

ULTRASOUND DIAGNOSIS

Phiwipha Kamonrat*

History :

A fifteen-year-old, spayed, female, cross-breed dog was presented at the Chulalongkorn University Small Animal Veterinary Teaching Hospital with a four-month history of anorexia, weight loss and abdominal enlargement. After being spayed when eight months old, the dog was mated but not surprisingly, never became pregnant. One year ago, the dog was treated for a vaginal venereal granuloma by chemotherapy. At the time of presentation, the dog dyspneic and emaciated with a large protruding abdomen. The results of hematological and serum biochemistry profiles were within normal ranges with the exception of an azotemia (73.9 mg% blood urea nitrogen, 2.7 mg% serum creatinine). Plain radiographs of the abdomen showed an overall abdominal haziness. The stomach and bowel loops were displaced cranially and caudally, respectively. Thoracic radiographs revealed a cardiomegaly with no evidence of metastatic lung disease.

* **Department of Surgery, Faculty of Veterinary Science, Chulalongkorn University, Bangkok 10330, Thailand.**

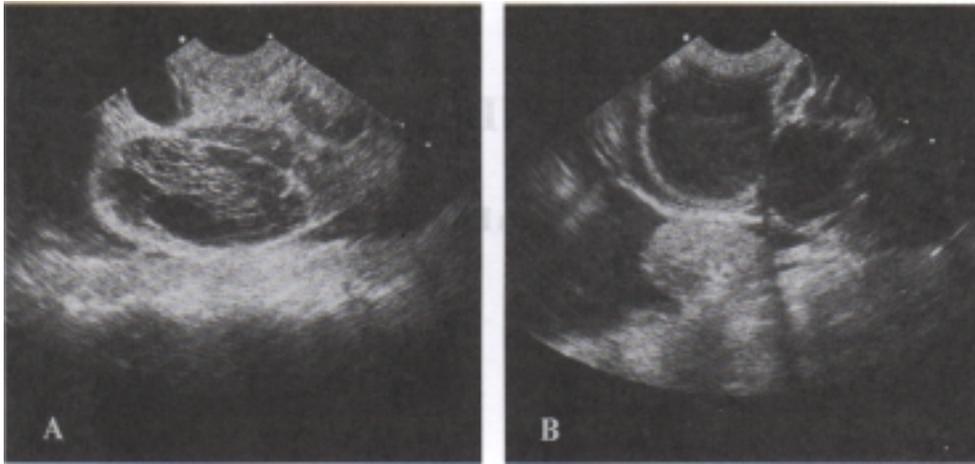


Figure 1 Sagittal ultrasonographic images of two midventral, abdominal, complex masses in a 15-year-old spayed dog, in dorsal recumbency. **A.** A 3 by 7-in mass, located caudal to the right kidney, was heterogeneous and contained multiple small anechoic areas. **B.** A 4 by 6-in mass, located between the left kidney and urinary bladder, was also heterogeneous with larger anechoic fluid-filled areas which were separated by echogenic septa.

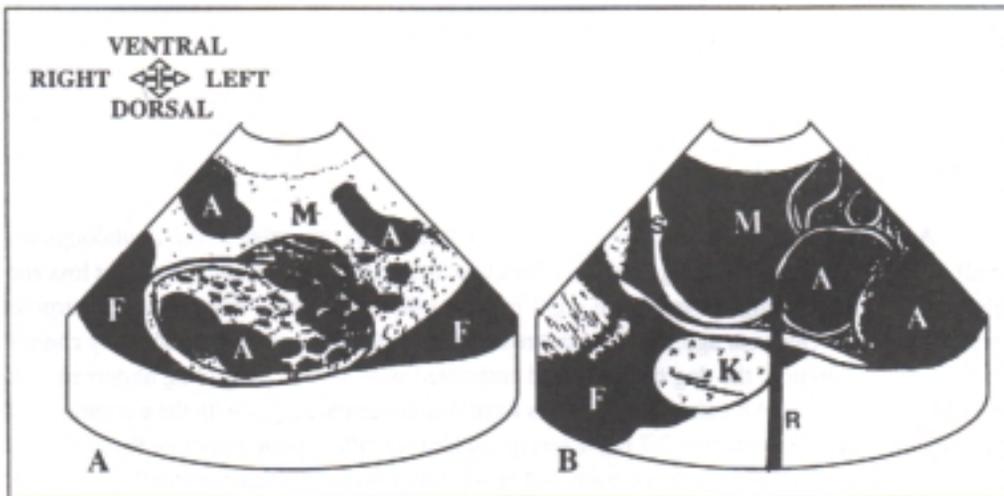


Figure 2 Schematics of the relative position of the structures scanned in figure 1. M-heterogeneous mass; A-anechoic component; F-peritoneal anechoic fluid; S-echogenic septum; K-kidney; R-beam refraction artifact.

