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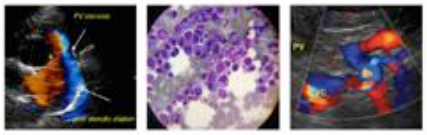

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Clinical Sonography & Telecytology
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PATIENT

Piper Klukach

SPECIES

Canine

BREED

Papillion

SEX

Spayed Female

AGE

11 years

WEIGHT

16 lbs

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Amy Mayhew LVT

HOSPITAL NAME

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Dearborn Family Pet Care

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PRESENTING CLINICAL SIGNS

Increase in liver enzymes. Please see attached labs.
Abnormal PE/Chem/CBC/UA Results: ANNUAL EXAM/BLOOD WORK Exam findings and abnormal lab values: LUXATING PATELLAS, 1/2 SYSTOLIC MURMUR, DENTAL TARTAR Is on Vetmedin and Enalapril, Also Heartgard. Last saw cardiologist in September.

Urinary System

The urinary bladder is adequately distended with anechoic contents. The wall is smooth and regular. No abnormalities are noted with the trigone or proximal urethra, and there is no evidence of sediment, cystoliths, polyps or a mass.

Kidneys

The **left** kidney measures 4.55 cm (within normal limits). The capsule is smooth, however, the cortex is severely hyperechoic. A moderate loss of the normal definition of the cortico-medullary junction is present. A round, anechoic structure, with a smooth, thin wall, measuring 0.42 cm, is visualized within the cortex along the antimesenteric border. It is most consistent with a benign cyst. Small mineralizations of the diverticulae and pelvis are present, without evidence of nephroliths. The pelvis measures between 0.14 (transverse) – 0.17 cm (longitudinal), which may be associated with polydipsia and polyuria. The surrounding mesentery is not hyperechoic.

The **right** kidney measures 4.65 cm. The pelvis measures 0.27 cm in transverse view. Findings are similar to the left kidney.

Aortic bifurcation/trifurcation

No abnormalities observed.

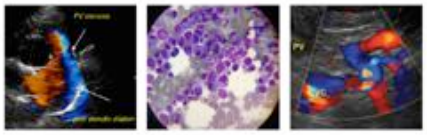
Adrenal Glands

The **left** adrenal gland measures 0.66 cm at the cranial pole, 0.47 cm at the caudal pole. 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 1.38 cm at the cranial pole, 1.61 cm at the caudal pole. A hyperechoic nodule is observed in the caudal portion of the gland, a few millimeters medial to the pole. The nodule measures 1.02 cm in diameter and 1.81 cm in length. A hypoechoic nodule with a well circumscribed hyperechoic capsule is noted mid body. The nodule measures 6.8 mm in diameter x 8.3 mm in length. Multiple hypoechoic to anechoic foci and nodules are noted at the very distal aspect of the caudal pole. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable, i.e. there are no signs of invasion of the surrounding vasculature.

Spleen

The spleen is within normal limits in size, architecture, echotexture, and echogenicity. The capsule is smooth. A heterogeneous mass is observed at its head. It has a "stellate" pattern. It is comprised of an echogenic "stellate" pattern and an anechoic periphery. It does not appear to disrupt the integrity of the



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capsule. The mass measures 1.11 cm in diameter x 1.48 cm in length. The center of the mass is vascularized. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified. Perivascular cuffing is observed which is not considered clinically significant.

Liver

There are no obvious signs of hepatomegaly and its borders are smooth and sharp to very mildly rounded. It is homogeneous, and diffusely hyperechoic. No focal lesions are noted. No abnormalities are observed with the hepatic vessels.

The gallbladder (GB) wall is within normal limits in thickness and echogenicity. A very small amount of echogenic material is present within the GB. 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.

Gastrointestinal

A large amount of gas is present within the lumen of the stomach. 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 fogging and stippling of the mucosa of the duodenum is present.

The small intestinal wall thickness, including the duodenum, is within normal limits and the definition of the wall layers is preserved. Abnormally dilated loops of bowel are not observed.

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

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

Other

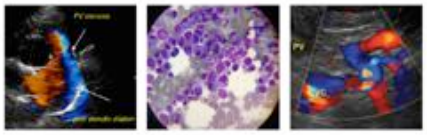
Lymph nodes

No abnormalities are observed

Abdominal effusion is not visualized.

