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What Is Your Diagnosis?

In collaboration with the American College of Veterinary Radiology

Chronic hyporexia, vomiting, and hematochezia in a 2-year-old male German Shepherd Dog

Keywords: colonic stricture, intestinal obstruction, chronic perforation, radiograph, adhesions

History

A 2-year-old 32.5-kg intact male German Shepherd Dog presented for a 4-week history of hyporexia, weight loss, hematochezia, and vomiting after eating.

One month prior, the patient had presented to the primary care veterinarian for vomiting and hematochezia. At this point, the patient weighed 36.7 kg. The veterinarian prescribed maropitant citrate (1 mg/kg, SC), cefovecin sodium (0.1 mg/kg, SC), and metronidazole (500 mg, PO) for 7 days. A parvovirus antigen test was performed, and the result was negative.

One week later, the clinical signs persisted and the patient was sent to an emergency and specialist care center. On physical examination, the patient was mildly dehydrated but otherwise normal. An abdominal focused assessment with sonography for trauma, triage, and tracking (FAST) scan was performed, which showed a mildly hyperechoic mesentery and a fluid ingesta wave in the colon. Further diagnostics were declined, and the owners elected to do supportive care. The dog was administered lactated Ringer solution (30 mL/kg, SC), maropitant citrate (1 mg/kg, SC), and mirtazapine (30 mg, PO) every 24 hours for 5 days.

Three weeks later, the patient presented again for progressive clinical signs, now including lethargy, abdominal pain, and weight loss. On presentation, the patient was quiet, alert, responsive, and mildly dehydrated, with normal vital parameters. The patient weighed 32.5 kg. The abdomen was distended, firm, and painful on palpation. The patient had hind end weakness, bilateral hyperflexion of the tarsus, and hind end muscle wasting, with a body condition score of 3/9. On the CBC, there was eosinopenia at 0.02 X 10^9/L (reference range, 0.04 X 10^9 to 1.62 X 10^9/L) but the results were otherwise normal. On the chemistry, there was mild hyperphosphatemia at 2.08 mmol/L (reference range, 0.61 to 1.61 mmol/L), mild hypercalcemia at 3.11 mmol/L (reference range, 2.25 to 3.10 mmol/L), a mild elevation in ALT at 160 U/L (reference range, 0 to 120 U/L), and a mild elevation in total bilirubin at 14 µmol/L (reference range, 0 to 9 µmol/L). Abdominal radiographs were obtained **(Figure 1)**.

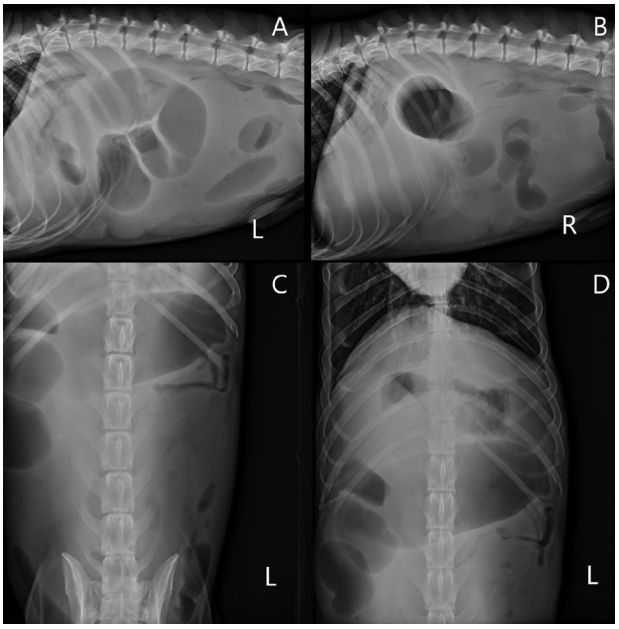

Figure 1—Left lateral (A), right lateral (B), and ventrodorsal (C and D) radiographic views of a 2-year-old 32.5-kg intact male German Shepherd Dog that was referred for chronic hyporexia, weight loss, vomiting, and hematochezia.

Formulate differential diagnoses, then continue reading.

