

Tropical Veterinarian

ISSN 0794-4845

Volume 30 (1) 2012

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CASE REPORTS

MANAGING BITE WOUNDS IN MALE A MONA MONKEY (*CERCOPITHECUS MONA*)

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Keywords: Wound healing, Mona monkey

Abstract

This paper reports on the management of bite wounds inflicted on an adult male mona monkey by two other males in an attempt to mate the only female in the group. The deep laceration wounds which were at the left cranial thoracic and left caudal abdominal walls, the lateral aspect of the right thigh, the planter surface of the right fore limb and the right triceps muscle were managed with honey incorporated bandage dressings and delayed primary closure with sutures. The unique wound management procedure especially in wild life species, as well as the need to prevent group fight among wild life species in captivity especially mona monkeys through understanding of their social interactive structure formed the objectives of this report. Information acquisition by Zoo Veterinarians and managers, on social interaction among wild life species could help in preventing injuries, reducing cost of zoo animal keeping and conserving the few wild species presently available in our zoological gardens and game reserves.

Introduction

Mona monkeys, *Cercopithecus mona*, are arboreal primates found primarily in rainforest of Africa in countries such as Nigeria, Ghana, Cameroon, Senegal, Congo, Angola, Gambia and Uganda (Estes, 1991, Glenn, 1997; Grzimek, 1990 and Liu, 2000). They are found toward the middle and top of trees in mangrove swamps, gallery forest and wood lands (Nowak, 1999).

Mona monkeys are small primates with body length of 32 to 53 cm and a long tail of 67 to 90 cm (Zoo Atlanta, 1998 and Liu, 2000). Individuals are usually very colourful, and their special attractive colours and body markings have been well documented (Zoo Atlanta, 1998 and Liu, 2000). The males are typically bigger than the females and weigh about 5 kg while females weigh about 4 kg.

Much is not known about the mating behavior among mona monkeys (Grzimek, 1991, Zoo Atlanta, 1998). Their social groups are known to consist predominantly of many females with few males which made some researchers to suggest a possibility of males forming polygynous bonds with females (Liu, 2000). Also, females show no signs of estrus swelling, which suggest that females communicate their sexual receptivity through behaviors. Since primates generally mate with only one male (Grzimek, 1991), fighting could occur if several males exist with few females resulting in injuries. Management of bite injuries could be challenging to the veterinarian depending on the extent of tissue damage, level of contamination, and decision to embark on primary, secondary or tertiary wound closure (Waldron and Zimmerman-Pope, 2003). Besides, there is a dearth of information on the use of natural honey incorporated bandage dressing to enhance wound debridement and healing in wild life species with bite injuries.

Case History

An adult male captive mona monkey weighing 4.5 kg was presented at the Veterinary Teaching Hospital, University of Ibadan, Ibadan, Nigeria, with deep laceration at the left cranial thoracic and left caudal abdominal walls, the lateral aspect of the right thigh, the planter surface of the right fore limb and the right triceps muscle (Figs. 2 and 3). A history of fight involving two other males in the group containing only a young female was given. The only female was a daughter of the severely injured male. The mother died some years earlier with the father living with the daughter without producing another offspring through the daughter. Two young male adult mona monkeys were later introduced into their pen. A fight broke out when the daughter was showing an estrus sign,

but the father would not allow any of the young males to go closer to it, neither would he perform the role. The fight was eventually controlled when the father mona was rescued from the pen, and one of the new males separated leaving only one male with the only female.

Wound management

The monkey was sedated with 5% ketamine (Ketamine®; Rotex Medica, Germany) at a dose rate of 10mg/kg body weight and 3% pentazocine (Pentalab®, Laborate Pharmaceutical, India) at a dose rate of 2mg/kg body weight (Joslin, 2003). Fluid (Dextrose saline) was administered via a preplaced scalp vein set cephalic venepuncture to compensate for blood loss and provide immediate energy. The wounds were thoroughly flushed with normal saline, debrided and covered with honey incorporated bandage dressings (Waldron and Zimmerman-Pope, 2003, Eyarefe *et al.*, 2012) (Fig. 4). The wounds on the planter surface of the fore limb, and triceps muscle were sutured following adequate assessment of wound cleanliness and advantages of the procedure. The monkey was placed on oral ciprofloxacin (Ciprotab® Medibios Laboratories Pvt. Ltd, India) at a dose rate of 16mg/kg body weight, and tramadol (Tramadex®, Laborate Pharmaceuticals, India) at a dose of 1.25mg/kg for five days. The rest of the wounds were closed on the third and fourth days following assessment of natural honey-bandage debridement and wound sterility (Fig. 5). Healing of wound was uneventful. Cage confinement aided adequate rest and recovery. Sutures were removed from the wounds on the planter surface of the fore limb, and that below the left elbow joint and left stifle at 7 days post closure and the cranial thoracic and abdominal wounds at 14 days post closure.



