



# Emergency Surgical Management of Thoracic and Limb Injuries in a Hare (*Lepus nigricollis*)

Gaurav Kumar <sup>a++</sup>, Neeraj Arora <sup>b++</sup>,  
Deepak Kumar Tiwari <sup>b+++\*</sup> and Satbir Sharma <sup>c++</sup>

<sup>a</sup> Department of Veterinary Surgery and Radiology, College of Veterinary Sciences, Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana, Punjab, India.

<sup>b</sup> Department of Veterinary Surgery and Radiology, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India.

<sup>c</sup> Department of Veterinary Clinical Complex, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India.

## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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## ABSTRACT

A one-month old hare (*Lepus nigricollis*) was brought to the department in emergency with a complaint of dog bite two hours ago due to long chase with dog. Animal was unconscious due to numerous wounds on the thorax and limbs. On clinical examination, fast heart beats were measured from the thoracic perforation at 5<sup>th</sup> intercostal space and an open wound at the hock joint with abrasions was visible on right hind limb. The animal was handled with appropriate care and after stabilization of vital parameters, surgical management was undertaken under general anaesthesia. The animal showed marked improvement and recovered uneventfully on the 10<sup>th</sup> post-operative day.

<sup>++</sup>Assistant Professor

<sup>\*</sup>Corresponding author: E-mail: [dr.deepaktiwari@gmail.com](mailto:dr.deepaktiwari@gmail.com);

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## 1. INTRODUCTION

Hare (*Lepus nigricollis*) are easy prey for dogs in the farm environment which results in various superficial and deep injuries to them. During a chase the severity of injury varies from superficial abrasion to penetrating wound on being caught by the predator which eventually results in the death of the animal. The teeth of the attacking animal can fracture bones of the limbs of rabbit. Bites located over the thorax and abdomen can penetrate these body cavities; in addition, the teeth crush, lacerate, and avulse muscle and subcutaneous fat and create large areas of dead space, leaving only small and seemingly innocuous puncture wounds in the skin [1]. The incidence of such penetrating thoracic injury was 12% which was potentially devastating component of acute trauma care [2]. In bite wounds, shearing, tensile and compressive forces often combine to damage tissues. Shearing forces responsible for the linear lacerations, tensile force results in avulsion of the skin from underlying tissue and compression of the skin by the teeth results in either puncture wounds, crushing injury or both depending on the shape of the teeth [3]. This combination of force is quite notable in the present case. The present case report deals with the surgical management of thoracic and limb injuries in a hare due to chase and bite of dog.

## 2. CASE HISTORY AND CLINICAL EXAMINATION

A one-month old hare (*Lepus nigricollis*) was brought to the Department of Veterinary Surgery and Radiology, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India in emergency hours with a complaint of dog bite two hours ago due to a chase with dog in the farm. The hare was rescued by the persons working in the farm, who brought it for the treatment. Immediate after the chase, the hare was unconscious with wound on the thorax and limbs. Looking to the critical condition, the hare was instantly attended and physiological parameters viz., rectal temperature (101.2°F), heart rate (276 beats/ minute) and respiratory rates (50 breaths/ minute) were recorded. Clinical examination revealed circular penetrating wound of approximately 1.5 cm diameter at the level of 5<sup>th</sup> rib on the left thorax separated by thin muscle band (Fig. 1). The wound was lacerating

the intercostal muscle along with fracture of the 5<sup>th</sup> rib and through which the heart beats can be easily visualized. Further, right hind limb also has abrasion injuries and an open wound at the hock joint through which distal end of femur and proximal end of tibia were visible exteriorly. On palpation, complete dislocation of the hock joint with minute muscular attachments were evident. However, the radiography was not performed looking to the critical condition of the patient and presentation during emergency hours. Upon interpreting the condition, it was decided to manage the case by surgical reconstruction of the thoracic wound margins and amputation of the affected hind limb.



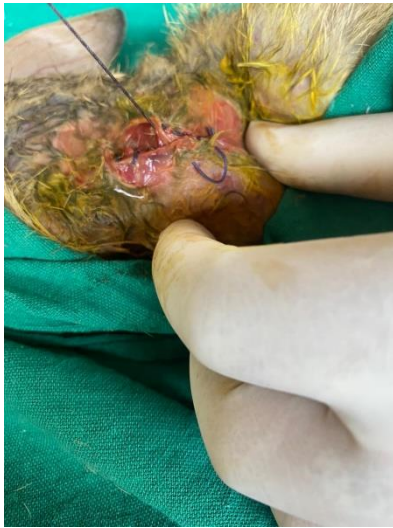
**Fig. 1. Penetrating thoracic wound**

## 3. SURGICAL MANAGEMENT

The intravenous fluids and Inj. Dexamethasone at the dose rate of 1 mg/kg body weight intramuscularly were administered instantly to combat the existing shock. Then, animal was aseptically prepared after clipping of long hairs, shaving and adequate scrubbing of the surgical area along with painting of povidone iodine solution on the surgical site. General Anesthesia was achieved intramuscular administration of ketamine at the dose rate of 25 mg/kg body weight and xylazine at the dose rate of 3 mg/kg body weight.

