

Research Article

Toxocariosis in a Puppy - Study of Haemato-Biochemical and Histopathological Changes

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Abstract

Toxocara canis is a worldwide distributed gastrointestinal roundworm of dogs with severe potential zoonotic issues. It is considered as one of the most common residents of intestines in the dogs population where unhygienic environments and irregular deworming practices are more. A three-month-old non-descript dog was presented to the clinic with a history of inappetence and vomiting for the past eight days and which was not responded to the therapy. Recorded clinical manifestations were pale mucous membranes, increased capillary refill time and sunken eyeballs. Microscopic examination of faecal smear revealed unembryonated eggs of *Toxocara* spp. While clinical examination, dog died and a necropsy was carried out which revealed the presence of congested and thickened intestinal mucosa. Histopathology revealed mononuclear cells infiltration in the intestinal mucosa.

Keywords: *Toxocara canis*, Dog, Intestinal obstruction, Histopathology

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Introduction

Endoparasitism considered as most encountered disease in dogs all over the world including in India. *Toxocara canis* considered a common intestinal zoonotic parasitic disease in dogs population where unhygienic environment and irregular deworming practices are more [1]. The prevalence of *Toxocara* considerably varies from one place to another considering aspects of public and animal health issues which required reports on *Toxocara* are essential. The infestation could occur from animal's contact with contaminated soil and ingestion of food contaminated with *Toxocara* spp ova, trans-mammary, transplacental and through the cutaneous route [2, 3]. The documented clinical signs of this disease include anorexia, weight loss, abdominal pain, diarrhoea, nausea, vomiting, mild fever, anaemia and bloat [4, 5]. These infections are self-limiting in a few dogs [6] and it is life-threatening due to mechanical obstruction in some dogs. Present communication reports on the case of *Toxocara canis* in a dog and serum biochemical parameters and histopathological changes in intestines.

Materials and Methods

A three-month-old non-descriptive dog was presented to the clinic with a history of inappetence, vomitions for the past eight days and achezia. Clinical examination revealed a heart rate of 148 beats/minute, rectal temperature of 103.4°F, respiration rate of 46 breaths/minute, pale mucous membranes, prolonged capillary refill time and abdominal distention. Faecal samples, whole blood and serum were collected for laboratory studies.

Results and Discussion

The faecal sample was collected for microscopic examination and revealed the presence of unembryonated eggs of *Toxocara* spp. (Figure 1A) and it passed the faeces along with white worms (Figure 1B). Blood haemoglobin 7.4 g/dL, packed cell volume 21%, total erythrocyte count $3.51 \times 10^6/\mu\text{L}$, total leucocyte count $18.3 \times 10^3/\mu\text{L}$, neutrophils 58%, lymphocytes 28%, eosinophils 13% and monocytes 1%. Serum total protein 6.17 g/dL, albumin 1.68 g/dL, alanine transaminase 88 IU/L, bilirubin 1.2 mg/dL, blood urea nitrogen 41 mg/dL and creatinine 1.35 mg/dL. On the day of presentation, it died and a necropsy was carried out which revealed the presence of congested and thickened intestinal mucosa (Figure 2A). Histopathology of intestinal samples revealed infiltration of mononuclear cells, degeneration and desquamation of microvilli and congested blood vessels and haemorrhages (Figure 2B).

Assessment of faecal samples is suggested for rapid clinical diagnostic procedures in dogs [7]. Obstruction of the alimentary tract due to ascariasis may occur to variety of extent that leads to scanty faeces, bloat, absence of defecation and even death due to functional abnormality which may be the possible inciting factor for the death of the present dog. The infection can cause, subclinical or clinical infections which can become serious or fatal in dogs. Larvae 2 (L2) cause visceral larval migration and ocular larval migration in paratenic hosts. The incidence of clinical disease is highest in young dogs less than 6 month of age and in adult dogs even if present, it does not exhibit any clinical signs and hence act as a reservoir of infection in a particular area [7]. Clinical manifestation in toxocariasis depends on the adult worm load and the immune status of the host [8]. Clinical signs are attributed to intestinal obstruction, irritation, maldigestion, malabsorption and protein-losing gastro enteropathy induced by the parasites and few cases it could be fatal.

In the present study, haematological findings revealed reduced red blood cell count, haemoglobin and packed cell volume and these results agreed with previous reports [9]. Elevated levels of leucocyte count were noticed which is indicative of secondary infections and these finding agreed with Chattha et al., (2009) and Sharma et al., (2010) [10, 11]. This increase might be related to the liberation of histamine and histamine-like substances from tissues damaged by the parasite effect. Elevated levels of eosinophils were noticed and it is in accordance with Sharma et al., (2010) [11] and might be due to the larval migration and defence mechanism against enteric parasites [12]. Low levels of albumin levels were noticed and it might be due to an increase the serum leakage through the injured gut and to the interference with the efficacy of absorption of the damaged intestine [13] and these findings were as per reported earlier [14]. Elevated levels of serum live enzymes might be due to migrating larvae leading to increase hepatic permeability of those enzymes to bloodstream [13]. Histopathology studies noticed the infiltration of mononuclear cells, degeneration and desquamation of microvilli and congested blood vessels and haemorrhages. These findings were in association with the previous studies [15, 16]. The present study is helpful to other researchers to understand the changes in clinical examination and advised further studies on aspects of the development of parasitic resistance in the canine population.