ULTRASONOGRAPHIC FINDINGS

- Differential diagnoses for the splenic nodule include nodular or lymphoid hyperplasia and extramedullary hematopoiesis. Neoplasia, such as lymphoma, mast cell or other round cell



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tumour, is considered unlikely. A fine needle aspirate is not suggested due to its vascularization, however, a sonographic re-evaluation may be performed in two to three months to monitor its appearance.

- Both adrenal gland are enlarged; the left gland is only very mildly enlarged at 0.66 cm. Two nodules are observed in the right adrenal gland, in addition to very small hypoechoic foci and nodules. The mass does not show criteria of malignancy. Despite its size, differential diagnoses include an adenoma and hyperplasia. However, other differential diagnoses to consider include a pheochromocytoma and adenocarcinoma. There are no signs of metastases to the surrounding vasculature. Bilateral, but asymmetrical hyperplasia, due to pituitary dependent hyperadrenocorticism, cannot be excluded. Further diagnostics for hyperadrenocorticism, such as, an ACTH stimulation test or low-dose dexamethasone suppression test, are recommended.
- The hyperechogenicity of the liver is most likely secondary to a vacuolar hepatopathy, for example, due to the adrenal mass.
- The above sonographic findings, mild elevations of Piper's liver enzyme activities and thrombocytosis are suggestive of hyperadrenocorticism.
- The renal changes observed are suggestive of age related degeneration, however, a component of the abnormalities noted may be due to glomerulonephritis associated with hyperadrenocorticism. There are no signs of pyelonephritis.
- The very mild dilation of the renal pelvises may be associated with polydipsia and polyuria, if present.
- The presence of sludge in the gallbladder is often 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.
- The fogging of the small intestines is a non-specific finding and may not be clinically significant. However, it may be suggestive of inflammation associated with inflammatory bowel disease. Further diagnostics are not required if Piper does not show GI signs.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

A urine protein: creatinine ratio is suggested as Piper's albumin has been slowly decreasing and is at the low end of the normal reference range.

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

Hypertriglyceridemia was present on Piper's blood work. This may be associated with the development of gallbladder sludge and mucoceles, 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. Furthermore, a low fat, low phosphorus diet (due to her age and possible decreased renal may be necessary.

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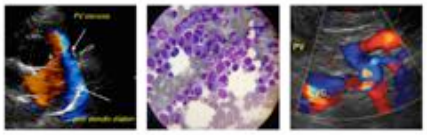

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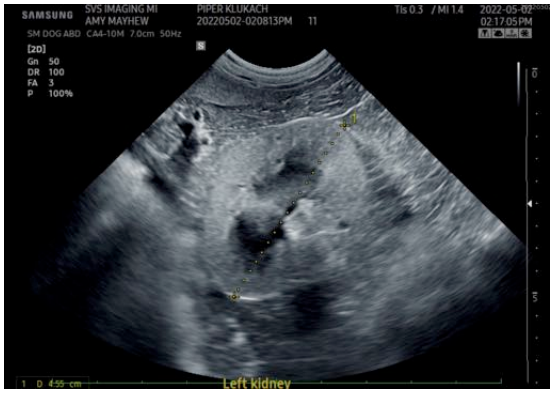

