

Ultrasound Diagnosis

Phiwipha Kamonrat

History

A twelve-year-old, 6-kilogram-body weight, spayed, Poodle dog was presented at the Chulalongkorn University, Small Animal Veterinary Teaching Hospital with more than a year duration of intermittent bloody diarrhoea. The dog had recently showed clinical signs of anorexia, weakness and panting. A physical examination revealed pink mucous membranes. A per-rectum palpation revealed an irregular mucosal lining of rectal wall with a bloody stool. Haematological examination was within normal limits. A mild elevation of alkaline phosphatase (129 IU/L) was identified on the serum biochemical analyses. *Ehrlichia canis* was also found. Survey radiographs of the thorax and abdomen revealed normal heart size and lung fields with no evidence of lung metastasis. There were a mild hepatomegaly and a moderate amount of radiopaque fecal content packed within the descending colon. Any abdominal masses were not observed. An abdominal ultrasonography was performed to assess the cause of bloody stool in this dog.

Ultrasonographic Findings

Transabdominal ultrasonographic examination was performed, using a real-time scanner with an 8.5 MHz broadband, convex, phased array transducer. The overall liver was hypoechoic to the spleen and hyperechoic to the kidneys and falciform fat. Hepatic nodules were not found. The descending colon contained a small amount of gas mixed with fecal contents. There was a localized, transmural, hypoechoic mass, protruding into the lumen of the colorectal segment (Fig 1 and 2). This mass was irregular, 5-11 mm thick and mainly involved the left-lateroventral aspect of the descending colonic and rectal wall, with loss of normal wall layering. The regional lymph nodes became reactive, which observed as mildly enlarged and rounder hypoechoic structures. Ultrasonography of other abdominal organs appeared normal in echotexture. Under colonoscopy, a fine needle aspiration of the rectal wall mass was taken and a cellular diagnosis of adenocarcinoma was suggested.

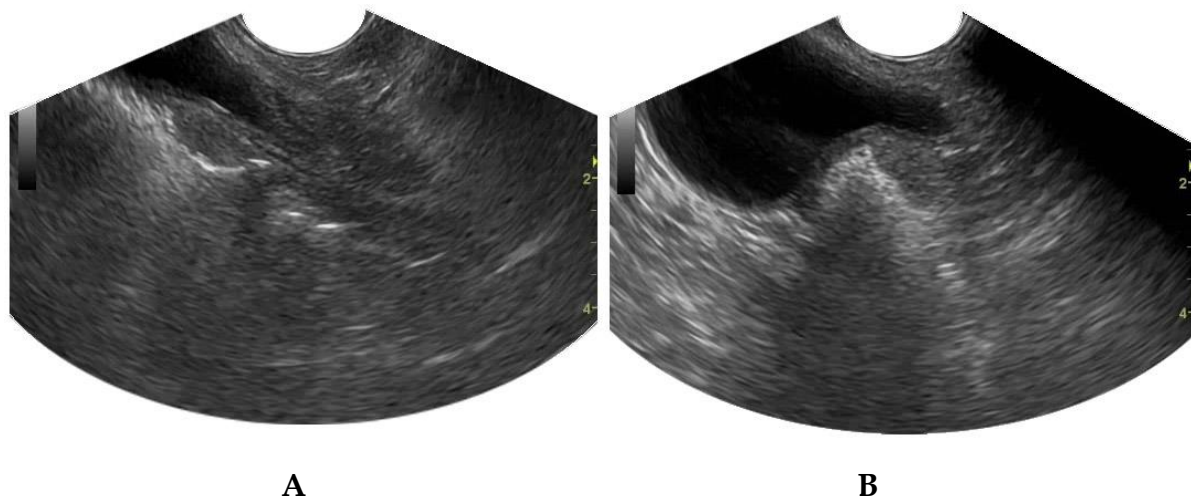


Figure 1 Longitudinal (A) and transverse (B) ultrasonograms of the colorectal wall mass of a twelve-year-old, spayed, Poodle dog, in dorsal recumbency. This mass was irregular, hypoechoic and protruded into its lumen. The normal wall layers were focally indistinct. The mixture of gas and fecal material in the colon created a dirty acoustic shadowing.

