What Is Your Diagnosis?

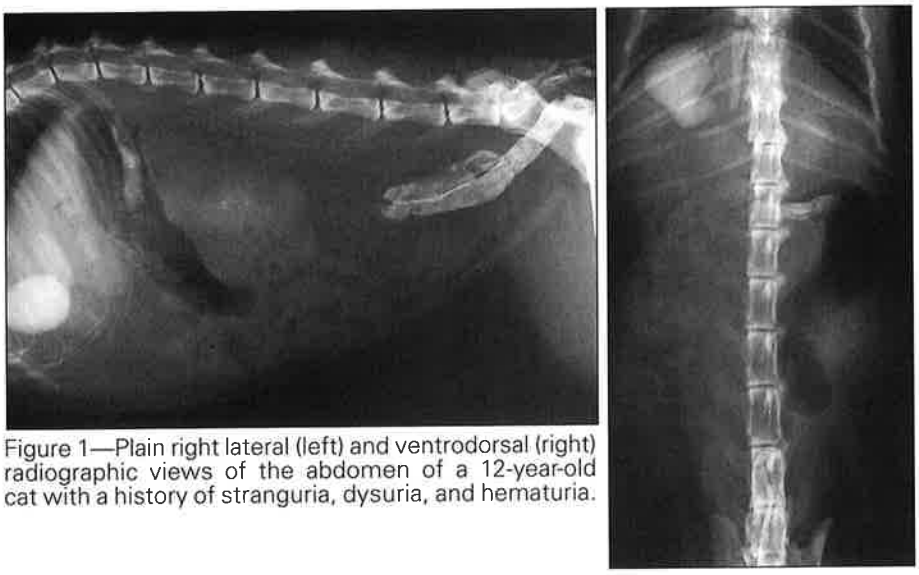

Figure 1—Plain right lateral (left) and ventrodorsal (right) radiographic views of the abdomen of a 12-year-old cat with a history of stranguria, dysuria, and hematuria.

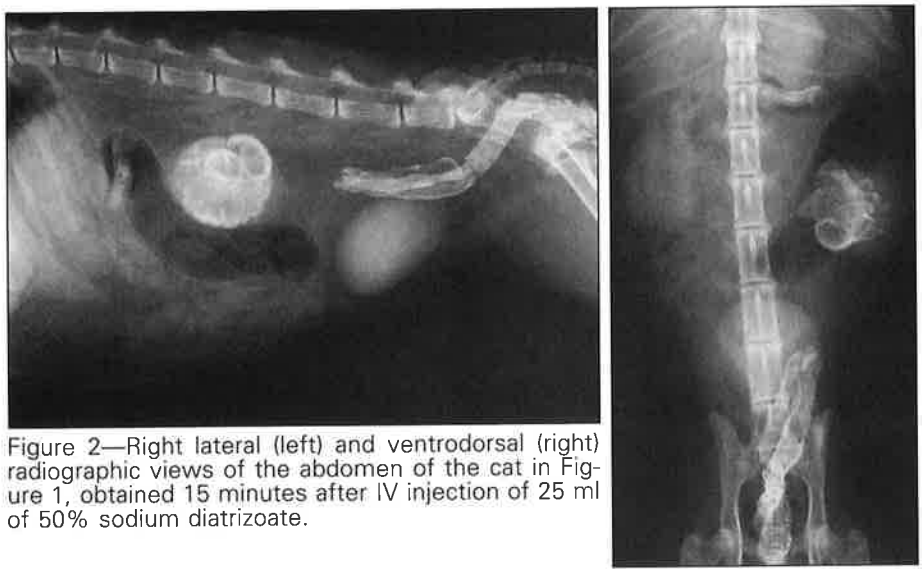

Figure 2—Right lateral (left) and ventrodorsal (right) radiographic views of the abdomen of the cat in Figure 1, obtained 15 minutes after IV injection of 25 ml of 50% sodium diatrizoate.

History

A 12-year-old castrated domestic shorthair cat with stranguria, dysuria, and hematuria was referred for further evaluation of apparent renal disease. The referring veterinarian had performed a CBC, serum biochemical analyses, urinalysis, survey abdominal radiography, excretory urography, and electrocardiography 2 days previously.

