

Case Study

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## Theileriosis in a Calf: A Case Study

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### ABSTRACT

Theileriosis is one of the most important arthropod-borne blood protozoan diseases, leading to morbidity and mortality especially in calves, causing considerable economic losses and a major constraint to the dairy industry and causes devastating losses to the livestock worldwide. The causative agent is protozoan parasite of the genus *Theileria*. The two main species known to affect cattle are *Theileria annulata* and *Theileria parva* and is transmitted through tick *Hyalomma* and *Rhipicephalus*, respectively. The present paper deals with clinical signs, diagnosis and treatment of bovine theileriosis in the crossbred Sahiwal calf, aged about 1 month. In this case report, the clinical signs observed were; high fever (106.7 °F), anorexia, dullness, staggering gait, absence of suckling reflex, slight pale mucus membrane, presence of ectoparasites (ticks), and enlarged pre-scapular lymph nodes. The peripheral blood smear and lymph node smear confirmed the presence of piroplasmic organisms and Koch's blue bodies respectively. The animal was treated with a single dose of Buparvaquone (Butalex) deep IM, @ 2.5 mg/kg BW, along with supportive therapy.

#### Keywords

Theileriosis,  
Piroplasmic,  
Koch's blue bodies,  
Buparvaquone.

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### Introduction

Theileriosis is arthropod transmitted blood protozoan diseases and is economically important vector-borne diseases of tropical and subtropical parts of the world including Ethiopia (Sitotaw *et al.*, 2014). The *Theileria* species infect a wide range of both domestic and wild animals and are transmitted by ixodid ticks of the genera *Amblyomma*, *Haemaphysalis*, *Hyalomma* and *Rhipicephalus* (Mans *et al.*, 2015). *T. parva* can infect cattle, African buffalo, water buffalo and waterbucks. Symptomatic infections are common only in cattle and water buffalo (Spickler, 2010). *T. parva* is highly virulent for European dairy cattle,

however, the indigenous cattle breeds and African buffaloes in endemic areas have a natural resistance to this *Theileria* species (Radostits, *et al.*, 2007). They are of great economic impact on livestock affecting 80% of the world cattle population and causes economic loss due to morbidity and mortality (Kasozi *et al.*, 2014). Haemoprotozoan diseases are causing devastating losses to the livestock industry and thus pose major constraints to the dairy industry throughout the world (Kohli *et al.*, 2014; Bhatnagar *et al.*, 2015). Theileriosis is also a tick borne protozoal disease in ruminants caused by hemoprotozoan parasites belonging to the

genus *Theileria* (Demessie and Derso, 2015). *Theileria* are obligate intracellular protozoan parasites that infect both wild and domestic *Bovidae* throughout much of the world (some species also infect small ruminants). They are transmitted by ixodid ticks, and have complex life cycles in both vertebrate and invertebrate hosts (OIE, 2014). There are a number of species of *Theileria* spp. that infect cattle; the two most pathogenic and economically important are *T. parva* and *T. annulata* (OIE, 2014). So globally the most common cause of bovine theileriosis is *Theileria annulata* and *Theileria parva* (Kohli *et al.*, 2014; Gul *et al.*, 2015; Bhatnagar *et al.*, 2015; Gebrekidan *et al.*, 2016). *T. annulata* infection (Tropical theileriosis) is characterized by high fever, weakness, weight loss, inappropriate appetite, conjunctival petechia, enlarged lymph nodes, and anemia. Lateral recumbency, diarrhea and dysentery are also associated with later stages of infection (Radostits *et al.*, 2007 and Muhanguzi *et al.*, 2014). Cattle may also develop an extremely fatal condition referred to as turning sickness. In this disease, capillaries of central nervous system are blocked by infected cells and leads to neurologic symptoms (Gul *et al.*, 2015).

The incubation period varies from 4 to 14 days after attachment of the infected ticks to the host. The disease may last as little as three to four days in the acute form or may be prolonged for about 20 days (Bakor, 2008). Mahmmud *et al.*, (2011) reported different degrees of the characteristic clinical signs of tropical theileriosis like fever (>103°F), enlargement of the superficial lymph nodes (acute form), anorexia, pale or congestion of the visible mucous membranes, conjunctivitis, severe congestion of the eyes, excessive lacrimation, corneal opacity, respiratory signs from serous nasal discharge to cough, purulent nasal discharge, and dyspnoea (chronic form). Unlike *T. parva*, which causes only a small reduction in circulating erythrocytes, mild to moderate anaemia is

observed in tropical theileriosis, although pathology produced by the schizont stage is usually the primary cause of mortality (Morrison, 2015). The present study documents bovine theileriosis in young crossbred Sahiwal calf aged above one month and its effective therapeutic management.

