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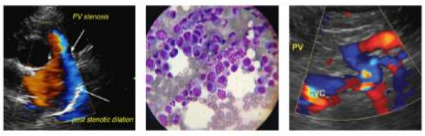

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Clinical Sonography & Telecytology
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**PATIENT**
Moira Rose Schneider

**SPECIES**
Feline

**BREED**
DSH

**SEX**
Spayed Female

**AGE**
2 Years

**WEIGHT**
9 Pounds

**INTERPRETED BY**
Lisa Carioto, DVM, DVSc, Diplomate ACVIM

**IMAGING PERFORMED BY**
Amy Mayhew, LVT

**HOSPITAL NAME**
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**INVOICE**
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## PRESENTING CLINICAL SIGNS

Anorexia, weight loss
Abnormal PE/Chem/CBC/UA Results: Labs - Intestinal Inflammation, Folate - high (22.2 - Increased serum folate is seen in patients with EPI and/or small intestinal bacterial overgrowth) **See attached labs for review

## ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

### *Urinary System*

The urinary bladder is well distended. The wall is smooth and regular. No abnormalities are present with the trigone or proximal urethra. A moderate amount of free floating sediment is present, however, there is no evidence of cystoliths, polyps or a mass.

**Kidneys**

The **left** kidney measures 3.21 cm (3.80-4.40 cm). Although it is decreased in size, all other characteristics are within normal limits, therefore, the measurement may be within normal limits for Moira. The capsule is smooth. Its overall architecture, including the definition of the cortico-medullary junction, are preserved. There are no signs of nephroliths or pyelectasia. The surrounding mesentery is not hyperechoic.

The **right** kidney measures 3.54 cm (3.80-4.40 cm). Findings are similar to the left.

**Aortic bifurcation/trifurcation**

No abnormalities observed.

### *Adrenal Glands*

The **left** adrenal gland measures 0.34 cm in diameter. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

The **right** adrenal gland measures 0.35 cm in diameter. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

### *Spleen*

The spleen is within normal limits in size 6.95 mm (normal = 10 mm), echotexture, and echogenicity. The capsule is smooth. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

### *Liver*

There are no obvious signs of hepatomegaly and its borders are smooth and sharp. The liver's echotexture is homogeneous. Subjectively, it is mildly hyperechoic, however, it remains hypoechoic to the falciform fat. Focal lesions are not observed. No abnormalities are observed with the hepatic vessels visualized.

The gallbladder wall is within normal limits in thickness and echogenicity. A trivial amount of echogenic material is present within the GB. The portions of the cystic and common bile ducts observed are not dilated or tortuous, i.e. there are no signs of an obstruction.

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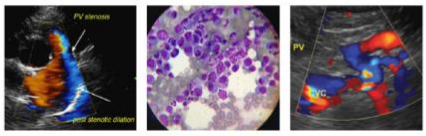

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### *Gastrointestinal*

The gastric wall is within normal limits in thickness and the wall layers are well defined. No obvious abnormalities are observed with its peristalsis.

Mild corrugation of the duodenum is present, however it is within normal limits with regard to its measurement and definition of wall layering.

Fogging of the mucosa and muscularis of the small intestines is present, as well as a mildly prominent submucosa. Other loops of the small intestine show a thickened muscularis and mildly prominent submucosa. The mesentery surrounding the GI tract is moderately hyperechoic.

No abnormalities are noted with the ileo-cecal-colic junction (ICCJ), however, the intestines surrounding the ICCJ have thickening and fogging of both the mucosa and muscularis layers.

Abnormally dilated loops of bowel are not observed. No obvious abnormalities are observed with its peristalsis.

The colonic wall is not thickened and mural detail is considered normal.

There are no obvious signs of a mass, foreign body, infiltrative disease or an obstruction in the gastrointestinal tract.

### *Pancreas*

The **left limb** is diffusely hypoechoic, but mildly heterogeneous compared. Multiple, pinpoint and small punctate, hyperechoic foci are noted dispersed haphazardly throughout the parenchyma. The mesentery surrounding the pancreas is mildly hyperechoic.

