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**Deeksha Bharti**  
Ph.D., Scholar, Division of  
Medicine, GBPUAT, Pantnagar  
Uttarakhand, India

**JL Singh**  
Professor and Head, Division of  
Medicine, GBPUAT, Pantnagar  
Uttarakhand, India

**Akshay Kumar**  
Ph.D., Scholar, Division of  
Surgery and Radiology, IVRI,  
Bareilly, Uttar Pradesh, India

**Anjali Jenna**  
Ph.D., Scholar, Division of  
Medicine, GBPUAT, Pantnagar  
Uttarakhand, India

**Shiv Sidar**  
Ph.D., Scholar, Division of  
Surgery and Radiology, IVRI,  
Bareilly, Uttar Pradesh, India

**Manish Arya**  
Ph.D., Scholar, Division of  
Surgery and Radiology, IVRI,  
Bareilly, Uttar Pradesh, India

**Lalit Maurya**  
BVSc. Student Fourth Year,  
Division of Medicine, GBPUAT,  
Pantnagar Uttarakhand, India

**Corresponding Author**  
**Akshay Kumar**  
Ph.D., Scholar, Division of  
Surgery and Radiology, IVRI,  
Bareilly, Uttar Pradesh, India

## Bovine clinical tetanus with concurrent unilateral carpal hygroma in a crossbred cattle and its therapeutic management

**Deeksha Bharti, JL Singh, Akshay Kumar, Anjali Jenna, Shiv Sidar, Manish Arya and Lalit Maurya**

### Abstract

Tetanus is a potentially mortal neurologic disease affecting cattle. *Clostridium. Tetani* spores are prevalent in the environment, and consequently the prospect for wound contamination will always be present. Astute identification of clinical signs in tetanus is paramount. Carpal hygroma refers to the accumulation of inflammatory fluid in the subcutaneous space above carpal joint. This case report describes successful diagnosis and subsequent management of a clinical presentation of a crossbred cattle with tetanus and concurrent carpal hygroma that was presented to Veterinary Teaching Hospital, GBPUAT, Pantnagar with the history of recent parturition and mummified foetus was removed through mechanical pulling 25 days ago. Clinical examination manifested stiff gait, erect tail, swelling of carpal joint of right forelimb, anxious and alert expressions. Hyperesthesia was evident. Anamnesis and clinical examination aspect diagnosed the ailment as clinical tetanus with concurrent carpal hygroma. The cattle was treated with fluid therapy, long acting penicillin in conjunction with muscle relaxant and anti-tetanus serum. Carpal hygroma was surgically managed. There was astounding improvement in the condition of the animal after the treatment.

**Keywords:** Anti tetanus serum, carpal hygroma, muscle relaxant, tetanus

### Introduction

Tetanus is an eminently fatal and clinically significant disease of all domestic animal species caused by neurotoxin tetanospasmin of *Clostridium tetani*. This condition is mainly characterized by a general increase in muscle stiffness, tremors, lockjaw and prolapse of third eyelid (Gupta *et al.*, 2018) [3]. *Clostridium tetani* is a motile, spore-forming obligate anaerobe, ubiquitous in soil additionally can also be isolated from the faces of domestic animals (Rings, 2004) [4]. This bacterium produces large spherical spores in anaerobic conditions, giving the organism a drumstick-like appearance. A tissue level neutral pH is the prerequisite for sporulation of *C. tetani*. This organism also produces tetanolysin, an exotoxin that has a necrotizing effect on tissues, which further decreases tissue oxygenation expediting proliferation of the bacteria (Rings, 2004) [4]. The most accustomed sites of *C. tetani* infection in cattle comprises of deep and necrotic wounds which can be either traumatic or surgical in genesis, necrotic lesions of the vulva or vagina following dystocia, forced mechanical traction of foetus and severe postpartum metritis (Garber and Smith, 2011) [2]. A hygroma is an adventitious or acquired bursa on the dorsum of the carpus caused by trauma or by chronic pawing and hitting the dorsum of carpus. Continual trauma causes thickening of skin, therefore a mass of thickened tissue and cellulitis envelops the swelling containing fluids or pus (Shukla *et al.*, 2020) [5]. The cavity of bursa may be simple, bilocular or multilocular (Tyagi and Singh, 2006) [6]. In chronic carpal hygroma conditions surgical excision is the most advantageous therapy (Chhatpar *et al.*, 2013) [1].

