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Pyometra with Babesiosis in a Bitch - A Case Report

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ABSTRACT

The present study investigated a case report of pyometra with canine babesiosis in a dog during March, 2025 at VCC, PGIVER, Jaipur, India. A two year-old unspayed female dog German shepherd weighing 28 kgs with the history of decline in body weight, anorexia, dehydration, swollen vulva, uterine pus discharge with foul smell, vomiting. polydipsia, polyuria, lethargy, weak pulse with shallow respiration and elevated temperature (104°F) presented to Department of Veterinary Clinical Complex. Clinical examination revealed pinkish mucus membrane and slightly distended abdomen with pain on palpation. Hematology revealed normal hemoglobin level, normal PCV value, normal total erythrocyte counts, slightly elevated total leucocyte count, neutrophilia, lymphocytopenia, and eosinophilia. Thrombocytopenia was also observed in this case. Mean corpuscular volume (MCV) and Mean corpuscular hemoglobin (MCH) were normal. Mean corpuscular hemoglobin concentration (MCHC) was slightly increased. Left shift of neutrophills was also seen in blood smear. Blood biochemical test revealed normal values of Alanine Aminotransferase (ALT), Alkaline Phosphatase (ALKP), Creatinine, Blood urea nitrogen, and Creatinine BUN ratio. Diagnosis was made by history, clinical symptoms and ultrasonography. Ultrasonography revealed an enlarged uterus with thickened wall and pus filled tubular horns. There were multiple, round, oval fluid filled pouches was also seen along the uterine horn. These pouches of pus were separated by thin septa. The microscopic examination of the thin blood smear revealed the presence of *Babesia* organisms.

KEYWORDS: Bitch, babesia organism, pyometra, microscopy, sepsis, ultrasonography

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1. INTRODUCTION

Pyometra,a bacterial infection,is the accumulation of purulent brownish exudate in the uterine lumen that occurs in small ruminants (Peixoto et al., 2023; Hagman, 2022).It is a secondary infection due to hormonal changes in a female's reproductive tract. It is a potentially life-threatening septicemic and toxemic uterine infection associated with hormonal imbalance and bacterial infection in bitches (Rautel and Katiyar, 2019; Liao et al., 2020; Agostinho, 2014; Fieni et al., 2014; Jitpean et al., 2014; Sant'Anna et al., 2014; Smith, 2006). Estrogen, through the progesterone receptor, increases the stimulation of progesterone in the uterus. Therefore, estrogen administration greatly increases the risk of pyometra. As theestrus cycle is completed, a steady increase in progesterone, which increasesthickening of thewall of theuterus that leadingto cystic endometrial hyperplasia. This is a favorable environment for bacterial growth, which develops the pyometra (Feldman and Nelson, 2004). It is the most common reproductive disease in canines, impacting up to 25% of non-castrated females (Hagman et al., 2018; Santanaand Santos, 2021). The age of bitches in pyometra varies from as young as four months to as old as 16 years (Baithalu et al., 2010). It can occur as an open or a closed condition depending on the functional patency of the cervix in affected bitches (Jitpean et al., 2017; Nayana et al., 2021). The etiology of pyometra in dogs depends on the breed, age, parity, and stage of the estrous cycle (Rautel and Katiyar, 2019). Some breeds have a higher incidence of pyometra, such as *Golden Retriever*, *Irish Terrier*, *Saint Bernard*, and *Rottweiler* Dogs (Antonov et al., 2015; Jitpean et al., 2014). It is characterized by polydipsia, polyuria, gastrointestinal disturbances, and vaginal discharge.It can cause peritonitis, sepsis, and the dysfunction of multiple organs if treatment is not given timely manner (Hagman 2022; Hagman 2018; Baithalu et al., 2010; Gasser et al., 2020). The cervix is the source for bacteria entering into uterus. Bacteria those are normally present in the vagina can enter the uterus along with sperm during estrus as the cervix is opened and relaxed. If the uterus is normal, the uterine environment is not favorable to bacterial survival; however, when the uterine wall is thickened or cystic, perfect conditions exist for bacterial growth. Besides It, when these abnormal conditions exist, the muscles of the uterus cannot contract properly either due to the thickening of the uterine wall or the hormone progesterone. This means that bacteria that enter the uterus cannot be expelled. Early diagnosis and therapeutic intervention may prevent further severe complications that are associated with sepsis. It can be diagnosed by clinical symptoms, bacteriological examination and ultrasonography. However, bacteriological analysis of vaginal discharge in pyometra is not sufficient for confirmation, as similar microorganisms can be present in healthy dogs (Lansubsakul et al., 2022). Ultrasound is used for the diagnosis of pyometra in dogs, confirming its high diagnostic value (Zarutska, 2022).Canine babesiosis is characterized by anemia, thrombocytopenia, and other mild to peracute non-specific clinical manifestations (Irwin, 2010). An uncomplicated form of babesiosis causes hemolysis-induced anemia, systemic inflammatory response syndrome (SIRS), and multiple organ dysfunctions in affected dogs (Matijatko et al., 2012). Complicated canine babesiosis manifestations may include acute renal failure, cerebral babesiosis, immune-mediated hemolytic anemia, icterus and hepatopathy, acute respiratory distress syndrome, coagulopathy, hemoconcentration, and shock (Jacobson and Clark, 1994).The present study investigated a pyometra in a bitch that was diagnosed by history, clinical examination, blood examination, and ultrasonography.

