What Is Your Diagnosis?

History

A 3.86-kg (8.5-lb) 14-year-old spayed female domestic shorthair cat was evaluated because of a history of an acute onset of stranguria and tenesmus. Prior to initial evaluation, the owner observed open-mouth breathing, 2 episodes of vomiting, vocalization, and a small amount of diarrhea when the cat was straining in the litter box. The cat did not have a previous history of urinary tract disease or gastrointestinal disease and was eating and drinking normally. Physical examination revealed a mass in the cranial portion of the abdomen and mild dehydration. A heart rate of 186 beats/min, respiratory rate of 54 breaths/min, body temperature of 37.1°C (98.8°F), and occasional open-mouth breathing were observed during physical examination. Initial diagnostic tests included serum biochemical analysis to determine electrolyte concentrations and evaluate acid-base balance, determination of PCV and total solids concentration, and blood pressure measurement. On the basis of electrolyte concentrations and acid-base status, respiratory acidosis with metabolic compensation was evident. The PCV, total solids concentration, and blood pressure were 45%, 9 g/dL, and 130 mm Hg, respectively. Thoracic radiographs were obtained, and there was no evidence of pulmonary disease. Abdominal radiography was then performed (Figure 1).

Determine whether additional imagining studies are required, or make your diagnosis from Figure 1—then turn the page →

Figure 1—Right lateral (A) and ventrodorsal (B) radiographic views of the abdomen of a 14-year-old spayed female domestic shorthair cat with a history of an acute onset of stranguria and tenesmus.

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Diagnostic Imaging Findings and Interpretation

An abnormal rounded fat and soft tissue opacity structure deforms the splenic contour between the gastric fundus and the left kidney in the left cranial portion of the abdomen. Multiple mineral opaque calculi are present in the urinary bladder (Figure 2).

Abdominal ultrasonography was performed. Two hyperechoic, smooth, well-marginated, round masses with faint distal shadowing were found in the left middle portion of the abdomen. The larger mass was 9.5 cm in diameter, and the smaller mass was 4.7 cm in diameter. The masses extended from the hilus of the spleen and had similar echogenicity and shape to that of multiple round hyperechoic nodules that deformed the splenic capsule (Figure 3). Differential diagnoses for the splenic masses included myelolipoma of the spleen, nodular fat necrosis of a myelolipoma, granuloma, abscess, hematoma, neoplasia, and nodular hyperplasia.

In addition, a moderate amount of echogenic peritoneal effusion was present on ultrasonographic examination. Multiple hyperechoic focal echogeneicities with strong distal shadowing were present in the urinary bladder, confirming cystic calculi. A concave defect on the left kidney was present and consistent with an infarct. The pancreas was 1.1 cm in diameter, and the left lobe was hypoechoic, suggestive of pancreatitis.

Figure 2—Same radiographic views as in Figure 1. A—Notice the decreased serosal detail within the middle portion of the abdomen (white arrows) and multiple mineral opaque cystic calculi (black arrow). B—Notice the abnormal rounded fat and soft tissue opacity structure that deforms the splenic contour between the left kidney and gastric fundus in the left cranial portion of the abdomen (black arrows).

Figure 3—Ultrasonographic images of the spleen in the same cat as in Figure 1. A—Notice a solid, smooth, well-defined solitary hyperechoic nodule (dashed arrow) alongside a cluster (thin arrow) of hyperechoic nodules within the periphery of the spleen on a transverse view. B and C—Sagittal images of the 4.7-cm-diameter (B) and 9.5-cm-diameter (C) hyperechoic, smooth, well-marginated round masses (thin dashed line) with faint distal shadowing (wide arrows).
Treatment and Outcome

During the course of the examination, the patient progressively declined in clinical status. An abdominocentesis, during ultrasonographic examination, revealed nonclotting blood, confirming hemoabdomen. The cat was immediately taken to surgery for laparotomy. The 2 splenic masses were removed and examined. No defects were evident on either mass, and both masses were sent for histologic evaluation. On inspection of the spleen, ruptures were present but without adhesions. A spleenectomy was then performed. A cystotomy was also performed to remove the cystic calculi. During the course of surgery and on the following day, bovine hemoglobin and packed RBC transfusions were given to compensate for acute hemorrhage. The cat stabilized following surgery and was discharged the day after surgery. However, the cat was lost to follow-up evaluation. Histologic evaluation of the splenic masses confirmed a diagnosis of myelolipoma.

Comments

Myelolipomas are rare, benign, endocrinologically inactive tumors composed of well-differentiated adipose and hematopoietic cells. In animals, myelolipomas develop in various organs and tissues, depending on the species. Splenic myelolipomas have been reported in cats, cheetahs, and dogs, but because of the paucity of published literature, cheetahs with splenic myelolipomas are the most frequently described. The pathogenesis and clinical importance still remain unclear, but in the case of cheetahs, their presence has been proposed to be a marker of chronic illness. Typically subclinical and observed as small, static lesions, myelolipomas are often incidental findings on ultrasonography. The 2 splenic masses found on ultrasonographic evaluation of the cat of the present report were suspected to be myelolipomas on the basis of their ultrasonographic appearance. Ultrasonographically, myelolipomas, whether nodules or larger masses, are hyperechoic, smooth, well marginated, and spherical or round in shape and may have variable degrees of distal acoustic shadowing. They can be found in clusters or as a solitary lesion and are solid and not cavitary. Myelolipomas are found in the periphery or adjacent to blood vessels in the spleen; they can range in size from millimeters to, less commonly, several centimeters in diameter; are soft and friable in consistency; and may have focal areas of hemorrhage or calcification.

In the cat of the present report, the spleen was diffusely infiltrated with smaller myelolipomas, and by virtue of associated gross and histologic features, one can speculate that the organ was more friable in consistency and consequently ruptured. It should be noted that hemoabdomen is an unusual outcome, and it has been reported only once before in a dog with a similarly large splenic myelolipoma. Notwithstanding, these large splenic myelolipomas should be closely monitored for risk of rupture and subsequent hemoabdomen. Unless a myelolipoma is very large and predominately fatty, these lesions are difficult or impossible to identify on plain radiography. Ultrasonography is a more sensitive diagnostic tool than radiography and allows for presumptive diagnosis, but a large myelolipoma can be accurately evaluated via CT or MRI on the basis of characteristic attenuation and enhancement or fat suppression techniques, respectively, allowing for preoperative planning.