

Management of a Traumatic Wound in a Malnourished Orphan Asian Baby Elephant (*Elephas maximus*)

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ABSTRACT

The present case report was carried out to evaluate the outcome of traumatic wound in a malnourished orphan elephant calf. A 1.5 month old, female Asian Elephant calf approximate weighing 100 kg, was admitted to the Teaching Veterinary Hospital, Chittagong Veterinary and Animal Sciences University, Bangladesh, with a history of squeezed and trapped in natural tree during foraging, detached from the herd, rescued by nearest forest people and treated by local veterinarian. The baby elephant was dull, depressed, dehydrated and emaciated on clinical examination. A local swelling (65 cm) was noticed on left hind limb (stifle joint) and a circular wound on lateral aspect of the limb where mild discharge was noticed. Gait and posture was not normal. Wound swab, blood and fecal sample were collected and sent to the respective departments. Pyogenic organisms were found in wound swab culture. Blood parameters revealed lower value of TEC, Hg, PCV, glucose and total protein. No parasite or ova were found in fecal sample. The elephant calf was fed with powder milk as 10% of total body weight (10 liters/day at 1 hour interval). Ceftriaxone sodium @ 20 mg/kg bwt along with pain killer ketoprofen @ 3 mg/kg bwt, amino acid solution @20 ml hematinic preparation @10 ml , vitamin ADE preparation @10 ml along with 5% dextrose saline (2liters/day), local application of Dressgel ointment (herbal preparation) and wound dressing with povidone iodine at regular interval as required until healing. The calf revealed improved condition such as more active and alert, improved gait, reduced local swelling and no discharge from the wound. The CBC and serum biochemical parameter was also improved by day 4 while the calf was shifted to Dulahazra safari park, Chokoria, Chittagong.

Keyword: Asian Elephant, Wound, Malnutrition, Management, Antibiotic

INTRODUCTION

Asian elephants (*Elephas maximus*) are the giant herbivores mammals. The Asian elephants were historically distributed through Asian continent. Unfortunately, Asian elephant populations are now only distributed in some isolated scattered pocket of tropical forest and grassland in 13 Asian countries. Illegal Killing (poaching), loss of habitat, elephant human conflict due to increased pressure of human growth and calf mortality are the major challenges for elephant conservation ^[1]. International Trade in Endangered Species of Wild Flora and Fauna (CITES) classified Asian elephant as an endangered or threatened species ^[2]. In many constant they suffer from man-made or natural catastrophe such as loss of habitat, attacked by human or other mates, social looser and become orphan. However, injury and infection in the skin and soft tissue of natural elephant population is one of the frequent case encountered by wildlife veterinarian^[3]. The severity of a wound is largely depends on its anatomical position and function to carry out. The foot of elephant is a highly evolved appendage that not only supports the enormous weight of the largest terrestrial mammal but also can withstand enormous concussion^[4]. Moreover, optimal wound healing not only relies on the medical therapy but also the nutritional status of the patient. Malnutrition interfere the normal processes that allow advancement through stages of wound healing. Malnutrition has also been linked to decreased wound tensile strength

and increased secondary infection rates ^[5]. This condition becomes more enigmatical in orphan elephant calf due to unavailability of large quantity of dam milk to nourish it artificially.

Over the past two decades the world has seen tremendous advances in modern medical wound care management, principally due to development of new scientific knowledge, skill, techniques, materials and facilities ^[6]. These advances have occurred mainly in developed countries and concentrated to public health but bit improvement towards animal health and full picture of their outcome is still obscure. The wound treatment and outcome of wild elephant is not also well documented in the world. Therefore, the case report is presenting the management and treatment outcome of traumatic wound in a malnourished orphan Asian baby elephant.

Case Description

A 1.5 month old, 100 kg body weight, female Asian Elephant (*Elephas maximus*) calf was admitted to the S.A Quadery Teaching Veterinary Hospital, Chittagong Veterinary and Animal Sciences University, Bangladesh at 28, September 2014 with a history of squeezed and trapped in a natural tree during foraging and detached from the herd (became orphan) which is rescued by nearest forest people and treated by local veterinarian. The rectal temperature was recorded as 101, 99.5, 99 and 99.5 °F while the heart rate was 59, 58, 60 and 58

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beat/minute (bpm) in 4 subsequent day of treatment accordingly.

