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Clinical Sonography & Telecytology
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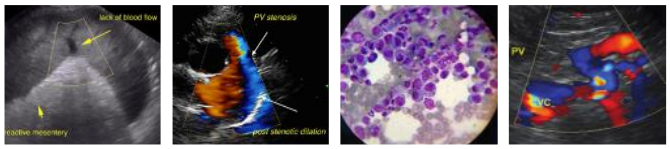


SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Maggie Vaughters

SPECIES
Canine

BREED
Jack Russell X

SEX
Spayed Female

AGE
13 Years

WEIGHT
22 Pounds

INTERPRETED BY
Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY
Emily Kirk

HOSPITAL NAME
Shiloh AH

REFERRING VET
Dr. Shana Silverstein

INVOICE
37493

DATE
5/6/22

PRESENTING CLINICAL SIGNS

Intermittent vomiting over last week or so, multiple times in one day yesterday, seeking grass. Relatively decent interest in food.
Abnormal PE/Chem/CBC/UA Results: ALT 770, ALP 476, GGT 16, SDMA 19, BUN 45 (Creat wnl 1.5); cPL Pending

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 trivial amount of free floating sediment is present. There is no evidence of cystoliths, polyps or a mass.

Kidneys

The **left** kidney measures 4.16 cm (decreased in size for Maggie's weight). The cortex is hyperechoic (i.e. isoechoic to the spleen). The capsule is moderately irregular, which is caused by a depression present on the antimesenteric border of the capsule. A mild to moderate loss of the normal definition of the cortico-medullary junction is present. Mineralizations of the diverticulae and pelvis are present, without evidence of pyelectasia. A nephrolith (4.75 mm) is present. An accumulation of intrapelvic fat is noted. The surrounding mesentery is mildly hyperechoic.

The **right** kidney measures 4.87 cm (low end of normal reference range for Maggie's weight). The cortex is hyperechoic (i.e., it is hyperechoic to the liver). The capsule is severely deformed by a large depression present on the antimesenteric border of the capsule. A moderate loss of the normal definition of the cortico-medullary junction is present. Mineralizations of the diverticulae and pelvis are present. A nephrolith, measuring 6.35 mm is observed within the pelvis, in addition to pyelectasia. The pelvis measures 4.9 mm. The surrounding mesentery is mildly hyperechoic.

Aortic bifurcation/trifurcation

No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.67 cm in diameter. It is mildly enlarged for a dog of Maggie's stature. A very mild heterogeneous echotexture is present, with both hypo and hyperechoic areas, which may be due to nodular hyperplasia and fibrosis, fat, and/or mineralization. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

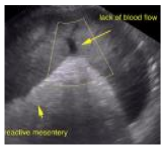
The **right** adrenal gland measures 0.56 cm at the cranial pole, 0.59 cm at the caudal pole and 1.51 cm in length. The caudal pole is at the high end of the normal reference range. It is "plump", however, no abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

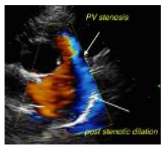
Spleen

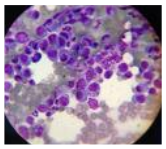
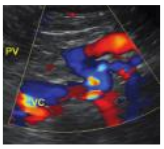
The spleen is within normal limits in size, architecture and echogenicity. Multiple hypo to anechoic nodules of verbal size are observed at the head. Two of them are subcapsular; they do not affect the integrity of the capsule. They do not appear cavitary.

Examples of measurement:

- Dorsal aspect, subcapsular, 2.68 mm diameter x 2.65 mm in length





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- At head, subcapsular, 3.62 mm diameter x 3.35 mm in length
- Moving toward mid-body, slightly heterogeneous with echogenic regions, 4.33 mm diameter x 6.60 mm in length.

The capsule is smooth. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

Liver

Hepatomegaly is present. The liver's borders are smooth, but rounded. A moderately coarse to moth eaten echotexture is observed diffusely throughout the liver.

Left liver: A large mass that is relatively similar in echotexture to the "normal" parenchyma is observed. It has a coarse, moth eaten echotexture, with punctate, hyperechoic foci that are concentrated toward the center of the mass (at its "waist").