Radiographic Findings and Interpretation

There was decreased serosal detail throughout the abdomen. There was severe gas dilation of a loop

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of intestine, most likely the transverse colon based on the central and cranial location. There was also severe fluid dilation of a loop of intestine in the central to caudal abdomen, thought to be the ascending colon. Both these loops were best delineated on the ventrodorsal (VD) projection. There was mild dorsal displacement of the gas-containing descending colon, most likely the loop ventral to L4-7. There was stippled mineral foci along the ventral aspect of the ascending colon ("gravel sign") at the level of the tenth through eleventh intercostal space on the lateral projections and the right twelfth intercostal space on the VD projection. The cecum was in a normal position but severely gas dilated. Multiple small intestinal loops were also fluid and gas dilated, with few normal-sized loops containing gas. The intestinal fluid and gas dilation caused dorsal displacement of the kidneys and cranial displacement of the stomach. There was a small intestinal to fifth lumbar vertebral height ratio of 2.02 (reference range, < 1.70). On the VD view, a radiographic focal area of narrowing was visible at the level of the transition from the transverse to the descending colon in the left cranial quadrant of the abdomen **(Figure 2)**.

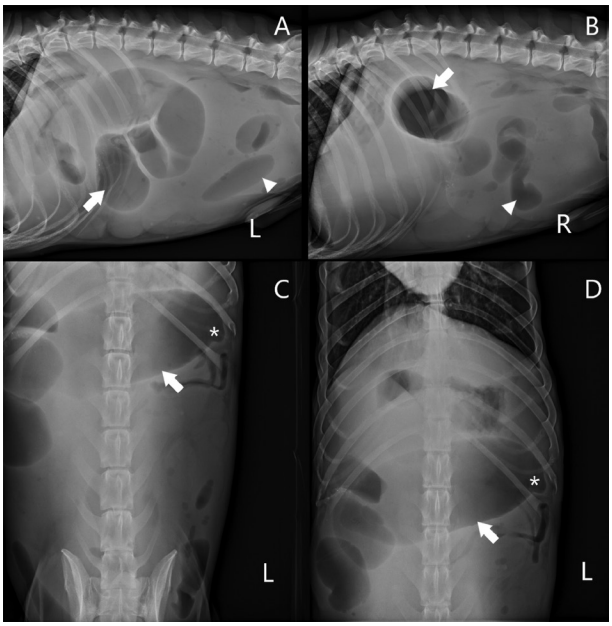

Figure 2—Same radiographic images as Figure 1. There is a decrease in serosal detail. The colon is markedly dilated and gas filled (arrows). At the junction of the transverse and descending colon, there is a radiographic focal narrowing at this point (asterisks). The small intestines is also moderately dilated and gas filled to fluid filled (arrowheads).

Based on these radiographic findings, a chronic colonic obstruction at the level of the proximal descending colon was diagnosed. To confirm a colonic obstruction in the colon, a pneumocolonogram or positive-contrast barium enema would have needed to be performed but was declined by the owners. Differential diagnoses for a colonic obstruction include colonic torsion with/without volvulus, foreign body, postoperative stricture formation, compression from neoplasia, cecal inversion, or colonic intussusception. The presence of a focal radiographic narrowing was suggestive of a colonic stricture.

Treatment and Outcome

The owners elected for a humane euthanasia. The patient was euthanized with propofol (4.6 mg/kg, IV) and pentobarbital (126 mg/kg, IV). A necropsy of the abdomen was performed in-house **(Figure 3)**. The abdominal cavity had a scant volume of serosanguinous fluid. There was significant gas and fluid dilation of the ileum, ascending colon, and transverse colon. At the splenic flexure, there was a colonic stricture composed of severe fibrous adhesions involving the colon, omentum, and jejunum. Within the fibrosis, a perforation was identified in the mesenteric wall of the jejunum. A foreign body could not be located in the intestines, but the intestinal mucosa was hyperemic with striated ulcerations. The liver, gallbladder, pancreas, spleen, and bladder were normal. The patient was diagnosed with a chronic intestinal perforation, causing secondary adhesions to form and entrap the colon, resulting in a colonic stricture and subsequent partial colonic obstruction.