The animal was positioned in right lateral recumbency, the thoracic wound was closed using Vicryl No. 1-0 by applying simple continuous sutures involving the intercostal muscles and subcutaneous tissues. The skin

was closed in routine manner using silk No. 1-0 by applying simple interrupted sutures (Fig. 2). The negative pressure in thorax was created by sucking the air from the thoracic cavity with the help of sterilized disposable syringe and needle. The needle was inserted in thorax adopting all precautions preventing the puncture to the lung parenchyma.



**Fig. 2. Surgical closure of the thoracic wound**

Then, the animal was shifted to left lateral recumbency and affected right hind limb was surgically disarticulated/ amputated at the hock joint under all aseptic precautions. The underlying muscle and skin were sutured using vicryl no 1-0 and silk no 1-0, respectively in routine manner (Fig. 3).



**Fig. 3. Surgically amputated right hind limb**

Post-operative care includes daily antiseptic dressing with povidone iodine and lixten powder for 10 days. Antibiotic cefotaxim at the rate of 50 mg/kg body weight twice daily orally and meloxicam at the rate of 0.5 mg/kg body weight orally once daily for five consecutive days along

with Syp. Verol at the rate of 2 drops once daily for a week. The improvement was observed in general condition and behavior from 3<sup>rd</sup> post-operative day and started consumption of green grasses on 5<sup>th</sup> post-operative day (Fig. 4). The animal had an uncomplicated recovery and the sutures were removed on the 10<sup>th</sup> day.



**Fig. 4. Postoperative recovery of animal on 5<sup>th</sup> post-operative day**

#### 4. DISCUSSION

Dog bite wounds are commonly encountered in small animal practice, representing approximately 10% of canine trauma cases [4]. Dogs are carnivores and in field condition rely on the hunting of small mammals such as hare and rabbits in order to satisfy their hunger. During chase thoracic injury is common in both high and low-energy trauma.

As dog bites results in penetrating wound so a precise physical examination is must so as to ascertain depth of internal injuries to the patient. Thoracic injuries are rare and are of potential hazard for the life of patient. Unfortunately, traumas are still a very important problem mainly associated with significant morbidity and mortality. Blunt chest trauma is a common problem in the care of critically ill trauma patients [5], and thoracic trauma accounts for 20%-25% of adult deaths caused by trauma [6].

Blunt Chest Trauma (BCT) is one of the most important leading causes of morbidity and mortality around the world. Various large-animal models for lung contusion (LC) have been developed, including studies in canines, swine, and monkeys [7]. As with the management of all traumas, thoracic trauma evaluation requires a systematic approach. The prior management in

thoracic trauma is its evaluation and stabilization of airways, breathing, and circulation (ABC) [8]. Some studies concluded that tube thoracostomy is required for pneumothoraxes with volumes greater than 5 times 80 mm, those involving more than 2 rib fractures, or in patients requiring positive pressure ventilation [9,10]. But here we employ aspiration as a treatment measure for spontaneous pneumothorax which has been described and is being adopted in the trauma setting, however some physicians use oxygen therapy to aid in intrathoracic air reabsorption [11]. Pulmonary contusions are one of the most destructive injury directly associated with 5% to 30% mortality [12] and esophageal trauma a rare condition but also associated with a mortality rate of 20% to 40% [13] was not reported here in this case. Anaesthetic protocol used in this case found to provide optimum anaesthesia for performing the surgery was in accordance with other workers [14].

As punctured wounds can result in infections due to bacterial colonization in deep wounds but in order to prevent the vital organs from further damage primary closure of the dog bite wound was done with generous placement of subcutaneous sutures. Closure of dog bite wounds has largely been considered contraindicated due to the increased possibility of infection; however, this management remains controversial. If the infection rates are less than 6%, the dog bite wounds may be closed if desired for cosmetic or functional reasons [15]. In another study, it was observed that the infection rate in patients who under-went primary closure was equivalent (7.6% versus 7.8%) to the patients whose wounds were left open to heal by secondary intention [16].

## 5. CONCLUSION

The specifics of this case have undergone, but an overarching emphasis remains on patient stabilization before definitive surgical repair. Thus, it is concluded that the early presentation of hare for treatment following chase and dog bite results in early and smooth recovery.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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