

CASE REPORT

Ascites Associated with Ancylostomiasis in Dogs

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Ascites is the accumulation of fluid in the abdominal cavity. It is a common presenting condition with diverse forms of etiologies. Ascites manifest in several disease conditions such as nephrotic syndrome, congestive heart failure, right-side heart failure, chronic liver failure, portal hypertension, kidney failure, malnutrition, hypoalbuminemia, lymphoma, peritonitis, hookworm infection (Peden and Zenoble, 1982; Randhawa *et al.*, 1988). It results in abdominal swelling, dyspnea, lethargy, anorexia, vomiting, weakness, discomfort. Ascites is always a sign of disease; therefore, the investigation should identify the primary underlying problem (Pradhan *et al.*, 2008; Kumar *et al.*, 2016). Ancylostomiasis (hookworm disease) is a disease of worldwide distribution. The most widespread and pathogenic of all hookworm species is *Ancylostoma caninum*, and it parasitizes dogs throughout the tropics and subtropics (Obiukwu and Onyali, 2006). The primary sign of hookworm infection is hemorrhagic diarrhea and anemia in dogs. *Ancylostoma* doesn't just cause the direct complications of blood loss but also causes nutritional deficiencies like iron and protein, making the dog prone to ascites. The present case study involves two dogs with ascites associated with *Ancylostoma* spp. infestation.

CASE HISTORY AND CLINICAL EXAMINATION

Two dogs were presented at Veterinary Clinical Complex, College of Veterinary Science & AH, AAU, Anand with a history of abdominal enlargement, weakness, dyspnea, and lethargy. Both the dogs were not having a history of vaccination and deworming. The first dog was a Rottweiler male aged 3 months (Fig. 1) presented with a history of abdominal enlargement and tarry-colored stool. Clinical examination revealed ascites, anemia, tachycardia, dyspnoea with normal body temperature. Fecal examination revealed eggs of *Ancylostoma* spp. Abdomino-centesis revealed transudate. Haematological examination revealed anemia, mild leucocytosis. Serum biochemistry showed hypoproteinemia and hypoalbuminemia, and elevated ALT (Table 1).

The second dog was a crossbred female aged 4 years who presented with abdominal enlargement, weakness, vomiting, anorexia. This dog was also found to be suffering from ascites, anemia, hypoproteinemia (Table 1). The presence of typical *Ancylostoma* spp. eggs in the faecal sample confirmed ancylostomiasis. (Fig. 3).

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The serum ascites albumin gradient (SAAG) was calculated by subtracting the albumin concentration of the ascitic fluid from the albumin concentration of a serum specimen obtained on the same day (Burgess, 2004). In the present study, SAAG was less than 1.1 g/dl in both dogs.

TREATMENT AND DISCUSSION

Both the dogs were treated symptomatically with fluid therapy, antibiotics, anthelmintics, diuretics, and hematinic preparations. Abdomino-centesis was carried out once to relieve thoracic pressure. Dogs were given Injection