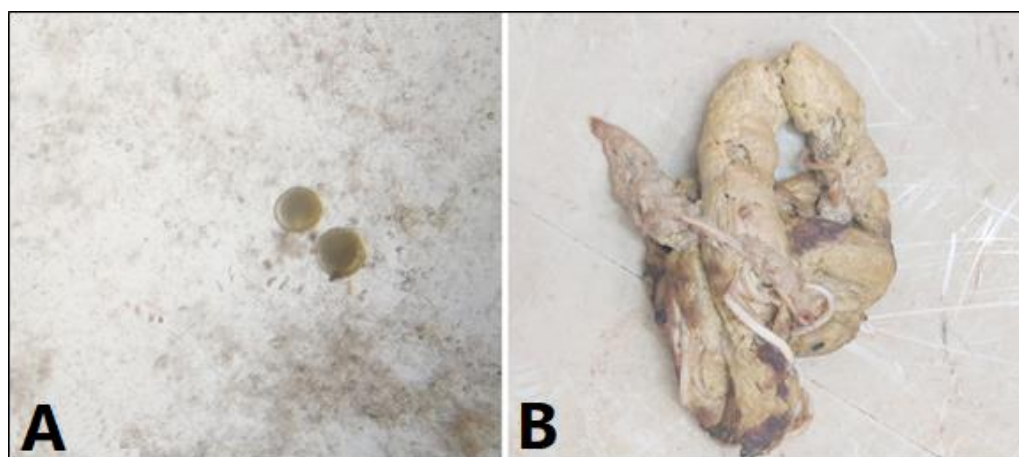


Figure 1 (A) Presence of *Toxocara spp.* eggs in the faecal sample (400X). (B) Presence of adult worms in the faeces

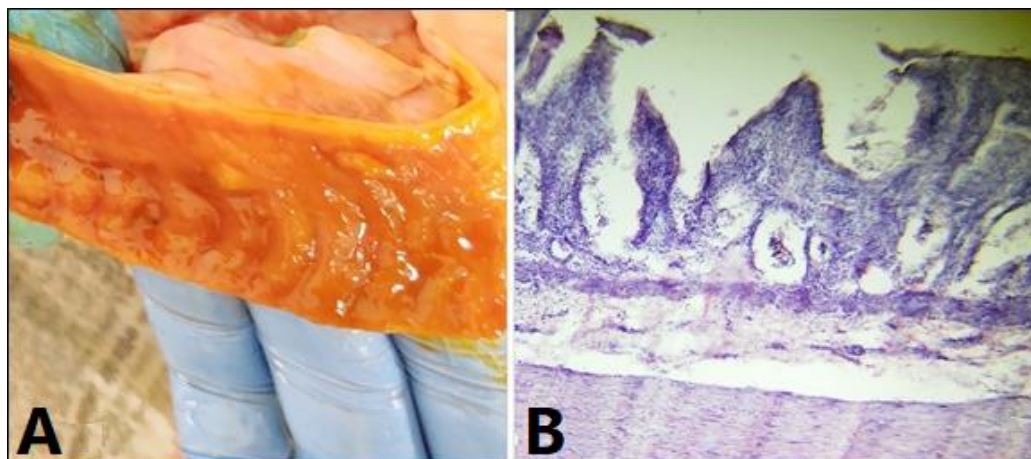


Figure 2 (A) Necropsy - Presence of thickened mucosa and enteritis.

Figure 2 (B) Histopathology-Presence of desquamation of microvilli and congested blood vessels (400X HE).

Conclusion

Toxocara canis, a gastrointestinal roundworm found in dogs worldwide, poses significant concerns regarding its potential transmission to humans. It is frequently encountered within the canine population, especially in unclean environments with irregular deworming practices. A three-month-old mixed-breed dog was brought to the veterinary clinic due to an eight-day history of loss of appetite and persistent vomiting that did not respond to treatment. Clinical observations included pale mucous membranes, prolonged capillary refill time, and sunken eyes. Examination of a fecal smear revealed non-developed eggs of *Toxocara* species. Unfortunately, during the clinical examination, the dog passed away, prompting a necropsy that revealed congested and thickened intestinal mucosa. Histopathological analysis showed infiltration of mononuclear cells in the intestinal lining.

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