



CASE REPORT

Extrahepatic Biliary Tract Obstruction due to Foreign Body in a Dog

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ABSTRACT

This case report describes a dog with extrahepatic biliary tract obstruction (EHBO) due to foreign body. An 11-year-old spayed female mongrel dog was referred with the complaint of vomiting and lethargy. On physical examination, mucous membranes and skin were yellowish, and abdomen was mildly distended. On ultrasonography, inspissated bile in gall bladder (GB) and distended bile duct were imaged. Because the patient had no response to the medical treatment, the biliary tract was flushed and hair-like material was drawn out through duodenotomy. The dog recovered within 2 weeks without any complication. In conclusion, it suggested that veterinary clinician should consider a foreign body as the cause of EHBO in dogs.

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INTRODUCTION

Extrahepatic biliary tract consists of hepatic ducts, gallbladder (GB), cystic duct and common bile duct. Extrahepatic biliary tract obstruction (EHBO) occurs most commonly due to neoplasia and inflammation; other causes include cholelithiasis, parasites, GB mucocele and diaphragmatic hernia (Fahie and Martin, 1995).

Clinical signs of EHBO include icterus, anorexia, vomiting, dehydration, lethargy, weight loss, polyuria/polydipsia, abdominal pain, distension of abdomen and hyperthermia (Fahie and Martin, 1995), and various complications such as cholecystitis can also occur. Therefore, early diagnosis and proper surgical treatment is suggested to alleviate clinical symptoms. Perioperative morbidity and mortality are typically high, especially in cases with sepsis (Mehler *et al.*, 2004).

In humans, foreign bodies are rarely found in biliary tract, and the most common sites are common bile duct and GB, however, other parts of biliary tract can also be involved. A foreign body can persistently lead to various problems, therefore, rapid decision for surgical treatment are required (Kaji *et al.*, 2004).

In our best knowledge, there was no case report of extrahepatic biliary tract obstruction due to foreign body in dogs. This case presentation describes a dog with the hair-coat as foreign body in extrahepatic biliary tract.

Case history and clinical findings: An 11-year-old spayed female mongrel dog, weighing 21 kg, was referred

to the hospital with the complaint of vomiting and lethargy. The dog had been suffering from abdominal pain and anorexia for the last four days. Vomiting and diarrhea were seen for the last two days. The dog was in a depressed state at the time of hospitalization.

On physical examination, mucous membranes and skin were yellowish, and abdomen was mildly distended. Complete blood count revealed anemia (26.9% hematocrit). Blood analysis showed that aspartate aminotransferase (102 U/L; reference range, 17 to 44U/L), alkaline phosphatase (ALP, >3500 U/L; reference range, 69 to 333U/L), gamma-glutamyl-transferase (GGT, 63U/L; reference range, 5 to 14U/L), bilirubin (3.7 mg/dL; reference range, 0.1 to 0.5mg/dL) and lipase (>1000U/L; reference range, 20 to 160U/L) were increased, while albumin (2.4g/dL; reference range, 2.6 to 4.0g/dL) was decreased.

On radiography, mild hepatomegaly was observed but no other specific findings were detected. On ultrasonography, the wall of GB had normal thickness (1.4 mm; normal range, < 3 mm) and shape (Fig. 1), and bile duct was distended with approximately 8.9 mm in diameter (Fig. 2). The medical management was tried using ursodeoxycholic acid (5mg/kg, BID, PO, Daewoong Pharma Co., Korea) and imipenem (5mg/kg, TID, IM, Choongwae Pharma Co., Korea). However, patient's condition continuously deteriorated in spite of the three days medical therapy.

Accumulation of hyper-echoic material in GB was visualized on ultrasonography, and the sludge and

inflammatory changes of GB were more severe than those seen in the previous image (Fig. 3). Although acholic feces were not observed, the absence of urobilinogen was detected on urinalysis, suggesting the occurrence of complete obstruction in biliary tract. Therefore, surgical treatment was considered.

During laparotomy, an enlarged GB and distended common bile duct, with yellowish ascitic fluid and mild peritonitis were observed. Duodenotomy revealed the absence of any obstruction in the major duodenal papilla. Then, the biliary tract was flushed several times with warm normal saline and hair-like material was drawn during flushing. After identifying the patency of common bile duct, incised site on duodenum was sutured and abdomen was closed routinely. Antibiotics and analgesics were given postoperatively.

DISCUSSION

In humans, it has been reported that foreign bodies obstructing biliary tract were suture material, thread ball, stent and woody fiber. The most common type of foreign body was residual material from previous surgery, and other types such as penetrating objects and ingested substances. However, the mechanism of the foreign body's migration has not precisely been understood (Kaji *et al.*, 2004; Kim *et al.*, 2004; Dias and Dharmaratne, 2012).