Fig. 1: Traumatized monkey under anaesthesia following presentation.



Fig. 2: Monkey showing left cranial thoracic and caudal abdominal wall injuries.

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Fig. 3: Arrows showing wounds on planter surface, below the right elbow joint and around the right stifle joint.



Fig. 4: showing thoracic and abdominal wound bandaged prior to delayed primary closure.



Fig. 5: Showing abdominal wound closure following adequate wound debridement.

Discussion

Wildlife/zoo practice is a challenging field of veterinary practice. This field is still at an infant stage in veterinary practice in Nigeria. Wild life including monkeys requires adequate chemical restraint to aid handling. The drugs used for this procedure often influence physiological data such as temperature, respiratory, heart, and pulse rates. Besides, lack of specialized equipment often limits the extent of animal monitoring thus tasking the clinical competence of the surgeon. The dosage of the anaesthetics administered was influenced by documented suggestions and the state of health of the animal (Joslin, 2003). Wound management is a challenging procedure demanding adequate knowledge of the dynamics of wound healing and the right use of topical wound healing agents. This is more challenging in wildlife practice where adequate chemical restraint is necessary to prevent further self-injuries by the wildlife patient and harm to the surgeon.

Bite wound in animals often result in severe under-skin soft tissue damage that require an initial bandage dressing and a reassessment of wound for viable and non-viable tissues. This may necessitate further surgical debridement, and allow granulation tissue formation; a reflection of wound relative sterility, tissue proliferation and indication for secondary closure (Waldron and Zimmerman-Pope, 2003). The use of honey incorporated bandage dressings enhanced both the debridement and the proliferative phases of wound healing. Honey has been reported to have antiseptic, antibacterial, and wound nourishing properties that enhance rapid wound healing (Molan, 2001. Eyarefe *et al.*, 2008, Eyarefe, *et al.*, 2012). The antibacterial properties of honey are associated with the low water activity causing osmosis, hydrogen peroxide effect, high acidity, and the antibacterial activity of methylglyoxal

(Molan, 2001). When honey is used topically as a wound dressing agent, hydrogen peroxide is produced by dilution of the honey with body fluids and released slowly and acts as an antiseptic (Molan, 1992). The honey pH which is commonly between 3.2 and 4.5. (acidic pH) also prevents the growth of many bacteria (Molan, 1998), and facilitates wound transition from debridement phase to the proliferative phase.

The story surrounding this monkey's injury is of interest in zoo animal husbandry and the prevention of future occurrence. Mona monkeys are known to keep good social structure and live in large social groups ranging from 5-50 often with only one male in a social group. But if the group gets large enough, there may be several adult males (Estes, 1991 Glenn, 1997). It was therefore abnormal to keep three adult males with a female. Besides, report of only few males existing among several females shows possible king male dominance, and elimination of weak males to establish a dominant structure in a social group. Sexual maturity among mona monkeys occurs between 2-5 years of age. The lack of mating of the daughter female by the father mona monkey may be due to none attainment of sexual maturity by the daughter mona monkey for the said period of stay with the father, or a yet to be documented Father-daughter sexual sanctity among mona monkeys.

Wound management with natural honey incorporated bandage dressings in wild life practice is still a new, cost effective procedure that enhances rapid healing of grossly contaminated wound without side effects when compared with topical antibiotics. Moreover, there is need to constantly educate zoo animal keepers and superintending veterinarians of zoo animals' social structures and behavior to avoid

fighting and injury as well as the associated cost of treatment of injured animal, including preservation of endangered wildlife species in captivity.

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