

Demonstration of the Diagnostic Value of Left and Right Lateral Radiographs in the Assessment of Gastric Foreign Bodies

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CASE HISTORY

A 15-month-old male neutered English Bulldog presented for evaluation of acute vomiting and anorexia. The owner reported finding a piece of a blanket in the vomitus which the patient had previously torn up. Findings on physical examination were unremarkable except for pain on abdominal palpation. Radiographs of the abdomen were obtained (Figure 1).

Diagnostic Imaging Findings and Interpretation

Right lateral and ventrodorsal radiographs of the abdomen revealed a normally positioned severely distended stomach containing fluid and gas. In addition, there was a distended loop of intestine oriented in a sagittal direction immediately right of midline in the cranial abdomen on ventrodorsal projection containing linear non-homogeneous soft tissue opaque material. A similar loop of bowel could be seen on the lateral image dorsal to the stomach. These findings are considered consistent with a proximal small intestinal obstruction; however, concurrent pyloric outflow obstruction and/or gastric functional ileus could not be ruled out (Figure 2).

FURTHER STEPS

For further evaluation, diagnostic options include a left lateral abdominal radiograph, upper gastrointestinal contrast study with positive or negative contrast, ultrasonography, endoscopy or surgery.

A left lateral abdominal radiograph revealed a well cir-

cumscribed tubular soft tissue structure surrounded by gas present within the pylorus and extending into the proximal duodenum (Figure 3).

TREATMENT AND OUTCOME

A diagnosis of mechanical obstruction of the pyloric outflow and proximal duodenum with foreign material was made on the basis of radiographic findings. An exploratory laparotomy was performed, and cloth blanket material was removed via gastrotomy and duodenotomy. The patient recovered without complication and was discharged from the hospital the following day. The dog was reported to be doing well at home 1 month following the procedure.

DISCUSSION

Dogs with gastrointestinal foreign bodies are common in small animal practice. Clinical signs can be variable, and often include vomiting, lethargy, decreased appetite and abdominal pain, and can be more severe in patients with linear foreign bodies than non-linear foreign bodies (1). Gastric foreign bodies have been reported to account for 16-50% of non-specific gastrointestinal foreign bodies. Linear foreign bodies account for approximately 36% of all foreign bodies, with the pyloric outflow being the most common site of anchor (1, 2). In this case, fluid and gas distention of the stomach on the initial two views is most consistent with functional disease or mechanical pyloric outflow obstruction. Attempting to differentiate gastric foreign bodies from functional disease such as pancreatitis, gastritis, or dysautonomia can be chal-

