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Successful management of *Babesia gibsoni* associated with multi organ failure in a boxer

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Abstract
A four year old Boxer male brought from Jammu on road by car three days ago was presented to TVCC, RIVER, with the history of partial appetite, syncope, and high colored urine. Upon clinical examination, the dog was dull and depressed, blanched conjunctival mucosa, tachycardia with aortic thudding. Laboratory examination revealed Hb - 7.3 g %, PCV- 22.8%, RBC count- 3.28 millions/mm^3, WBC count- 8900 cells/ mm^3, platelets- 1.78 lakhs/ mm^3, MCV- 69.7 fl, MCH- 22.2 pg, MCHC- 33.4%, DLC: N - 80%, L-18%, E - 1%, M - 1%. Serum biochemistry showed BUN-39.2 mg/dl, creatinine-1.7mg/dl, SGOT- 37 IU/L, SGPT- 96 IU/L, total proteins-8.9 gm %, albumin-2.2gm%, globulin – 6.7 gm%, bilirubin - total- 0.7mg%, direct- 0.1mg%, indirect- 0.6mg%. Peripheral blood smear revealed positive for *Babesia gibsoni.* ECG showed decreased atrial and ventricular amplitude. However, echocardiography showed normal fractioning shortening and ejection fraction. The dog was treated with Diminazene aceturate (Berenil) at 3.5 mg/kg body weight deep i. m three doses at 15 days interval along with Tab. Azithromycin @ 10 mg / kg sid P.O for the first 10 days. Subsequent blood smear examination conducted at 15 days interval showed negative results. The dog showed complete recovery after a month.

Keywords: Babesia gibsoni, diminazine aceturate, multi organ failure

Introduction
Babesiosis caused by infection with organisms *Babesia spp.* which is characterized by hemolytic anemia, fever and, splenomegaly. Babesia infections can be subclinical or can cause severe life threatening illness. It is caused by intra erythrocytic protozoan parasite of the genus Babesia, frequently transmitted by ixodid ticks, such as *Rhipicephalus sanguineus* (Matsuu *et al*., 2004; Uilenberg, 2006) [11, 13].

Over 100 *Babesia spp*. have been identified, but only *B. canis* and *B. gibsoni* have been shown to infect dogs (Levine, 1988) [7]. It is a small pleomorphic, intraerythrocytic parasite that can cause erythrocyte destruction and hemolytic anemia (Uilenberg, 2006) [13] transmitted by ticks called *Haemaphysalis bispinosa*.

Though protozoans of the genus Babesia undergo part of their life-cycles in the tick vector, it may be transmitted to a healthy host directly by blood transfusion, by direct contact between dogs through wounds, saliva or blood ingestion in most of the fighting dogs (Birkenheuer *et al*., 2005 [1]; Jefferies *et al*., 2007 [6]; Yeagley *et al., 2009*) [15].

Clinical signs of canine babesiosis are characterized by lethargy, anorexia, fever, hemolytic anemia, thrombocytopenia, splenomegaly and even septic shock (Chen and Huang, 2003) [2].

Based on the clinical signs, Babesiosis has been classified as uncomplicated and complicated (Lobetti, 1998) [8]. The uncomplicated cases have the signs of pale mucous membrane, fever, anorexia, depression, splenomegaly and water hammer pulse (Taboada and Merchant, 1991) [12], whereas the complicated cases have the signs of acute renal failure, cerebral babesiosis, coagulopathy, icterus and hepatopathy, immune-mediated haemolytic anemia, peracute Babesiosis, acute distress syndrome (ARDS), haemoconcentration and shock (Lobetti, 1998) [8]. This complication includes manifestations that cannot be directly explained by haemolysis alone but also appear to be the result of the host inflammatory response to the parasite rather than the parasite itself (Matijatko *et al*., 2010) [10]. Early detection of systemic inflammatory response syndrome (SIRS) and multiple organ dysfunction syndrome (MODS) is of major importance in clinical practice for providing information about severity and outcomes of the disease and therapy.