The biliary tract foreign body acts as nidus (Kim *et al.*, 2004). For self-protection, the animal body reacts to a foreign body by coating with proteins like fibronectin, fibrin and collagen. However, the coating could facilitate the adhesion of bacteria to the surface of foreign body paradoxically. Furthermore, phagocytic and bactericidal capacity of polymorphonuclear leukocytes could be reduced by contacting the foreign body. Because foreign bodies could induce persistent or periodic infection of biliary tract, the causative material should be removed (Sung *et al.*, 1991).

There are various surgical procedures for biliary system including cholecystotomy, cholecystectomy, choledochotomy and cholecystoduodenostomy. Although cholecystectomy is typically performed and is associated with good prognosis in dogs (Amsellem *et al.*, 2006), abdominal discomfort, episodic abdominal pain, fat intolerance, constipation and diarrhea were frequently reported in humans (Al-Rawi and Lewis, 1998). The duodenotomy for common bile duct lavage was performed in our case, because GB showed mild inflammatory changes, and this lavage procedure has shown good prognosis in feline EHBO with foreign body (Brioschi *et al.*, 2014).

In our case, increased ALP, GGT, bilirubin and cholesterol could be interpreted as cholestasis. It is well known that sepsis is deeply correlated with cholestasis (Chand and Sanyal, 2007). However, bacterial infection could not be identified because bacterial culture of ascites or bile was not performed in our case. According to a previous study, EHBO with sepsis and pancreatitis tends to result in poor prognosis (Amsellem *et al.*, 2006). In this case, increased level of lipase, which might mean concurrent pancreatitis, gradually recovered to normal range during postoperative period.

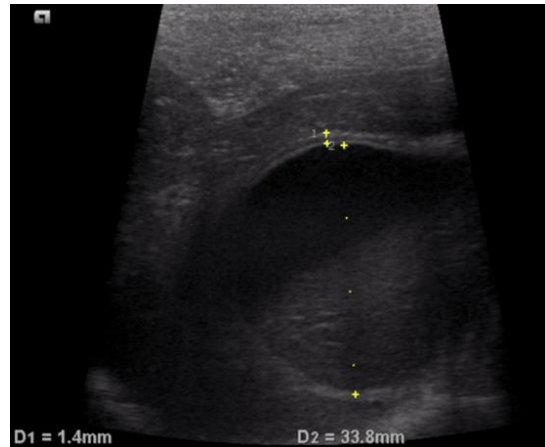


Fig. 1: Ultrasonograph of gall bladder of the dog. D1: thickness of gall bladder wall, D2: diameter of gall bladder).

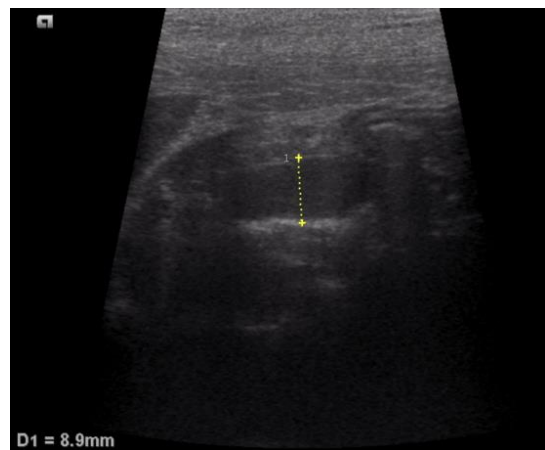


Fig. 2: Ultrasonograph of the dog (D1: diameter of common bile duct). Dilated common bile duct is visible.



Fig. 3: Ultrasonograph of gall bladder of the dog. Accumulation of hyper-echoic material in GB is visualized, showing more severity than previous ultrasonography (Fig. 1).

There are two possibilities of foreign body obstruction in this case. Firstly, when flushing tube was put into bile duct, foreign body located in common bile duct was pushed toward GB. Secondly, the foreign body in the neck of GB induced inflammatory change, which extended to common bile duct. The ultrasonographic findings indicated that common bile duct distension occurred before accumulations of hyper-echoic material in

GB, and it implies that the former possibility seems to be more reliable.

In our case, swallowed coat hair was the cause of EHBO. Similarly, in cats, it was reported that the EHBO could occur by hair (Linton *et al.*, 2015). The dog recovered to healthy state within 2 weeks, and no complications were identified during 1.5 year of follow-up.

In our best knowledge, EHBO due to foreign body in dogs has not been reported. Based on our report, foreign body should be considered as one of the factors causing EHBO in dogs.

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