Idiopathic, duodenogastric intussusception in an adult dog

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A 7-year-old male Basset Hound weighing 27.2 kg was admitted to the emergency service of the teaching hospital after an acute onset of vomiting (twice hourly for the preceding 4 hours). A small amount of frank blood was observed in the vomitus. The owner saw the dog eating garbage the preceding day. The dog had seemed depressed and had not eaten its meals for 48 hours. On physical examination, the dog was alert and responsive, tachycardic (150 beats/min), approximately 7% dehydrated, and had signs of pain in the cranial portion of the abdomen.

The dog had nonregenerative anemia (2.68×10^6 cells/μl; normal, 5.2 to 8.06×10^6 cells/μl), neutrophilia (35,100 cells/μl; normal, 5,400 to 15,300 cells/μl), a normal differential cell count, and a mild toxic change in the neutrophils. Serum biochemical analysis revealed high total protein (8.3 g/dl; normal, 5.8 to 7.9 g/dl) and albumin concentrations (4.7 g/dl; normal, 2.6 to 4.0 g/dl), supporting the dehydration apparent on physical examination, as well as increases in alkaline phosphatase activity (187 U/L; normal, 3 to 60 U/L), and concentrations of phosphorus (8.1 mg/dl; normal, 2.5 to 6.2 mg/dl), amylase (1,234 U/L; normal, 220 to 1,070 U/L), and lipase (1,119 U/L; normal, 0 to 600 U/L). Potassium (3.0 mEq/L; normal, 3.8 to 5.1 mEq/L) and chloride concentrations (103 mEq/L; normal, 109 to 122 mEq/L) were low, consistent with anorexia and vomiting, respectively.

Abdominal radiography revealed a soft tissue dense mass within the stomach. A diagnosis of gastric foreign body was made (Fig 1). A gastrogram was planned for the next morning.

The dog's condition was stable throughout the evening, but became acutely worse the next morning precluding the planned gastrogram. The dog was vomiting large quantities of frank blood every 20 minutes. An exploratory celiotomy and gastrotomy were performed immediately. At surgery, approximately 75% of the stomach was black, 15% diffusely hyperemic, and the remaining 10% (near the cardia) normal. The pylorus, proximal portion of the duodenum, and pancreas were inverted into the body of the stomach. Gastrotomy revealed a cervix-like projection into the lumen of the stomach. The intussusception was not reducible. The dog was euthanatized because of extensive gastric necrosis and poor prognosis.

Gross postmortem findings were consistent with those found at surgery. Lesions were not found to cause the intussusception. The pyloric valve appeared to be normal. A line of demarcation was demonstrable in the gastric mucosa between necrotic and more normal-appearing mucosa, although the stomach did not appear normal. Portions of the gastric wall were 2-cm thick from submucosal edema and hemorrhage. Minimal centrilobular hepatocellular degeneration and focal glomerular sclerosis were evident. An adenoma was found in the right adrenal gland. Unclotted blood was found in the oral cavity, thorax, and abdominal cavity. The dog had bled extensively from a 25-gauge needle venipuncture at the time of anesthetic induction. This pattern of hemorrhage was similar to that found in cases of disseminated intravascular coagulation. Antemortem documentation of disseminated intravascular coagulation had not been confirmed by coagulation profile.

Small intestinal intussusception develops most often at the ileocecal junction of animals <1 year old.[1] Most cases of intussusception are of unknown origin.[2,3] Internal parasitism, bacterial or viral enteritis, neoplasia, or other conditions associated with increased intestinal motility have been implicated in causing small intestinal intussusceptions. Gastroesophageal intussusceptions also have been reported in young dogs. The cause of gastroesophageal intussusceptions is unknown, but a functional disorder of the gastroesophageal or esophageal phase of swallowing is thought to have a role in the disease.[4] Duodenogastric intussusceptions are extremely rare, probably because of the presence of a competent pyloric sphincter. The