A four year old Boxer male brought from Jammu on road by car three days ago was presented

to the TVCC, RIVER, Puducherry (U.T) with the history of syncope, inappetence, depressed behavior and high colored urine.

Clinical assessment

The following vital parameters were recorded: Rectal temperature 101.3°F, heart rate 130 bpm, respiratory rate of 42 breaths / min with a normal capillary refill time of 2sec. Conjunctival mucous membrane was blanched, with Tachycardia, aortic thudding and whirring of pulse. Subsequently, the conjunctival mucosa became slightly icteric indicating the development of jaundice.

Laboratory assessment

The following table showing the hematology (Table-1) and serum biochemistry of the dog.

Table 1: The following table showing the hematology

Parameter	Values observed	Normal value (Jain, 1986)
Hemoglobin	7.3 g /dL	12-18 g / dL
PCV	22.8 %	37-55 %
RBC	3.28 million / mm^3	5.5-8.5 million/mm^3
WBC	8900 / µL	6000-17000/µL
Platelets	1.78 lakhs / µL	200,000 - 500,000 /µl
Neutrophils	7120	3000 -11,500
Lymphocytes	1602	1000 - 4800
Monocytes	89	150 – 1350
Eosinophils	89	100 - 1250
MCV	69.7 fL	60 – 77 fL
MCH	22.2 pg	21 – 32 pg
MCHC	33.4 %	32 – 36 %
BUN	39.2 mg/dl	12-25 mg/dl
Creatinine	1.7 mg/dl	0.5-1.5 mg/dl
Protein (Total)	8.9 g/dl	5.4-7.7 g/dl
Albumin	2.2 g/dl	2.3-3.8 g/dl
Globulin	6.7 g/dl	2.3 – 5.2 g/dl
SGPT	96 IU/L	10-88 IU/L
Total bilirubin	0.7 mg/dl	0.1-0.6 mg/dl
Direct bilirubin	0.1 mg/dl	0.0-0.3 mg/dl

Peripheral blood smear: Thin blood smears obtained from ear vein and stained with Giemsa stain revealed positive for oval shaped *Babesia gibsoni* within the RBCs (Fig – 1).

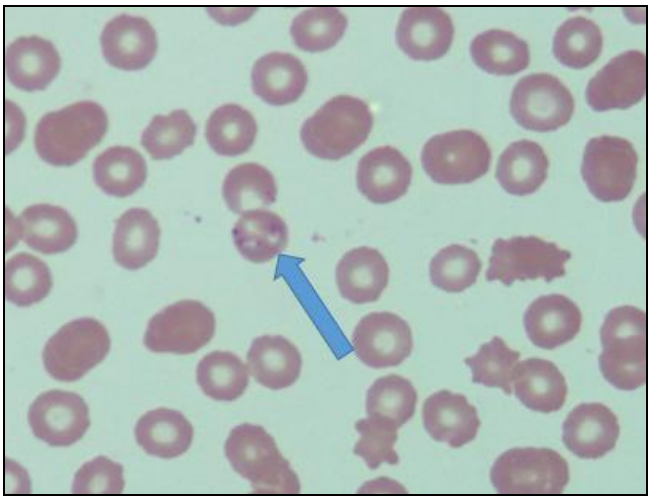

Fig 1: Arrow shows *Babesia gibsoni*

Electrocardiography

The electrocardiography of the dog showed (Fig- 2) decrease atrial and ventricular amplitude.