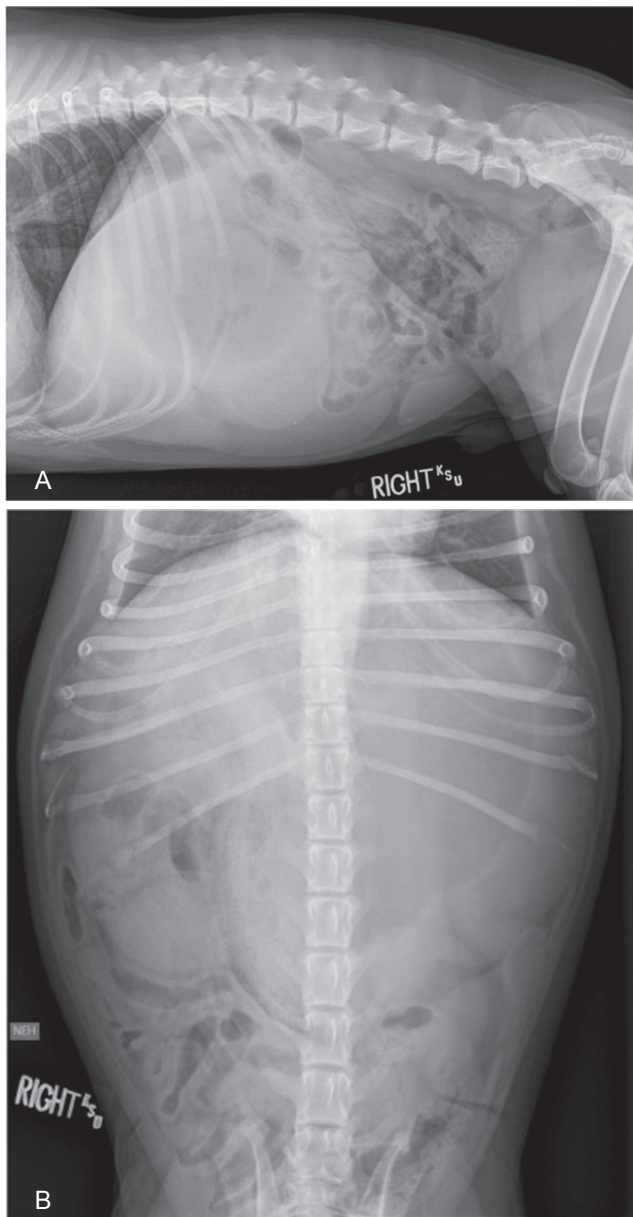


Figure 1: Right lateral (A) ventrodorsal (B) radiographic views of the abdomen of a 15-month-old male neutered English Bulldog evaluated because of acute vomiting and anorexia.

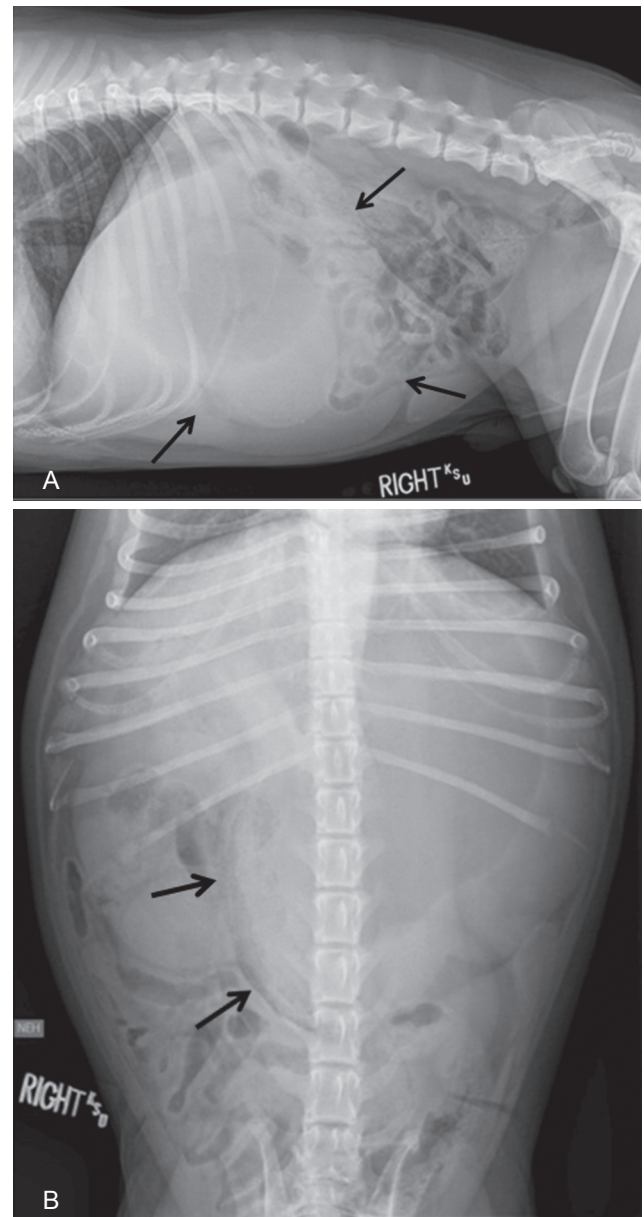


Figure 2: The same radiographic images as in Figure 1. A – A severely fluid and gas distended stomach (arrows) is suggestive of a mechanical or functional gastric outflow obstruction. B – Linear soft tissue opacity material is located within a distended loop of small intestine (arrows) suggestive of a small intestinal foreign body.