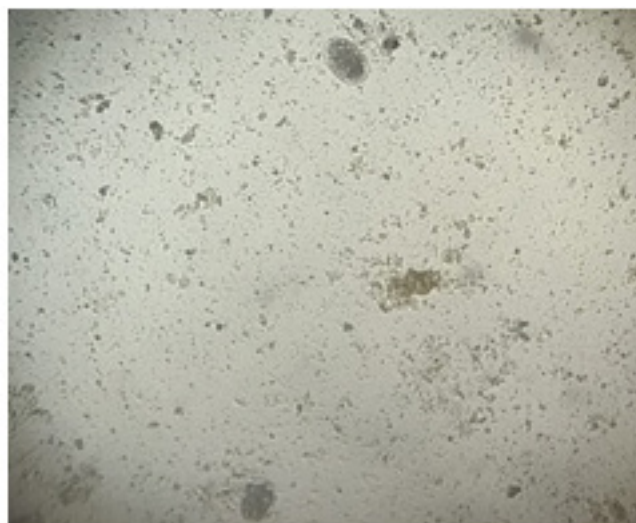
Fig. 1: Rottweiler pup with ascites

Table 1: Haemato-biochemical parameters in ascites affected dogs

Parameters	Reference range	Crossbred dog	Rottweiler pup
Hb (g/dl)	11.9-18.9	6.00	5.0
PCV (%)	35-57	18.20	15.06
TEC ($10^6/\mu\text{L}$)	4.95-7.87	4.14	2.49
TLC ($10^3/\mu\text{L}$)	5.0-14.1	14.7	22.9
Neutrophils %	58-85	19.00	73.9
Lymphocytes %	8-21	79.50	22.00
Eosinophils %	2-10	0.75	0.70
Basophils %	0-1	00.25	00.20
Platelet count ($10^3/\mu\text{L}$)	211-621	224	175
Serum ALT (U/L)	10-109	22.00	152.20
Serum AST (U/L)	13-15	31.50	20.50
BUN (mg/dl)	8-28	10.70	21.65
Creatinine (mg/dl)	0.5-1.7	0.79	0.70
Total Protein (g/dl)	5.4-7.5	3.8	2.9
Albumin (g/dl)	2.3-3.1	1.2	0.8
Globulin (g/dl)	2.7-4.4	2.6	2.1
Ascitic fluid total Albumin (g/dl)	--	0.2	0.1
SAAG Ratio	--	1.0	0.7

**Fig. 2:** Rottweiler pup after treatment

Ceftriaxone Tazobactam @ 15 mg/kg b.wt. for five days. Anthelmintic containing a combination of pyrantel pamoate, febantel, and praziquantel was given @ one tablet/10 kg b.wt. and was repeated after 15 days. Injectable Iron Dextran was given at a weekly interval. Frusemide was given @ 2 mg/kg b.wt. till the recovery of ascites. In both cases, ascites symptoms resolved at the end of two weeks (Fig. 2). The dosage of frusemide was tapered and withdrawn at the end of the fourth week. Oral hematinic preparation

**Fig. 3:** *Ancylostoma caninum* eggs

continued for a couple of months. Fecal examination after 15 days of treatment did not reveal any parasitic eggs. Both dogs recovered from ascites, anemia, and ancylostoma infestation.

In the present study, ascites was found to be associated with ancylostoma. Turkar *et al.* (2009) and Bhatt *et al.* (2011) also reported ascites in dogs due to ancylostomiasis. Behera *et al.* (2017) among 58 ascitic dogs found ascites of cardiac origin in 7 (12.06%), hepatic origin in 21 (36.2%), renal origin in 9 (15.51%), both renal and hepatic origin in 9 (15.51%), genital origin in 6 (10.34%) and parasitic origin in 6 (10.34%) cases. Whereas, Ihedioha *et al.* (2013) reported most of the ascites cases largely due to congestive heart failure (50% of cases), and the other causes were cirrhotic liver disease (14.3%), chronic active hepatitis (21.4%), and kidney disease (14.3%).

In the present case, dogs were not dewormed and harbored *Ancylostoma* spp. worms. *Ancylostoma* was found to cause anemia and protein loss. Adult *A. caninum* live in the small intestine, where they attach themselves with its buccal capsule containing three pairs of ventral teeth and one pair of dorsal teeth. They feed on the dog's blood, secrete anticoagulants, and ingest blood from multiple bite sites. *A. caninum* is a voracious, bloodsucker and consume blood in the range of 0.01 to 0.09 ml per worm per day (Grant Maxie, 2016). In the case study both the dogs were hypoproteinemic and hypoalbuminemic. Hypoalbuminemia decreased the oncotic pressure and increased the hydrostatic pressure causing fluid to escape from the vasculature into the body cavity. SAAG ratio in both dogs was less than 1.1 gm/dl suggesting low gradient ascites (Burgess, 2004).

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