2. CASE HISTORY

A 2-year-old female dog German Shepherd, 18 kg body weight, presented to the Department of Veterinary Clinical Complex with the history of decline in body weight, anorexia, vomiting, diarrhea, polydipsia, polyuria, lethargy, vulvar discharge with foul smell,weak pulse with shallow respiration and elevated temperature (104˚F). Clinical examination revealed pinkish mucus membrane and slightly distended abdomen with pain on palpation. Blood sample from cephalic vein was taken in EDTA anticlot vial for hematology and another sample of blood in clot activator vial for blood biochemistry was taken and sent to Veterinary Clinical Diagnostic Laboratory of Department of Veterinary Clinical Complex, PGIVER, Jaipur.

3. RESULTS AND DISCUSSION

Clinical examination, complete blood count (CBC), biochemical profile, and ultrasonography were performed to confirm the diagnosis. CBC revealed normal hemoglobin value (14.5 g %), normal hematocrit (37.8%), normal total erythrocyte count ($5.83_x 10^{12}$ l^{-1}), slightly elevated leucocyte count ($16.20_x 10^9$ l^{-1}), neutrophilia (83.99%) with a left shift due to infection, eosinophillia (12.90%), lymphocytopenia (2.44%), and thrombocytopenia ($81_x 10^9$ l^{-1}) (Table 1). The biochemical profile showed normal levels of blood urea nitrogen (13 mg dl^{-1}), normal levels of serum creatinine (0.8 mg dl^{-1}), normal levels of Alanine aminotransferase (34 U l^{-1}) and normal levelsof Alkaline phosphatase (111 U l^{-1}) (Table 2).

In the present case, blood smear revealed a paired form of Babesia species (Figure 1). Abalaka et al. (2021) reported *Babesia vogeli* after molecular analysis of the heart blood in a *Belgian Malandis* bitch. Leukocytosis that occurred in the present case indicates systemic inflammatory reactions. This

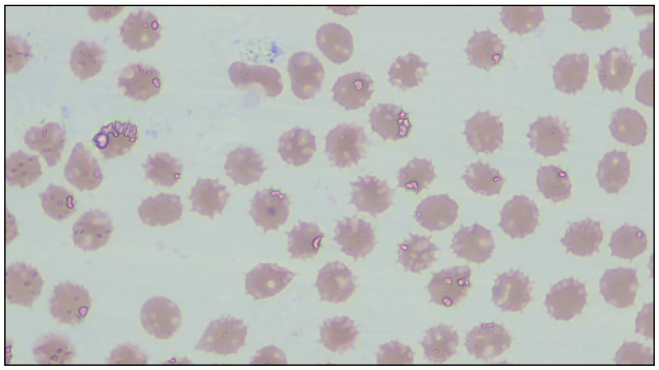

Figure 1: Babesia species seen within the RBC of a dog, Giemsa stain oil immersion, 1000X