A circular traumatized wound was noticed in the lateral aspect of stifle joint (Fig. 1) which was characterized by 65 cm diameter in the first day(Fig.2). The wound diameter gradually reduced towards normal in therapeutic management as 65, 63, 62 and 60 cm in subsequent follow-up day. Pyogenic infection manifested by pus and oozing of serous fluid was seen from wound area in admitted date but no such condition was found in released date. Foul smell from the wound, mild corneal opacity and rough body coat were found on the first day. Fecal sample was collected directly from the rectum for coproscopy. Direct smear, sedimentation and floatation techniques were adopted to perform coproscopy but no parasite or ova were found. The right stifle was found in normal condition and considered as control to compare the clinical improvement of wound noticed in left. Treatment protocol used for the management of traumatized wound in malnourished Asian elephant calf was described in table-1

and an indication of anemia. Hemoglobin (Hgb) was 7 gm% and 8 gm% and Packed Cell Volume (PCV) was 23% and 35% respectively in day 1 and day 4 that were also under the normal parameter but turned close to the normal at released date which denotes the recovery from anemia. The Erythrocytes Sedimentation Rate (ESR) values were 62 mm and 60.5 mm respectively that was closed to the normal reference value. The Total Leucocytes Count (TLC) was 7.65 and 4.9 per cubic millimeter respectively in two tested day and occupied within normal physiological range. The lymphocytes, neutrophils, eosinophils, monocytes and basophils were 66%, 26%, 3%, 5% and 0% respectively in the first day and 70%, 24%, 2%, 4% and 0% respectively in the released day. Higher lymphocyte count may be due to infection (Table: 2).

Initial evaluation of serum found lower glucose level (68.4 mg/dl) but after four days therapy with 5% dextrose it's become within the physiological range (92 mg/dl). The hematology of mineral constituents such as calcium, magnesium, phosphorus was 11.2, 4.4 and 3.6 milligram per deciliter respectively in the

Table 1: Treatment protocol used for the management of wound in malnourished Asian elephant calf:

Day	Treatment	Route
Before admitted to SAQTVH (at forest office)		
01 ^a	Penicillin (Combipen vet [®] , Acme pharma. Ltd.) @ 32000 IU/kg body weight (BW)	Intra muscular (i/m)
02 ^a	Ketoprofen (Kop vet [®] , Square pharma. Ltd.) @ 3 mg/kg BW Streptomycin + Penicillin (SP vet [®]) @ 2.5 gm (Combined total dose) Pheneramine maleate (Asta vet [®]) @ 1.5 mg/kg BW Ketoprofen (Kop vet [®]) @ 3 mg/kg BW	i/m
	Gentian violet + Povidone iodine solution (1%)	Topical in wound
At SAQTVH		
01 ^b	*Ceftriaxone sodium (Triject Vet [®] , SK+F pharma. Ltd.) @ 10 mg/kg BW bis in die (b.i.d.) Ketoprofen (Kop vet [®]) @ 3 mg/kg BW	i/m i/m
	5% dextrose normal saline (5% DNS [®]) + Systemic amino acid preparation (Aminovit plus vet [®]) @ (1000 ml + 20 ml) Dressgel ointment [®] (Herbal antimicrobial and fly repellent)	Intravenous (i/v) Topical in wound
02 ^b	As day one (01 ^b)	Ditto
03 ^b	As day two (02 ^b) and additional Hematinic drug (Fe + Cu + Co + B ₁₂) (Hemovit [®]) @ 10ml Vitamin ADE (Vita ADE [®]) @ 10 ml	i/v i/m
04 ^b	As day three (03 ^b)	Ditto
At Dulahazara safari park		
01 ^c	As day four (04 ^b) at SAQTVH	
02 ^c	Povidone iodine 1% (Povisep [®]) for dressing Dressgel ointment [®] (Herbal antimicrobial and fly repellent)	Topical in wound