Physical examination by the attending veterinarian revealed a large left kidney. Abnormal laboratory findings at our institution included anemia (PCV, 18.7%), lymphopenia (230 lymphocytes/µl), azotemia (BUN, 44 mg/dl; creatinine, 4.2 mg/dl), high amylase activity (1,589 IU/L), isosthenuria, and hematuria (10 to 14 RBC at 40X magnification). Plain radiographs of the abdomen were obtained (Fig 1). On the basis of these results, excretory urography was performed (Fig 2).

Determine whether additional imaging studies are required, or make your diagnosis from Figures 1 and 2—then turn the page ➧

Diagnosis

Radiographic diagnosis—Survey radiography revealed multiple mineral radiopacities in the kidneys. The left kidney is large (2.75 times the length of L2, 3 times the width of L2) with smooth margins. Radiopaque fecal material is evident within the colon, and the gall bladder appears homogeneously opaque. A catheter can be identified within the urinary bladder. Differential diagnoses for the large left kidney included hydronephrosis, infiltrative neoplasia, perirenal pseudocyst, large solitary renal cyst, renal amyloidosis, and glomerulonephritis.

The right renal pelvis was not defined by contrast medium during excretory urography. The left renal pelvis and diverticuli are dilated. A large filling defect is evident within the left renal pelvis and extends to the diverticuli, resulting in margination of contrast medium. A small filling defect is evident in the proximal portion of the left ureter. Differential diagnoses for the abnormal left kidney and left ureter included uroliths or blood clots.

Comments

Exploratory celiotomy was performed. The left kidney was markedly large. A firm mass could be palpated within the left kidney that corresponded to the location of the filling defect evident on the excretory urogram. Nephrotomy revealed a large amount of firm but friable, brown-green material completely filling the renal pelvis and extending into the diverticuli. The material formed a cast of the renal pelvis and diverticuli. A small fragment of the material had broken away and was found lodged within the proximal portion of the left ureter. The location of this material corresponded to the small filling defect evident on the excretory urogram. The cat did not recover well from anesthesia and had seizures throughout the night. Abdominal distention was noticed the next morning and uroperitoneum was diagnosed. The owners elected to have the cat euthanatized.

Histologic examination of the material from the left renal pelvis revealed granular proteinaceous material and blood pigment consistent with a blood clot. Quantitative analysis of the material indicated it consisted of 100% dried blood, compatible with a matrix urolith. The cause of matrix uroliths in cats is not known.

Indications for excretory urography include hematuria, suspected renal calculi, masses believed to be associated with the urinary tract, ectopic ureters, and infiltrative or inflammatory renal parenchymal disease.[1] Reported adverse effects of excretory urography include vomiting, retching, transient fever, hypotension, and fatal cardiac collapse.[2] The recommended dose of contrast medium for urography is 880 mg of iodine/kg of body weight; however, azotemic animals may fail to concentrate contrast medium adequately, and urography may be nondiagnostic. Because of low initial nephrographic opacification, minimal fading of the nephrogram, and failure to induce a pyelographic phase during excretory urography, function of the right kidney was believed to be subnormal. Doubling the dose of contrast medium may partially compensate for impaired concentrating ability and is safe in azotemic patients provided they are hydrated adequately. A BUN concentration > 50 mg/dl or a serum creatinine concentration > 4 mg/dl can be used to identify patients for which the dose of contrast medium must be doubled.[2] Secondary routes of contrast excretion become apparent when the glomerular filtration rate is low. Contrast medium that persists in the blood is excreted via the liver, bile, and small intestinal mucosa.[3] If excretion of contrast medium via these routes is impaired, then additional routes of excretion include tears and saliva.[3] Opacification of the gall bladder and feces on survey radiographs was attributed to secondary routes of excretion of iodinated contrast medium from the excretory urogram performed by the referring veterinarian 2 days previously.

1. Ackerman N. Intravenous pyelography. *J Am Anim Hosp Assoc* 1974;10:277–280.

2. Pugh CR. Contrast studies of the urogenital system. *Vet Clin North Am Small Anim Pract* 1993;23:281–305.

3. Holland M. Contrast agents. *Vet Clin North Am Small Anim Pract* 1993;23:269–279.

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