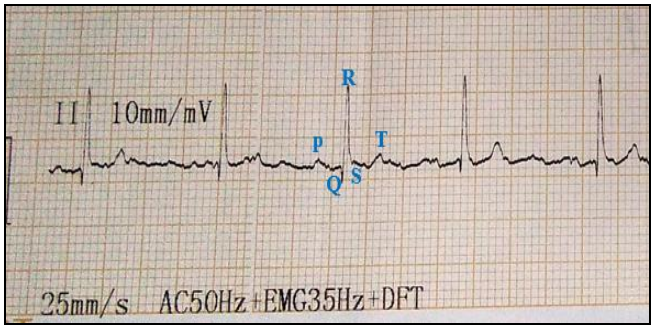

Fig 2: Decreased atrial and ventricular amplitude

Echocardiography

The echocardiography (Fig- 3) showed normal fractioning shortening and ejection fraction. The values are IVSd - 1.08cm, LVId - 4.47cm, LVFVd - 0.98cm, IVSs - 1.38cm, LVIs - 2.94cm, LVFVs - 1.69cm, Aorta - 1.98cm, Left Atrium - 2.93cm, Aorta : Left Atrium – 1.47, EPSS - 0.38(normal), Fraction shortening – 34.22% (Normal-25-50%) and Ejection fraction – 63.39% (Normal- 50-65%).

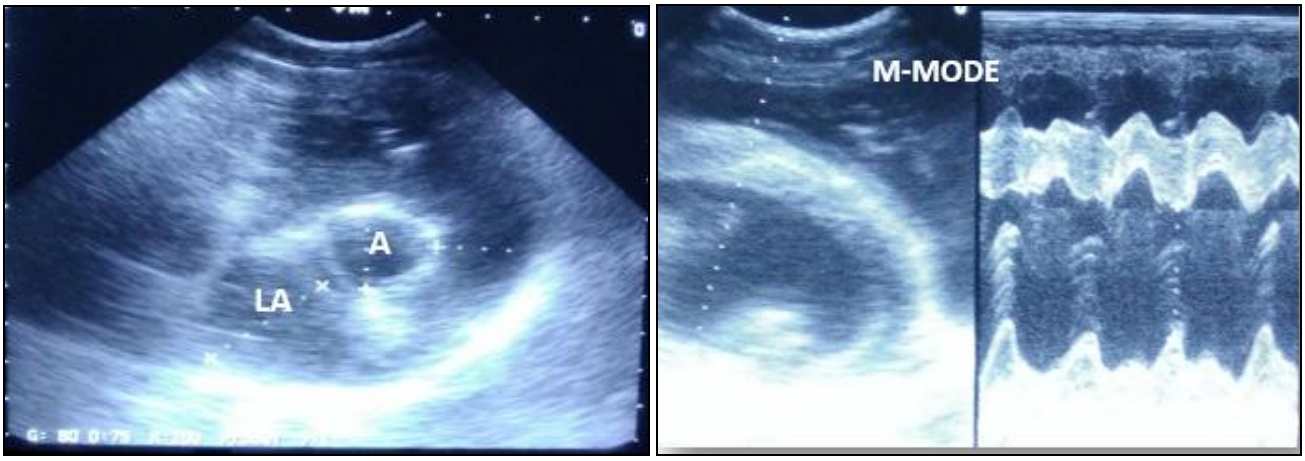

Fig 3: Echocardiographic view of Aorta and Left atrium and M-mode

Clinical management and outcome

The dog was treated with Inj. Diminazene aceturate (Berenil) - 3.5 mg/kg body weight deep i.m three doses at 15 days interval and tab. Azithromycin - 10 mg / kg Sid P.O for the first 10 days. The dog was supported with Immuno plus (5ml – 0 – 5ml) po daily, Livoferol 10 ml P.O S.I.D Subsequent blood smear examination conducted at 15 days showed negative results. The dog showed complete recovery after a month.

Discussion

Jacobson (2006) [4] reported that the Babesiosis is a multi-systemic disease, which causes multiple organ dysfunction syndrome is documented in canine Babesiosis caused by *B. canis* rossi (Welzl *et al.*, 2001) [14]. In this case it is caused by *Babesia gibsoni* organism. As per the Goris *et al*. (1985) [3] hypothesize, the multiple organ dysfunction syndrome develops as the consequence of dysregulation of pro-inflammatory and anti-inflammatory mechanisms resulting in overwhelming auto-destructive inflammation. In this case, the increase in the creatinine value can be explained by the fact that the affected animal with multiple organ dysfunction syndrome will have hypotension and that causes poor perfusion to the renal tissue (Matijatko *et al*., 2009) [9]. Welzl *et al.* (2001) [14] reported that the most frequent organs involved during B. canis rossi infection was the liver, then kidney, muscles, lungs and the central nervous system, in this case electrocardiography of the dog showed decrease atrial and ventricular amplitude indicate cardiac involvement.