The mass appears bilobed and measures 6.26 cm in height. The dorsal "lobe" measures 4.72 cm in length and the ventral "lobe" measures 3.72 cm in length. In another view, the mass appears more elliptical and measures 6.27 cm in height x 5.14 cm in length. As the probe sweeps through the liver, the mass becomes oval in shape and has a similar echotexture the adjacent liver lobe. The mesentery surrounding the abnormal liver lobe is moderately to severely hyperechoic.

A mildly heterogeneous lobe is observed in another view, whereby hypo to anechoic lacunae are noted.

No abnormalities are observed with the hepatic vessels visualized.

The gallbladder (GB) is moderately distended with a moderate amount of free floating and inspissated echogenic material. The GB wall is within normal limits in thickness and echogenicity. The portions of the cystic and/or common bile ducts observed are not dilated or tortuous, i.e. there are no signs of an obstruction. The parenchyma surrounding the GB is hyperechoic.

Gastrointestinal

A large amount of fluid and gas are present within the lumen of the stomach, which is dilated. Peristalsis is decreased. Findings are consistent with an ileus. Although the gastric wall is within normal limits in thickness, the submucosa is moderately thickened. The mesentery surrounding the stomach is severely hyperechoic.

The duodenum measures 0.45 cm. The mucosa is more prominent than usual i.e. thicker than usual and fogging is present.

The small intestinal wall thickness, including the duodenum, is within normal limits and the definition of the wall layers is preserved. A large amount of gas and fluid are present within the small intestines. Decreased peristalsis is observed, i.e. a "to and fro" motion is noted.

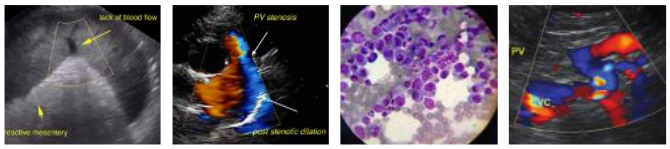
No abnormalities are observed with the ileo-cecal-colic junction.

The mesentery surrounding the small intestines is mildly hyperechoic.

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

Pancreas

No overt abnormalities are observed with the echogenicity or echotexture of the left limb. There is no evidence of hyperechogenicity of the surrounding mesentery, i.e., signs of active pancreatitis are not present.



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The right limb has a mildly coarse echotexture and is mildly hypoechoic compared to the surrounding mesentery. Overt signs of neoplasia are not appreciated, however, smoldering pancreatitis, in addition to age related changes cannot be excluded.

Other

Lymph nodes

No abnormalities are observed

Abdominal effusion is not visualized.

ULTRASONOGRAPHIC FINDINGS

- Hepatic masses, a single large mass, in addition to a couple of other smaller hepatic nodules, as well as a mass that has hypo to anechoic lacunae. It should be noted that target lesions are not observed. Differential diagnoses include a well differentiated adenocarcinoma, or multiple adenomas. A component of the coarse echotexture may be due to nodular hyperplasia and a reactive hepatopathy. A secondary bacterial infection ascending from the gastrointestinal tract cannot be excluded.
- The abnormalities observed with the stomach and duodenum are suggestive of inflammation and a mild to moderate ileus caused by the acute vomiting episodes Maggie recently experienced. A mild ileus of the small intestines is also present, which may be secondary to vomiting and possibly pancreatitis. Underlying inflammation, such as inflammatory bowel disease, may also be present depending on Maggie's history.
- The presence of sludge in the gallbladder may be clinically insignificant, however, some dogs 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 or ursodeoxycholic acid may be required depending on the patient's history.
- Smoldering pancreatitis, in addition to age related changes cannot be excluded. Overt signs of neoplasia are not appreciated.
- The splenic nodules observed are suggestive of nodular or lymphoid hyperplasia and extramedullary hematopoiesis. Neoplasia, such as lymphoma, mast cell or other round cell tumour, is considered less likely, but cannot be excluded.
- The diffuse hyperechogenicity of the mesentery is suggestive of steatitis secondary to gastrointestinal and possibly pancreatic inflammation.
- The left adrenal gland is mildly enlarged, while the right is at the high end of the normal reference range. These findings may be due to adrenal hyperplasia secondary to chronic illness, which is a form of stress.
- The moderate renal changes are multifactorial. They are most likely a combination of age related degeneration, mineralization and nephrolithiasis, as well as previous episodes of ischemia and infarcts based on their irregular capsules. Pyelonephritis cannot be excluded and both the mineralizations and nephroliths may act as a chronic nidus for infection.