*Based on culture sensitivity (CS) test, @ = at the rate of, [®]= trade name, ^a=At forest department office, ^b=At SAQTVH ^c = At Dulahazara Safari Park

The Total Erythrocytes Count (TEC) was 1.3 and 2.13 million/cu.mm. respectively in date of admitted and released that was below than the normal value

first day and stood 11.7, 1.8, 3.5 milligram per deciliter respectively in the fourth day. Exclude calcium the serum magnesium and phosphorus level

turned down which may be due to dilution of mineral constituents after fluid therapy. Total protein was lowered in both tested days but condition improved from first day (64 mg/dl) to fourth day (69 mg/dl) in

was higher (7.30%) than the normal reference value and thus may be the cause of rapid improvement of serum glucose level in addition of 5% dextrose saline.

Table 2: Hematological parameters of injured elephant calf

Parameter	Tested value		Reference value*
	Day 1	Day 4	
TEC (million/cu.mm.)	1.3	2.13	2.42
TLC (thousands/cu.mm.)	7.65	4.9	4.0-11.5 ^a
Hemoglobin (Hgb.) (gm %)	7.0	8.0	11.12
PCV (%)	23	35	37.7
ESR (mm in 1 st hour)	62	60.5	61.3
Lymphocyte (%)	66	70	59.0
Neutrophils (%)	26	24	32.12
Eosinophils (%)	3	2	3.80
Monocytes (%)	5	4	4.5
Basophils (%)	0	0	0.6

Cu.mm. = cubic millimeter, mm = millimeter, % = percentage, * = [7], ^a= [8], Day 1= Admission of the patient, Day 4= Release of the patient

compare to the reference value (82.50) may be due to systemic amino acid administration. ALT (Alanine Aminotransferase) and AST (Aspartate Aminotransferase) value found 10.90 (U/L), 3.5 (U/L) and 70.80 (U/L), 61.20 respectively in the two separate tested day. Triglyceride value found 125.2 mg/dl that was higher than the normal physiological range. Albumin and uric acid was only tested in released date and found 12.3 mg/dl and 25.7 mg/dl respectively. Albumin value was lower than the normal value which may be due to malnutrition as a sequel of orphan (Table: 3).

DISCUSSION

The elephant calf shows a higher temperature of 101⁰ F than the normal range of 95.5⁰ F on presenting day at Teaching Veterinary Hospital [9]. The increased temperature is due to presence of infection in the local wound [10]. The recorded heart rate was also higher 59 than the normal ranges (25-30 beats/min). It is possibly due to a new clinical environment and pain in the wound area [11]. Oozing from the wound area with foul odour often indicate the secondary bacterial infection by pyogenic bacteria like *Staphylococcus sp*, *Streptococcus sp*[12]. Present

Table 3: Hemato-biochemical (serum) parameters of injured elephant calf

Parameter	Tested value		Reference value*
	Day 1	Day 4	
Glucose (mg/dl)	68.4	92	89 ± 20 ^a
Calcium (mg/dl)	11.2	11.7	12.20
Phosphorus (mg/dl)	3.6	3.5	5.54
Magnesium (mg/dl)	4.4	1.8	2.41
Total protein (mg/dl)	64	69	82.50
AST (SGOT) (U/L)	70.8	61.2	10.2
ALT (SGPT) (U/L)	10.9	3.5	5.6

mg/dl = milligram per deciliter, * = [7], ^a= [8], Day 1= Admission of the patient, Day 4= Release of the patient