lenging, and can be aided by obtaining both right and left lateral abdominal views. Fluid and gastric contents move to the dependent portion of the stomach, and gas will rise to the non-dependent portion of the stomach. Obtaining left and right lateral views allows this gas to be used as negative contrast to assess different regions of the stomach. If insufficient gas is present, a pneumogastrogram can be performed by administering additional air via an orogastric tube (3, 4).

This can enhance visualization of gastric content by providing negative contrast. In this case, on the left lateral projection, gas fills the pylorus enabling identification of the pyloric outflow tract obstruction with foreign material extending into the duodenum. Gastrography with positive contrast, such as barium sulfate, can also be considered when evaluating gastric

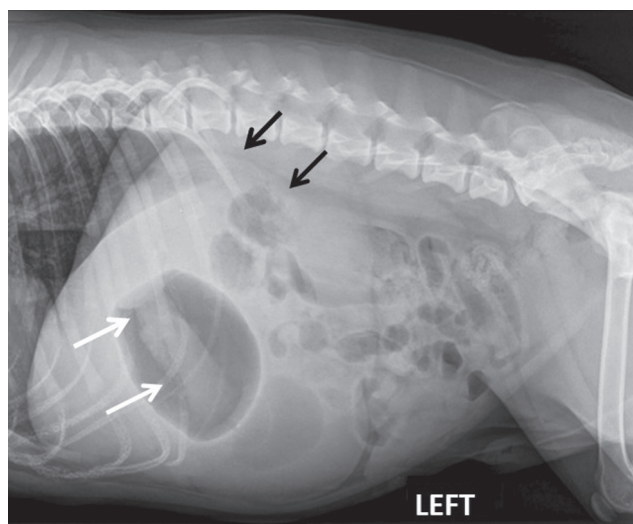


Figure 3: On the left lateral radiographic view (C) gas is positioned in the pylorus providing contrast to allow for identification of linear soft tissue opaque material extending from the pylorus (white arrows) into the duodenum (black arrows).

foreign material. The appearance of foreign material can be variable and may create a filling defect or, in some cases, absorb contrast and be better visualized once the stomach has emptied. Smaller volumes of contrast may be beneficial in outlining certain objects that can be obscured by larger volumes typically used in upper gastrointestinal studies (5). If the patient is considered to be at risk of gastrointestinal perforation, non-ionic iodinated contrast should be considered. Leakage of barium into the peritoneal cavity can increase severity of peritonitis associated with gastrointestinal perforation, and hyperosmolar ionic iodinated contrast agents may cause influx of fluid into the gastrointestinal tract (6).

Abdominal ultrasonography has been shown to have a high sensitivity in detecting gastrointestinal foreign bodies and can provide additional information regarding peristalsis, integrity of bowel wall, changes in surrounding mesentery and presence of peritoneal effusions (7, 8). Visualization of gastric content with ultrasound can be limited by the presence of luminal gas. Gas artifact can be reduced and the acoustic window enhanced by adding water to the stomach (9).

Gastroscopy can be used to diagnose and in many cases remove gastric foreign material thus negating the need for surgery. It can also allow for assessment of esophageal and gastric mucosal surfaces and acquisition of biopsy samples if mural disease is suspect. Factors limiting the use of endoscopy may include cost, requirement of anesthesia, obstructed field of view by gastric content, limited small intestinal access, and failure to remove foreign material. Linear gastric foreign material extending into the small intestine can impede the successful removal via endoscopy, and often require gastrotomy (1).

In this case, abdominal radiographs including ventrodorsal and both left and right lateral projections provided an accurate diagnosis of a gastric foreign body with a linear component extending into the duodenum. This information was critical in determining surgery to be the best option for the successful treatment of this patient.

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