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Management of ear laceration in a two-years-old female chimpanzee (*Pan troglodytes*): A case report

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Abstract
Laceration is the tearing of the skin that results in an irregular wound. Lacerations may be caused by injury with a sharp object or by impact injury from a blunt object or force. They may occur anywhere on the body. In most cases, tissue injury is minimal, and infections are uncommon. This type of wound is often irregular and jagged. When they do not involve deep tissue or have other significant problems, they are called uncomplicated simple lacerations. This case study presents the successful treatment and healing of a dorsal helix laceration in a Two-years-old female chimpanzee domicile at the Oracle Zoo, Makurdi, Nigeria. The treatment regimen administered includes; antibiotics, penicillin-streptomycin injection for three days, wound care spray, a single dose of Ivermectin, and multivitamin injections for three days. The chimpanzee showed remarkable healing progress by day 5 after the treatment initiation, emphasizing the effectiveness of this multi-modal therapeutic approach.

Keywords: Laceration, chimpanzee, antibiotic, ear

Introduction

Occurrence

The chimpanzee (*Pan troglodytes*) native to tropical Africa's forests and savannahs, is a great ape species with four confirmed and one proposed subspecies [1]. Adults typically weigh between 40-60 kg (males) and 32-47 kg (females). In captivity, females can live up to 39 years, while males live around 32 years [2]. Chimpanzees are omnivores and unfortunately, their population is decreasing, earning them an endangered conservation status [1, 2].

Chimpanzees (*Pan troglodytes*), our closest living relatives, share about 98% of our DNA, showcasing their remarkable genetic similarity to humans [1, 3]. These highly social animals thrive in African forests, spending most of their time in treetops and traveling on all fours when on the ground, although they can walk upright for considerable distances [1, 3, 4, 5]. Chimpanzees exhibit impressive tool use, utilizing sticks to extract termites and leaves to collect drinking water. However, these activities often take place in environments with potential hazards, leading to injuries such as cuts, bruises, and lacerations [1, 6, 7].

laceration is a wound that is produced by the tearing of soft body tissue on any part of the body [8]. Lacerations may be caused by injury with a sharp object or by impact injury from a blunt object or force [9]. They may occur anywhere on the body. This type of wound is often irregular and jagged. If they do not involve deep tissue or have other significant problems, they are called uncomplicated simple lacerations. Such cuts are usually managed by complete closure; however, this may not be possible if the wound is dirty or infected. Mostly a laceration wound is often contaminated with bacteria and debris from whatever object that caused the cut [10, 11]. Lacerations in animals, including non-human primates like chimpanzees, can pose health risks and potentially impair an individual's overall well-being when left untreated [12, 13, 14].

In this study, we present a case of a dorsal helix laceration in a two-years-old female chimpanzee, which was successfully treated using a unique combination of sutures, penicillin-streptomycin injection, wound care spray, Dexamethasone and multivitamin injections [11].

Signs and symptoms

Most presented symptoms of lacerations include: bleeding, scar, pain, swelling of the affected tissues or organs, warmth [11]. In most cases, tissue injury is minimal, only deep at the bleeding site and infections are uncommon. However, severe lacerations may extend through the full thickness of the skin and into subcutaneous tissues, including underlying muscle, internal organs, or bone. When occur in the limb. Severe lacerations often are accompanied by significant bleeding and pain [8, 11, 15, 16].

Treatment

Most Lacerations typically are treated only through irrigation with a sterile saline solution, which helps to remove dead tissue fragments and foreign debris and topical antibiotics spray or ointment and systemic antibiotics administration. However, some wounds are then closed by suturing [8, 11, 17]. The type of wound closure used depends on the extent and severity of the laceration. Primary healing of a laceration occurs when the wound is closed with skin adhesives, tissue tapes, or sutures. Secondary healing occurs when the wound is left open to heal by the formation of granulation tissue (a covering of connective tissue and capillaries), contraction (the drawing of wound edges near to one another), and epithelialization (the growth of new epithelium over the site of injury). Infected wounds typically heal through secondary healing. Delayed primary closure is often used for lacerations that are not considered to be clean enough for primary closure [8, 11, 15, 16, 17]. The wound is left open to heal for 5 to 10 days in a moist wound-healing environment, and then it is sutured. A moist wound-healing environment is created through the use of dressings that retain moisture to improve pain control, that encourage autolytic debridement (natural enzymatic breakdown of dead tissue), that provide physical and bacterial barriers, and that promote the formation of granulation tissue [11].

Case Presentation

A Two-years-old female chimpanzee caged with other older and bigger two chimpanzees comprising of a male and female at Oracle Zoo, Makurdi, Nigeria. And sustained a dorsal helix fresh laceration with bleeding, possibly due to an altercation with a conspecific. The laceration measured ap proximately 3 cm in length and exhibited slight on the bleeding deepest site. (Figure 1, 2, 3), swelling, and mild pain upon palpation at the non - bleeding area [15, 16, 17]. Due to the potential risk of infection and discomfort, prompt medical intervention was requested by the chief executive manager of the zoo.

