

# Extrahepatic Bile Duct Obstruction

(Blockage of the Extrahepatic or Common Bile Duct)

## Basics

### OVERVIEW

- The liver is the largest gland in the body; it has many functions, including production of bile (a fluid substance involved in the digestion of fats); bile ducts begin within the liver itself as tiny channels to transport bile—the ducts join together to form larger bile ducts and finally enter the extrahepatic or common bile duct, which empties into the upper small intestine; the system of bile ducts is known as the “biliary tree”
- The gallbladder is the storage unit for bile; bile is stored until it is needed for fat digestion
- “Extrahepatic bile duct obstruction” is a blockage of the biliary tree at the level of the extrahepatic or common bile duct or at the level of the liver bile ducts (may involve one, several, or all ducts, depending on the underlying cause) that results in the flow of bile being decreased or stopped (known as “cholestasis”)

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Dogs
- Cats

#### Breed Predispositions

- Pets with increased likelihood of developing inflammation of the pancreas (known as “pancreatitis”)—breeds having high levels of lipids (compounds that contain fats or oils) in their blood (known as “hyperlipidemic breeds”), such as miniature Schnauzers, Shetland sheepdogs; those predisposed to gall bladder mucoceles
- Those breeds with large duct plate malformations (Caroli’s malformation); predisposed to infection and gall bladder stones
- Presence of hard, solid material in the bile duct or gallbladder (known as “cholelithiasis”)—small-breed dogs

#### Mean Age and Range

- Middle-aged to old pets
- Younger animals with ductal plate malformation



## **SIGNS/OBSERVED CHANGES IN THE PET**

- Depend on underlying disorder and how complete the blockage is
- Progressive sluggishness (lethargy)
- Intermittent illness; vague signs
- Yellowish discoloration to the gums and other tissues of the body (known as “jaundice” or “icterus”), progressive
- Pale or grayish coloration to the stools (known as “acholic feces”), due to the lack of bile pigments that cause the normal brown color of bowel movements: indicate complete blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction); if intestinal bleeding, may have some pigment though
- Increased appetite (known as “polyphagia”)—complete blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) causes poor digestion of fats due to lack of bile flow
- Bleeding tendencies within 10 days of complete obstruction of the common bile duct; observed more easily in cats than in dogs
- Weight loss
- Enlarged liver (known as “hepatomegaly”); sometimes small if end-stage (cirrhosis)
- Abdomen discomfort at front end upon palpation
- Orange urine if jaundice severe

## **CAUSES**

- Associated with diverse disorders
- Presence of hard, solid material in the bile duct or gallbladder (cholelithiasis)
- Inflammation of the common bile duct (known as “choledochitis”); the extrahepatic or common bile duct empties into the upper small intestine
- Cancer
- Malformation of bile ducts
- Parasitic infestation (flukes in cats)
- Compression of the bile duct from surrounding tissues (such as lymph nodes, cancer, inflammation of the pancreas [pancreatitis], diaphragmatic hernia, lodged foreign material in the stomach outflow area to the small intestine)
- Scarring of the bile duct (known as “duct fibrosis”), such as secondary to trauma, inflammation of the lining of the abdomen (known as “peritonitis”), inflammation of the pancreas (pancreatitis); major duct involvement in some cats with inflammation of the bile duct or biliary tree (known as “cholangitis”) and inflammation of the bile ducts and liver (known as “cholangiohepatitis”)
- Narrowing of the bile duct, secondary to blunt trauma, surgical manipulations/procedures

## **Treatment**

### **HEALTH CARE**

- Inpatient—surgical treatment of blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) unless the cause is pancreatitis that is responsive to medical therapy
- Fluid therapy—depends on underlying conditions; rehydrate and provide maintenance fluids before general anesthesia and surgery
- Water-soluble vitamins—B complex in intravenous fluids
- Antibiotics—start antibiotics prior to surgery
- Vitamin K1 in certain cases

### **ACTIVITY**

- Dependent on patient status, and if the pet has a blood-clotting disorder secondary to liver disease

### **DIET**

- Maintain nitrogen balance: the veterinarian will avoid protein restricted diets
- Restrict fat—if there is abnormal fat digestion caused by lack of intestinal bile acids (used in normal digestion of

fats)

