BILIARY TRACT DISORDERS: IMPORTANT BUT TYPICALLY MISSED Michael D Willard, DVM, MS, DACVIM

Cholecystitis

Cholecystitis is much more common than many people realize. Dogs that have evidence of antibiotic responsive hepatobiliary tract disease may have a bacterial cholecystitis. Typically, both the ALT and SAP are increased, and icterus is common. Most dogs with cholecystitis do not have discernable gall stones. Many (maybe most) gall stones found in dogs and cats are clinically insignificant and only serve to confuse veterinarians. Ultrasound findings in dogs with bacterial cholecystitis are non-specific: finding "sludge" in the gall bladder can also occur in clinically normal dogs.

At this time, aspirating bile via ultrasound-guided, percutaneous puncture with a 22-25 gauge needle may be the best diagnostic test we have. You are much more likely to find bacteria in the bile than you are to find them in hepatic parenchyma (this applies for cytology/histopathology as well as culture). Rarely, such percutaneous aspiration techniques will cause a vagal response that will cause extreme bradycardia (this is rare, but it is more likely in cats than in dogs); however, if this happens all that is usually needed is an injection of a parasympatholytic such as glycopyrrolate. If you use ultrasound guidance to insert the needle through the quadrate lobe of the liver (which is adherent to the gall bladder), then there is no risk or concern with leakage of bile into the abdomen. In this case, if bile leaks from the gall bladder, it will simply leak into the liver lobe which is harmless.

Finding WBCs and/or bacteria in the bile seems to be very specific, but we are not really sure how sensitive this test is for cholecystitis. It is important to note that normal dogs and cats can have a very few bacteria in the bile. This is because there is a normal entero-hepatic-biliary circulation of bacteria in bacteria go from the intestines to the liver (probably due to translocation across the intestinal mucosa) where they are excreted into the bile and then ejected with the bile back into the intestinal lumen. Therefore, you need to find more than just one or two bacteria in the bile before you make this diagnosis.

Therapy of infectious cholecystitis usually involves chronic (i.e., > 6-8 weeks) antibiotic therapy. If I can see lots of bacteria but cannot culture the bacteria and obtain a sensitivity assay (which happens surprisingly often), I prefer to use a combination of amoxicillin and enrofloxacin. If that approach is unsuccessful, then cholecystectomy is usually the next step. Do not do a cholecystotomy or an incisional biopsy of gall bladder wall; dehiscence appears to be a major cause of morbidity and mortality after such surgery. Rather, remove the entire gall bladder and submit it for histopathology and microbiology. Be sure that you do not ligate or transect the common bile duct, or you may kill the dogs. Remember that cholecystectomy may be required to cure a patient with cholecystitis.

Emphysematous cholecystitis is classically associated with diabetes mellitus or hyperadrenocorticism, but it probably occurs just as often in non-diabetic animals. This malady is diagnosed radiographically: gas in the wall of the gall bladder or gas within the gall bladder lumen. Both lesions are typically are very obvious on abdominal radiographs, but care must be taken to not off-handedly attribute any gas seen in the cranial abdomen to gastric or intestinal gas. Treatment with antibiotics that are effective against gas-producing anaerobic bacteria (e.g., penicillin, metronidazole, chloramphenicol, or clindamycin) is indicated. If that approach is unsuccessful, then cholecystectomy will be required.

Necrotizing cholecystitis is typically the result of long standing bacterial cholecystitis or mucocoele (see below). The three most important things to remember about this problem are that a) necrotizing cholecystitis can be clinically obvious or clinically occult, b) abdominal ultrasound can be relatively specific for cholecystitis, but it is insensitive, and c) if the gall bladder ruptures, the prognosis is grave.

Sometimes during surgery or laparoscopy, the gall bladder obviously looks like it may be necrotic. However, some dogs with severe necrotizing cholecystitis have a gall bladder that visually appears normal. It is critical to realize that a gall bladder can look and feel normal and yet have transmural necrosis and be about to spontaneously rupture. This lack of obvious gross changes in affected animals is one of the major reasons why cholecystotomy is such a bad idea. If you try to suture diseased (often necrotic) tissue together, perforation is almost expected.

Ultrasound might reveal changes that are very suggestive of necrotizing cholecystitis (e.g., discontinuous wall, markedly thickened wall, trilaminate wall), mildly suggestive of necrotizing cholecystitis (e.g., pericholecystic edema or hyperechoic fat), or nothing at all. Aspirate cytology is still the most reliable diagnostic test.