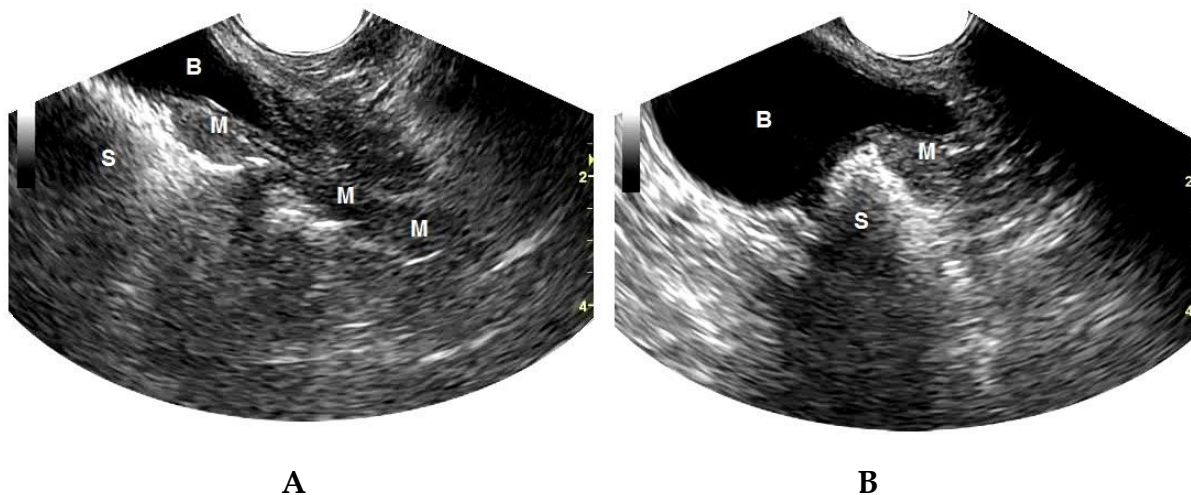


Figure 2 Schematics of the relative positions of the affected colorectal segment scanned in figure 1. M - hypoechoic mass of colorectal wall, S -acoustic shadowing distal to fecal material in the descending colon, B -urinary bladder.

Diagnosis

A colorectal wall adenocarcinoma

Comments

In dogs, the commonly seen intestinal neoplasms include adenocarcinoma, leiomyosarcoma and lymphoma, and the most common sites are the colon and the rectum. Compared with other diagnostic modalities, ultrasonography has the advantage of being cheap, portable and non-invasive although it has limitations with penetration in obese dogs and with acoustic shadowing artifacts distal to the intraluminal gas, impairing image quality. Abdominal ultrasound is used to evaluate the tumor location, identify other metastatic sites, guide the fine needle aspiration or tissue-core biopsy, plan the treatment course, follow-up the disease response and monitor the recurrence.

Ultrasonographic criteria used to diagnose the colonic adenocarcinoma include transmural,

poorly echogenic mass with an irregular contour, segmental asymmetrical thickening with various degree of the colonic wall and a significant loss of normal wall layer appearance (Paoloni et al., 2002). Other ultrasonographic findings are moderate to severe fluid accumulation proximal to the lesion site, decreased colonic movement and regional lymphadenopathy. In normal dogs, the wall thickness of the colon ranges from 2 mm to 3 mm when it is measured with ultrasound (Penninck et al., 1989). Lymphadenopathy consistent with intestinal neoplasia appears as enlarged heterogeneous lymph nodes. The short/long axis ratio of the lymph node more than 0.5 is usually predictive of neoplasia (Nyman et al., 2004). However, some ultrasonographic features of neoplastic and inflammatory lesions may mimic each other. Therefore, the accurate diagnosis of the intestinal lesion must be confirmed by cytologic or histopathologic examination.

Reference

- Nyman HT, Kristensen AT, Flagstad A and McEvoy FJ. 2004. A review of the sonographic assessment of tumor metastases in liver and superficial lymph nodes. *Vet Radiol Ultrasound*. 45(5):438-448.
- Paoloni MC, Penninck DG and Moore AS. 2002. Ultrasonographic and clinicopathologic findings in 21 cases of canine intestinal adenocarcinoma. *Vet Radiol Ultrasound*. 43 (6): 562-567.
- Penninck DG, Nyland TG, Fisher PE and Kerr LY. 1989. Normal ultrasonography of the canine gastrointestinal tract. *Vet Radiol Ultrasound*. 30 (6): 272-276.