Surgical management and release of an injured Clouded Leopard (*Neofelis nebulosa macrosceloides)* in Assam, India

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Abstract

An injured clouded leopard (*Neofelis nebulosa macrosceloides*) was rescued by villagers and Merapani Forest Range Officials, Golaghat (N 26^0 19' 36.0" E 094^0 05' 35.9"), Assam, which was handed over to Centre for Wildlife Rehabilitation and Conservation (CWRC), Wildlife Trust of India. Clinical examination revealed the presence of stab injury resulting in evisceration of small intestinal loop. After surgical repair under anaesthesia lasting 45 minutes, the animal was kept under post-operative care for ten days. Subsequently the animal was released at an aerial distance of 5.25 km from rescue site.

Introduction

Clouded leopards (*Neofelis nebulosa macrosceloides)* are medium-sized felids, with males weighing from 16 to 18 kg and females weighing between 11.5 to 13.5 kg (Grassman *et al.* 2005). They have distinct cloud shaped patches on their pale-yellow to brown coloured fur that camouflages them in dense forests (Sunquist and Sunquist 2002). The state of Assam is highly diverse in feline specie (Choudhury, l993). As cats are opportunistic and enters human settlement for easy prey, this causes them to occasionally come into conflicts with the humans (Brakefield, 1993), thus necessitating intervention. Wildlife rescuers operating either as individuals or through larger Non-Governmental Organisations play an important role in mitigating conflict by responding to such emergencies. Wildlife Trust of India (WTI) is one of the leading Indian nature conservation organisations working in Assam since 2002 to provide emergency relief to displaced wild animals through its Centre for Wildlife Rescue and Rehabilitation (CWRC) and its associated satellite Mobile Veterinary Service (MVS) units.

Listed as Vulnerable in the IUCN Red List, clouded leopard is under threat in Northeast India, despite the highest legal protection as a Schedule-I assigned to it in the Indian Wildlife Protection Act (1972).

Protrusion of abdominal viscera through a defect created by congenital anomaly, trauma, gore injury, wound dehiscences or due to penetrating foreign bodies has been commonly noticed in wild animals (William *et.al* 2011). This case report is on the successful surgical management of eviscerated of abdominal content due to traumatic injury under Ketamine- Xylazine anaesthesia in a female sub-adult clouded leopard.

Fig 1. Anasthetized clouded leopard

Fig 2. Lavaging of the eviscerated content

Fig 3. Operative procedure

Methodology

Case history

Assam Forest Department handed over an injured female sub-adult clouded leopard from Merapani ($26^0$19'36.0" N; $094^0$05'35.9"E), under Golaghat Division, Assam, India. Weighing 11.6 kg, the animal had a gore injury on the right flank resulting in the evisceration of abdominal content and was attended

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Table 1. Size of stabilization cage and refuge den

Cage/Den	Length (cm)	Breath (cm)	Height (cm)
Stabilization cage	213	107	122
Refuge Den	122	46	46

Fig 4. Recovery of the animal

Fig 5. Postoperative days

at CWRC (Centre for Wildlife Rehabilitation and Conservation), Borjuri, Assam.

Morphometry

Morphometry studies revealed weight (11.6 kg), body length including tail (195 cm), height at shoulder level (40 cm), neck girth (28 cm), forelimb paw width (7 cm), forelimb paw length (9 cm), hindlimb paw width (7.5 cm), hindlimb paw length (9.8 cm), upper canine (2.5 cm) and lower canine (2.1 cm).

Clinical examination

Clinical examination revealed presence of wound with mild dehydration and slightly pale visible mucous membrane.

Physiological examination

Physiological examination revealed heart rate (72/ min), pulse rate (79/min), respiratory rate (29/min) and temperature (100.1 ^{0} F).

