



Case Report

Platynosomum fastosum Infestation in a Domestic Cat in Korea

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Cat liver fluke (*Platynosomum fastosum*) was identified upon necropsy of a *Felis catus* (domestic cat). This trematode has not been reported in domestic cats previously in Korea. Diagnosis of this fluke was made by the presence of eggs in the feces of the cat through the fecal sedimentation method. Flukes in the gallbladder, bile duct, and liver parenchyma were revealed by the necropsy findings. This report describes as the first case of a domestic cat with *Platynosomum fastosum* in Korea.

Key words: *Platynosomum fastosum*, cat, liver fluke

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Liver flukes (*Platynosomum fastosum*) belong to the Class Trematoda (Subclass Digenea, Family Dicrocoeliidae) and cause extrahepatic biliary duct obstruction in cats (Bunch, 2003; Cullen, 2007). *Platynosomum fastosum* can infest orangutans (Warren et al., 1998). Intermediate hosts of this fluke are land snails, crustaceans (woodlouse), and lizards (Flynn, 1973; Willard et al., 2005). *Platynosomum fastosum* is known as "Lizard poisoning" (Flynn, 1973; Urquhart et al., 1996). Cockroaches can be an intermediate host because of the fluke's presence in the stomach of some infected cats (Retnasabapathy et al., 1971).

A tentative diagnosis can be made by complete blood counts (eosinophilia), serum biochemical profiles (high serum alanine transaminase and aspartate transaminase activities and hyperbilirubinemia), abdominal ultrasound, and verification of eggs through fecal sedimentation examination (Willard et al., 2005; Haney et al., 2006; Xavier et al., 2007).

Daily subcutaneous administration for 3 days of praziquantel (20 mg/kg) and nitroscanate are effective treatments of liver flukes (Urquhart et al., 1996; Willard et al., 2005). However, severely infested cats are usually euthanized because of complications (Haney et al., 2006; Xavier et al., 2007). The prognosis for severe obstruction of the bile duct is guarded

(Willard et al., 2005; Xavier et al., 2007). Control of the liver flukes might depend upon eradication of the intermediate hosts (Flynn, 1973). *Platynosomum fastosum* is not a zoonosis. There is no immediate concern for the public health (Flynn, 1973).

A domestic cat, purchased at Moran Market, Seongnam, Korea, was brought into the Department of Experimental Animal Research, Clinical Research Institute, in Seoul National University Hospital. It underwent three days of anorexia but did not show any peculiar outward appearances. It was found dead following 4-day vomiting and diarrhea. From necropsy findings, there were brown sediments in the subcutaneous area. The gallbladder and bile duct were distended. Three reddish sediments were found in the gallbladder, and three liver flukes were found upon dissection of the gallbladder and one from the liver parenchyma (Figure 1). There were many adult *Toxocara cati* in the stomach and small intestine. From the laboratory findings, the shape of the adult flukes were lanceolate shape and measured 9 mm by 2.5 mm. *Toxocara cati* eggs were found in the feces. The eggs of the liver flukes were detected in the gallbladder and from the fecal sedimentation analysis. The eggs of the liver flukes were oval, thick-shelled with operculum, and measured 40×30 µm (Figures 2 and 3). Thus, the flukes were diagnosed as *Platynosomom fastosum*.

Histological findings included hyperplasia of the biliary epithelium (Figure 4) and the presence of fluke eggs in the biliary ducts and portal vein (Figure 5), fibrosis of the duct wall, and cellular infiltration of the lamina propria (Figure

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Figure 1. Adult *Platynosomum fastosum* observed in the gallbladder and bile duct upon dissecting the liver parenchyma.



Figure 2. An egg of *Platynosomum fastosum* found in the bile juice.



Figure 3. A egg of *Platynosomum fastosum* found in the feces.

6). Confirmatory diagnosis was made through the presence of eggs in the feces or flukes in the gallbladder or bile duct during necropsy or from histological findings.

Liver flukes usually reside within the bile ducts and gallbladder (Bunch, 2003; Willard *et al.*, 2005). In this case, an egg of liver fluke was detected incidentally in the histopathological findings of the portal vein in the domestic cat.

Liver fluke infestations in cats generally are asymptomatic

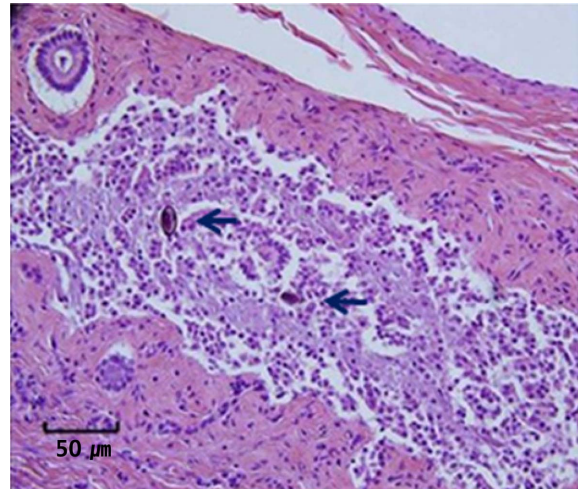


Figure 4. Hyperplasia of biliary epithelium and eggs (arrows) of *Platynosomum fastosum* in the biliary duct (H & E stain).