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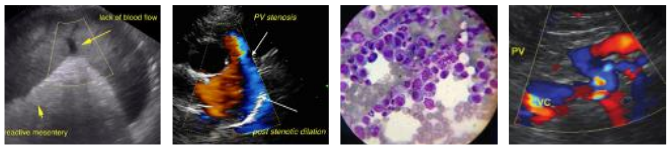

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

A fine needle aspirate (FNA) of the liver is recommended, however, it can be difficult for clinical pathologists to differentiate adenomas from well-differentiate adenocarcinomas and they will often recommend a tissue biopsy to evaluate the hepatic architecture.

A fine needle aspirate of the splenic nodules may be performed to confirm the suspicion of lymphoid or nodular hyperplasia or extramedullary hematopoiesis if FNAs of the liver will be performed.

Ideally, a coagulation profile is suggested prior to performing a FNA. Administration of vitamin K (0.5 mg/kg SQ q8-12h for 1-3 doses) is suggested even if the results of the PT/PTT are within normal limits.

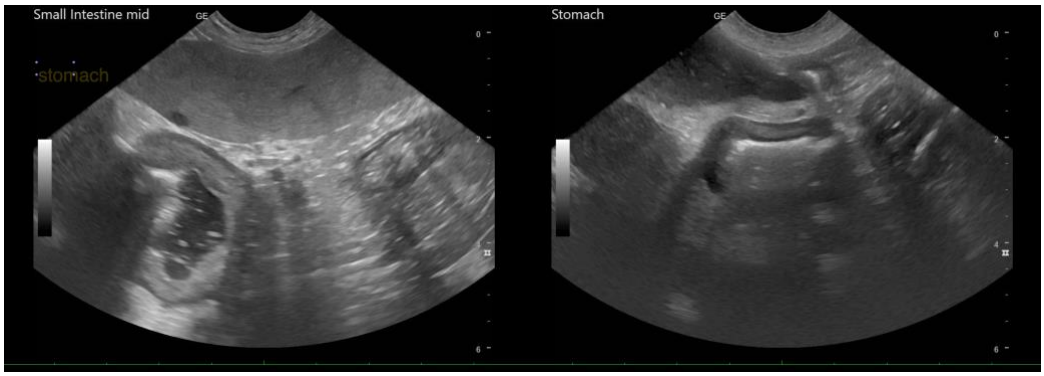
Obtaining a history regarding signs of GERD from the client is suggested. Treatment with an anti-acid, proton pump inhibitor or ursodeoxycholic acid may be required depending on the patient's history.

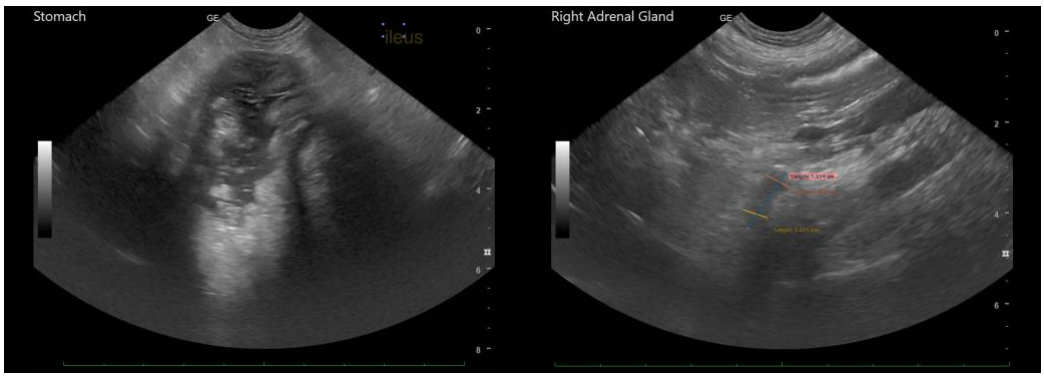
A urinalysis and urine culture and sensitivity are suggested due to the renal changes observed.

