

Maxillofacial injury from a leopard attack

ABSTRACT

Although leopards are found worldwide, the incidence of leopard attack on humans is reported most often from India and Nepal. Usually, leopards avoid contact with people, but humans may occasionally be targeted as prey. Animal bite wounds may express as punctures, abrasions, tears, or avulsions. 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. As the bite injuries are commonly found on the face, an oral and maxillofacial surgeon should be familiar with the management of animal bites. This article reviews a case of a victim attacked by the leopard, the treatment provided to the victim, and brief notes on the management of such facial animal bite injuries.

Keywords: Animal attack, facial wounds, soft tissue injuries

INTRODUCTION

Literature review indicates a considerable number of animal bite injuries in humans.^[1] However, animal bites caused wild animals such as tiger, bear, and leopard are rarely reported. Our literature search found only one case report of leopard attack documented by Bahram *et al.*^[2] In this case report, we present a case with extensive soft-tissue injury associated with a zygomaticomaxillary complex (ZMC) fracture due to leopard attack.

CASE REPORT

A 55-year-old farmer reported with an alleged history of an attack by a leopard. The attack on the left side of face resulted in compound lacerated wounds on the left side of the face suggestive of severe IVB type (Lackmann's classification) of wound [Figure 1]. There was no injury to the orbital contents or to the facial nerve branches.

Immediately on arrival, foreign bodies such as soil, dry grass were removed from the wound. Wound was irrigated and debrided using povidone iodine, hydrogen peroxide, and normal saline. Primary suturing was completed in the emergency department. In view of the lack of immunization

history, tetanus toxoid and anti-rabies injections were injected. Intravenous amoxicillin with clavulanic acid started at the same time to avoid infection.

Computed tomography scan of facial bones was advised which revealed a fracture of the left ZMC [Figure 2]. Open reduction and internal fixation at the left frontozygomatic region and left maxillary buttress region were performed under general anesthesia [Figures 3 and 4]. Due diligence was exercised during soft-tissue closure [Figure 5].

Follow-up of the patient was taken on outpatient department basis. Scar was found satisfactory at follow-up of 6th month [Figure 6].

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Access this article online

Website:
www.njms.in

DOI:
10.4103/njms.NJMS_41_16

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How to cite this article: Pawar SR, Kshirsagar RA, Raut PH, Patankar AP. Maxillofacial injury from a leopard attack. Natl J Maxillofac Surg 2018;9:96-9.



Figure 1: Extensive soft-tissue injury – status at arrival



Figure 2: Computed tomography scan showing fracture of left zygomaticomaxillary complex



Figure 3: Fixation at Frontozygomatic region

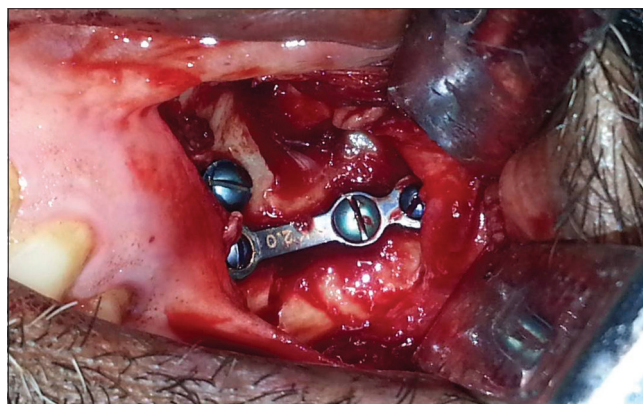


Figure 4: Fixation at maxillary buttress – intra-oral approach

DISCUSSION

The leopard (*Panthera pardus*) is one of the five “big cats” in the genus *Panthera*. The leopard is known by its stout build, muscular and short limbs, a broad head, and a coat of spots arranged in rosette pattern. Several human–leopard clashes have been reported in India. Such attacks of leopard take place in close vicinity to dense forests, where the health-care facilities are deficient. Severely injured patients have to travel hundreds of kilometers. There is a need to setup trauma centers in the rural areas to facilitate the health-care facilities to rural population.

As the face is a functional and cosmetic area of the body, bite wounds are considered as complex injuries and have been classified by Lackmann [Table 1]. They are contaminated with an exclusive polymicrobial inoculum. Because of dental background and expertise in the pathogenic oral flora, oral and maxillofacial surgeons have remained in the forefront of the surgical treatment of these injuries.^[3,4]

The dentition and morphology of wild animals are different, but when the bite is induced these parameters may help to differentiate the bite mark and analyze and assess the culprit for the bite. Bites of wild animals may cause local infection and also transmit systemic diseases which give significant morbidity and mortality to the patient.

