

Management of a bite wound on forelimb of a Golden Langur (*Trachypithecus geei*)

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Abstract

A Golden Langur (*Trachypithecus geei*) with a bite wound on the forearm was presented. The patient was sedated with xylazine (20 mg, IM)-ketamine (100 mg, IM). Wound debrided with potassium permanganate (1:1000), hydrogen peroxide (6%) and povidone iodine solution, edges infiltrated with lignocaine (2%) and freshened. Placenta-extract and neomycin powder were applied. Subcutaneous tissues and muscles were apposed by Polyglactin-910 (size: 2-0). Skin edges were closed by Monofilament-polyamide (size: 2-0). Gauze-bandage and adhesive tape were wrapped. The animal ripped bandages on the 5th and 30th days, causing self-mutilation. A broad-spectrum ayurvedic ointment (Himax[®]) was applied over bandages, deterring the patient from biting bandages due to pungent smell and prohibited peeling due to ointment's slippery nature. The wound was dressed at 7-day intervals. Mixed-intention healing was observed by 44 days.

Key words: Bite wound, Golden Langur, Infighting, Laceration, Monkey

Highlights

- Surgical management of lacerated wound in Golden langur anaesthetized with xylazine and ketamine.
- Thorough debridement, dressing, suturing and bandaging of the wound were done.
- The patient removed bandages by hand and teeth, self-mutilating wound site delaying healing.
- Layering of bandage with a pungent ayurvedic ointment effectively prevented mutilation.
- Mixed intention healing in 44 days, the patient was released to the enclosure.

An adult Golden Langur (*Trachypithecus geei*) (15 years, male, and 10 kg body weight) from the Assam State Zoo had sustained a large lacerated wound on the right forelimb at the carpal region (Fig. 1) due to infighting with another male of the same species, newly introduced to the enclosure. The skin and underlying structures lost continuity, and torn tendons could be observed. Carpal bones (medial) could be seen upon extension of the joint. After transferring the animal into a squeeze cage, a combination of xylazine (20 mg) and ketamine (100 mg) was injected intramuscularly. First signs of sedation were observed after 2 minutes, and deep sedation at

7 minutes. Vital clinical parameters were recorded, and the animal was observed to be stable for surgical intervention. The wound was washed with normal saline, potassium permanganate (1:1000) and povidone iodine. Hydrogen peroxide (6%) was poured. The edges were desensitized by lignocaine hydrochloride (2%) infiltration. Devitalized skin and underlying tissues were removed, and wound edges were freshened. The wound was mopped with sterile gauze followed by application of placenta-extract gel and packed with neomycin sulphate powder. The subcutaneous tissues and muscles were apposed by Polyglactin-910 (size: 2-0) under

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a simple-interrupted suture pattern. Skin edges closed by Monofilament-polyamide (size: 2-0) in horizontal-mattress pattern (Fig. 2). A thin layer of cotton gauze bandage followed by adhesive tape was wrapped.

The patient was administered normal saline solution (@10 mL/kg, IV), ceftriaxone (Intacef, @250 mg, IV), vitamin-B complex (Tribivet-M, @1.5 mL, IV), meloxicam (Melonex, @0.8 mL, SC), chlorpheniramine maleate (Anistamin, @1 mL, deep IM) for five days. Tetanus toxoid injection @0.5 mL, IM and placed on post-bite Anti-Rabies vaccine schedule @1 mL, deep IM. Anaesthesia was reversed with Yohimbine @0.75 mg, IV. The entire procedure took 45 minutes. The patient raised his head within 2 minutes, and complete anaesthetic recovery was observed after 18 minutes. The patient was shifted to a squeeze cage.

The wound was dressed and bandaged on 4-day intervals. The animal had ripped the bandage on the 5th day and mutilated the wound site, causing rupture of suture and bleeding (Fig. 3).