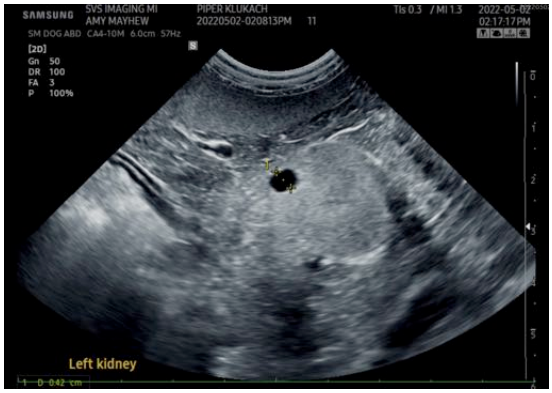

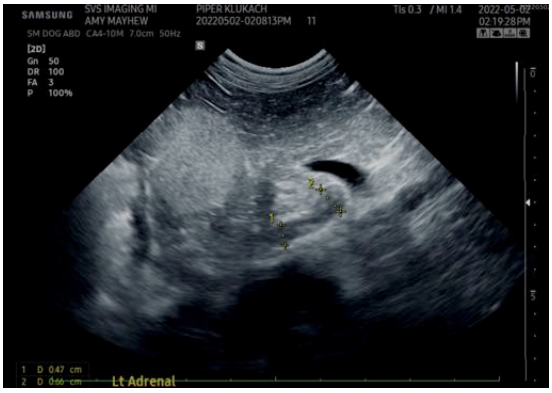

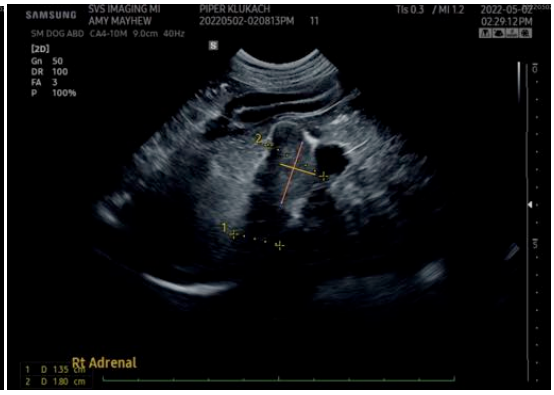

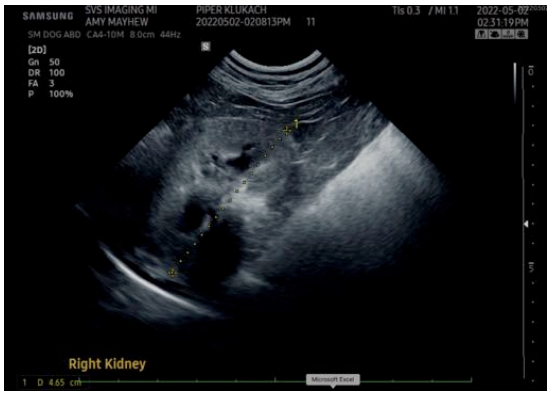

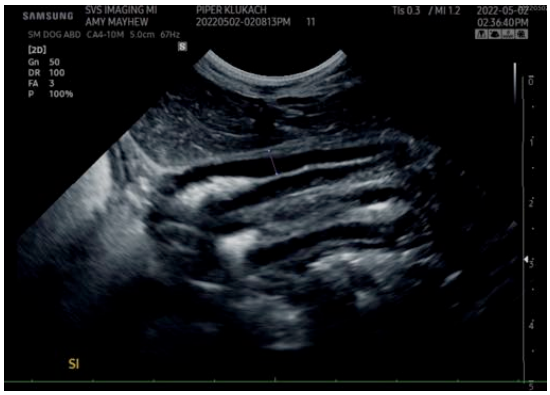

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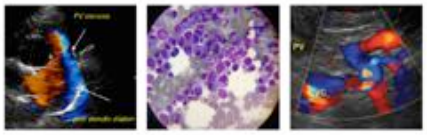

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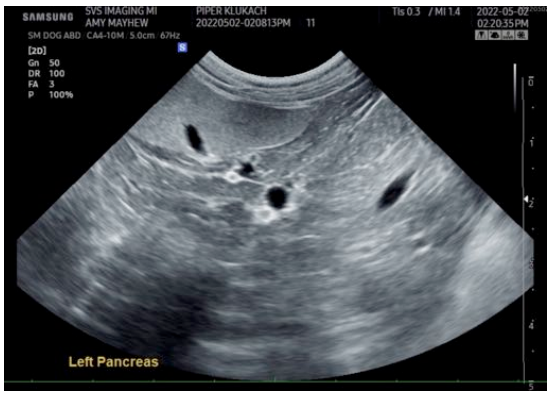