Facial bite wounds usually show low infection rate, due to rich blood supply of the face. Cat bites are usually more prone to infection as it consists of more toxic organisms. Delay beyond 6–12 h in seeking medical attention raises the probability of infection. It may also affect the therapeutic efficacy of antibiotics.^[4] Most infections caused by animal bites are multibacterial, with *Pasteurella* (*Pasteurella multocida*) being the most common species. *P. multocida* are Gram-negative coccobacilli most frequently isolated in bite injuries by large cats. Anaerobic species play a key role in animal bite infections and are isolated in 56%–70% of infected animal wounds. Other aerobic microorganisms found in mammalian bite injuries are *Streptococcus viridans* and staphylococci.^[2]



Figure 5: Skin closure



Figure 6: Postoperative – 6-month follow-up

According to current recommendations, combination of amoxicillin and clavulanate is the antimicrobial agent of choice for prophylaxis [Table 2]. The duration of course for antibiotic prophylaxis is 3–5 days and may extend to 10–14 days in cases of cellulitis.^[4]

Bite injuries are tetanus-prone, thus correct immunization should be administered if the patient has had <3 doses of “tetanus toxoid” or more than 5 years have passed since the last dose.^[4] In case of canine and wildlife animal bites, postexposure prophylaxis of anti-rabies should be instituted immediately unless adequate laboratory surveillance and data indicate that the species involved is not a vector of rabies.^[5]

Considering the wound contaminated, vigorous irrigation and thorough debridement to remove all foreign material should be given utmost importance rather than antibiotics in preventing infection. Irrigation and removal of necrotic tissue are two main components of wound care. Cleansing with soap and scrubbing are best measures taken for high-risk wounds. Irrigation with a 19-gauge catheter on a 30- to 60-ml syringe delivers a pressure range between 5 and 8 psi, is considered most favorable decontamination technique. Normal saline (250–500 ml) is the fluid of choice for irrigation as it minimizes the risk of cytotoxicity. A 1% povidone-iodine solution has been suggested for irrigation as it provides a best therapeutic balance between bactericidal capacity and tissue toxicity.^[6]

It is prudent to note that routine debridement should not exceed 1 mm of tissue. Suturing should not be performed in the presence of overt infection, gross edema, foreign bodies, or visible contamination, and it would be advisable to consider delayed closure. No benefit shall be obtained by the culture of fresh uninfected wounds because it depicts the polymicrobial flora of the wound rather than the causative organisms of any subsequent infection.^[4]

Table 1: Classification of facial bite injuries

Type	Clinical findings
I	Superficial injury without muscle involvement
IIA	Deep injury with muscle involvement
IIB	Full-thickness injury of the cheek or lip with oral mucosal involvement (through-and-through wound)
IIIA	Deep injury with tissue defect (complete avulsion)
IIIB	Deep avulsive injury exposing nasal or auricular cartilage
IVA	Deep injury with severe facial nerve and/or parotid duct
IVB	Deep injury with concomitant bone fracture

Table 2: Antimicrobial prophylaxis for common facial bite wounds

Patient	Primary regimen	Alternative regimens/allergy
Adult	Amoxicillin/clavulanate	Clindamycin plus ciprofloxacin Cefuroxime axetil Doxycycline Moxifloxacin Azithromycin
Child	Amoxicillin/clavulanate	Clindamycin plus trimethoprim-sulfamethoxazole Azithromycin
Pregnant	Amoxicillin/clavulanate	Azithromycin

Radiographic examination of craniofacial skeleton is advised when a fracture is suspected.^[4] A classification of facial bite wounds, based on its extent, are mentioned in Table 1.^[6]

As compared to soft-tissue injury, bony injuries are less common. As reported by Shah *et al.*, bony injury was found in 31.41% cases of an animal attack, in which face was commonly involved site (27.09%). In contrast another study by Divedi *et al.* almost all the cases presented with fractures of facial skeleton.^[7]

A well-organized team of oral and maxillofacial surgeon, orthopedic surgeon, plastic surgeon, otolaryngologist,

ophthalmologist, microbiologist, and psychiatrist should be called/formed for the management of these cases.

Through clinical as well as radiological examination of the neck and nape area must be taken into consideration even if there is minimal soft-tissue injury. The reason is these wild animals have tendency to attack over the neck. Therefore, we should not miss associated hidden tracheal or cervical vertebral injury. Underlying bony injuries should also be ruled out and addressed if any, with equal importance.

CONCLUSION

We conclude that the oral and maxillofacial surgeons must be aware of various patterns of animal bite injuries, along with their treatment plan including postexposure prophylaxis of anti-rabies, tetanus toxoid, and antibiotic regimen as the leopard attack on human beings is going to increase due to encroachment of humans into animal habitat or forest. In our review of literature, we found reports of only soft-tissue injury, but in our case study, soft-tissue injury was associated with osseous fractures which required ORIF. We suggest that through clinical as well as radiological examination of the neck and nape area must be taken into consideration even if there is a minimal soft-tissue injury.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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