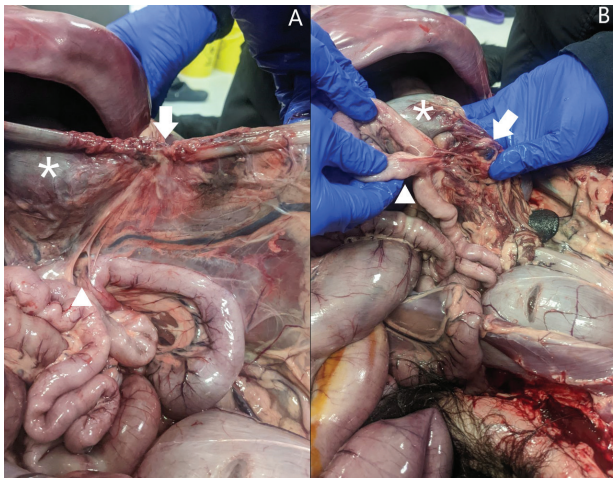

Figure 3— Images of the colon and small intestines (A and B) following a post mortem performed of a 2-year-old male German Shepherd dog with chronic hyporexia, vomiting, and hematochezia. A colonic stricture was present at the splenic flexure (arrows), causing severe dilation of the transverse colon (asterisks). The stricture was formed from fibrinous adhesions spanning from a perforation in the jejunum (arrowheads).

Comments

The owners had consented to pursuing initial diagnostics for the patient's vomiting and diarrhea. Bloodwork was pursued (serum chemistry panel and CBC) but did not identify a cause, prompting proceeding to radiographs of his abdomen as

a next-step diagnostic. Conditions such as foreign bodies, intussusception, space-occupying masses, and other causes of mechanical obstructions can be identified on radiographs. Studies have evaluated objective radiographic measurements to assess small intestinal dilation from obstruction. A ratio of the diameter of the small intestine by the height of the fifth lumbar vertebra can be used. With a ratio of 1.7, the sensitivity is reported to be between 54% and 92%.[1] For this patient, the severity of dilation with the ratio of the small intestinal dilation of 2.02 suggested an obstructive process. However, the involvement of the proximal colonic dilation was surprising and criteria for assessment of this is less well-defined, as ratios for dilation have not been established. Common radiographic signs of a colonic obstruction include segmental distention, focal narrowing, cecal or colonic displacement, and/or mild-to-absent small intestinal distension.[2] An indicator of a chronic obstruction is the presence of a gravel sign, as seen in this case presentation. This is characterized by the accumulation of gravity-dependent mineral material with a dilated loop of bowel, oral to the obstruction. It suggests poor intestinal motility and outflow obstruction. German Shepherd Dogs have been reported to be overrepresented with chronic obstructions showing a gravel sign.[3] Other differentials to consider for a mechanical colonic obstruction would be strictures, foreign bodies, and intra-abdominal masses.

One diagnostic that was not able to be pursued in this case was positive-contrast enterography. A positive-contrast study can confirm a colonic obstruction and may also provide indicators for the type of obstruction. This is especially useful in cases where colonic torsion is suspected, which can present with helical longitudinal striations at the focal narrowing.[2] In this case, although positive-contrast radiography could not be pursued, this would have been the next diagnostic test to confirm a colonic obstruction. However, a "natural" negative-contrast study was present to highlight the focal narrowing/triangular shape of the loop of intestine. Given the location in the abdomen and the patient's clinical signs and overall stability, this dilated loop was attributed to the colon.

Abdominal radiographs may also be complemented with secondary imaging, including an ultrasound, which has higher reported specificity and sensitivity for identification of obstructions.[4,5] The reported diagnostic sensitivity for an ultrasound to detect an intestinal obstruction is between 85% and 100%.[1,5] Ultrasonographic signs of a colonic obstruction include dilated, fluid-filled intestinal loops oral to the stricture, nondilated intestines aboral to the stricture, thickened colonic wall (> 4 mm), hyperechoic speckling of intraluminal fluid with gas, to-and-fro or whirling movement of intraluminal fluid, and poor peristalsis.[4,5] Severe obstructions could also present with free fluid if there is perforation or ischemia if the obstruction is acute.[4] However, some practices may be limited to radiography due to finances, availability of equipment, or lack of training in ultrasonography. Intestinal gas and ingesta can obstruct an ultrasonographic image, resulting in an ultrasound not being able to rule out an intestinal foreign body.[4] This case also highlights a limitation of abdominal FAST scans. While ileus and enterocolitis were present when abdominal FAST was performed at the original presentation to the specialty center, ingesta and intestinal gas likely made intestinal tracing very challenging, thus missing the root cause (ie, colonic stricture) of these findings. In conclusion, appropriate diagnosis of gastrointestinal obstructions requires comprehensive diagnostic approaches, including bloodwork, radiographs, and advanced imaging techniques, to accurately identify and address the underlying condition.

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