

Multifactorial case of ascites and anemia in a Golden Retriever involving *Babesia* sp. and *Toxocara canis* infections

Yustina Septi Dyanitha^{1*}, Putu Ayu Sisyawati Putriningsih², I Gusti Made Krisna Erawan²

¹ Veterinary Medicine Professional Program, Faculty of Veterinary Medicine, Udayana University, Denpasar, Bali

² Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana University, Denpasar, Bali

ABSTRACT: A seven-year-old male Golden Retriever presented with lethargy, anorexia, abdominal enlargement, and weakness. Hematology tests revealed lymphocytosis, microcytic hypochromic anemia with anisocytosis, hypoalbuminemia, hyperglobulinemia, and elevated levels of alkaline phosphatase (ALP), blood urea nitrogen (BUN), and creatinine. Radiographic examination showed pneumonia, an abnormal heart shape resembling an inverted "D," and fluid accumulation in the abdominal cavity. Blood smears indicated a *Babesia* sp. infection. Additionally, the dog expelled a worm identified as *Toxocara canis*. The complex interaction between *T. canis* infection, multiple organ dysfunction, *Babesia* sp. infection, and malnutrition contributed to the development of ascites and anemia in this case. Treatment included abdominocentesis and fluid therapy. The dog was also prescribed furosemide, methylprednisolone, digoxin, Hematodin®, VipAlbumin®, and Drontal® for the worm infection. Unfortunately, the dog died on the 5th day of treatment due to dehydration and worsening anemia.

Keywords:

ascites, liver dysfunction, pneumonia, right ventricle hypertrophy, *Toxocara canis*

■ INTRODUCTION

Ascites is a clinical condition characterized by fluid accumulation in the peritoneal cavity (Jana *et al.* 2019). In dogs, ascites can be associated with various diseases, including congestive heart failure, liver cirrhosis, chronic active hepatitis, kidney and reproductive diseases, and parasitic infections such as *Babesia* sp., *Toxocara canis*, *Toxocara cati*, or *Ancylostoma caninum* (Choi *et al.* 2018). Ascites is categorized into three grades based on fluid volume. Grade 1 ascites can only be detected by ultrasonography, while Grade 2 ascites is marked by symmetrical abdominal distention. Grade 3 ascites is characterized by a large abdomen easily observed by both the owner and veterinarian (Nwoha 2019).

Diagnosis of ascites is based on clinical signs, physical examination (specifically undulation), and tests such as abdominocentesis, hematology, blood chemistry, and radiographic examination (Cahyanti *et al.* 2023). Further diagnosis of the underlying disease is required to determine the ideal therapy for the dog. This paper reports a multifactorial case of ascites and anemia in a Golden Retriever involving *Babesia* sp. and *Toxocara canis* infections.

■ CASES

Signalment: A 7-year-old male Golden Retriever, weighing 21 kg. **Anamnesis:** The dog presented with abdominal enlargement, decreased appetite, weight loss,

difficulty standing, dyspnea, and lethargy for two weeks.

Physical Examination: Heart rate was 128 bpm, pulse was 127 bpm, respiration rate was 18 bpm, capillary refill time (CRT) was less than 2 seconds, body temperature was 38°C, body condition score (BCS) was 3/9, and mucous membranes were pale. The dog had decreased skin turgor, thoracic breathing, an enlarged abdomen, mucopurulent nasal discharge, and mild infestation of *Rhipicephalus sanguineus* in the neck. Fluid accumulation in the abdominal cavity was identified as Grade 3 ascites.

Laboratory Examination: Tests included a complete blood count, blood chemistry, blood smear, nasal discharge cytology, radiography, urinalysis, and ascitic fluid analysis. **Diagnosis:** The dog was diagnosed with ascites associated with *T. canis* and *Babesia* sp. infections, resulting in systemic dysfunction. **Prognosis:** Dubious to infaust. **Therapy:** Treatment included abdominocentesis, fluid therapy with Ringer Lactate, furosemide (2 mg/kg BW, PO, q12h), methylprednisolone (0.5 mg/kg BW, PO, q12h), digoxin (0.25 mg, PO, q12h), Hematodin® (0.2 ml/kg BW, IM, q24h), Drontal®, ondansetron HCl (0.1 mg/kg BW, IV, q12h), and VipAlbumin® (2 capsules, orally, three times a day).

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■ RESULT AND DISCUSSION

Blood chemistry revealed hypoalbuminemia (10 mg/dL), hyperglobulinemia (78.3 mg/dL), azotemia (BUN 26.57 mmol/L, creatinine 185.4 mmol/L), and elevated ALP (484 U/L). Albumin levels below 20 g/L indicate poor prognosis and increased risk of systemic organ failure, pulmonary edema, and hypercoagulability (Mazzaferro *et al.* 2002). Hypoalbuminemia likely resulted from malnutrition, evidenced by emaciation (BCS 3/9) and chronic inflammation, indicated by elevated globulin levels (Yoon *et al.* 2021). A twofold ALP increase without a similar ALT rise suggests liver dysfunction (Assawarachan *et al.* 2020). No urinalysis abnormalities were found. Hematology showed lymphocytosis and microcytic hypochromic anemia with anisocytosis, likely due to chronic inflammation (Maria & Ioannis 2016) and iron deficiency from malnutrition (Naigamwalla *et al.* 2012). Low albumin levels hinder nutrient absorption (Gatta *et al.* 2012). Although *Babesia* sp. was found in the blood smear, the dog did not have thrombocytopenia, the hallmark of babesiosis (Salem 2013), suggesting the infection might not have caused systemic dysfunction.