Ultrasonographic Findings

An ultrasonographic examination of the abdomen was performed using a real-time scanner with an 8-5 MHz broadband, convex, phased array transducer. Two large heterogeneous masses were shown in the midventral abdomen. The one on the right, 3 by 7 inches in diameter, was found caudal to the right kidney and pushed the urinary bladder to the left side of the abdominal wall (figs. 1A and 2A). The left mass was 4 by 7 inches in diameter and was situated between the left kidney and the urinary bladder (figs. 1B and 2B). These masses, especially the left one, were lobulated and contained multicystic anechoic structures with irregular margins. There was no evidence of abdominal metastasis. A large amount of anechoic fluid was also present in the abdominal cavity.

Diagnosis

Ultrasonographic diagnosis - Bilateral, complex ovarian masses with ascites

Comments

The ovaries are routinely scanned with the dog in dorsal recumbency, using a 7.5 MHz transducer in the dog and a 10.0 MHz transducer in the cat (Mattoon and Nyland, 1995). Normal ovaries are small, oval to round structures, located caudal to the kidneys and their ultrasonographic appearance varies at different stages of the estrous cycle. They have a uniform echogenicity similar to the adjacent renal cortex in anestrus and early proestrus. The follicles are anechoic with a well-defined far wall and distal acoustic enhancement. At the beginning of metestrus, the corpora hemorrhagica or corpora lutea are anechoic-to hypoechoic and sometimes hyperechoic structures.

Ovarian abnormalities include cystic ovarian disease, stump granuloma, and neoplasia. Ovarian cysts may be solitary or multiple, unilateral or bilateral and very small to quite large in size. Any ultrasonographic findings should be correlated with

history, clinical signs and cystic lesion size to determine if their presence is abnormal since they resemble cystic structures normally seen after ovulation. Complex lesions of stump granuloma have been evaluated in animals with prior ovariohysterectomy (Mattoon and Nyland, 1995).

Ovarian neoplasms are relative uncommon in dogs (Jubb and Kennedy, 1970) but when present, they may be unilateral or bilateral, small or quite large. The ultrasonographic appearance of large ovarian tumors such as adenocarcinomas were described as having mixed echogenicity, mostly solid and contained multicystic structures with irregular margins (Goodwin et al., 1990). Small cysts were also seen in dogs with granulosa cell tumors (Rivers and Johnston, 1991). Abdominal fluid may be present in some dogs with ovarian tumors.

Ultrasonography is helpful for diagnosing the origin of ovarian masses and for checking for abdominal metastasis. However, ultrasound-guided biopsy for histopathologic examination is required to differentiate between tumor types and between cystic ovaries and ovarian tumors containing small cysts. In this dog, both abdominal masses were surgically removed and granulosa cell tumors were subsequently diagnosed histopathologically.

References

- Goodwin, J.K., Hager, D., Phillip, L., and Lyman, R. 1990. Bilateral ovarian adenocarcinoma in a dog: ultrasonographic-aided diagnosis. *Vet. Radiol.* 31 (5) :265-267.
- Jubb, K.V.F., Kennedy, P.C., and McEntee, K. 1970. The female genital system. In: *Pathology of Domestic Animals*. K.V.F. Jubb and P.C. Kennedy (eds) Vol.1. 2nd ed. New York: Academic Press, Inc. 502-503.
- Mattoon, J.S. and Nyland, T.G. 1995. Ultrasonography of the genital system. In: *Veterinary Diagnostic Ultrasound*. T.G. Nyland and J.S. Mattoon (eds.) Philadelphia: W.B. Saunders Company. 141-145.
- Rivers, B. and Johnston, G.R. 1991. Diagnostic imaging of the reproductive organs of the bitch. *Vet. Clin. North Am. Small Anim. Pract.* 21 : 437.