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Case Report

**Gnathostomiasis in a Dog in Lusaka
Zambia**

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Abstract

A 6-month-old male mongrel dog was presented with clinical signs of vomiting, anorexia, weakness and chronic weight loss. At necropsy, an ulcerated granuloma containing numerous nematodes was found in the fundus of the stomach. Several worms were also noted in the gastric lumen. Histologically, there was a granulomatous gastritis with intralesional nematodes characteristic of *Gnathostoma spinigerum*. This is the first report of gnathostomiasis in a dog in Zambia.

Keywords: *Gnathostoma spinigerum*, dog, Zambia.

Introduction

Gnathostoma spinigerum is a nematode parasite mostly found in the stomach wall of canine and feline definitive hosts (Soulsby, 1982). When eggs passed in feces reach fresh water, first -stage larvae are released which are ingested by small copepods (first intermediate hosts) and develop to second- stage larvae. When the infected copepods are ingested by paratenic hosts like fishes, amphibians, and birds, the larvae develop further to become third-stage larvae which infect the definitive hosts. Third-stage larvae migrate further into the definitive host tissue and finally develop into adults in the stomach wall to complete their life cycle, thereby inciting a localized/focal granulomatous gastritis.

Gnathostomiasis is an emerging food borne zoonotic parasitic disease endemic to Southeast Asia including Thailand, Vietnam, Philippines, Malaysia, Myanmar, Bangladesh, Cambodia, Laos and Indonesia and has been widely documented in Japan, China and Mexico [De Gorgolas *et al.*, 2003]. Outside the endemic areas, gnathostomiasis has recently been reported in Zambia, Tanzania and Botswana, often in tourists who had consumed raw marinated or undercooked fresh water fish (Hale *et al.*, 2003; Herman *et al.*, 2009; McCarthy and Moore, 2000)

Gnathostoma spp was first reported in the stomach wall of a tiger from a London Zoo in 1836 (Herman and Chiodin, 2009). In domestic cats and dogs, reports of gnathostomiasis are few. Based on a coprologic survey, Arafa *et al* (1978) reported a prevalence of 0.7% in cats in Cairo, Egypt. Case reports for

gnathostomiasis in a cat from the USA and 3 cats from Australia have also been documented. (Kirkpatrick *et al.*, 1987; Trueman and Ferris, 1977). The parasite has extensively been reported in dogs, cats and humans in Thailand (Rojekittikhun, 2002). Reported is a case of gnathostomiasis in a dog from a tropical southern African country of Zambia.

Case Report

A 6 month- old male mongrel dog was presented to the Small Animal Clinic at the School of Veterinary Medicine, University of Zambia with a history of anorexia, vomiting, weakness and chronic weight loss. The usual diet of the dog included kitchen scraps and occasionally fish. As the dog died due to a combination of anemia and gastritis, necropsy was performed. The dog was

emaciated and there was generalized pallor. Gross lesions seen in the gastric fundus consisted of an ulcerated, 3cm, diameter granuloma containing numerous nematodes. Several worms were also noted in the lumen of the stomach.

Tissues from the stomach were fixed in 10% formalin, embedded in paraffin, sectioned and stained with hematoxylin and eosin. Histopathology revealed granulomatous gastritis characterized by the infiltration of moderate numbers of macrophages and lymphocytes, few eosinophils and a thick band of fibrous connective tissue around the granuloma which were restricted to the tunica muscularis of the stomach. Parasitological evaluation revealed that nematodes were 1-2cm long with a head bulb and cuticle spines. Histologically, these parasites had nematode characteristics, including the presence of a body cavity, thin outer

wall, cuticle spines, coelomyarian muscles with lateral cords, prominent cuticle ornamentations in form of spines, intestine and gonad. (Fig.1)

Please see Figure 1 in the PDF version

Discussion

This report is the first in a definitive host from Zambia. Since the diet of this dog included fish, it is likely that the dog contracted this parasitosis during one of the feeding episodes; most probably raw or undercooked fish. In Zambia, the host range of infestation by *G spinigerum* is not known. A recent coprological survey in dogs in Lusaka did not reveal any prevalence of this parasite, indicating that the parasite is rare (Bwalya *et al.*, 2011).

However, this parasite is present in Zambia and people should be warned about dangers of consuming raw or undercooked fresh water fish. In addition, dog owners should be encouraged to regularly deworm their pets using fenbendazole and ivermectin (Bowman, 1999). Further research to investigate the prevalence of *G. spinigerum* larvae in fresh water fish in Zambia is recommended.

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