Albanian Journal of Trauma and Emergency Surgery (2021) 5/2: 879-882
DOI: 10.32391/ajtes.v5i2.233

CASE REPORT

Complex Femoral Injuries after Hippopotamus Bite: A Case Report

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Received: 15 April 2021 / *Accepted:* 08 May 2021 / *Published online:* 20 July 2021
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Abstract

Introduction. Attacks by large animals, which lead to a critical patient condition, have not been systematically and statistically analyzed in the previous literature. Some papers about animal attacks are case reports and address fatal cases. Hippopotamus bite injury is a major trauma associated with complications.

Case report. In 2018, an American woman celebrating her 37th birthday in Zimbabwe embarked on a river rafting trip. After the hippopotamus bite, the patient had extensive soft tissue injuries and a comminuted fracture of the right femur. It was undertaken extensive multiple wound debridement and the femur was nailed as the site of entrance of the nail was away from the soft tissue injuries.

Conclusion. Usually, hippopotami avoid contact with people. Similar to many wild animals, hippopotami can attack in anticipation of danger, especially when protecting their offspring. In the present case, the inflicted injury is severe and has a combined character.

Keywords: animal attack, human, femoral fracture, hippopotamus bite

Introduction:

The most common animal-inflicted injuries are divided into those due to attacks by nonvenomous or venomous animals [1, 2]. In general, injuries caused by Hymenoptera constitute a substantial part of these injuries; injuries caused by nonvenomous animals are typically because of cows, horses, and dogs [3].

Attacks by large animals, which lead to a critical patient condition [4], have not been systematically and statistically analyzed in the previous literature. Nevertheless, it has been demonstrated that hippopotamus attacks are the tenth largest reason of human deaths in humans (apart from malaria, tapeworms, snakes et cetera), with 500 deaths worldwide in 2018 [5]. Hippopotami are dangerous if people appear to disrupt the hippopotamus access to the water and get run over by the 1.3 to 2. tons of weight by a speed of 50 km/hour.

Some papers about animal attacks are case reports and address fatal cases [6 - 9]. The type and mechanism of these injuries are significant in forensic medicine as they could help forensic pathologists to identify the attacking species and its modus operandi [10]. There is a connection between species and type of injuries. An example of an attack by large exotic animals is a hippopotamus bite. Hippopotamus bite injury is a major trauma associated with exquisite complications [11, 12]. The following case report provides an example.

Case report

In 2018, an American woman celebrating her 37th birthday in Zimbabwe with a romantic boat tour embarked on a river rafting trip. When the guide stopped on a bank to observe two hippopotami, a third hippopotamus suddenly swam towards the boat and attacked it. Grabbing the tourist by the leg with its jaws, it pulled her out of the boat. At that time, the victim hit her head against the back of the hippopotamus and lost consciousness. Shortly after the hippopotamus

Original article, no submission or publication in advance or in parallel

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freed her, the victim was taken to a local hospital by her husband and the ranger.

The patient had extensive soft tissue injuries and a comminuted fracture of the right femur (Figure 1).

The location of wounds was on the distal right thigh. The fracture had not communication with the subtrochanteric region, but it has been classified as open fracture due to high energy trauma sustained by wild animal bite. Neurologically all nerves were intact, and it was good distal pulses. Large open wounds in distal thigh area were with damage to quad muscles. The avulsion skin injury over the right knee joint was anteriorly and there was a large open wound in popliteal fossa.

All wounds were provisionally sutured (Figure 2), and the fracture was stabilized with extension. Furthermore, she was airlifted to a level I trauma center in South Africa.

