

Case Study

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Acute Anaemia Induced by Ancylostomosis in a Puppy and its Successful Therapeutic Management - A Case Report

R. Jasmin¹, M. Balagangatharathilagar*¹, R. Edith² and S. Prathaban¹

¹Department of Veterinary Clinical Medicine, ²Department of Veterinary Parasitology,
Madras Veterinary College, Chennai- 600 007
Tamil Nadu Veterinary and Animal Sciences University

*Corresponding author

ABSTRACT

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A 6 month old Labrador pup was presented to the Critical Care Unit of Madras Veterinary College Teaching Hospital with the history of anorexia, vomiting and diarrhea for two days. Clinical examination revealed poor hair coat, blanched mucous membranes and hemorrhagic diarrhoea. Hematological and serum biochemical parameters showed severe anaemia, leukocytosis and hypoproteinemia. Faecal floatation examination revealed eggs of *Ancylostoma caninum*. The pup was stabilized with whole blood transfusion, fluids, antibiotics, amino acid injections, hematinics and treated with anthelmintic medications. The animal responded well to the treatment.

Introduction

Ancylostomosis is a hook worm disease caused by *Ancylostoma caninum* in dogs which is characterized by anorexia, anaemia, weakness, rough hair coat and haemorrhagic enteritis. The *Ancylostoma* spp. are voracious blood sucking hook worms and also characterized by 3 pairs of ventral teeth and a pair of dorsal teeth in the head end causing

bleeding ulcers at the site of bite and also the due to the anticoagulant action of the buccal secretions of the worm. Adult worms lay eggs in small intestine which are excreted through the faeces. The eggs of *Ancylostoma* spp are oval in shape with thin shelled and segmented yolk. In a suitable environment, eggs then hatch into L₁ larvae and undergo two moults into L₂ and L₃ (Bowman *et al.*, 2010). Infective stage larvae (L₃) ingested by the

dogs moult into L₄ and mature to adult in the small intestine of dogs. The main routes of transmission are ingestion of infective stage, skin penetration, prenatal and trans-mammary transmission. Yavuzer *et al.*, (2010) diagnosed a case of hookworm-related cutaneous larva migrans in woman and treated her successfully with albendazole indicates the zoonotic potential of the *Ancylostoma* spp. This paper reports a case of acute anaemia induced by ancylostomosis in a pup and its therapeutic management.

Case history and observations

A six month old intact male Labrador Retriever weighing 15 kg was brought to the Critical Care Unit of the Madras Veterinary College Teaching Hospital with the history of anorexia, vomiting and haemorrhagic enteritis for two days. The pup was vaccinated and had never been dewormed earlier.

Clinical examination revealed poor hair coat, blanched mucous membranes (Fig.1), palpable lymph nodes, tachypnea, tachycardia and hemorrhagic enteritis (Fig.2). Hematological findings included anemia (Hemoglobin of 2.8 g/dL, packed cell volume of 4.2% and total erythrocyte count of 1.04 million cells per cu.mm), leukocytosis (WBC Count 27,600 per cu.mm) and neutrophilia.

All Serum biochemical parameters were within normal reference ranges except hypoproteinemia (4.8 g/dL) and hypoalbuminemia (1.7 g/dL). Parvo viral enteritis was ruled out through polymerase chain reaction (PCR) assay of the faecal sample.

Ancylostomosis was confirmed by the presence of typical *Ancylostoma* spp. eggs in the faecal sample of the pup through standard faecal examination technique. (Fig 3).

Results and Discussion

Treatment approach in this case involved anthelmintic therapy and supportive care. The dog was treated with broad spectrum anthelmintic tablet containing pyrantel, fenbendazole and praziquantel. Broad spectrum antibiotic therapy was given with combination of amoxicillin and potassium clavulanate at 12.5 mg per kg BID and metronidazole at 10 mg per kg BID for 5 days. Supportive care included were fluid therapy, hematinics, amino acid supplements and blood transfusion. Around 350 ml of whole fresh blood was transfused after cross matching to relieve severe anaemia (Fig 4). The pup responded well to the treatment.

Ancylostomosis is a very common helminthiasis in dogs under 1 year of age but sometime causes severe fatal anemia in puppies. 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* are voracious blood sucker and consumes in the range of 0.01 to 0.09 ml of blood per worm per day (Jubb *et al.*, 2016).

The predominant anticoagulant serine protease inhibitor isolated from the adult *A. caninum* hookworms which are responsible for the pathogenesis of hookworm associated blood loss and anemia (Cappello *et al.*, 1995). Don *et al.* (2004) identified a pore-forming hemolysin from the hookworm, *A. caninum*. Barakat *et al.* (2012) recorded the *in vivo* endoscopic imaging of ancylostomosis-induced gastrointestinal bleeding which showed varying small intestinal injuries resulting in luminal blood pools.



Fig.1 Blanched mucous membranes



Fig.2 Haemorrhagic enteritis

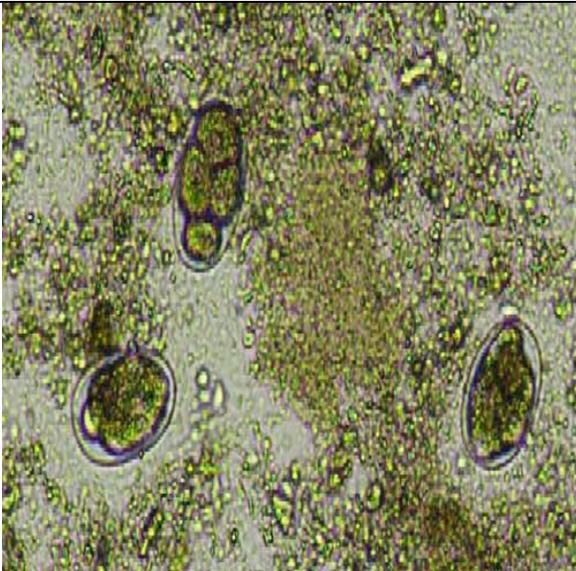


Fig.3 *Ancylostoma caninum* eggs



Fig.4 Emergency whole blood transfusion

According to Helm and Knottenbelt (2014) blood transfusions are recommended when an animal has a PCV of less than 10 percent. In the present case animal had a PCV of 4.2%. A combination of pyrantel pamoate and febantel reported to have very good activity against hookworms (Georgi, 2003). The role of good kennel management practices and disposal of litter should be emphasized to pet owners as a preventive measure. The client education regarding the deworming has been felt very important from this case study because the clients may not be aware of the risks of parasitic zoonotic diseases from pet dogs.

A clinical case of acute anaemia induced by *Ancylostoma caninum* in a puppy and its successful therapeutic management with whole blood transfusion emphasis the significance of blood transfusion in saving the precious lives of young dogs during acute anaemia induced by the voracious blood sucking canine hook worm, *A. caninum*.

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