- Supplement fat-soluble vitamins, especially vitamins E and K

## **SURGERY**

- Surgical exploration—imperative for treating and determining underlying cause
- Surgical treatment of blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction)
- Remove masses; remove gallstones (known as “choleliths”) and thickened bile
- May need to remove the gallbladder in some cases
- May need to produce a new connection between the biliary tree and the small intestines (known as a “biliary-enteric anastomosis” if the bile duct obstruction cannot be resolved or if the pet has scarring inflammation of the pancreas (known as “fibrosing pancreatitis”) or cancer
- Surgical biopsies/samples—the veterinarian will submit tissue and bile samples for bacterial cultures; submit tissues for microscopic examination to determine type of tissue (such as inflammation or cancer); inspect samples for evidence of bacterial infection and presence of parasite (fluke) eggs
- Sclerosing inflammation of the bile duct or biliary tree (cholangitis) in cats (characterized by thickening or hardening of the biliary and/or liver tissues)—clinically may mimic blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) since disease may involve intrahepatic biliary structures (known as “intrahepatic ductopenia”); will not respond to biliary tree decompression; liver biopsy essential for diagnosis

## **Medications**

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Vitamin K<sub>1</sub>—necessary for normal blood clotting; will be administered 12–36 hours before a surgery
- Vitamin K<sub>1</sub> and Vitamin E—administered routinely in pets with long-term (chronic) blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) that cannot be resolved by surgery
- Before surgery broad-spectrum antibiotics for potential biliary infections may be used, as surgical manipulations may lead to spread of bacteria into the blood stream (known as “bacteremia”)
- Antioxidants—vitamin E (tocopherol) orally for chronic obstruction
- S-adenosylmethionine (SAME) orally for chronic obstruction
- Ursodeoxycholic acid—to improve secretion of bile (ensure adequate hydration); should be used after the bile-duct obstruction has been relieved
- Agents that reduce stomach acid and protect the stomach—famotidine (H<sub>2</sub>-blocker) or omeprazole (pump inhibitor) combined with sucralfate, if medications administered by mouth are tolerated; your veterinarian will recommend that you stagger sucralfate administration from other oral medications to avoid drug interactions

## **Follow-Up Care**

### **PATIENT MONITORING**

- Depends on underlying conditions
- Monitor bloodwork (serum chemistry profile, especially total bilirubin values [reflect effectiveness of relief of bile-duct obstruction—should decline to near normal within days] and liver enzymes [decline slowly])
- Complete blood count (CBC)—repeat every 2–3 days initially, if the pet has generalized bacterial infection (known as “sepsis”)
- Inflammation of the lining of the abdomen due to bile leakage (known as “bile peritonitis”)—evaluate body weight and fluid accumulation in the abdomen (such as by feeling the abdomen [known as “palpation”], ultrasound examination [preferred], tapping the abdomen to withdraw accumulated fluid [known as “abdominocentesis”])
- Determine necessity for pancreatic enzyme supplementation based on site of the new connection between the biliary tree and the small intestines (biliary-enteric anastomosis); pancreatic enzymes are digestive enzymes that breakdown dietary proteins, fats, and starches in the intestines

## POSSIBLE COMPLICATIONS

- Inflammation of the lining of the abdomen due to bile leakage (bile peritonitis)
- Repeated narrowing or stricture of the bile duct
- Narrowing or stricture of the new connection between the biliary tree and the small intestines (biliary-enteric anastomosis)
- Severe intestinal bleeding—high blood pressure in the intestinal blood vessels (known as “hypertensive enteric vasculopathy”) with blood-clotting disorder due to vitamin K deficiency
- Bleeding during surgery
- System-wide inflammatory response or showering of bacteria elsewhere via the bloodstream
- Low blood pressure (known as “hypotension”) and slow heart rate (bradycardia)—may occur with biliary tree manipulation during surgery

## EXPECTED COURSE AND PROGNOSIS

- Depend on underlying disease
- Prognosis good if inflammation of the pancreas (pancreatitis) resolves; bile-duct patency may return
- Permanent scarring of the liver tissue surrounding the biliary tree from blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction)
- Sclerosing inflammation of the bile duct or biliary tree (cholangitis) in cats (characterized by thickening or hardening of the biliary and/or liver tissues)—clinically may mimic blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) since disease may involve intrahepatic biliary structures; will not respond to biliary tree decompression; liver biopsy essential for diagnosis

## Key Points

- Surgical treatment to relieve bile duct obstruction is essential; obstruction will lead to progressive damage and scarring of the biliary tree and liver (known as “biliary cirrhosis”) within 6 weeks; exception is inflammation of the pancreas (pancreatitis) causing blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) that may resolve within 2–3 weeks
- Surgical success is based on underlying cause, results of liver biopsy, and specimen cultures