

## What Is Your Diagnosis?

In collaboration with the American College of Veterinary Radiology

### History

A 15-year-old 2.35-kg spayed female Siamese cat was referred because of a history of chronic intermittent vomiting that had progressed over a 7-month period from twice weekly to vomiting daily. The patient had a 1-month history of diarrhea, polydipsia, polyphagia, weight loss, and diffuse muscle wasting. Inflammatory bowel disease (IBD) was presumptively diagnosed 5 years earlier and was treated with a gastrointestinal supportive diet and prednisolone (0.75 mg/kg, PO, q 24 h), which moderately improved the frequency of vomiting. A CBC, serum biochemical profile, and measurement of thyroxine concentration were performed, and the abnormalities included mild anemia (30% [reference range, 36% to 60%]), high liver enzyme activities (aspartate aminotransferase, 81 U/L [reference range, 15 to 66 U/L]; alanine aminotransferase, 155 U/L [reference range, 12 to 118 U/L]), azotemia (BUN, 44 mg/dL [reference range, 6 to 31 mg/dL]; creatinine, 1.8 mg/dL [reference range, 0.5 to 1.6 mg/dL]), hypernatremia (159 mEq/L [reference range, 139 to 154 mEq/L]), hypokalemia (3.4 mEq/L [reference range, 3.6 to 5.5 mEq/L]), hyperchloremia (129 mEq/L [reference range, 102 to 120 mEq/L]), and low triglycerides concentration (26 mg/dL [reference range, 29 to 291 mg/dL]).

On physical examination, a body condition score of 2/9 was estimated, indicating the patient was substantially underweight with no discernable body fat and loss of muscle mass. Additionally, the small intestines were subjectively thickened on abdominal palpation. The rest of the findings on examination were within reference limits. Abdominal ultrasonography was performed (**Figure 1**).

**Formulate differential diagnoses, then continue reading.**

### Diagnostic Imaging Findings and Interpretation

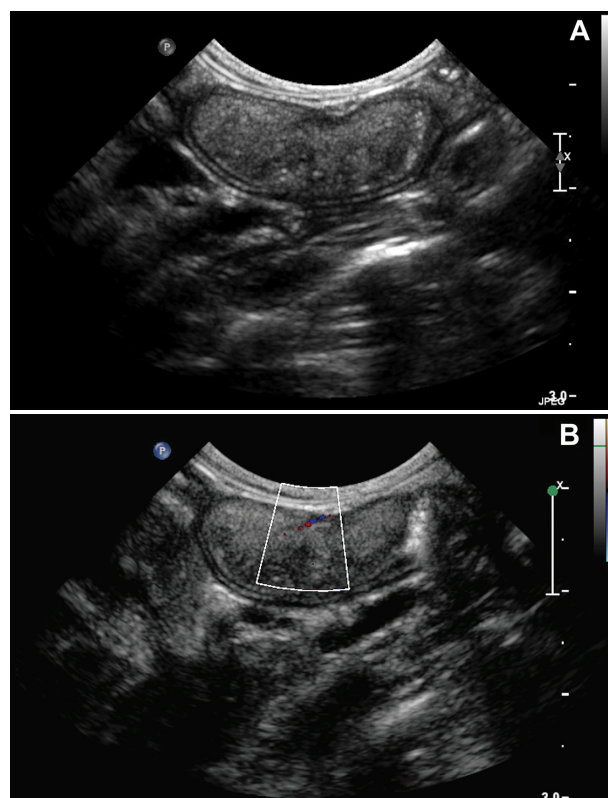
On abdominal ultrasonography, an ovoid and broad-based intraluminal nodule (approx 1 X 2.5

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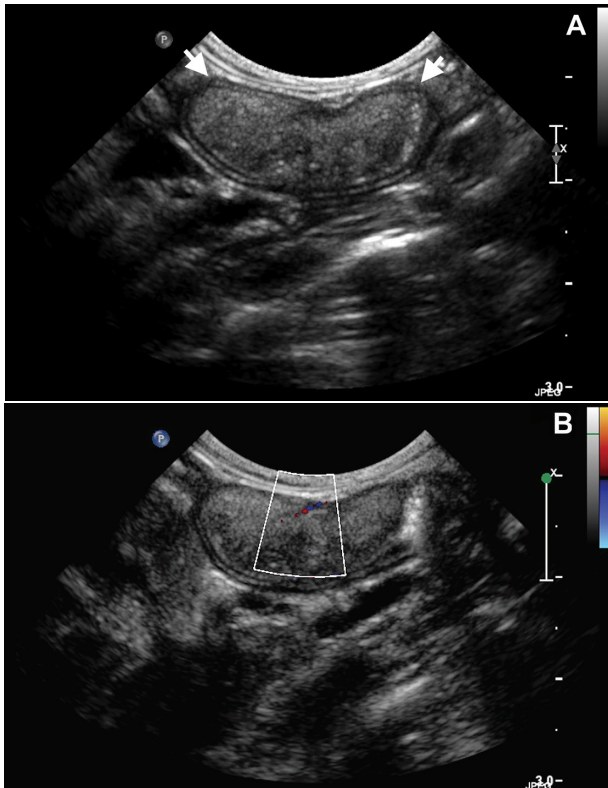
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**Figure 1**—Sagittal plane 2-D (A) and color-flow Doppler (B) ultrasonographic images of the midjejunum of a 15-year-old 2.35-kg spayed female Siamese cat referred because of chronic progressive vomiting, diarrhea, polydipsia, polyphagia, and weight loss. The scale toward the right in both images is in centimeters.

