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Ultrasound Diagnosis

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History

An eleven-year-old, intact male, Poodle dog was presented at the Chulalongkorn University, Small Animal, Veterinary Teaching Hospital because of the chronic diarrhoea and progressive weight loss for four months. The dog had poor appetite, depression and emaciation. A physical examination revealed pink mucous membranes and abdominal enlargement with a marked cramp on palpation. Haematological and biochemical profiles showed a mild leukocytosis (1.9 x 10^3 white blood cells/μl, 87% neutrophils, 11% lymphocytes and 2% monocytes) and elevation of serum liver enzyme (ALT 216 IU and ALP 1,808 IU). No blood parasite was found. Plain radiographs of the abdomen revealed a mild peritoneal effusion and a long-standing partial mechanical obstruction, demonstrating ileus and gravel signs of multiple small bowel segments. Any radiopaque foreign bodies were not found. The distal colon contained some fecal content. A mild prostatomegaly was also evident. An abdominal ultrasonography was performed to obtain more specific information.

Ultrasonographic Findings

A real-time, ultrasonographic examination of an entire abdomen was performed using an 8 MHz microconvex, phased array transducer with the dog in dorsal recumbency. An abdominal pain was detected during scanning. There was a moderate quantity of hypoechoic peritoneal fluid with diffuse hyperechoic and hyperattenuating omental fat, which was consistent with a peritonitis (Figs 1A and 2A). The striking changes found were multiple segments of small bowel distension, containing gas and fluid content. The most over-distended part was the segment of the terminal ileum, just proximal to the ileocecocolic junction (Figs 1B and 2B). A large amount of echogenic fluid mixed with food particles and small pieces of bone-like foreign bodies accumulated within the lumen of the ileum. During a peristaltic movement, most of these contents were still swirled in the lumen. These findings might be related to a mechanical obstruction from a stenosis of ileocecocolic orifice. However, there were no any morphologic changes of intestinal wall layers detected in this area. The wall thickness of the muscular layer of the distal jejunal segment was mildly thickened, relative to the mucosal layer. Peripheral mesenteric lymph nodes were also reactive. Hepatic parenchyma was mildly heterogeneous and contained a cystic lesion, 7.5 mm in diameter. A 7.5 mm, anechoic cyst was seen at the left renal cortex. The prostate was mildly enlarged.

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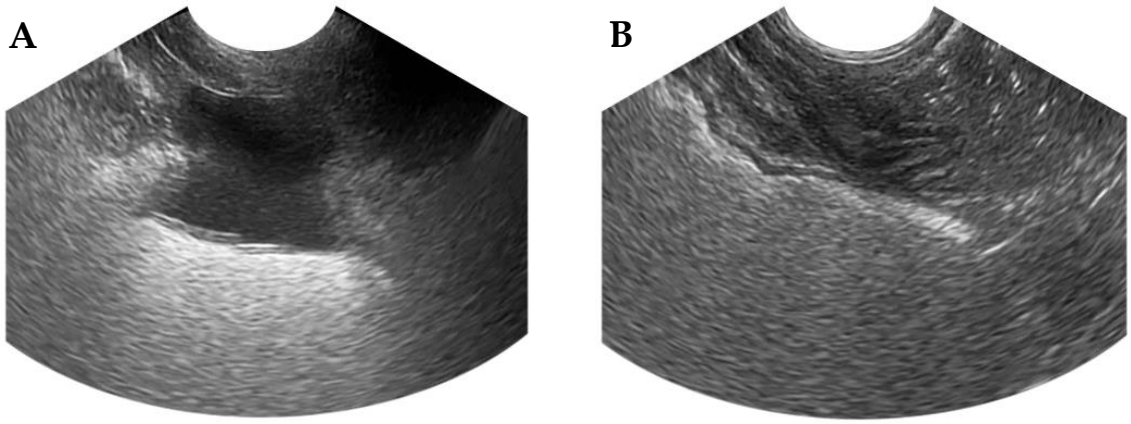

Figure 1 Ultrasonographic images of the abdomen of an eleven-year-old, intact male, Poodle dog in dorsal recumbency. A. Hypoechoic peritoneal fluid and diffuse hyperechoic and hyperattenuating omental fat were consistent with peritonitis B. Echogenic fluid accumulation was present within an over-distended segment of the terminal ileum, secondary to obstruction from an ileocecocolic stenosis.

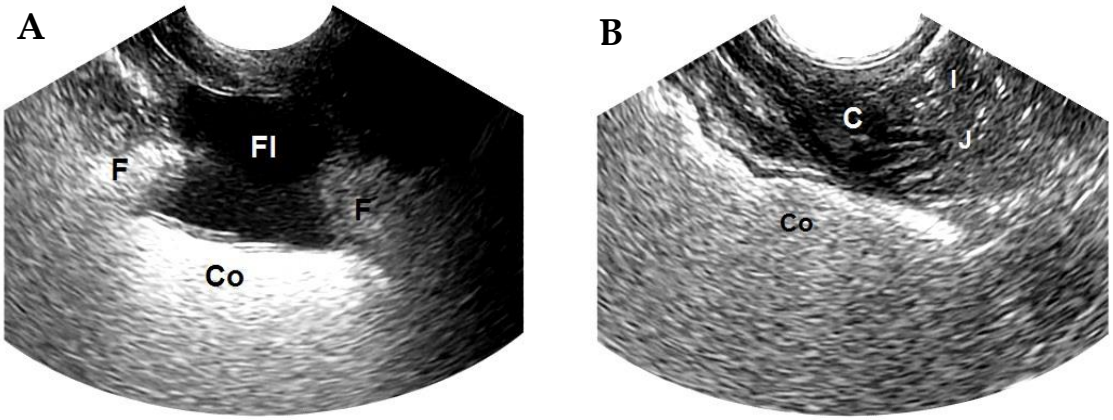

Figure 2 Schematics of the relative positions of the structures scanned in figure 1. Fl –Hypoechoic peritoneal fluid F –Hyperechoic omental fat, Co –Gas-distended colon, I –Over-distended ileum, J –Ileocecocolic junction; C –Cecum.

Diagnosis

Ultrasonographic diagnosis —Ileocecocolic stenosis with peritonitis.

Comments

Ultrasonographic criteria used to diagnose the gastrointestinal disorders include gastric wall thickness and layering, motility, peritoneal fluid and regional lymphadenopathy (Penninck, 2008). The identification of segmental distension of the gastrointestinal tract with fluid or gas may signify ileus due to a mechanical obstruction by foreign body, intussusception or neoplasia. A more generalized distension may be a more chronic mechanical obstruction or a functional ileus resulting from drug-induced or gastroenteritis. In the right cranial abdomen, the loops of the jejunum, ileum and ileocolic junction are difficult to ultrasonographically differentiate from one another. The ileocolic junction may appear as a small diameter segment of ileum entering a larger diameter segment of colon. The cecum and colon are often gas-filled, which may mask the visualization of the wall layer definition.

The ultrasonographic appearance of inflammatory condition of the small bowel varies and the most common finding is wall thickening. Inflammation is usually extensive and symmetrical wall thickening with retained wall layering (Penninck, 2003). In this present dog, surgical biopsy of the affected jejunal segment revealed a mild chronic lymphocytic enteritis with muscular hypertrophy.

Reference

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Penninck D. 2008. Gastrointestinal tract. In: Atlas of Small Animal Ultrasonography. 1st ed. D Penninck and MA Anjou (eds.) Ames: Blackwell Publishing. 281-318 pp.