

Incidental Finding of *Capillaria hepatica* in a Raccoon Dog (*Nyctereutes procyonoides*)

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Abstract. *Capillaria hepatica*, a primary trichuroid nematode parasite in rodents, has been reported in wide range of secondary hosts including humans. We report a rare case of Capillariasis in a 4-year old raccoon dog (*Nyctereutes procyonoides*) submitted to the Veterinary Diagnostic Laboratory, Chonbuk National University, for necropsy on July 5, 1996. Grossly, the thoracic cavity contained approximately 200 mls of blood-tinged exudate. Edematous lesion was present around aorta and vena cava. Liver was slightly swollen and mottled, and contained multifocal yellowish-white lesions ranging from 1 to 3 mm in diameter. Histologically, liver lesions were localized around central veins and were characterized by cell swelling and necrosis with mixed inflammatory cells surrounding parasite eggs. These eggs were barrel-shaped with polar caps consistent with *Capillaria hepatica*.

Key words: *Capillaria hepatica*; capillariasis; liver; raccoon dog.

Capillaria hepatica is a nematode parasite of the super family Trichuroidea. Although it has most common in rats, it has been reported in numerous mammalian hosts.^{2,5} It is rarely found in human and less than 30 cases have been reported in the literature. Fatal cases have been recorded in children. The first human case of Capillariasis in Korea occurred in 1993 in Chungju.¹ This report describes the pathological features of a natural infection of *C. hepatica* in a raccoon dog.

A 4-year old raccoon dog was submitted to Veterinary Diagnostic Laboratory, Chonbuk National University on July 5, 1996. The dog has no previous history of illness other than lethargy shortly before death. A complete necropsy was performed and major gross abnormalities included edematous lesion around the aorta and vena cava with accompanying large amounts of blood-tinged thoracic fluid. Urinary bladder was filled with urine. Liver was swollen and mottled contained slightly raised 1 to 3 mm diameter yellowish-white lesions in the lateral lobes. On cut surface these lesions extended into the underlying parenchyma.

Microscopically, a moderate centrilobular necrosis with a few inflammatory cell infiltrate was present around numerous barrel-shaped eggs with bipolar caps (Fig. 1). These parasitic eggs were surrounded by two shell components. The inner shell was thin while the outer shell was bordered by radially arranged pillars (Fig. 2). Areas

of necrosis with mixed inflammatory cell activity were associated with degenerating adult parasites (Fig. 3). Other incidental findings included moderate diffuse tubular nephrosis, pulmonary congestion, eosinophilic infiltration in lamina propria of small intestine and lymphoid necrosis in the Peyer's patches.

Gross and microscopic finding in the liver were consistent with natural infection with *C. hepatica*.^{1,5}

Detection of hepatic capillariasis is difficult due to their complex life cycle.⁴ The gravid female lays eggs in the liver parenchyma, where the eggs remain dormant without undergoing further development. These eggs can reach soil after decay of infected carcass or after they are eaten by predators which then pass undigested eggs through the feces. The eggs then develop to infective stage under appropriate conditions. Infection occurs when a mammalian host ingests contaminated water or food. Children are highly susceptible to infection due to their play habits and frequent contact with soil. Following ingestion, the eggs hatch in the intestine and larvae penetrate the mucosa and migrate to the livers via portal vein.

Cannibalism among rats serves as a primary egg-releasing mechanism and is a source of infection in colony burrows.³ In addition, insects and soil invertebrates such as fly and ground beetle have a minor role in egg dissemination. Surveys on the presence of parasite in *Rattus norvegicus* in Korea revealed that 36% and 88% of