An arterial blood pressure are recommended to rule out hypertension associated with hyperadrenocorticism, ideally in the presence of the client to minimize the effects of stress.

Treatment for pancreatitis and gastritis is recommended, i.e., intravenous fluids and intravenous analgesics if possible. If hospitalization is not possible, subcutaneous fluids and oral analgesia should be prescribed, in addition to gastroprotectants and anti-emetics.

Once she is ready to eat, a bland, easily digestible, low fat, moderately restricted fibre diet is recommended to help decrease bloating and cramps.





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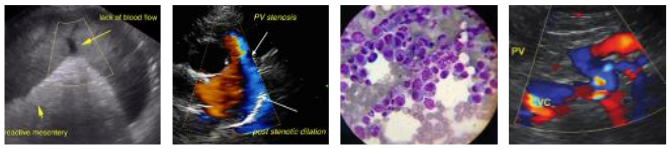

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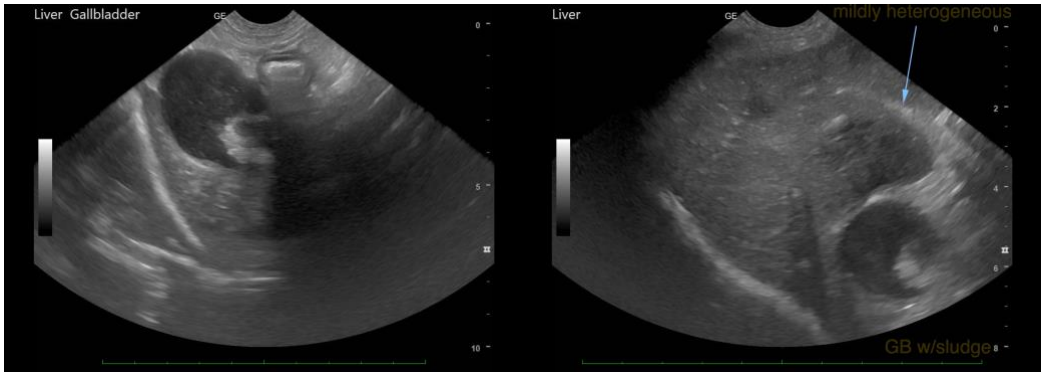