X 1 cm) was identified within the midjejunum (**Figure 2**). The lesion was heterogeneously hyperechoic, and the broad-based aspect was confluent with the mucosal layer making the mucosal layer partially to completely indistinct. The lesion occupied the entire jejunal lumen at this level and was associated with segmental small intestinal dilation, compared with the remainder of the small intestine. The remainder of the small intestines was characterized by diffuse mucosal hyperechogenicity with varying degrees of severity. Additionally, within the gastric lumen at the level of the lesser curvature, an intraluminal, heterogeneously hyperechoic mass effect was noted and appeared to arise from the gastric mucosa.



**Figure 2**—Same ultrasonographic images as in Figure 1. A—There is a broad-based ovoid intraluminal mass-like lesion (arrows) occupying the entire lumen at this site in the midjejunum. The lesion is heterogeneously hyperechoic and measures 1 X 2.5 cm in this image. B—Color-flow Doppler ultrasonography shows that this intraluminal structure is vascularized (red and blue areas).

Differential diagnoses for both the jejunal and gastric mass-like lesions included malignant neoplasia (eg, round-cell neoplasia), adenomatous hyperplasia, or feline gastrointestinal eosinophilic sclerosing fibroplasia. Gastritis or an adenomatous polyp were considered less likely differential diagnoses for the gastric wall changes. The mild diffuse small intestinal changes were most consistent with IBD or small-cell lymphoma. An additional ultrasonographic finding was indistinct renal corticomedullary margins with a generalized hyperechoic appearance to the renal parenchyma, indicating a chronic nonspecific nephropathy.

## Treatment and Outcome

The patient underwent exploratory laparotomy for resection and anastomosis of the midjejunal mass and biopsies of the liver, a jejunal lymph node, the small intestine in an area unrelated to mass, and the gastric wall from the area affected with the gastric mass-like lesion. The liver and lymph node biopsies were performed primarily for potential staging purposes regarding the suspected neoplasia related to the gastric and jejunal mass-like lesions as well as for possible small-cell lymphoma.

Histologic findings indicated that the intraluminal jejunal lesion exhibited features of a hybrid mix-

ture of gastric pyloric mucosa and duodenal mucosa. The epithelium formed elongated papillary folds and glands as well as frequent differentiation of goblet cells. This was interpreted as an epithelial polyp associated with an area of ectopic gastric mucosa that was cured by excision.

Regarding the other samples, findings for the gastric lesion indicated mild lymphoplasmacytic gastritis, and findings for the jejunal lymph node were consistent with reactive hyperplasia. In addition to the ectopic gastric mucosal polyp, the small intestines displayed considerable infiltration by mature lymphocytes, indicating alimentary small-cell lymphoma. Oncological and maintenance treatments included prednisolone (2 mg/kg, PO, q 24 h), chloramibucil (0.83 mg/kg, PO, q 72 h), and ondansetron (0.42 mg/kg, PO, q 12 h).

## Comments

Choristoma, or heterotopy, is a growth of mass-like lesions composed of normal tissue and cellularity that form in ectopic regions of the body.<sup>1</sup> In the intestinal tract, this condition most commonly involves gastric or pancreatic tissue and in this specific case is classified as gastric heterotopy.<sup>2,3</sup> The exophytic masses occur on the antimesenteric side of the mucosal surface and are more commonly focal lesions. As in this case, ultrasonography was utilized to identify the focal, mass-like intraluminal structure within a small intestinal segment. Ultrasonography was integral in determining that the interface between the lesion and the mucosal layer was indistinct, thus strongly suggesting confluence between the lesion and the mucosa. In agreement with these findings, on histology, some of the tissue architecture was structurally similar to normal gastric mucosa. Furthermore, with the use of ultrasonography, we determined that the lesion was not associated with the other wall layers and that there was an absence of alteration in the submucosal, muscularis, and serosal layers.

It is undetermined whether the origin of this process in animals is related to a congenital condition, acquired, or spurious due to the minute number of reported cases. It is thought that this condition could potentially result in symptomatic or asymptomatic cases.<sup>2</sup> In our patient, ultrasonographic findings indicated that the ectopic mucosal lesion occupied almost the entire small intestinal lumen and could have acted as a partial mechanical obstruction, causing chronic vomiting. Despite these findings, another inciting factor, including the presumed IBD or concurrently diagnosed alimentary small-cell lymphoma, cannot be ruled out as the primary cause of the clinical signs.

Scintigraphy, using pertechnetate (Tc 99m) as a radioindicator, is another imaging modality that may be advantageous in identifying regions of ectopic gastric mucosa.<sup>4</sup> In human medicine, scintigraphy of the abdomen with pertechnetate has been shown to be a reliable indicator of the presence of ectopic gastric mucosa.<sup>4</sup> Tc 99m pertechnetate is taken up by

goblet cells, which line normal gastric mucosa, and is then excreted into the stomach as well as the intestinal lumen in these cases.<sup>4,5</sup> The focal expression of radioactivity can be evaluated on scintigraphy, and areas of ectopic gastric mucosa can be identified. If ectopic gastric mucosa is suspected in a veterinary patient and scintigraphy is available, then it could be a valuable noninvasive diagnostic tool.

## References

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