Diagnosis

Laceration is diagnosed base on the history; clinical and physical examination of the wound and bacteria culture of the lacerated wound is carried out to confirmed the degree of sepsis [8, 9, 15, 16, 17]

Treatment Methodology

Most lacerations are self-limiting when there is mild bleeding. However, when the laceration is deep and caused severe bleeding, it then calls for urgent attention [8, 9] The treatment approach involved in this present case were; the descaling and cleaning of the wound with antiseptic and administration of two rolls of subcutaneous bleeding site antibiotic, penicillin-streptomycin injections at the dose rate of 1ml / 20kg body weight for three consecutive days for alleviating the risk of bacterial infection. Additionally, wound care spray was applied topically to cleanse and facilitate wound healing. To eliminate potential parasitic infestation and minimize related complications, a single dose of Ivermectin (Ivanor oral manifactj Jubaili Animal Health Nigeria) was administered orally. Dexamethasone (Dexanor, Jubaili Animal Health Nigeria) was given at the dose of 1ml Intramuscularly for four days. To enhance overall healing and immune response, multivitamin injections were given daily for three days.

Surgical Management

The chimpanzee was sedated with Xylazine hydrochloride at the dose of 3 mg/body weight intramuscularly and anaesthetized with ketamine at the dose of 35mg/kg body weight intramuscularly. And it was also given Dexamethasone (Dexanor, Jubaili Animal Health Nigeria was given at the dose of 1ml Intramuscularly for four days. at the dose of 10mg/kg body weight intramuscularly then placed on dorsal recumbency. The surgical management was carried out according to the method by Hassan *et al.*, 2014, Gretchen (2020) and Joseph and Mareira (2024). The dorsal aspect of the ear was thoroughly descaled and flushed with sterile saline solution and 0.5%iodine tincture repeatedly to remove all remaining debris. The bleeding site was sutured subcutaneously with chromic cat gut size 5 - 0 to arrest bleeding. Chamil ointment was then applied on the laceration and the chimpanzee was returned to the cage after healing on day five (Figure 2 & 3).

Fig 1: Treatment of Ear Lacerations in a One-Year-Old Female Chimpanzee

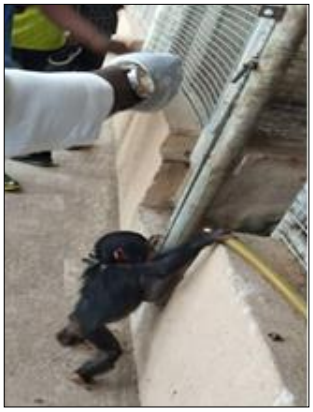

Fig 2: Post treatment examination of One-Year-Old Female Chimpanze

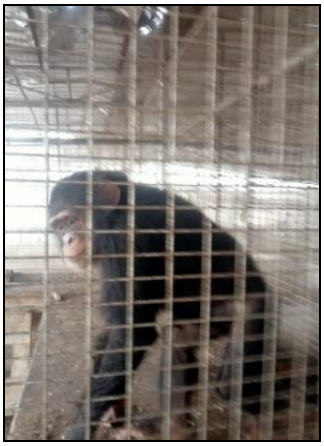

Fig 3: Post treatment examination of Female Chimpanze in cage

Post-Treatment Observations

Following the initiation of the treatment regimen, the chimpanzee displayed noticeable and progressive healing. Follow-up was done by dexamethasone, antibiotic administration and Chamil ointment application for three days. on day 5 of observation healing occurs by the formation of granulation tissue (a covering of connective tissue and capillaries), contraction (the drawing of wound edges near to one another), and on day 10^{th} there was epithelialization (the growth of new epithelium over the site of injury). No signs of infection or reoccurrence of laceration was observed.

Discussion

Health indicators for nonhuman primates encompass a range of factors, including body weight, appetite, body condition score, coat and skin condition, eye appearance, gait pattern, presence of injuries or diseases, pain or inflammation, posture, body temperature, and characteristics of feces and urine, as well as susceptibility to disease and wound healing ability.

When assessing nonhuman primates, it's crucial to consider behavioral indicators on an individual basis, relative to a predetermined baseline for each animal. Changes in normal behavior, such as a calm animal becoming aggressive, can signal potential pain or distress, highlighting the importance of monitoring individual behavioral shifts.

When evaluating animal well-being, it's essential to consider individual differences in aggression levels, focusing on whether aggression leads to anxiety, stress, or injury. While some aggression between animals may not impact welfare, others may cause significant distress, emphasizing the need to account for sources of variation in stress and aggression to ensure accurate assessments.

This case demonstrates the effective treatment of a dorsal helix laceration in a one-year-old female chimpanzee using a multi-modal therapeutic approach. Penicillin-streptomycin injections at the dose of 1ml/20kg body weight intramuscularly to minimize the risk of bacterial infection, one of the major concerns associated with open wounds. The inclusion of wound care Chamil ointment facilitated wound cleansing and expedited the healing process. The administration of dexamethasone targeted potential allergy known to be associated with body irritation during the healing process. Multivitamin injections were provided to improve the chimpanzee's overall health and immune response, thus promoting faster wound healing.

Conclusion

The successful treatment and subsequent healing of a dorsal helix laceration in the one-year-old female chimpanzee showcased the efficacy of the multi-modal therapy approach consisting of penicillin-streptomycin injections, wound care Chamil ointment, dexamethasone and multivitamin injections. This case report signifies the importance of prompt and comprehensive veterinary care in non-human primates, contributing to their overall health, wellbeing, and successful rehabilitation within captive settings.

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Declaration of Competing Interest

The authors declare that there is no conflict of interest regarding the publication of this case report.

Ethical Approval

This work involved the clinical management of an injured chimpanzee under the care of Oracle Zoo, Makurdi, Nigeria. All procedures were performed in accordance with professional veterinary standards.

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