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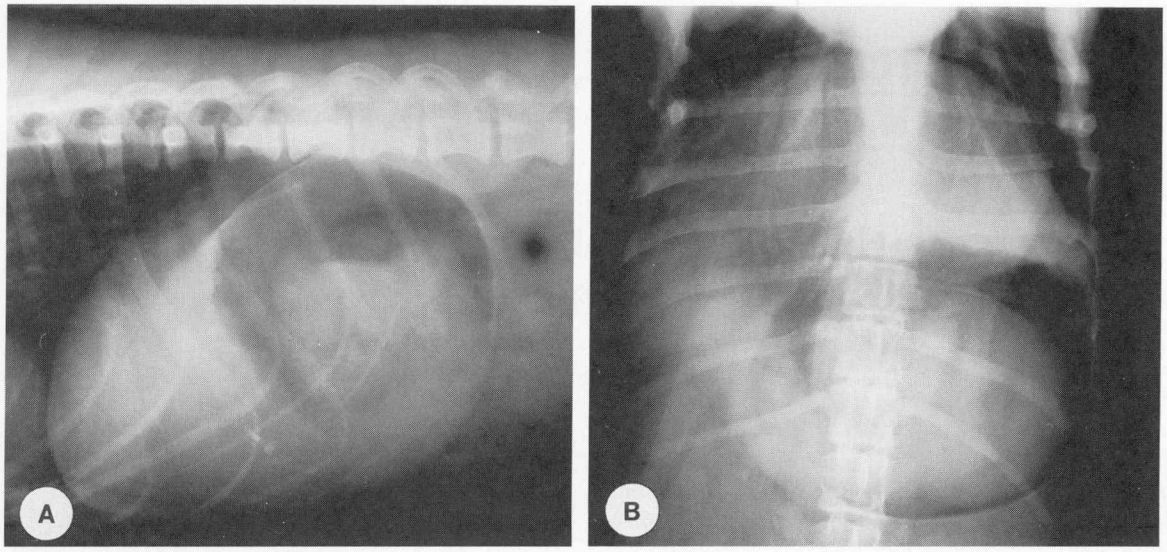

Figure 1—Lateral (A) and ventrodorsal (B) radiographic views of abdomen of a dog with a duodenogastric intussusception. Notice the soft tissue density within the lumen of the stomach that appears to be a gastric foreign body.

pyloric valve appeared normal in this dog. Apparent pylorogastric intussusception was described in a 2-year-old Old English Sheepdog.[5] A gastric foreign body also was diagnosed tentatively by radiography in that dog as it was in the dog of this report. In this case, a contrast gastrogram would have helped to further define the lesion seen on plain radiography. Contrast studies were performed in the Old English Sheepdog, but did not aid in establishing the correct diagnosis of pylorogastric intussusception. Gastroscopy would be helpful in establishing this diagnosis, but could not be performed in this dog because of its rapidly declining status. Although rare, duodenogastric intussusception should be considered in cases of apparent gastric obstruction secondary to gastric foreign bodies. The cause of this duodenogastric intussusception could not be determined during surgery or at necropsy.

1. Rosin E. Small intestines, surgical diseases. In: Slatter DH, ed. *Textbook of small animal surgery*. Philadelphia: WB Saunders Co, 1985;748–749.

2. Strombeck DR. *Small animal gastroenterology*. Davis, Calif: Stonegate Publishing, 1979;295.

3. Richter KP. Diseases of the large bowel. In: Ettinger SJ, ed. *Textbook of veterinary internal medicine*. 3rd ed. Philadelphia: WB Saunders Co, 1989;1416.

4. Hoffer RE. Esophagus, surgical diseases. In: Slatter DH, ed. *Textbook of small animal surgery*. Philadelphia: WB Saunders Co, 1985;675.

5. Marks DL. Canine pylorogastric intussusception. *VM SAC* 1983;78:677–680.