

Severe strongyloidosis in a young Boxer

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Abstract:

An 8-month old female entire Boxer dog was presented with chronic diarrhoea and emaciation. Our investigations revealed marked non-regenerative anaemia, panhypoproteinaemia and ascites. Faecal analysis identified larvae and strongyle type eggs suspected to be due to *Strongyloides stercoralis* infection. The analysis of the ascitic fluid revealed migrating larvae within a transudate fluid consistent with disseminated strongyloidosis. The dog was also diagnosed with an abscessation of one peripheral lymph node and demodicosis, suspected to be due to the immunosuppression associated with the strongyloidosis. The dog required intensive hospitalisation for over two weeks but responded well to treatment with ivermectin and made a complete recovery.

Introduction:

Strongyloides stercoralis is the causative agent of strongyloidosis in a range of vertebrate hosts including dogs, most commonly reported in tropical and subtropical areas of the world (Ferreira-Júnior, *et al.*, 2006, Gonçalves, *et al.*, 2007). The prevalence of this infection in the UK is rarely researched but has been reported as 1.75% in Northwest England (Wright, *et al.*, 2016). Infections are often considered to be asymptomatic and mainly involve dogs in large breeding establishments with poor hygiene (Dillard *et al.*, 2007). Nevertheless, autoinfection can be part of the worm's lifecycle allowing the development of a hyperinfection (Schad *et al.*, 1984) that can be fatal (Bourguin *et al.*, 2018). We report an uncommon case of severe, disseminated strongyloidosis in a private-owned dog.

Case history:

An 8-month old female entire Boxer dog was presented with chronic mixed pattern diarrhoea and weight loss. The dog was initially fed raw food but had been transitioned to a balanced commercial diet for over 4 months. Previous faecal culture and parasitology had identified *Salmonella* spp and *Cystoisospora* spp respectively. There was no clinical response to fenbendazole, amoxicillin/clavulanic acid, enrofloxacin and metronidazole treatment trials. One of the littermates was known to have been euthanized due to progressive similar clinical signs and numerous small nematodes were found within the mucosa and lumen of the intestinal tract on *post-mortem* examination.

Physical examination

- Body condition score 1/9.
- Marked skin tent, pale mucous membranes, cold extremities, poor peripheral pulses.
- Peripheral lymphadenopathy.
- Multi focal areas of alopecia and comedones over trunk and face and crusting alopecic areas over dorsal metatarsi and tuber ischii.

Picture 1: The dog appeared emaciated with multifocal skin lesions on presentation



Further investigations:

Test	Result
Basal cortisol	Within reference range
Vitamin B12 and folate	Normal
TLI	High
Bile acid stimulation test	Normal
Urine protein: creatinine ratio	Mild proteinuria at 1 (reference interval <0.5)
Iron panel	Consistent with iron deficiency
Faecal culture and parasitology	Strongyle type eggs and living larvae worms that were strongly suspected to be <i>Strongyloides stercoralis</i>
Abdominal fluid analysis	Transudate with two larvae identified on cytology
Cytology popliteal lymph node	Septic inflammation, <i>E.coli</i> isolated in culture
Skin scrapes	<i>Demodex canis</i> identified
Thoracic radiographs	Unremarkable
Abdominal ultrasound	Diffusely hyperechoic small intestinal mucosa

Picture 2: *Strongyloides* spp. larva isolated in faeces



Diagnosis and treatment:

- Fluid resuscitation
- Packed red blood cell transfusion due to deteriorating anaemia and cardiovascularly unstable status
- Ivermectin (0.2mg/kg subcutaneously, 2 doses 14 days apart) for the treatment of strongyloidosis
- Amoxicillin/clavulanic acid (Clavaseptin; Vetoquinol) 20mg/kg orally three times a day following diagnosis of the popliteal lymph node abscessation
- Fluralaner orally for demodicosis
- Intensive care and physiotherapy to manage the severe emaciation and muscle wastage
- Probiotic supplementation (Pro-kolin Enterogenic; Protexin) and highly digestible commercial diet

Picture 3: The dog recovered completely within 8 weeks and it was still healthy on follow-up 6 months later



Initial investigations:

Parameter	Result		Reference Interval
Haematocrit	19.9	LOW	37.1-57
Platelets	1249	HIGH	143-400 x 10 ⁹ /L
Urea	12.2	HIGH	2-7 mmol
Albumin	18.4	LOW	32-38 g/L
Globulin	15.5	LOW	20-35 g/L
Alanine aminotransferase	261	HIGH	20-60 U/L

Discussions and conclusions:

We report an uncommon case of disseminated strongyloidosis presented with severe clinical signs that would likely have been fatal without intensive care and ivermectin treatment. The dog was diagnosed in the basis of larvae identified in the ascitic fluid and faecal parasitology, alongside the compatible history of a littermate dying due to strongyloidosis. Although given the signalment and affected littermate, impaired immunity may have had a part to play in the disseminated infections observed, the dog made a complete recovery following treatment with ivermectin with no further illness reported on follow-up 6 months later. Furthermore, the dog did not clinically respond to conventional treatment with fenbendazole. Anthelmintic treatment with fenbendazole can be effective against strongyloidosis (Itoh *et al.*, 2009) but resistance to fenbendazole has been reported (Eydal & Skírnisson, 2016) and ivermectin is being recommended historically (Mansfield & Schad, 1992; Paradies *et al.*, 2019) although not licensed for this use. In conclusion, strongyloidosis should be considered in young dogs with chronic gastro-intestinal signs unresponsive to conventional treatments.

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