### Case history and Clinical observation

A crossbred cattle was presented to Veterinary Teaching Hospital, GBPUAT, Pantnagar with the history of recent parturition and mummified foetus was removed through mechanical pulling 25 days prior. Other aspect of anamnesis included drooling hyper salivation, anorexia, and rigidity of the entire body. It was discernible that the tail was rigidly extended (Fig.1) and was conspicuously stiff. Clinical examination manifested, swelling of carpal joint of right

Forelimb (Fig.2), anxious and alert expressions. Hyperesthesia was evident. The jaw was completely locked and difficult to open. Rectal temperature was 101° F, Pulse rate was 72/min and mucous membrane was normal in appearance. Anxious and alert expressions were observed in animal (Fig.3). Initially the animal was feeding and drinking properly but during clinical presentation there was anorexia. Primitively there was stiffness of hind limbs causing an unsteady straddling gait and tail held out stiffly but in the later stage there was general increase in muscle stiffness. Delineated and fluctuating swelling of the carpal joint was noticed on physical examination of the right forelimb of the animal. Palpation of the hygroma was done to check its physical consistency which revealed that the carpal hygroma is not completely fibrosed. Aspiration of the carpal hygroma revealed serosanguineous discharge (Fig.4).

### Treatment

The treatment protocol of tetanus is predicated on the following principles as: elimination of causative bacteria, neutralization of residual toxin, control of muscle spasm and maintenance of hydration and nutrition (Radostitis *et al.*, 2000). The cattle for tetanus was treated with fluid therapy, Inj long acting Penicillin G @ 22,000 IU per kg body weight I/M daily for 7 days, Inj Tribivet 10 ml I/M daily for 7 days, ATS (anti tetanus serum) 3000 IU I/M and Methyl carbamol as a muscle relaxant @ 10 mg/kg body weight. For rehydration and neutralization therapy Intalylte @ 20 ml/kg b.wt. I/V were administrated for three consecutive days. Anistamin 2ml I/M was used for seven days as antihistaminic. The carpal hygroma was surgically managed with needle drainage with a 16 gauge hypodermic needle and pressure bandage was applied. Aspiration of the carpal hygroma revealed serosanguineous discharge (Fig.4). The cavity was flushed with normal saline solution and infiltrated with corticosteroid preparations, liquid beta dine and ampicillin antibiotic and Inj Melonex for anti-inflammatory action @ 8ml total dose I/M for 5 days. There was remarkable improvement in the condition of the animal after the treatment.

### Discussion

Clinical signs of tetanus in cattle ranges from mild to severe on clinical presentation. The initial perceptible clinical signs of tetanus in cattle are usually generalized stiffness and reluctance to move. With the progression of the disease, a change in gait is detected. A stiff, contrived walk is definitive for tetanus in cattle (Rings, 2004) [4]. Favorable outcomes in tetanus cases rely on early detection of the typical clinical signs and therapeutic protocol. In this case the mechanical pulling of the mummified foetus produced optimal conditions for growth and proliferation of the organism and production of neurotoxin (Garber and Smith, 2011) [2]. The neurotoxin is responsible for neurological symptoms. The organism proliferated and produced tetanospasmin and tetanolysin toxins during lowered local tissue oxygen tension. Considering the increased occurrence of tetanus cases during parturition, tetanus toxoid vaccine may be advised in pregnant dairy animals to provide long lasting immunity. Penicillin is the drug of choice which aided in the elimination of causative organism. Anti-tetanus serum is advocated parentally to neutralize the residual effect of toxin. Fluid therapy is foremost for neutralization of toxin and for maintaining the hydration status of animal. Methyl carbamol is centrally

acting muscle relaxant, which diminishes skeletal muscle hyperactivity in tetanus cases. Usually rectification of clinical signs of tetanus began within one week of treatment initiation, and clinical signs were thoroughly resolved within two weeks of treatment but it also relies on the severity of cases.

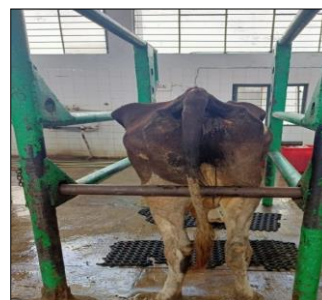


Fig 1: Erect tail

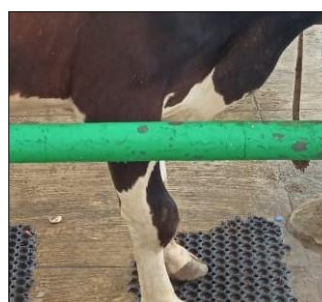


Fig 2: Knee hygroma



Fig 3: Anxious and alert expressions



Fig 4: Serosanguineous fluid drained from carpal hygroma

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