study was characterized by neutrophilia and eosinophilia, which could be attributable to the *E. coli*-induced vaginal discharges. However, the bitch was not anemic, which indicates non-hemolytic manifestations in some canine babesiosis cases (Solano-Gallego et al., 2016). It might be due to the host's inflammatory responses towards parasites rather than direct parasitic effects (Matijatko et al., 2010). The role of the acute phase response is to limit inflammation, remove the damaging factor, and restore homeostasis. The systemic effects of pyometra are reflected by acute phase proteins and several biochemical parameters (Nejra et al., 2024).

Table 1: Hematology

Parameters	Results	Reference range
Hg (g dl^{-1})	14.5	11–19
HCT (%)	37.8	36–56
TEC ($_x10^{12}l^{-1}$)	5.83	5.10–8.50
TLC ($_x10^{9}l^{-1}$)	16.20	6.00–16.00
Lymphocyte ($_x10^{9}l^{-1}$)	0.39	0.830–4.690
Monocyte ($_x10^{9}l^{-1}$)	0.09	0.140–1.970
Neutrophil ($_x10^{9}l^{-1}$)	13.6	3.620–11.320
Eosinophil ($_x10^{9}l^{-1}$)	2.08	0.040–1.560
basophil ($_x10^{9}l^{-1}$)	0.012	0.000–0.120
Neutrophil (%)	83.99	52–81
Eosinophil (%)	12.90	0.50–10.00
Lymphocyte (%)	2.44	12–33
Monocyte (%)	0.59	2–13
Basophil (%)	0.08	0.00–1.30
MCV (fl)	64.9	62–78
MCH (pg)	24.8	21–28
MCHC (g dl^{-1})	38.3	30–38
PLT ($_x10^{9}$ l^{-1})	81	117–460
MPV (fl)	13.2	5–15

Table 2: Biochemical parameters

Parameters	Results	Reference range
CREA (mg dl^{-1})	0.8	0.5–1.8
BUN (mg dl^{-1})	13	7–27
BUN/CREA	15	
ALT (U l^{-1})	34	10–125
ALKP (U l^{-1})	111	23–212

3.1. Clinical examination

The bitch revealed anorexia, vomiting, polydipsia and polyuria, lethargy, pyrexia, brownish fetid thick purulent fluid within the uterus and vaginal discharge suggested canine pyometra according to Hagman (2018).

The ultrasonography of female dogs with pyometra revealed an enlarged uterus with tubular horns filled with pus (Figure 2). This observation agreed with the findings of some other authors (Jena et al., 2013; Llazani et al., 2021). Nilsson et al. (2023) studied the sonography in noncomplicated postoperative abdominal in pyometra and reportedthatthe ultrasound imaging is a valuable diagnostic

Figure 2: Pus-forming pouch seen in pyometra of bitch

tool in monitoring the post-operative condition of patients. Sklyarov and Piatibrat (2021) also used ultrasound for the diagnosis of pyometra in dogs.

3.2. Treatment

It is done by using mifepristone 10mg kg^{-1} b.wt. once orally, cabergoline 5 µg kg^{-1} b.wt. Once in a day for 7 days and misoprostol (prostaglandin) 5µg kg^{-1} b.wt. once a day for 4 days along with gentamycin at the rate of 4.0 mg kg^{-1} I/M for 5 days, England et al. (2007). Wozna-Wysocka et al. (2021) reported that timely diagnosis and treatment of pyometra accordingly increase the likelihood of animal survival.

4. CONCLUSION

The present study investigated a pyometra in a bitch that was diagnosed by history, clinical examination, blood examination, and ultrasonography. The bitch showed

normal hemoglobin value, leukocytosis, neutrophilia and neutropenia. Blood biochemistry revealed normal biochemical parameters. Leukocytosis and neutrophillia observed in this case which indicates systemic inflammatory reactions. This study was characterized by neutrophilia and eosinophilia, which could be attributable to the bacterial infection. However, the bitch was not anemic, which may be due to non-hemolytic manifestations in some canine babesiosis cases.

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