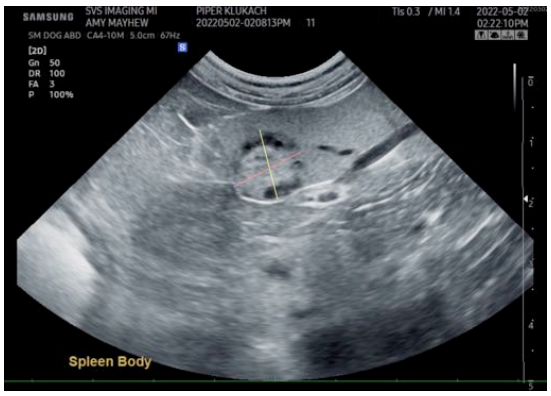

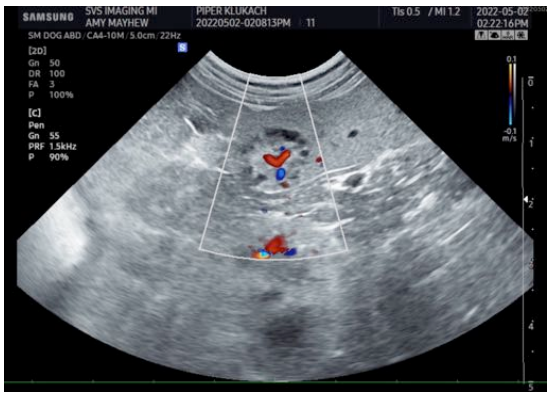

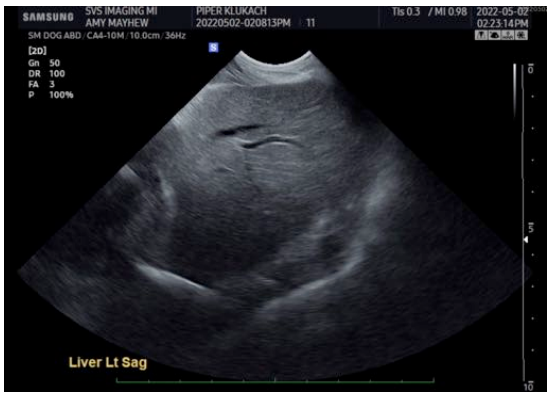

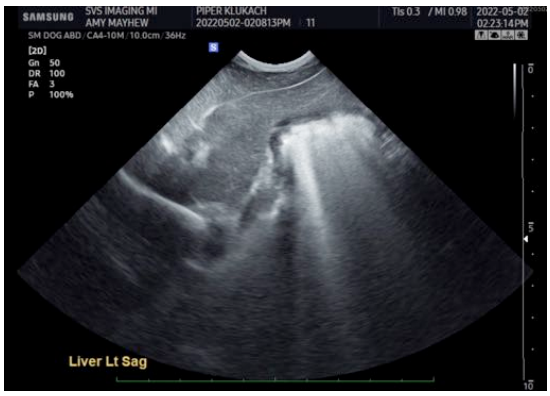

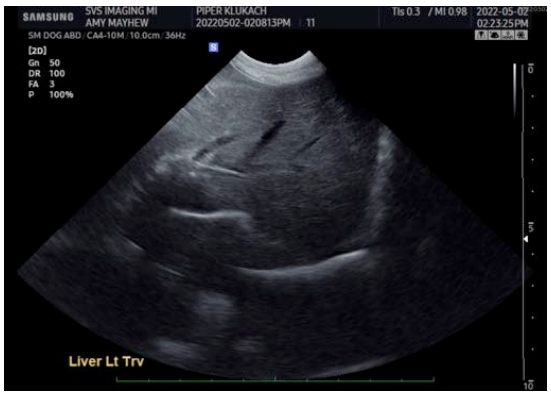

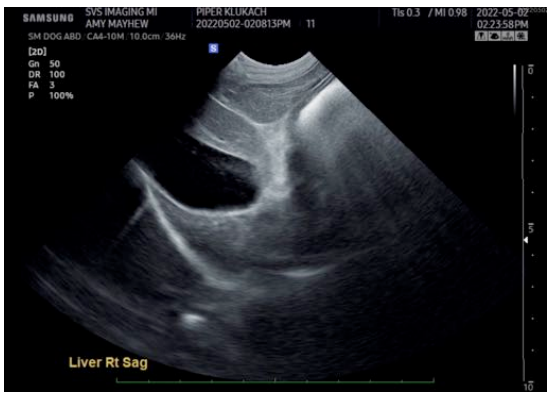

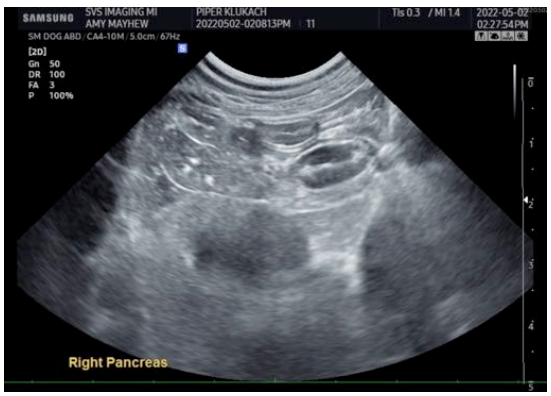

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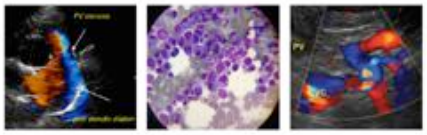