The **body** and **right limb** are also diffusely hypoechoic, but homogeneous. The mesentery surrounding the pancreas is not hyperechoic.

**Other**

**Lymph nodes**

No abnormalities are observed

**Abdominal effusion** is not visualized.

## ULTRASONOGRAPHIC FINDINGS

- The gastrointestinal abnormalities observed are subtle and somewhat subjective. They may be caused by inflammation due to inflammatory bowel disease, including a food intolerance. There is no evidence of neoplasia. Moira's folate concentration is compatible with dysbiosis.
- The very mild and diffuse hyperechogenicity of the liver may be due to subclinical hepatic lipidosis secondary to hyporexia. Other differential diagnoses, such as cholangitis/cholangiohepatitis cannot be excluded.
- The presence of sludge in the gallbladder is most likely clinically insignificant, however, secondary bacterial infections ascending from the gastrointestinal tract may occur and some patients may show clinical signs of gastroesophageal reflux disease (GERD), therefore, obtaining a history regarding signs of GERD from the client is suggested. Treatment with an anti-acid, proton pump inhibitor for a 10-14 days may be required depending on the patient's history.
- It is uncommon to see hyperechoic punctate and pinpoint foci in young animals, such as Moira's left limb. However, one cannot ignore the diffuse hypoechogenicity of the pancreas. A low

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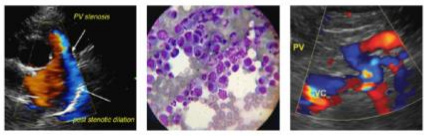

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grade, smoldering pancreatitis cannot be excluded, despite the spec fPL within the normal reference range.

- The above sonographic abnormalities are subtle, but are suggestive of "triaditis" and the elevated folate is compatible with dysbiosis.
- The free floating sediment within the lumen of the urinary bladder is most likely composed of mucus, crystalline material and exfoliated cells. The debris is likely clinically insignificant given the lack of inflammatory changes to the bladder wall, however, findings should be correlated with clinical signs and a urinalysis.
- Although both kidneys are mildly decreased in size, all other characteristics are within normal limits, therefore, the measurement may be within normal limits for Moira. Findings should be correlated with clinical signs, blood work, including a SDMA and a urinalysis.

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Fine needle aspirates of the liver and pancreas, or biopsies of the liver, pancreas and gastrointestinal tract would be required to obtain a definitive diagnosis. These may be achieved via abdominal ultrasound guided FNA and endoscopy, laparoscopy or exploratory laparotomy. The latter being the most invasive.

Obtaining a history regarding signs of GERD from the client is suggested. Treatment with an anti-acid, proton pump inhibitor for a 10-14 days may be required depending on the patient's history.

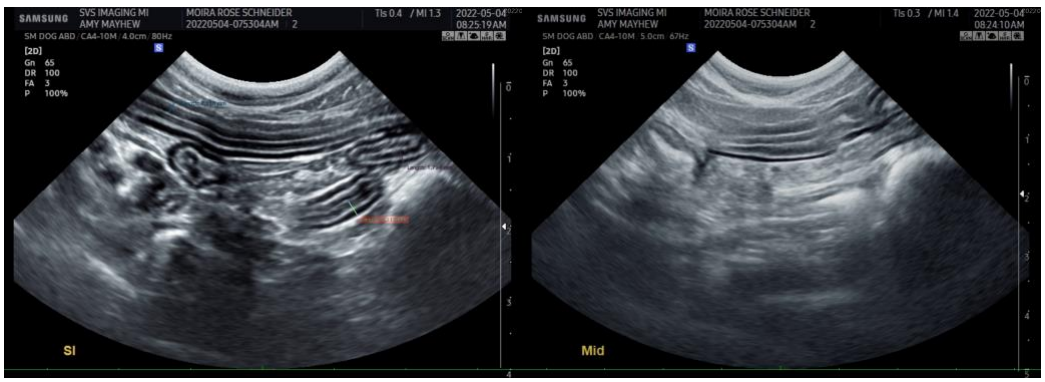
Analgesia for visceral pain, such as buprenorphine, is suggested.