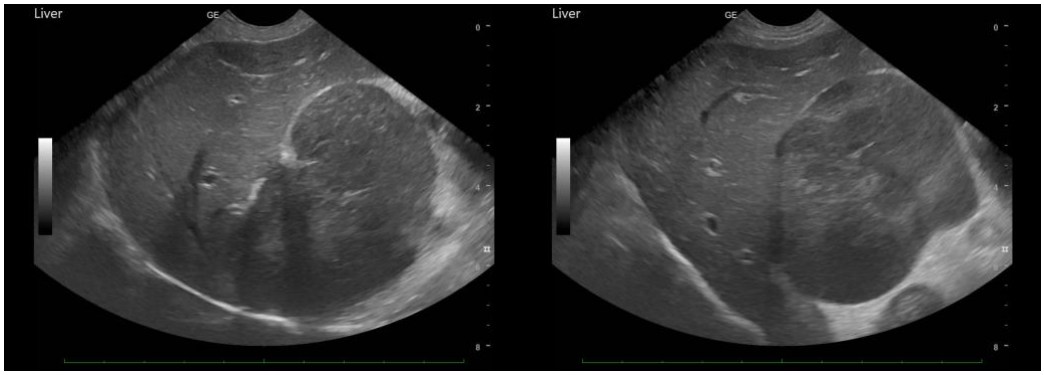

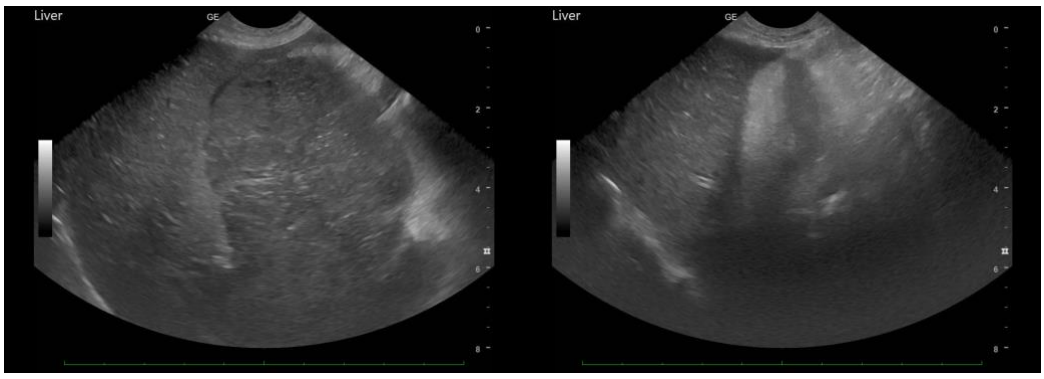

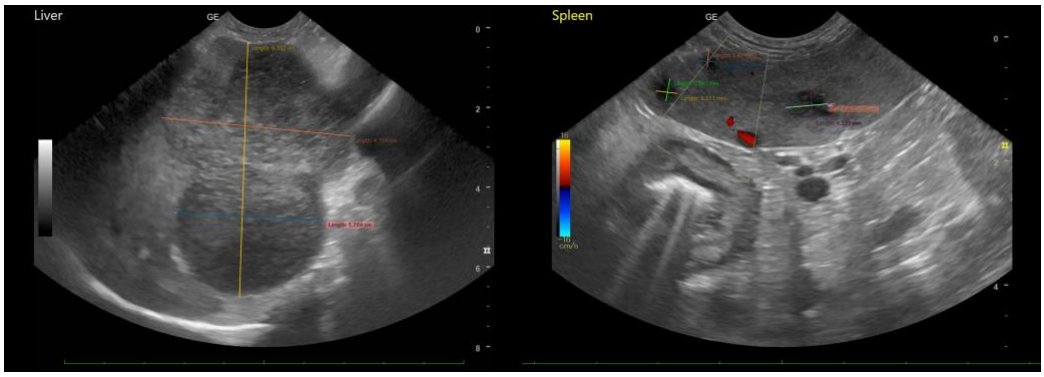

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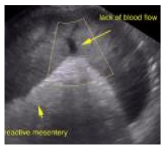
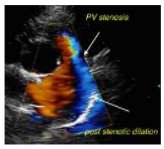
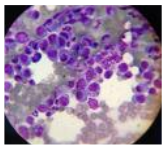
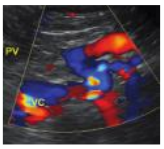

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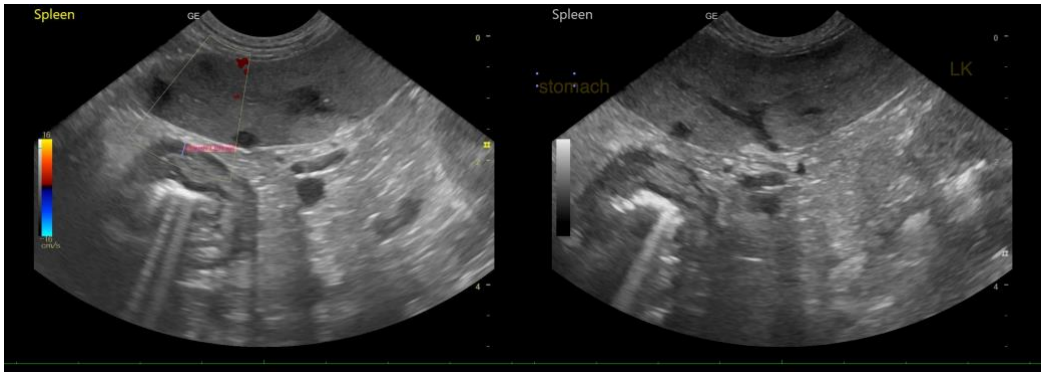