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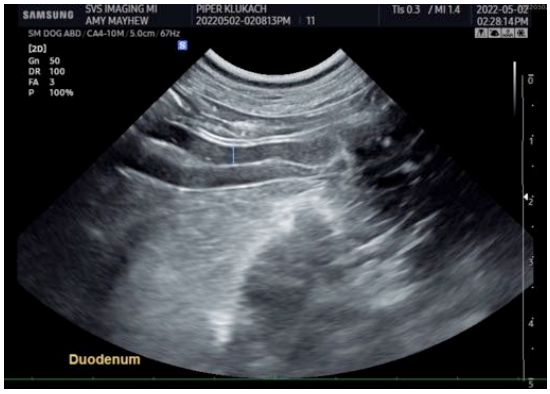

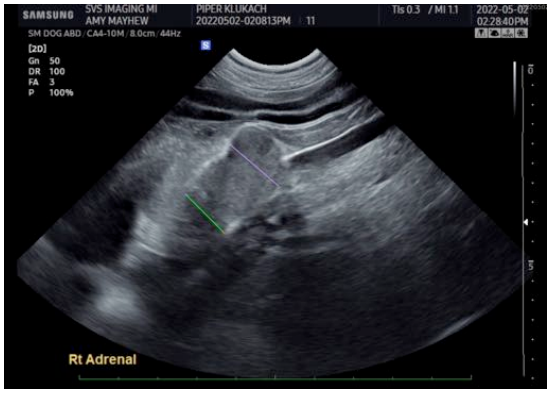

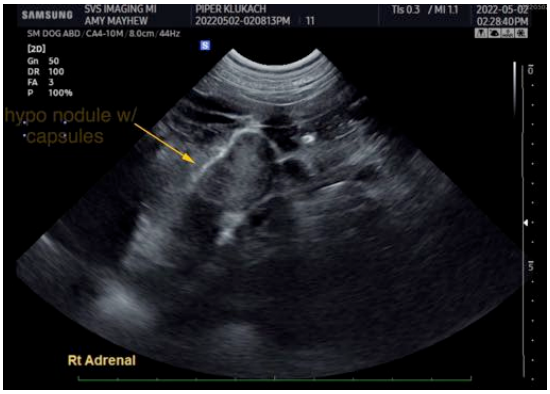

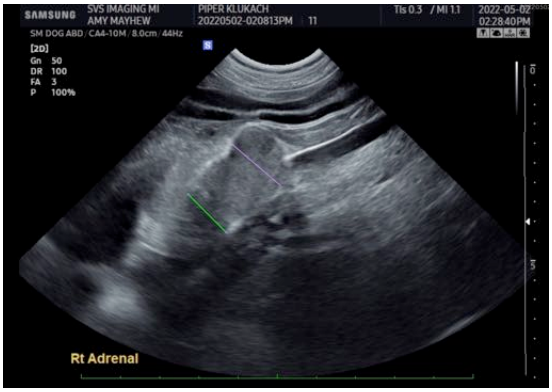

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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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