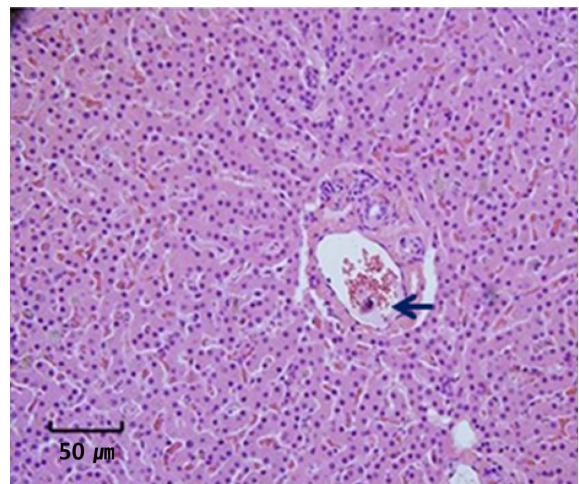


Figure 5. An egg (arrow) of *Platynosomum fastosum* in the portal vein (H & E stain).

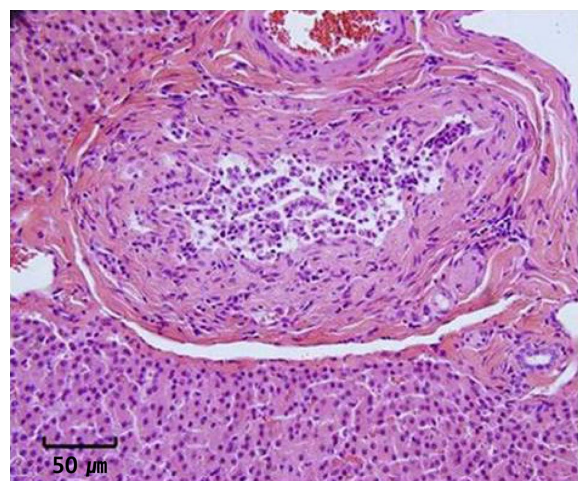


Figure 6. Cellular infiltration of the lamina propria and fibrosis of the duct wall (H & E stain).

or cause fibrosis, obstruction, cholecystitis, vomiting, lethargy, inappetence, anorexia, jaundice, cirrhosis, diarrhea, and death (Flynn, 1973; Urquhart *et al.*, 1996; Willard *et al.*, 2005; Haney *et al.*, 2006; Xavier *et al.*, 2007). Among 5 infested cats, 2 cases were asymptomatic and diagnosed incidentally by necropsy findings while the other 3 cats had complications of severely extensive pulmonary carcinoma in Nigeria (Ikede *et al.*, 1971). It is hard to induce death from a single infestation of trematode; a combination of strongyloidesis (*Strongyloides stercoralis*), poor body condition, and reduced immune status all contributes to death (Warren *et al.*, 1998). In this case, vomiting, diarrhea, jaundice, and death were the clinical symptoms, and death was thought to be a result of co-infection with *Platynosomum fastosum* and *Toxocara cati*, in addition to stress induced by capture.

The liver and gallbladder were cut into 1 cm slices, and the sliced liver parenchyma was compressed to expel flukes (Rodriguez-Vivas *et al.*, 2004). In this case, the liver fluke was observed by the naked eye when the liver was cut. After necropsy, anything above 125 flukes per cat is classified as a high fluke burden, while less than 125 flukes per cat is considered a low fluke burden (Rodriguez-Vivas *et al.*, 2004). Although the number of flukes was not counted one by one in this experiment, the host was assumed to have a low fluke burden in spite of the cat's death.

Fecal sedimentation is a good choice to detect eggs from liver flukes (Willard *et al.*, 2005). Formalin-ether sedimentation technique is highly available to detect eggs (Bunch, 2003). *Platynosomum fastosum* is a flatworm with adult trematodes ranging from 4 to 8 mm long and 1.2 to 2.5 mm wide (Flynn, 1973). Eggs range 34-50×20-35 µm in size (Flynn, 1973). In this case, the eggs of the liver fluke were oval, thick-shelled with operculum, and measured 40 µm by 30 µm in size.

The most common histopathological findings were hyperplasia of the biliary duct epithelium, periductal inflammation consisting of eosinophils, lymphocytes, plasma cells, neutrophils and macrophages, and fibrosis. These symptoms may lead to obstructive disorders or terminal liver disease (Flynn, 1973; Bunch, 2003; Xavier *et al.*, 2007). Also the liver from our necropsy findings showed hyperplasia of the biliary epithelium, cellular infiltration of the lamina propria, and fibrosis of the duct wall with eggs present within the biliary duct and portal vein.

Isolation and identification of *P. fastosum* in coproscopy of a Siberian tiger (*Panthera tigris altaica*) was done in Far Eastern Russia by fecal sedimentation (Gonzalez *et al.*, 2007). Likewise, the distribution of *P. fastosum* in Korea can be obtained by coprological examinations of wild cats, and this is thought to be a necessary process.

Platynosomum fastosum is a fluke principally found in animals from Florida, Hawaii, the Caribbean, and Malaysia (Warren *et al.*, 1998; Willard *et al.*, 2005). This fluke is seldom diagnosed (Willard *et al.*, 2005). It is the first report of *Platynosomum fastosum* in a domestic cat in Korea.

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