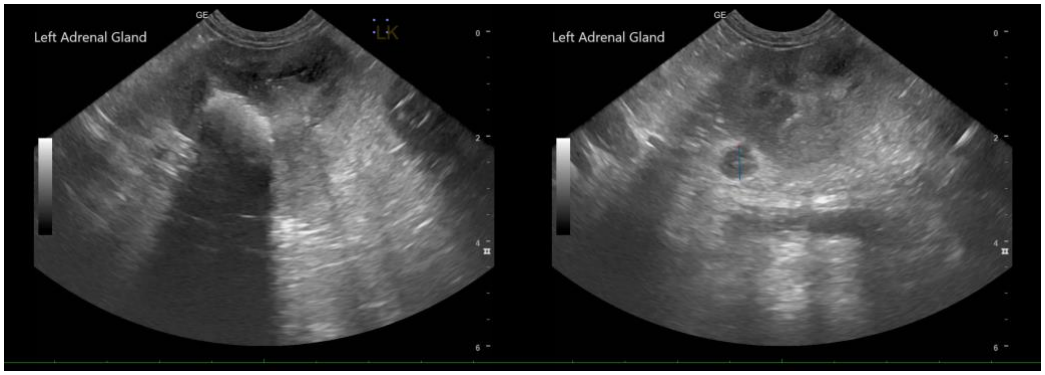

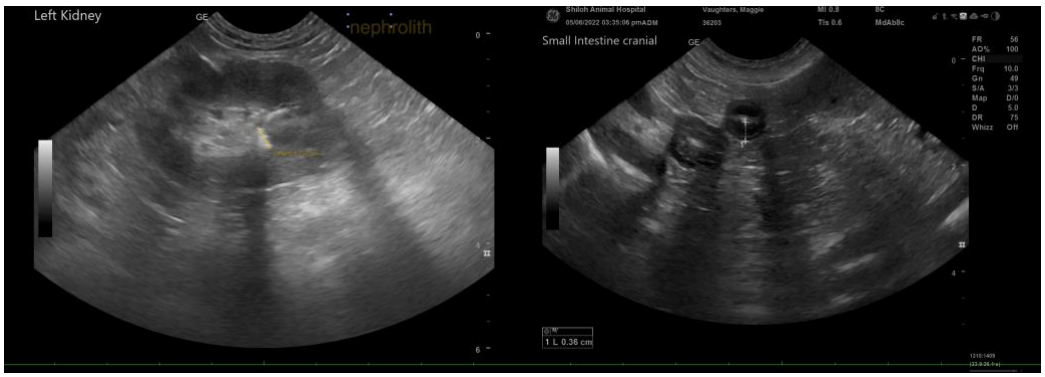

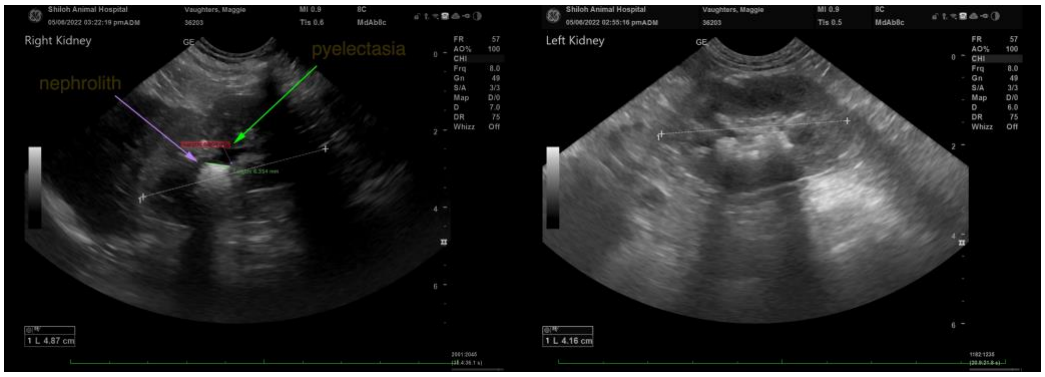

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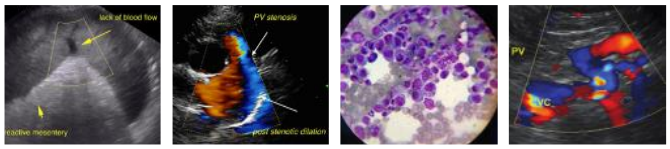

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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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

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