case (Ogunbodede & Arotiba 1997; Zaki et al., 2021). The patient, who has been rearing camels for than ten (10) years, got bitten in his right forearm by an aggrieved male camel while he was

separating a fight between two male camels over the right to copulate.

Camel bite injuries can be very severe and limb threatening because of their very high biting force resulting from their large tooth size, strong jaw musculature and huge body size (Ogunbodede & Arotiba 1997; Abu-Zidan et al., 2012). In the index case, the patient sustained open distal radioulnar shaft fracture (Gustilo-Anderson type 3B) from a single bite by an aggrieved male camel. There were extensive soft tissues loss, heavy contamination and significant periosteal stripping caused by a close-range high-energy camel bite.

Like most animal bites, camel bite injuries are prone to infection (Suess et al., 2004; Dende & Looke, 2008). Dende & Looke (2008) revealed that the infection rate from camel bites was high as 86%. In the index case despite the relatively early presentation, thorough wound debridement,

antibiotic therapy and wound care, the patient still developed wound infection which was not completely resolved before he left against medical advice.

Undoubtedly, camels are very useful domesticated animals for transportation, agricultural activities and source of food. Although not very common, injuries from camel attack can be life or limb threatening. It is very important to adopt preventive measures while handling camels to prevent attack from them. These measures include maintaining respectful distance away from apparently aggrieved camel, recognition of signs of aggression such as curled lip, avoid provocation such as direct eye contact, avoid feeding camels with hand, wearing of muzzle on the camels especially during mating season and periodic public education on safe handling of camels.

CONCLUSION

Camel bite injuries are usually severe and associated with high risk of infection with resultant limb threatening and /or functional impairment as in this reported case. Thus, care should be taken when dealing with camels especially during mating season. Also, multidisciplinary approach should be adopted for better outcome of managing camel bite injuries.

Human Ethics

Consent was obtained or waived by all participants in this case report

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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