Radiographic imaging and nasal discharge cytology indicated bacterial pneumonia, secondary to *T. canis* larva migration, leading to pulmonary hypertension and right ventricular enlargement (Poser & Guglielmini 2016). Antibiotics were not prescribed as the main therapy focus was stabilizing the dog's physiological condition. Abdominocentesis in dogs with ascites relieves dyspnea and aids diagnosis. The dog's yellowish-clear ascitic fluid indicated liver dysfunction, ruling out ascites from cancer, pancreatitis, peritonitis, tuberculosis, and lymphoma, which typically present with exudate or blood (Huang *et al.* 2014). The dog died on the 5th day of treatment due to worsening anemia and dehydration. The low albumin level contributed to ineffective therapy, given its role in enzyme transport, hormones, and pharmacological substances. Treating hypoalbuminemia is more effective with plasma donors or 10% amino acid intravenously (Schneider *et al.* 2023). Ringer Lactate is not recommended for liver dysfunction cases, as it may increase liver workload (Oh *et al.* 2024). These factors contributed to the ineffective treatment.

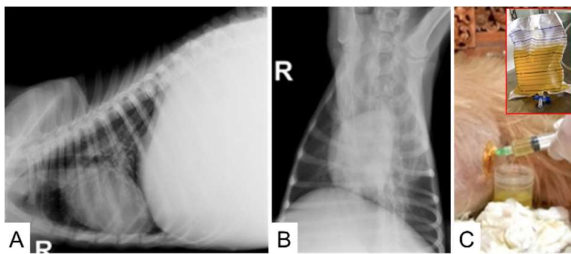


Figure 1. Thoracic radiography of a Golden Retriever with ascites and anemia. (A) Right lateral recumbency view shows pneumonia, (B) Ventrodorsal view shows an inverted "D" shaped heart, and (C) yellowish ascitic fluid from abdominocentesis.

■ CONCLUSION

The dog had *T. canis* infection and mild babesiosis, causing ascites, pneumonia, heart abnormality, liver dysfunction, malnutrition, and anemia, leading to death. Treating hypoalbuminemia should be the primary focus.

■ AUTHOR INFORMATION

Corresponding Author

* YSD: septidyanitha26@gmail.com

Veterinary Medicine Professional Program, Faculty of Veterinary Medicine, Udayana University, Denpasar, Bali

■ REFERENCES

- Assawarachan SN, Maneesaay P, Thengchaisri N. 2020. A descriptive study of the histopathologic and biochemical liver test abnormalities in dogs with liver disease in Thailand. *Canadian Journal of Veterinary Research*. 84(3): 217-224.
- Cahyanti PY, Widyastuti SK, Jayanti PD, Sewoyo PS, Permana R. 2023. Ascites with abdominal venous distention due to liver dysfunction in dog: a case report. *Indonesia Medicus Veterinus*. 12(2): 223-232
- Choi Y, Park CM, Kim JW, Park YS, Lee J, Choi JW, Lee CH. 2018. Toxocarasis mimicking lymphoma and presenting as multiple lymphadenopathy: a case report. *Journal of the Korean Society of Radiology*. 79(5): 286-289.
- Gatta A, Verardo A, Bolognesi M. 2012. Hypoalbuminemia. *Internal and Emergency Medicine*. 7: 193-199.
- Huang LL, Xia HHX, Zhu SL. 2014. Ascitic fluid analysis in the differential diagnosis of ascites: focus on cirrhotic ascites. *Journal of Clinical and Translational Hepatology*. 2(1): 58.
- Jana S, Das PK, Banerjee D, Ghosh D, Mukherjee P, Mukherjee J. 2019. A case study on ascites of hepatic origin in a dog. *Indian Journal of Animal Health*. 58(1):135-138.
- Maria KK, Ioannis LO. 2016. The interpretation of leukogram in dog and cat. *Hellenic Journal of Companion Animal Medicine*. 5(2): 62-68.
- Mazzaferro EM, Rudloff E, Kirby R. 2002. The role of albumin replacement in the critically ill veterinary patient. *Journal of Veterinary Emergency and Critical Care*. 12(2):113-124.
- Nwoha RI. 2019. Review on ascites in pets. In *Veterinary Medicine and Pharmaceuticals*. IntechOpen: 127.
- Oh SY, Woo HY, Lim L, Im H, Lee H, Lee JM, Hong SK, Choi Y, Yi NJ, Lee KW, Suh KS. 2024. Comparison of postoperative ascites replacement strategies on time to first flatus after living donor liver transplantation: Albumin vs. lactated Ringer's solution. *Clinical Transplantation*. 38(1):e15231.
- Poser H, Guglielmini C. 2016. Pulmonary hypertension in the dog. *Acta Veterinaria-Beograd*. 66(1): 1-25.
- Schneider S, Hartmann K, Dörfelt R. 2023. Influence of intravenous 10% amino acids infusion on serum albumin concentration in hypoalbuminemic dogs. *Frontiers in Veterinary Science*. 10:1198534.
- Yoon JS, Yu D, Park J. 2021. Changes in the serum protein electrophoresis profile in dogs with pyometra. *Frontiers in Veterinary Science*. 8: 626540.