Animals with Babesiosis caused by *Babesia canis* in which multiple organ dysfunction syndrome developed, have poor outcome (Matijatko *et al*., 2010) [10], Animals that have survived Babesiosis remain sub clinically infected. These dogs may suffer a relapse of disease in future or serve as point source for further spread of disease in a given area. In this case, although the blood smear shows negative results for *B. gibsoni*, the owner had been made aware of the possibility of subclinical infection and relapse of disease in future.

References

1. Birkenheuer AJ, MT Correa, MG Levy, EB Breitschwerdt. Geographic distribution of Babesiosis among dogs in the United States and association with dog bites: 150cases (2000-2003). J. Am. Vet. Med. Assoc. 2005; 227:942-7.
2. Chen YP, Huang HP. Prevalence and laboratory findings of canine tick borne diseases in the National Taiwan University Veterinary Hospital. Taiwan Vet J. 2003; 29:97-103.
3. Goris RJ, Bockhorst TP, Nuytinek JK, J. S. Gimbrere. Multiple-organ failure. Generalized auto destructive inflammation? Arch. Surg. 1985; 120:1109-1115.
4. Jacobson LS. The South African form of severe and complicated canine babesiosis: Clinical advances 1994-2004. Vet. Parasitol. 2006; 138; 126-139.
5. Jain NC. Schalm's veterinary hematology. 4th ed. Philadelphia: Lea and Febiger. 1986; 103-125.
6. Jefferies R, Ryan UM, Jardine J, Broughton DK, Robertson ID, Irwin PJ, *et al* Blood, Bullterriers and babesiosis: further evidence for direct transmission of Babesia gibsoni in dogs. Aust. Vet. J. 2007; 85:459-63.
7. Levine, N. The protozoan phylum Apicomplexa, Boca Raton (FL): CRC press, 1988, pp.154.
8. Lobetti RG. Canine babesiosis. Pract Comp. Cont. Educ. Vet. 1998; (20):418-431.
9. Matijatko VI, Kiš M, Torti M, Brkljačić N, Kučer R, Barić Rafaj, *et al.* Septic shock in canine babesiosis. Vet. Parasitol. 2009; 162: 263-270.
10. Matijatko VI, Kiš M, Torti M, Brkljačić R, Barić rafaj, Žvorc Z, *et al* Systemic inflammatory response syndrome and multiple organ dysfunction syndrome canine Babesiosis. Vet. Arhiv. 2010; 80(5):611-626.
11. Matsuu A, Kawabe A, Koshida Y, Ikadai H, Okano S, Higuchi S. *et al* Incidence of canine Babesiagibsoni infection and subclinical infection among Tosa dogs in Aomori Prefecture, Japan. J Vet Med Sci. 2004; 66:893-897.
12. Taboada J, Merchant SR. Babesiosis of companion animals and man. Vet. Clin. North Am. Small Anim. Pract. 1991; 21:103-123.
13. Uilenberg G, Babesia a. historical overview. Vet Parasitol. 2006; 138:3-10.
14. Welzl, C, Leisewitz AL, Jacobson LS, Vaughan-scott T, Myburgh E. Systemic infl ammatory response syndrome and multiple-organ damage/dysfunction in complicated canine babesiosis. J. S. Afr. Vet. Assoc. 2001; 72:158-162.
15. Yeagley TJ, Reichard MV, Hempstead JE, Allen KE, Parsonsl M. *et al*. Detection of Babesia gibsoni and the canine small Babesia 'Spanish isolate' in blood samples obtained from dogs confiscated from dog fighting operations. J. Am. Vet. Med. Assoc. 2009; 235:535-9.