On arrival, the patient was fully conscious and in fair general condition, and the patient was taken directly to the operation theatre, where extensive wound debridement was undertaken (Figure 3) and the femur was nailed as the site of entrance of the nail was away from the soft tissue injuries (Figure 4, 5). Furthermore, the wounds superficial to the fracture site did not communicate with the fracture. After multiple debridement and antibiotic therapy, the wounds cleaned up (Figure 6). Subsequently, plastic skin surgery was performed to the wound surfaces and the patient was discharged for outpatient follow-up care

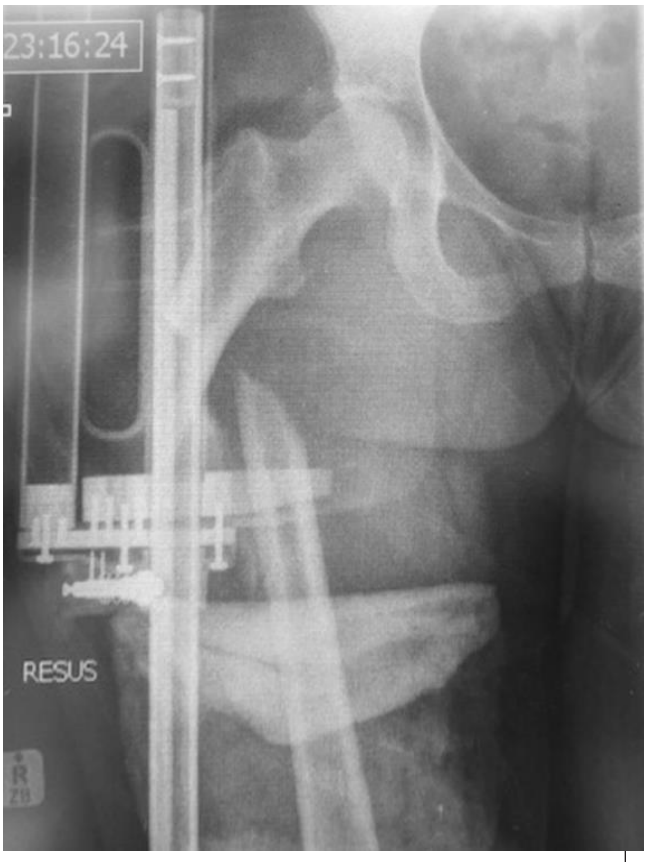

Figure 1. Fracture of the right femur after Hippopotamus bite.

Figure 2. Bite injuries include deep partial skin decollement at the level of the thigh after the initial cleaning

Figure 3. Hippopotamus bite injury with extensive soft tissue injuries after extensive wound