Treatment with a synbiotic (combined product consisting of a probiotic and prebiotic) may be considered. Another option is the Hill's Biome diet. However, it is very difficult to obtain due to backorders.

A veterinary prescription brand hypoallergenic diet, whether hydrolyzed or novel protein, may be tried. Multiple diets may be required, including only canned food, as some individuals cannot digest dry. The kibble may be soaked if an all canned diet is cost prohibitive.

Small, frequent meals are recommended.

If there is no improvement with the above treatment suggestions, further diagnostics or empirical therapy for cholangitis/cholangiohepatitis is recommended.



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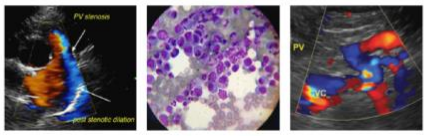



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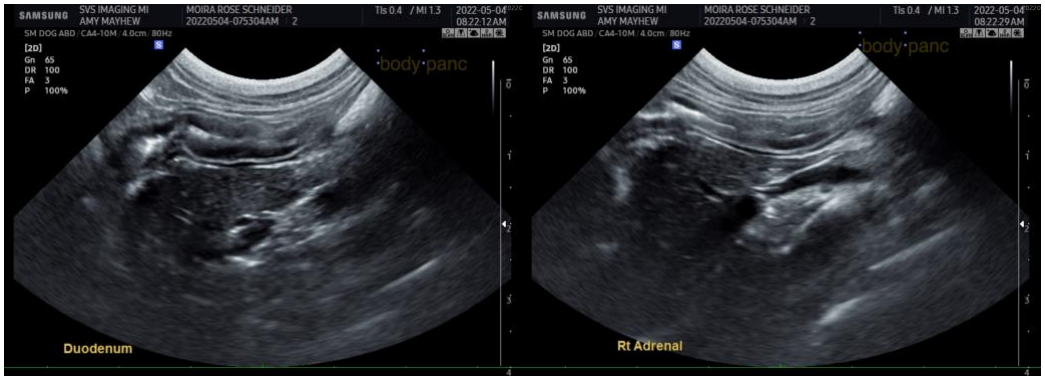