If rupture of the gall bladder is suspected, immediate surgery is indicated. Rupture of a gall bladder with necrotizing cholecystitis releases bacteria as well as bile into the abdomen. Such patients can almost literally melt in front of your eyes in a matter of hours. This is a genuine surgical emergency.

MUCOCOELES

Sometimes excessive mucus is secreted into the gall bladder and becomes so thick and inspisated that it essentially becomes a solid mass. This is referred to as a biliary mucocoele. Endocrinopathies (e.g., hyperadrenocorticism, diabetes mellitus, excessive androgens as are suspected to occur in Scottish Terriers) and animals with problem of lipid metabolism (e.g., Schnauzers) seem to be at increased risk, but the cause is probably multifactorial. Poor emptying of the gall bladder seems to be important, but its cause is uncertain. Biliary mucocoeles are essentially unknown in cats. For reasons that are not clear, the incidence of this disease appears to have substantially increased compared to 15 years ago.

As mucus fails to be evacuated from the gall bladder, it accumulates and becomes thicker, similar to the consistency of extra-thick jell-O. Initially, the gall bladder expands as it becomes more and more filled. Eventually, as the gall bladder becomes more filled, the mucus will be pushed into the cystic duct, causing occlusion and extra-hepatic biliary tract obstruction (EHBO). Diagnosis is typically accomplished by abdominal ultrasound. You are not looking for gravity-dependent sludge; rather, you are looking for a "stellate" appearance to the gall bladder (the so-called "kiwi fruit" appearance). Cholecystectomy appears to be the only appropriate therapy. Many of these patients have necrosis of the wall of the gall bladder due to the pressure exerted by the lumen of mucus. Because the gall bladder is typically a very thin-walled structure, this

intraluminal pressure can result in avascular necrosis with eventual rupture causing peritonitis. Prognosis is good, as long as you do surgery before the gall bladder ruptures and there are no post-surgical complications such as pancreatitis.

A couple of very controversial points are what constitutes the ultrasonographic diagnosis of an immature biliary mucocoele, and whether gall bladders with non-gravity dependent "sludge" need to be removed or not. Some animals with "immature" mucocoeles seemingly resolve if treated with choleretics such as ursodeoxycholic acid.

GALLSTONES

Gall stones, as mentioned are usually there simply to distract the veterinarian. I am not saying that they never cause disease. I am saying that they are usually innocent of causing disease. If you find gall stones, you should first look elsewhere for the cause of the patient's illness. If you can find nothing else that seems likely to be responsible for causing hepatobiliary tract disease in the patient, only then should you allow yourself to focus on the gall stones. Of course, if there are bacteria in the bile, then the gall stones are likely to be very important and should be removed so as to prevent recrudescence of the infection.

EXTRHEPATIC BILIARY TRACT OBSTRUCTION FROM OTHER CAUSES

Pancreatitis is the most important cause of extrahepatic biliary tract obstruction (EHBO) in the dog. If EHBO is present in a sick dog and appears to be idiopathic, it should generally be assumed to probably be due to pancreatitis until there is evidence to the contrary. History and physical examination are helpful in diagnosing pancreatitis, but not as useful as we=d like. Schnauzers and Yorkies are famous for pancreatitis, but these breeds get a lot of other diseases that cause vomiting, and pancreatitis can be found in any breed of dog. Canine pancreatitis is classically considered to present with acute vomiting and anorexia. Abdominal pain is frequently present, but it is easy to miss during physical examination, and fever is occasionally seen. However, we are recognizing more and more Aatypical@ cases to the point that we are no longer sure what a Atypical@ case of canine pancreatitis is. We are now recognizing more and more cases of severe disease which present in shock due to systemic inflammatory response syndrome (what used to be called septic shock, until we found out that you can have the same thing occur with any cause of massive inflammation); such patients may die very suddenly. We are also recognizing more and more dogs with acute pancreatitis that present as though they had an acute, septic abdomen. Some have substantial amounts of abdominal fluid. If acute pancreatitis is associated with or due to pancreatic carcinoma (rare), you may also see a dog that has widespread subcutaneous fat necrosis causing sterile abscesses that are typically painful and cause cutaneous discoloration. Most cases of canine pancreatitis are related to either ingestion of fat or lipemia associated with diabetic ketoacidosis. Trauma and drugs can also cause canine pancreatitis. Drugs that are suspected of causing pancreatitis in people and animals include azathioprine, sulfonamides, tetracycline, and potassium bromide.