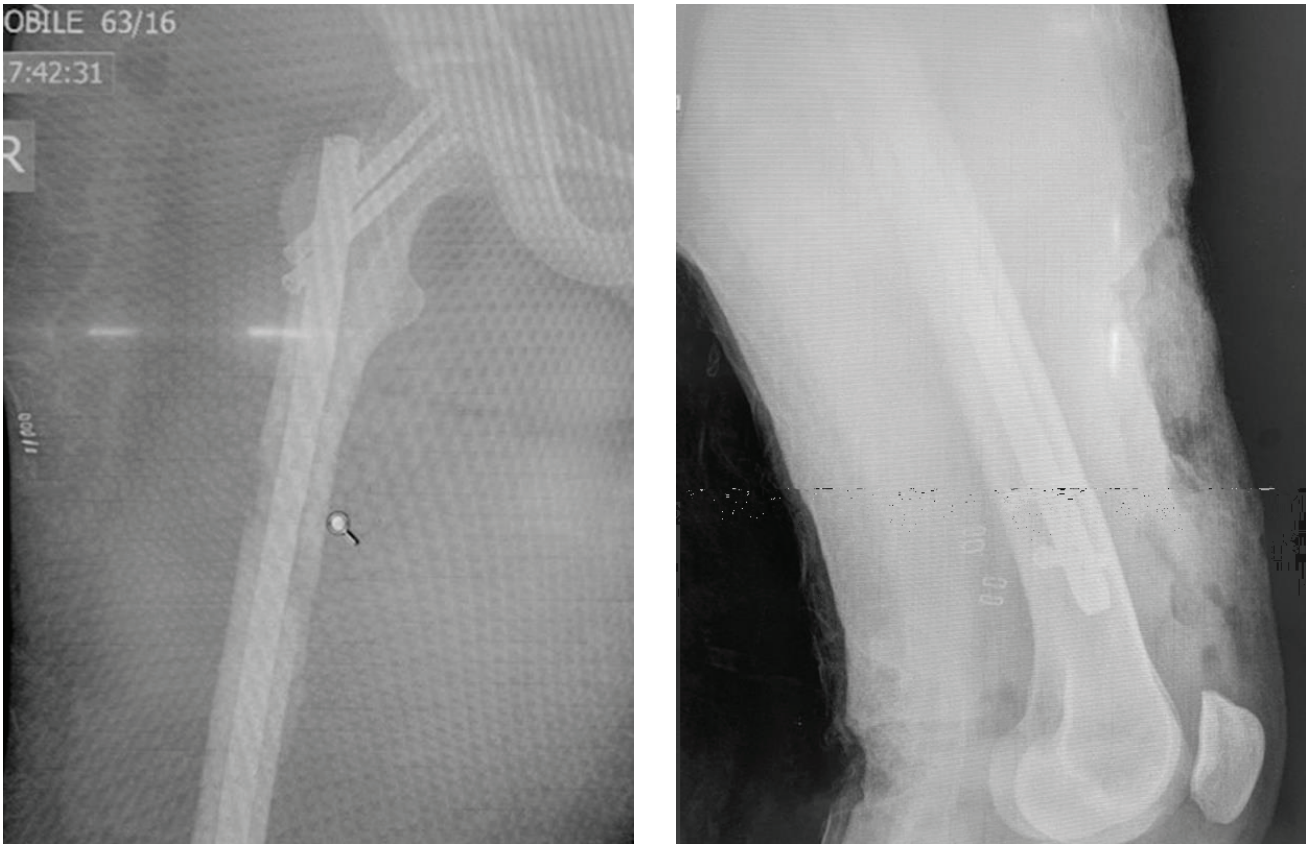

Figure 4, 5. Fracture of the right femur after nail osteosynthesis

Figure 6. Wound after repetitive debridement

Discussion

As most of the readers won´t know (and the author didn´t before as well), the mouth of a hippopotamus can swing open to 180° and slams shut with a force of 230 kg.

Therefore, in this case, the trauma from the bite was understandably severe and resembling more a bone crush than a bone shear mechanism. Extensive soft tissue damage was combined with a multi-comminuted fracture of the femur. Crushing deep structures required multiple wound debridement. Therefore, defining the vital boundary required time and repetitive surgeries. In addition, treatment of this case was complicated by the primary wound infection. Fortunately, though, the soft tissue injuries were away from fracture; thus, rapid intraosseous osteosynthesis without major infectious risk was possible.

Otherwise, external osteosynthesis would have been necessary, which would have caused additional procedures and definitive bone fixation later if the wounds requiring regular debridement were clean. Adequate choice of antibiotic therapy is also of great importance, where no guidelines exist.

In many cases, attacks from hippopotami are fatal. In one case in 2014 in Niger, a boat was capsized by a hippopotamus, and 13 people were killed [13].

Extensive injuries are of particular interest in forensic medical examinations when taking history is not possible and there are no witnesses. Therefore, a systematic analysis of attacks by large animals is important not only from a medical but also a forensic point of view. This case report enables to depict the variety of injuries received during a single short hippopotamus attack.

Conclusion

Usually, hippopotami avoid contact with people. Similar to many wild animals, hippopotami can attack in anticipation of danger, especially when protecting their offspring. In the present case, the inflicted injury is severe and has a combined character.

The force and bluntness of the teeth increase the probability of a crush injury with devitalized tissue. The clinical presentation and appropriate treatment of infected bite wounds vary according to extent of the wound. These wounds are considered complex injuries infected with a unique polymicrobial inoculum [14].

Ignorance of animal behavior and flagrant disregard of rules by tourists may lead to fatal attacks by hippopotami. Tourists' ethological naivety and failure to determine the experience of trail guides prior to travel may result in inadvertent behavior, unnecessary risk taking, and preventable injury [4]. The consequences may be dire, but can be survived with major surgical care, as described in this case report.

COI Statement: The submitted work has not been published before (except as part of a thesis or report, or abstract); it is not under consideration for publication elsewhere; and its publication has been approved by all co-authors.

This research received no specific grant from any funding agency in the public, commercial, or nonprofit sectors. There are no relevant or minor financial relationships from authors, their relatives or next of kin with external companies.

Disclosure: The authors declared no conflict of interest. No funding was received for this study.

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