On the 6th day, the patient was sedated, sutures were removed, and the wound was dressed without disturbing new granulation

tissue; sutures were placed as mentioned. The wound was bandaged, and the arm was put on a sling, attaching it to the animal's torso-caudally using gauze-bandage and adhesive tape to prevent further self-mutilation.

However, the patient faced balancing difficulties, toppling onto the cage bars; therefore, the arm was freed to avoid serious head injury. Maggoticidal spray (D-Mag, Intas Pharmaceuticals Ltd.) was applied over the bandage and surrounding area, deterring licking and biting for 15-20 hours due to its pungent smell. However, the animal ripped the bandages and caused self-injury on 30th day (Fig. 4). Broad-spectrum ayurvedic ointment (Himax[®]) was applied over the gauze-bandage and another layer over the adhesive tape. This technique ensured the bandage lasted for 5-6 days. Since the wound showed fair granulation, dressing was performed once a week. On the 44th day, the bandage was removed since the wound had healed under second intention of healing (Fig. 5).

Blood samples were collected for routine examination/complete blood count (CBC) and serum biochemistry on the 14th day, shown in Table 1.

Table 1. Haematological and biochemical profile of a Golden Langur (*Trachypithecus geei*)

Sl. No.	Parameters	Clinical value
1.	Haemoglobin (g/dL)	7.46
2.	Red blood cells ($10^6/\text{mm}^3$)	4.80
3.	White blood cells ($10^6/\text{mL}$)	12.36
4.	Lymphocytes (%)	45.33
5.	Monocytes (%)	4.13
6.	Granulocytes (%)	50.54
7.	Packed cell volume (%)	60.03
8.	Mean corpuscular volume (fL)	65.65
9.	Platelets ($10^6/\text{mL}$)	384
10.	Mean corpuscular haemoglobin concentration (g/dL)	19.24
11.	Alanine transaminase (U/L)	25.59
12.	Aspartate aminotransferase (U/L)	48.28
13.	Alkaline phosphatase (U/L)	259.83
14.	Serum creatinine (mg/dL)	0.83
15.	Blood urea nitrogen (mg/dL)	15.80
16.	Glucose (mg/dL)	108.10
17.	Total protein (mg/dL)	4.60

Management of wound in Golden Langur



Fig. 1. Extensive lacerated bite wound on right forearm of Golden Langur (*Trachypithecus geei*)



Fig. 2. Application of monofilament polyamide suture with horizontal mattress pattern



Fig. 3. Mutilation of wound site on the 5th day



Fig. 4. The patient ripped his bandages on 30th day



Fig. 5. Complete healing of wound observed on 44th day

The animal was released to its indoor enclosure (isolated) and observed for signs of self-mutilation for 7 days. Upon no incidence, the animal was allowed in the outdoor enclosure as per normal routine. The animal tried to use the recovered arm to carry out daily activities such as picking up food, swinging on tree branches, etc.

A perusal of literature on the normal range of haematological and biochemical data of Golden Langur revealed no accounts. It is also observed that no publication has been made regarding the surgical management of bite wounds in Golden Langur (*Trachypithecus geei*). It is the first reporting of such a case. However, a single case of abdominal evisceration due to an incisional wound in an adult Golden Langur was observed and treated by Dutta *et al.* (2014). Physical aggression between unrelated male rhesus monkeys was observed by Reinhardt (1989) when placed in pairs. Kumar and Sankhya (2021) enlisted

infighting as one of the common causes of musculoskeletal injuries reported in free-ranging rhesus macaques in the Himalayan Shivalik Hills. Palit and Rajput (2015) reported an incidence of large bite wounds on the left forearm and shoulder of a Mandrill during infighting; however, self-mutilation of wounds during recovery was not reported.

Successful management of a bite wound on forelimb of a Golden Langur is reported.

Conflict of interest: Authors have no conflict of interest in this study.

Author's contribution: NS: Administered anaesthesia, wound assessment, administration of treatment, follow-ups, data analysis and compiling article; DK: Administered treatment, provided expert guidance and correction of the article; SS: Provided all essential facilities, medication, equipment and assistance in treatment.

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