Ultrasound Diagnosis

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History

A seven-year-old, castrated male, Labrador Retriever dog was referred to the Chulalongkorn University, Small Animal, Veterinary Teaching Hospital for further investigation after a six-month duration of intermittent haematuria. The dog was alert, had a normal appetite and failed to respond to vigorous treatment for bacterial cystitis. Physical examination revealed pale mucous membranes and a tensed abdomen. A large firm mass was palpable in the caudal abdomen. Haematological profiles indicated a normal haemogram with blood morphology showing anisocytosis. Blood parasite was not found. Elevated alanine aminotransferase (238 units) and alkaline phosphatase (342 units) activities with normal levels of blood urea nitrogen (13 mg%) and creatinine (0.8 mg%) were identified on the serum biochemical analyses. Plain abdominal radiography showed a normal hepatic size and a marked distension of urinary bladder without any evidence of radiopague calculi. Thoracic radiography revealed normal heart size and lung fields.

Ultrasonographic Findings

Ultrasonographic evaluation of the abdomen was performed using a real-time scanner with an 8-5 MHz broadband, convex, phased array transducer. The echogenicity relationship of liver, spleen and kidney parenchyma were within a normal limits. A large, 4.5 by 9.5 cm in diameter, mass with mixed echotexture occupied the bladder with only small amount of anechoic urine surrounding it (Figs. 1 & 2). This mass was sessile and had an irregular intraluminal margin protruding from the mid-dorsal region of bladder wall. The urinary bladder wall was thickened (6 mm in diameter) at the wide base of the infiltrative mass attachment. Abnormalities in the kidneys, ureters and iliac lymph nodes were not observed.

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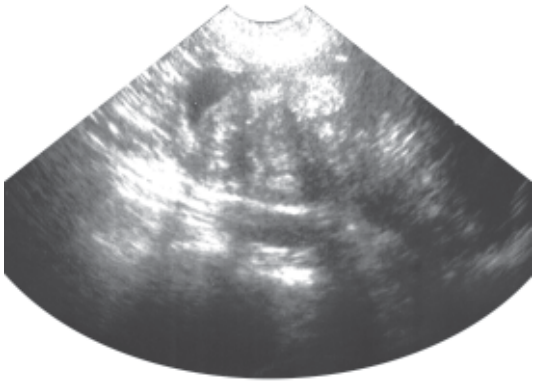

Figure 1 A sagittal ultrasonographic image of the urinary bladder of the seven-year-old, castrated male, Labrador Retriever dog. A large, sessile mass, with mixed echogenicity occupied the urinary bladder with only small amount of urine surrounding it. The urinary bladder wall was thickened at the infiltrative mass attachment.

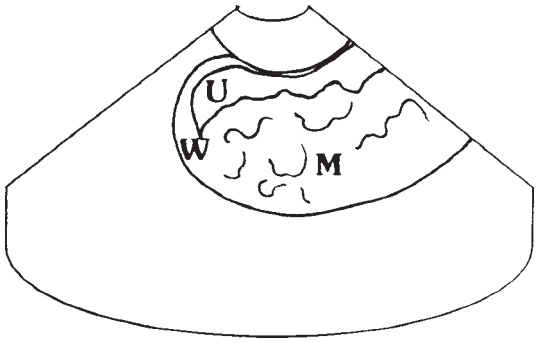

Figure 2 Schematics of the relative positions of the structures scanned in figure 1. M -heteroechoic mass, U -urine, W -urinary bladder wall.

Diagnosis

Ultrasonographic diagnosis——Transitional cell carcinoma of the urinary bladder.

Comments

Ultrasound now provides an alternative method of diagnosing urinary bladder disease. It is cost and time effective compared to contrast cystography. In the presented dog, a transitional cell carcinoma of the bladder was histopathologically confirmed from the specimen surgically removed.

Transitional cell carcinoma is ultrasonographically characterized by focal urinary bladder wall thickening with a sessile mass protruding into the bladder lumen (Leveille et al., 1992). The tumor mass is generally hypoechoic or heteroechoic and tends to have an irregular intraluminal margin. The attachment of the mass to the bladder wall is often abrupt and thickening of the bladder wall at the site of attachment can usually be recognized. The tumor mass may also be seen as papillary or polypoid extension into the bladder lumen. However, some bladder neoplasias may spread through the bladder wall.

The ultrasonographic appearance of bladder neoplasia is similar to those of polypoid cystitis, adherent blood clots and mural haematomas. Aspiration, biopsy or both are necessary to confirm the presence of bladder neoplasia. It may be better to use the technique of ultrasound-guided catheter biopsy (Lamb et al., 1996) because of the possibility of seeding the needle track with tumor cells when the aspiration technique was chosen (Gilson and Stone, 1990). When a bladder mass is detected, the sublumbar region should be ultrasonographically evaluated for evidence of iliac lymphadenopathy (metastatic or reactive). Renal pelvis and ureter should also be examined for dilation secondary to ureteral obstruction.

References

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Leveille R., Biller D.S., Partington B.P. and Miyabayashi T. 1992. Sonographic investigation of transitional cell carcinoma of the urinary bladder in small animals. Vet. Radiol. Ultrasound. 33:103-107.