Elephant milk was unavailable for the calf during treatment period thus reconstituted powder milk (Lactogen-2^R) was offered @ 10 liters per day (10% of the body weight) which was served at one hour interval (1litre/hour). The specific gravity (1.030), total solids (16.50%), total ash (0.70%), and calcium (86.17 mg %) values of supplied milk was within the normal range of elephant milk. Total protein (2.24) and fat (3.0) percentage was lower than the normal value that may be the cause of muscle breakdown and increase serum AST (SGOT). The milk sugar lactose percentage of the reconstituted supplied milk

cases of wound having characteristic pus and odour indicate the pyogenic infection. At the first instance, the local veterinarian administered Penicillin, Streptomycin + Penicillin, Pheneramine maleate, Gentian violet + Povidone iodine solution (1%) but these drugs are ineffective against this infection. Bacterial culture sensitivity test often recommended choosing an effective antibiotic against the secondary bacterial infection [13]. Thus, CS test was performed & ceftriaxone was administered as per manufacturer guideline. Ceftriaxone is a 3rd generation cephalosporin effective in both Gram's positive &



Figure 1: Traumatized wound in the caudo-lateral aspects of left stifle joint

Gram's negative bacteria. Cephalosporin is frequently used for management of wound especially in case of pyogenic infection^[14]. Ketoprofen was used to subside the pain and inflammation with the antibiotic^[15].

therapy was administered to the elephant. The lymphocyte count was higher 66% than the normal range 59% possibly for the infection in the wound. In serum evaluation, Blood glucose level and Total protein (TP) found below than the normal range. The

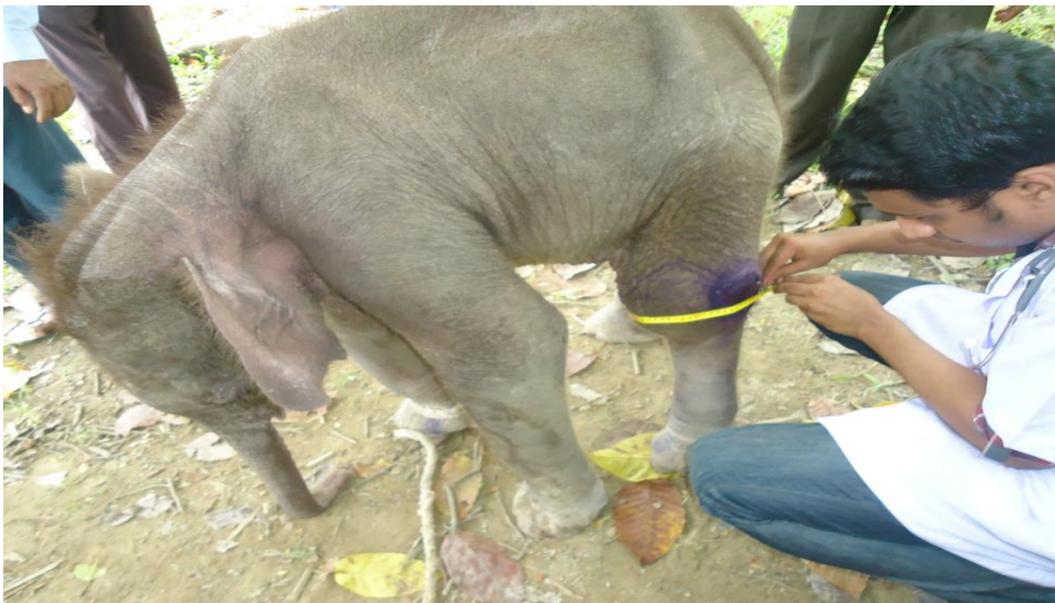


Figure 2: Measuring the diameter of swelling and wound area (65 cm diameter) at first day.

The routine hematological examination was performed as it is used to investigate the physiological and nutritional status of an individual^[16]. A lower erythrocyte count 1.3 million/cu.mm and Hemoglobin 7.0% was recorded which indicate the anemia and malnutrition in the elephant. Hematinic mixture, vitamin-mineral preparations and fluid therapy (DNS) is often recommended to recover the anemic condition. So the supportive

orphan state and malnutrition might be responsible for the lower value. However, the parameter was recovered near to the normal range after administration of DNS and other supportive therapy. Nutritional supplement play a crucial role in rapid healing of wound^[17]. So the supplementary milk was provided to the elephant according to guidelines. Safari park provide moderate natural environment to the wild animal and effective for rapid healing^[18].

Thus the animal was relocated from clinical setup of TVH to nearest safari park.

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