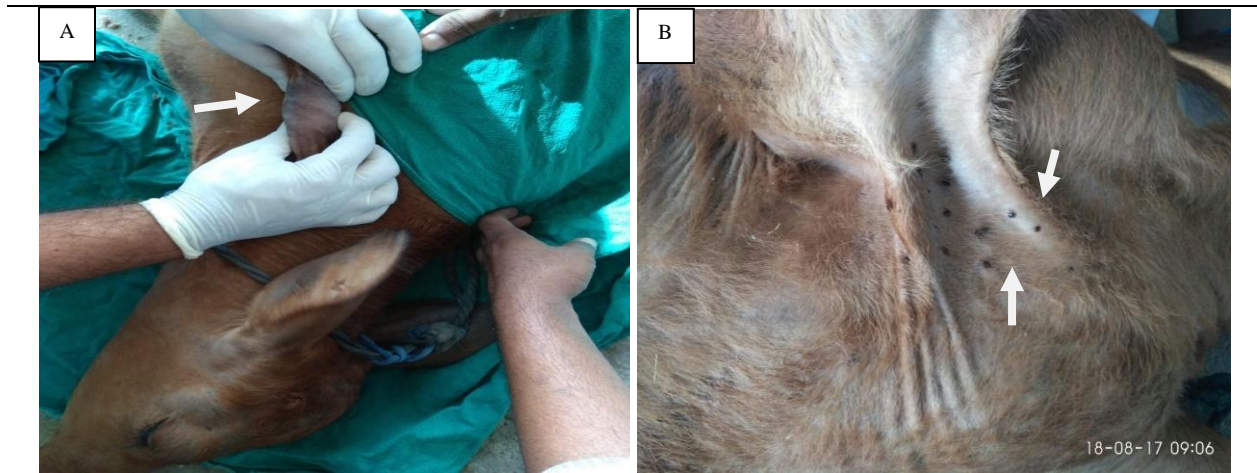
### **History and Observations**

Calf aged above one month was presented at Teaching Veterinary Clinical Complex IIVER Rothak Haryana with a history of high body temperature (106.7 °F), anorexia, bilateral pre scapular lymphadenitis and tick infestation (Figure 1), dullness, staggering gait, absence of suckling reflex with slight pale mucus membrane. The calf was suspected to be a hemoprotozoan disease and for confirmation, five blood smears were made from ear tip for presence of any piroplasms in red blood cells. Pre-scapular lymph node aspiration was also performed for the presence of Koch's blue bodies, indicative of piroplasm infection. The blood and lymph node smears were prepared and stained with Giemsa stain and examined under microscope 100X magnification for the presence of any intra-erythrocytic piroplasms and Koch's blue bodies.

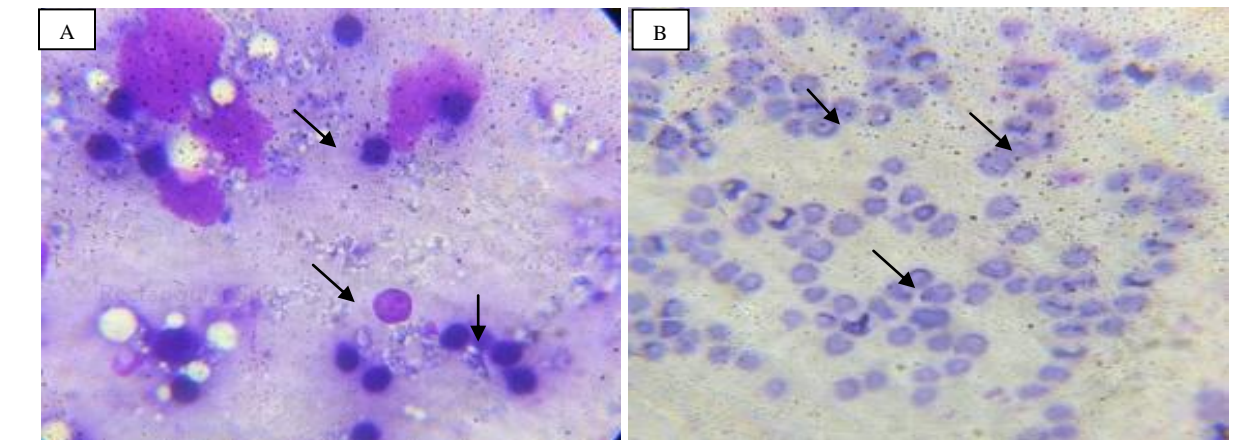
### **Therapeutic Management and Discussion**

The calf was diagnosed positive for theileria after blood smear and pre-scapular lymph node smear examination stained with Giemsa stain. Intra-erythrocytic piroplasm and Koch's blue bodies were found (Figure 2) on microscopic examination (100X) of prepared smears, similarly Gupta *et al.*, (2004) reported theileriosis in 7 day old bovine calf. According to Mudgal (1993), Sharma and Nichani (1990) and Grewal (1992), young calves are highly susceptible for theileriosis hence the calves should be given proper immuno-prophylactic measures immediately after birth.

**Fig.1** A male calf showing enlarged pre-scapular lymph nodes (A) with ectoparasites/tick manifestation (B) in the axillary region



**Fig.2** Pre-scapular lymph node smear shows Koch's blue bodies infected lymphocytes (A) and blood smear showing Intra-erythrocytic piroplasms (Theileria) (B) (Giemsa, 100X)



In the present study the calf was treated with Buparvoquone (Butalex) at the dose rate of 2.5 mg/kg BW injected deep intramuscular in the neck region along with Normal saline 150 ml IV, Melonex 1 mL IM, Avil 1.5 mL IM, Tribivet 2 mL IM. The calf recovered with single dose of buparvaquone.

This is in accordance with Gupta *et al.*, (2004) and Naik *et al.*, (2010) who used Buparvoquone along with supportive therapy for the successful treatment. Theileriosis is one of the most important arthropod-borne

blood protozoan diseases, leading to morbidity and mortality especially in calves, which are commonly affected during the perinatal period. The blood and lymph node smears are used as supplementary methods for the laboratory diagnosis of the presence of any intra-erythrocytic piroplasms and koch's blue bodies respectively. In the present case, it was found that a single dose of buparvaquone is effective against cases of theileriosis along with supportive therapy when treated at the earliest.

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