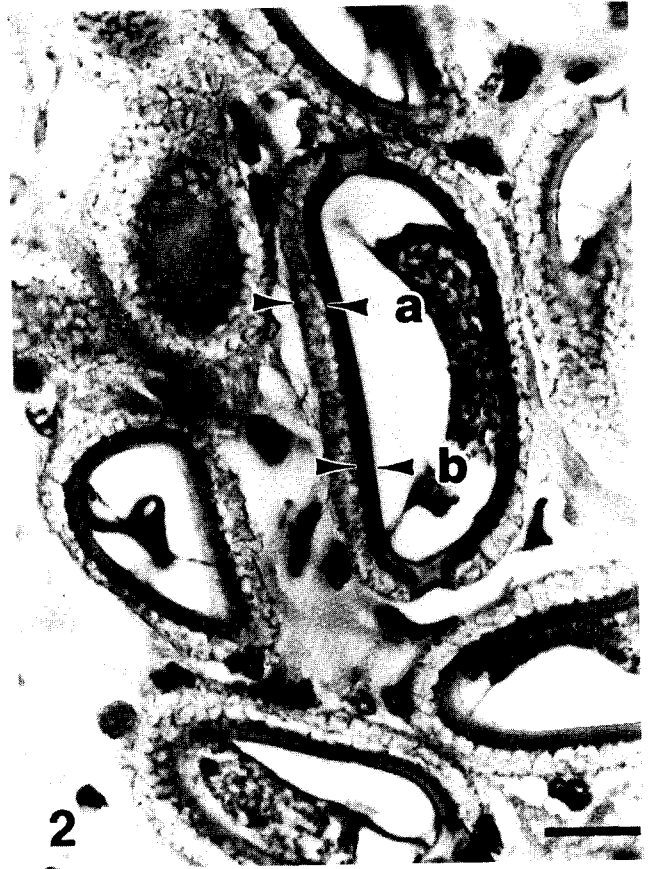
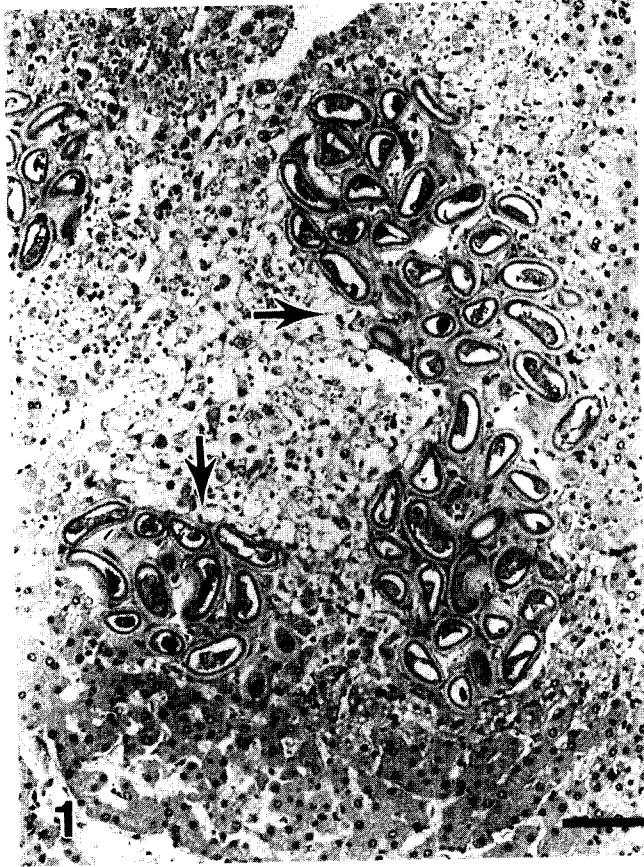


Fig. 1. Liver; Raccoon dog. Note numnerous barrel-shaped eggs of *Capillaria hepatica*(arrows) and the moderate central lobular necrosis with only a few inflammatory cell infiltration. HE. Bar= $80\mu\text{m}$

Fig. 2. Liver; Raccoon dog. An egg of *Capillaria hepatica* in the liver. Note the double shells with radiating striations in the outer shell with concave bipolar caps. a = outer shell; b = inner shell. HE. Bar= $20\mu\text{m}$.

Fig. 3. Liver; Raccoon dog. Note intensive focal necrotic areas with inflammatory cells around fragments of degenerated adult worm (arrow). HE. Bar= $80\mu\text{m}$.

rats in Seoul were infected in 1936 and 1964 surveys respectively, while 38.1% in Kyungki and 25.9% in Chunchon were infected in 1979 and 1936 studies respectively. In view of the high *C. hepatica* infection in rats in Korea together with the rare incident of human capillariasis, Choe et al postulated that human infection may be subclinical and generally nonfatal.¹ Infected carrier rats pose a public health hazard and eradication of these pests should be considered.

References

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