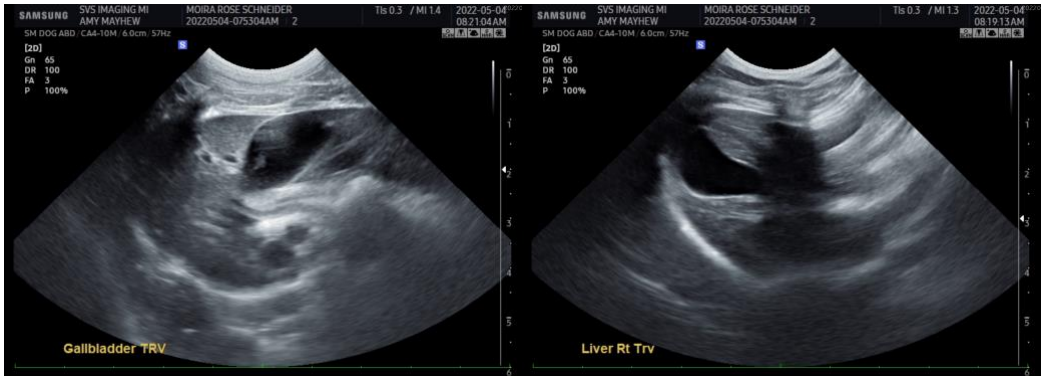


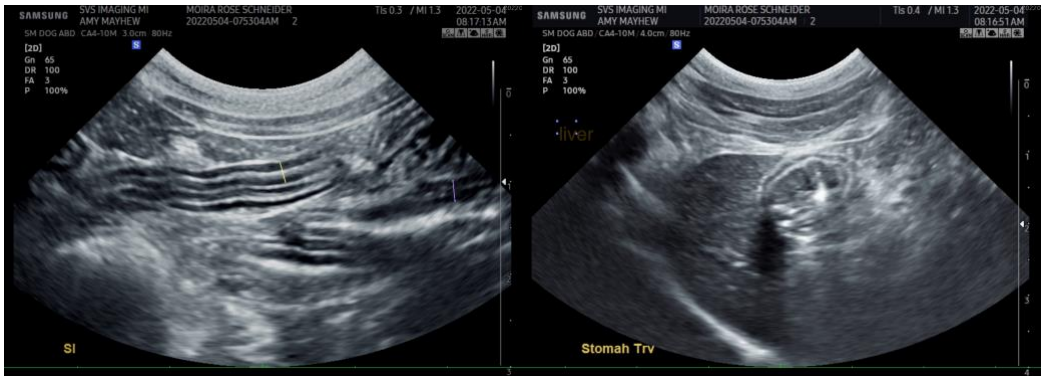


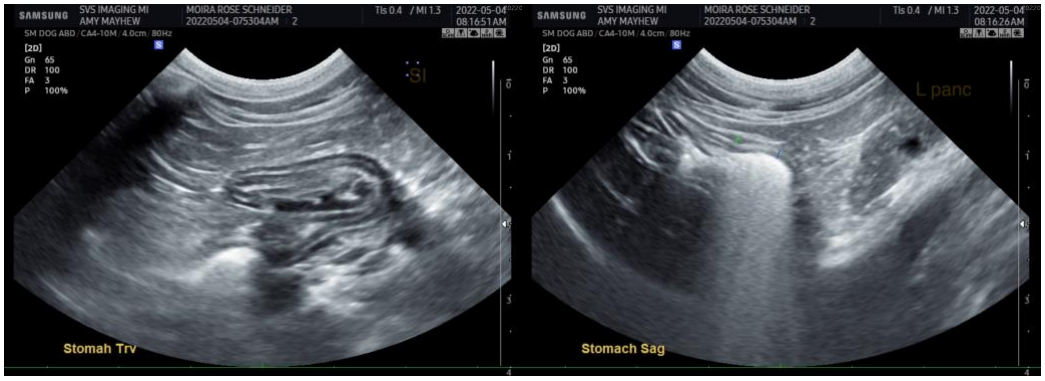

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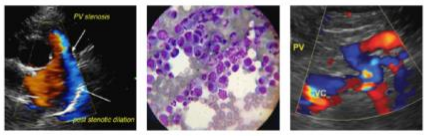

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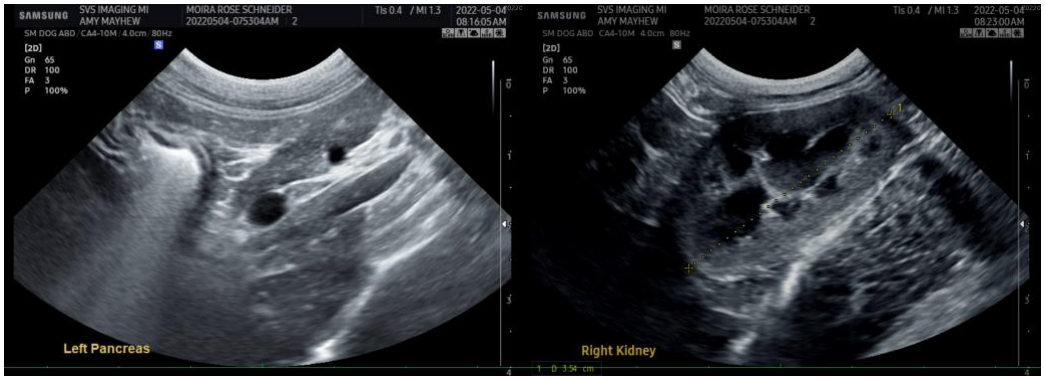


