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CANINE BILIARY TRACT DISEASES
HOW TO REVEAL AND TREAT THEM
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Introduction

In dogs, primary biliary tract diseases have been recently recognized as more commonly occurring than previously thought. However, they have been rarely reported. Pathologic findings described include gallbladder mucocele, cholelithiasis or choledocholithiasis, cholecystitis with or without gallbladder perforation, neoplasia, parasitic gallbladder diseases, extrahepatic biliary tract rupture, gallbladder aplasia, and extrahepatic biliary atresia. The diseases were mostly diagnosed in the advanced stage and confirmed by surgery or necropsy. To date, diagnosing these diseases at an earlier stage or identifying less obvious biliary disturbances causing malfunction of bile excretion has been difficult (1, 2).

In humans, benign or malignant papillary stenosis is a well-described finding and can be diagnosed by endoscopic retrograde cholangiography (ERC). In dogs, however, stenosis of the major papilla has been reported in association with a ganglioneuroma of Vater’s papilla in one dog (3). ERC based diagnosis and treatment of benign papillary stricture has been reported in another dog (2). In contrast to total extrahepatic biliary obstruction, there is currently only little knowledge about the prevalence, diagnosis and treatment of partial biliary obstruction which might occur more often than previously thought (2, 4).

The abstract shall give a short overview about possibilities to diagnose and treat biliary tract diseases with total or partial extrahepatic biliary obstruction and patency of the bile duct system.

Diseases with complete extrahepatic biliary obstruction (EHBO)

In dogs, the most common reasons for obstructive biliary tract diseases are pancreatic diseases. Other, less frequent causes are gallbladder mucocele or bile inspissation, neoplasia of intestine, biliary tract and liver, diaphragmatic hernia, and rarely biliary stones. In cats, tumors or inflammatory diseases of the intestine and/or pancreas are main and liver flukes minor reasons (1, 4).

Main clinical signs supporting the suspicion of biliary tract diseases, regardless of their cause, are jaundice, vomiting, abdominal pain, and ascites. With total common bile duct obstruction, patients can have pale, achylous feces. Depending of the development of complications such as gallbladder...
rupture with leakage of sterile or septic bile the patients can show more severe signs such as fever, acute abdomen, and septic shock.

Laboratory test results that support the clinical suspicion are increased serum alkaline phosphatase, hyperbilirubinemia without evidence of hemolytic anemia, hypercholesterolemia, and increased serum alanin aminotransferase when the hepatic parenchyma is involved in the disease process. In case of cholecystic inflammation complete blood cell count shows inconsistently abnormalities. Bilirubinuria occurs before hyperbilirubinemia (1).

Imaging technique of choice is abdominal ultrasound because radiography has been proven to be too insensitive for the diagnosis of biliary diseases. Ultrasound enables to differentiate between hepatic and posthepatic icterus in most cases. It can help in many cases to differentiate medical diseases such as hepatopathy with intrahepatic cholestasis from surgical diseases. Ultrasound reveals most causes of extrahepatic biliary obstructions such as pancreatitis, neoplasia, stones, and gallbladder mucocele. In case of equivocal findings repetition of the sonographic examination is recommended in order to assess the dynamic of a probably obstructive process. So it is known that the gallbladder extends and loses its pear shape 24 hours after experimental ligation of the common bile duct. The common bile duct dilates within 48 hours and the other extrahepatic ducts within 72 hours. Dilated intrahepatic bile ducts can be seen after 1 week (1). However, in many cases the clinical condition of the patient does not allow to wait for several days and the final diagnosis may be performed by laparoscopy or laparotomy. On the other hand, it has been reported that dilation of the common bile duct in absence of obstruction can occur during imaging in older animals or patients with previous biliary disease (1, 2). Main indications for surgical diagnostic (and therapeutic) approach are biliary peritonitis, stones, neoplasia, and other mass lesions.

Once diagnosed, the treatment of EHBO depends on the underlying disease. In case of extraductal common bile duct obstruction due to pancreatitis the treatment of the causative disease may resolve the problem. In severe cases a surgical approach is recommended. Cholecystectomy is the treatment of choice in cases of cholelithiasis, and mucocele. Choledochotomy should be avoided (1). The surgical success of neoplastic processes depends on the tumor stage. Due to the high percentage of severe complications caused by special surgical procedures such as cholecystojejunostomy, choledochal stent placement with or without cholecystectomy seems to be a reasonable surgical alternative (5). Current attempt to establish ERC as a diagnostic and therapeutic toll into Veterinary medicine might offer the chance for endoscopic, minimal invasive treatment of extrahepatic biliary obstruction as it has already been possible for humans (2, 6, 7).

**Diseases with partial extrahepatic biliary obstruction**

Recently, first reports support the idea that dogs and cats can also suffer from partial obstruction (2, 4). The clinical and laboratory signs can be similar to total obstruction or the patients just show chronic recurrent abdominal

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discomfort combined with vomiting and/or diarrhea but no sign of cholestasis. Ultrasound can not reveal partial obstruction per se. But dynamic imaging techniques such as ultrasound controlled gallbladder contraction (8), ERC combined with ceruletide induced gallbladder contraction (2) and hepatobiliary scintigraphy (4).

Possible reasons for partial EHBO can be benign or malignant papillary stenosis, strictures, bile inspissation and extraductal compression.

Treatment can be medical by application of ursodesoxycholic acid to improve bile flow, minimal invasive with ERC guided spincterotomy or surgical if indicated (2, 4).

**Diseases with patency of the biliary system**

Reported nonobstructive diseases are bacterial, necrotizing and emphysematous cholangitis, cholangiohepatitis, choleliths, parasites of the gallbladder and/or bile ducts, neoplasia of the extrahepatobiliary tract including gallbladder and traumatic induced rupture of extrahepatic bile ducts (1).

Clinical signs and laboratory findings do not differ much from total or partial obstructive processes and the diagnosis is finally made by ultrasound and ultrasound guided aspiration of bile or ascites. For bile aspiration out of the gallbladder it is recommended to use a 22- to 25-gauge needle and to withdraw as much bile as possible in order to prevent bile leakage (1, 9). When free abdominal fluid is sampled, bilirubin and/or bile acids should be determined in fluid and serum. With bile rupture the values of both parameters are higher in the fluid than in serum.

Bacterial incl. emphysematous cystitis is treated with long term antibiotics such as enrofloxacin for gram negative bacteria such as *E. coli* and amoxicillin or metronidazole for anaerobes such as *C. perfringens*. In case of recurrent problems bacterial culture with resistance testing of bile and/or hepatic tissue should be performed. Surgical approach with cholecystectomy is the treatment of choice for necrotizing cholecystitis, choleliths, and ruptured extrahepatoac bile ducts or gallbladder (1).

**References**