Haematological examination

Haematological examination of the animal resulted White blood corpuscles (73. 24 × 10^3 per mm^3), Lymphocytes (72.9 %), Monocytes (3.9%), Neutrophils (15× 10^3 per mm^3), Red blood corpuscles (7.89 × 10^5 per mm^3), Mean corpuscular volume (51.1 fl), Haematocrit (40.3%), Mean corpuscular haemoglobin (17.6 g/dl), Mean corpuscular haemoglobin concentration (34.4g/dl), Red cell distribution width (11.8 %) and Haemoglobin (13.9 g/dl) and Thrombocytes (2657 × 10^3 per mm^3).

Biochemical examination

Biochemical examination revealed alanine aminotransferase (SGPT-257 U/L), aspartate aminotransferase (SGOT-527 U/L), blood urea nitrogen (BUN- 23 mg/dl), and creatine kinase (CK-1.1 mg/dl).

Treatment

Anaesthesia

A mixture of Xylazine and Ketamine hydrochloride was injected with the help of jab stick intramuscularly at gluteal musculature (Fig. 1), using 22 gauge needles at dosages Xylazine (1 mg/kg body weight) and Ketamine (5 mg/kg body weight). Induction time was 4 minutes, down time 6 minutes and anaesthesia time was 40 minutes. Induction time and downtime coincided with reduction in tongue reflex, mild relaxation in musculature tone and loss of reflexes to external stimulus. Depth of anaesthesia was determined by the complete absence of tongue reflex, total relaxation of musculature, fully dilated pupil on exposure to light and absence of pain and reflexes. Recovery of anaesthesia was determined by return of tongue reflex, return of muscle tone and alertness and constriction of pupil on exposure to light (Fig 4).

Pre-operative preparation

The area was shaved and scrubbed with antiseptic along with lavaging of eviscerated small intestinal loop (Ali *et al*. 2015) with ceftriaxone mixed in normal saline @250mg/500ml (Fig. 2) before being painted with povidone iodine.

Operative procedure

After chemical restrain and pre-operative preparation the abdominal tear was incised to enlarged and the contents were pushed back into abdominal cavity (Fig 3). Peritoneum and muscle were sutured individually using polygalactin 910 (2-0) and skin was sutured

Fig 6. Release of the animal

with monofilament nylon 2-0 in simple interrupted manner. The suture line was sealed with compound tincture benzoine.

Post- operative care

Post-operatively the animal was kept under long acting antibiotic Enrofloxacin[4] @ 7mg/kg body weight i/m side by side a dose of Tetanus Toxoid @0.5 ml TD was given. The wound was dressed with povidone iodine on alternate days (Fig. 5). The skin sutures were removed eight day post surgery.

Husbandry and Management

Under the care the animal was held in a stabilization cage (weld mesh) having a wooden refuge den (Fig 6). In order to provide a dark and calm environment the cage was screened using a black cloth. The animal was fed on local chicken during the period.

Site selection and release

The site selection was done keeping in mind that the aerial distance between capture and release site is around 5 km. The animal was released (Fig. 6) on the tenth (10^{th}) post operative day after implanting transponder chip bearing the identification number 0007156EA4 on the left side of tail base. The release site ($26^0$16'44.31"N; $094^0$05'12.46"E) was 5.25 Km from the rescue site ($26^0$19'36.0"N; $094^0$05'35.9"E),

Results and Discussion

Wildlife Trust of India has rescued five infants and three sub adult. After hand rearing two male and two female infants were released back to the wild and one infant is under hand rearing process and out of three sub adult after treatment and care two were released back to wild.

The injury may have caused due to human animal conflict situation (William *loc. cit*). Xylazine and Ketamine combination was found to provide complete immobilization along with good muscle relaxation and analgesia in clouded leopard (Fernando, 2013). Post operative complications like mutilation of external suture, repeated evisceration of abdominal content due to mutilation of suture (Ali *loc. cit*) and secondary infection would have resulted but use of broad spectrum antibiotic along with topical antiseptic having regional analgesic effect for dressing has reduced the chances of above complication.

If the animal has been left in wild in such situation it may have succumbed due to secondary infection. Veterinary intervention has saved the life of ailing animal.

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Announcement

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