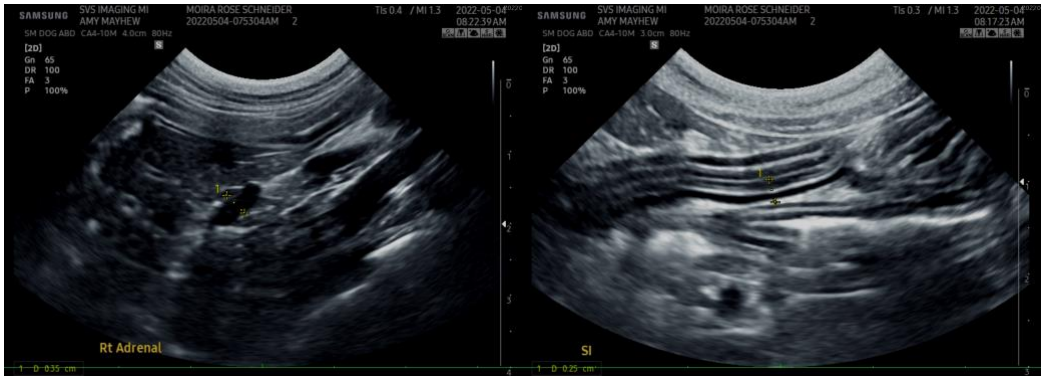


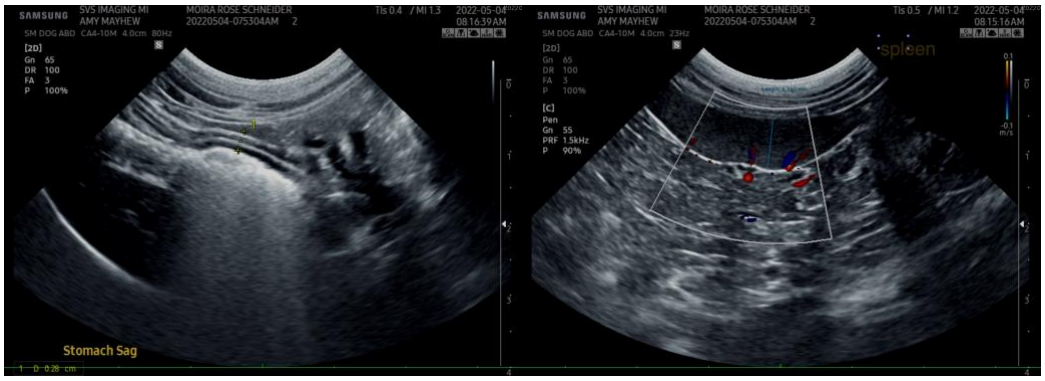


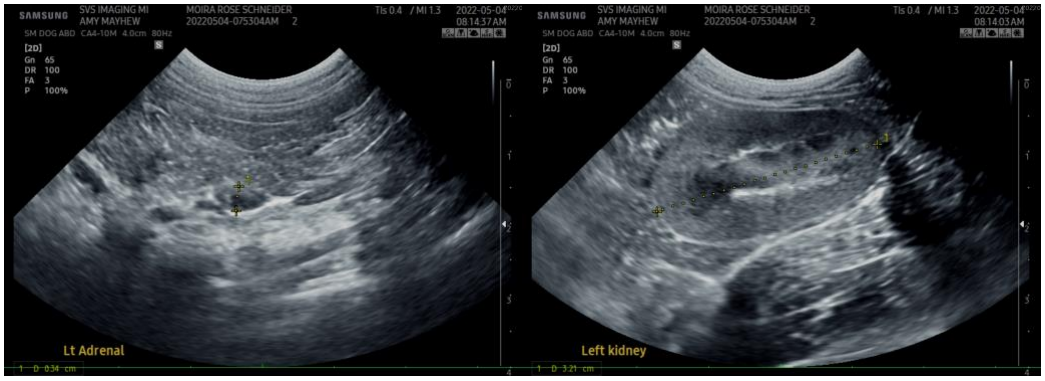

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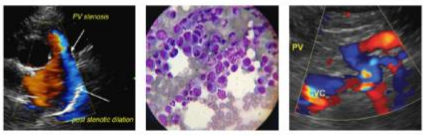

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**The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

**Lisa Carioto, DVM, DVSc, Diplomate ACVIM**

Lisa.Carioto@sonopath.com