**PATIENT**

Teddi Murphy 261283

SPECIES

Canine

BREED

Keeshond

SEX

Spayed Female

AGE

9 Years 5 Months

WEIGHT

14.7 kg

INTERPRETED BYEric Lindquist, DMV
DABVP, Cert. IVUSS**IMAGING PERFORMED BY**

Tom McNeill

HOSPITAL NAME

Bel Air VH

REFERRING VET

Dr. Witzel- WVRC

INVOICE

16186

DATE

6/17/22

PRESENTING CLINICAL SIGNS

History: Acute onset of vomiting

Abnormal PE/Chem/CBC/UA Results: CBC - HCT 50.2%(N), MCHC 31.3(L), Retic 99(N), WbC 9(N), Plt 344(N) Chem - Ca 12.3(H), Cl 78(L), ALT 4981(H), ALP 2475(H), AST 774(H), GGT 16(H), T.bili 1.7(H), Chol 832(H) T4 - WNL 4DX - negative UA - USG 1.011, prot 3+, quiet sediment

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**Urinary System**

The urinary bladder is well 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 5.76 cm. The capsule is smooth. The cortex is mildly hyperechoic and appears mildly thicker than usual. The normal definition of the cortico-medullary junction is preserved. There is no evidence of nephroliths or pyelectasia. The surrounding mesentery is not hyperechoic. An anechoic structure (0.38 cm), consistent with a benign cyst, is noted in the cortex.

The **right** kidney measures 5.81 cm. An anechoic structure (0.33 cm), consistent with a benign cyst, is noted in the cortex. Findings are similar to the left kidney.

Aortic bifurcation/trifurcation

No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.57 cm at the cranial pole, 0.43 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 0.60 cm at the cranial pole, 0.59 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.

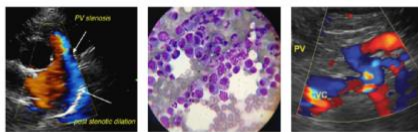
Spleen

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

Liver

Subjectively, the liver appears enlarged for a dog of Teddi's stature. It also appears "swollen" with smooth, but rounded borders. It is diffusely heterogeneous, with multiple hypoechoic nodules of variable size dispersed haphazardly throughout the parenchyma. The two largest nodules measure 1.16 cm in diameter x 1.79 cm in length; 0.85 cm in diameter x 1.74 cm in length. An anechoic nodule (0.50 cm) is observed in the left liver. Target-like lesions are not noted. No obvious abnormalities are noted with the hepatic vessels.

The gallbladder (GB) is moderately distended with a moderate amount of free floating, gravity-dependent and inspissated echogenic material. The GB wall is within normal limits in thickness and

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echogenicity. The parenchyma surrounding the GB is mildly hyperechoic, which is suggestive of inflammation. The common bile duct is dilated (0.37 cm).

Gastrointestinal**SPECIES**

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Gas is present within the lumen of the stomach. A foreign body is not observed. The gastric wall is within normal limits in thickness and the wall layers are well defined. The muscularis and mucosa appear more prominent than usual. No obvious abnormalities are observed with its peristalsis.

BREED

Keeshond

The small intestinal wall thickness, including the duodenum (0.35 cm), is within normal limits and the definition of the wall layers is preserved. Jejunum (0.38 cm) - WNL. A large amount of ingesta fluid and gas are present within the gastrointestinal tract. Peristalsis is difficult to assess due to panting artifact.

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The colonic wall is not thickened and mural detail is considered normal. Formed stools are within the colon.

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

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Pancreas

The pancreas has a mildly coarse echotexture. Pinpoint hyperechoic foci are scattered throughout the parenchyma. These changes are suggestive of fibrosis, which may be due to an age-related change, and/or secondary to previous episodes of pancreatitis, mineralization, as well as, amyloid deposition. In addition to these changes, subtle areas of hypoechogenicity are noted, particularly the body and a small portion of the left limb. The mesentery surrounding the body and a small portion of the left limb is very mildly hyperechoic. Overt signs of active pancreatitis are not appreciated, however, subtle regions of the pancreas appear inflamed. Obvious signs of neoplasia are not appreciated.

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INTERPRETED BYEric Lindquist, DMV
DABVP, Cert. IVUSS**Other****Lymph nodes**

Isoechoic medial iliac lymph nodes are observed, otherwise no other abnormalities are noted.

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Abdominal effusion is not visualized.

ULTRASONOGRAPHIC FINDINGS**HOSPITAL NAME**

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- **Liver:** Nodular hyperplasia is suspected as the cause of the hypoechoic nodules. However, the hepatomegaly and swollen appearance may be due to inflammation secondary to acute vomiting. Cholestasis, cholangitis/cholangiohepatitis and cholecystitis cannot be excluded. However, a flare up of chronic hepatitis must also be considered. Hepatitis may be primary (immune-mediated) or secondary (toxins, including medications and natural supplements, infectious agents (parasites, viruses, or bacteria).

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- **Gallbladder:** *Gallbladder sludge* is often clinically insignificant, however, gastroesophageal reflux disease (GERD), can occur in some patients. Obtaining a history regarding signs of GERD from the client is suggested. Treatment with an anti-acid or proton pump inhibitor may be required. Cholecystitis is suspected based on the hyperechogenicity surrounding the gallbladder and the mildly dilated common bile duct, as well as the blood work results. A suppurative component may also be present.

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- **Gastrointestinal tract:** Acute gastroenteritis without signs of a foreign body or an obstruction. There are no signs of a mass. An underlying inflammatory condition, such as a chronic enteropathy, for example, inflammatory bowel disease cannot be excluded.
- **Pancreas:** A smoldering or "emerging" pancreatitis cannot be excluded. Age-related changes, as well as changes due to previous episodes of pancreatitis are suspected.
- **Kidneys:** Glomerulonephritis may be causing the bilateral hyperechogenicity of the renal cortices and proteinuria (due to systemic inflammation). Further diagnostics are not suggested for the moment due to false positive results. Mild, early age-related changes are likely.
- **Adrenal hyperplasia:** The adrenal glands are not overtly enlarged, but are at the high end of the normal reference range for a dog of Teddi's stature. This is attributed to adrenal hyperplasia secondary to stress.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The following are suggested suggested/recommended

Obtaining a history regarding signs of GERD from the client is suggested. Treatment with an anti-acid or proton pump inhibitor may be required.

Exclude *Leptospira* spp. (*Leptospira* spp. PCR on blood and urine), medications and natural supplements (SNAP 4Dx was negative)

+/- Spec cPL

Fasting triglycerides (exclude hypertriglyceridemia)

Arterial blood pressure

Reticulocytes are elevated, despite hematocrit within the normal reference range

IV fluids and other supportive care for nausea and vomiting

Analgesics, even if does not appear painful (hepatomegaly is uncomfortable)

Differential diagnoses include cholecystitis, cholangitis/cholangiohepatitis, and secondary ascending bacterial infections. Although indiscriminate use of antibiotics is not recommended, consider broad-spectrum antibiotic with reassessment of liver enzymes, including GGT, in a few weeks, while *still receiving* the antibiotics. If an improvement is observed, continue antibiotic for an additional two weeks.

If no improvement, fine needle aspirate or biopsy of the liver pending coagulation profile

Ursodeoxycholic acid (Ursodiol) may also be beneficial for the GB sludge and hepatic changes, however, **gradual** introduction (once no longer nauseous) and slow uptitration suggested.

Easily digestible, low fat diet; small meals fed multiple times a day

A urine protein: creatinine ratio 3-4 weeks after systemic signs of illness have resolved.

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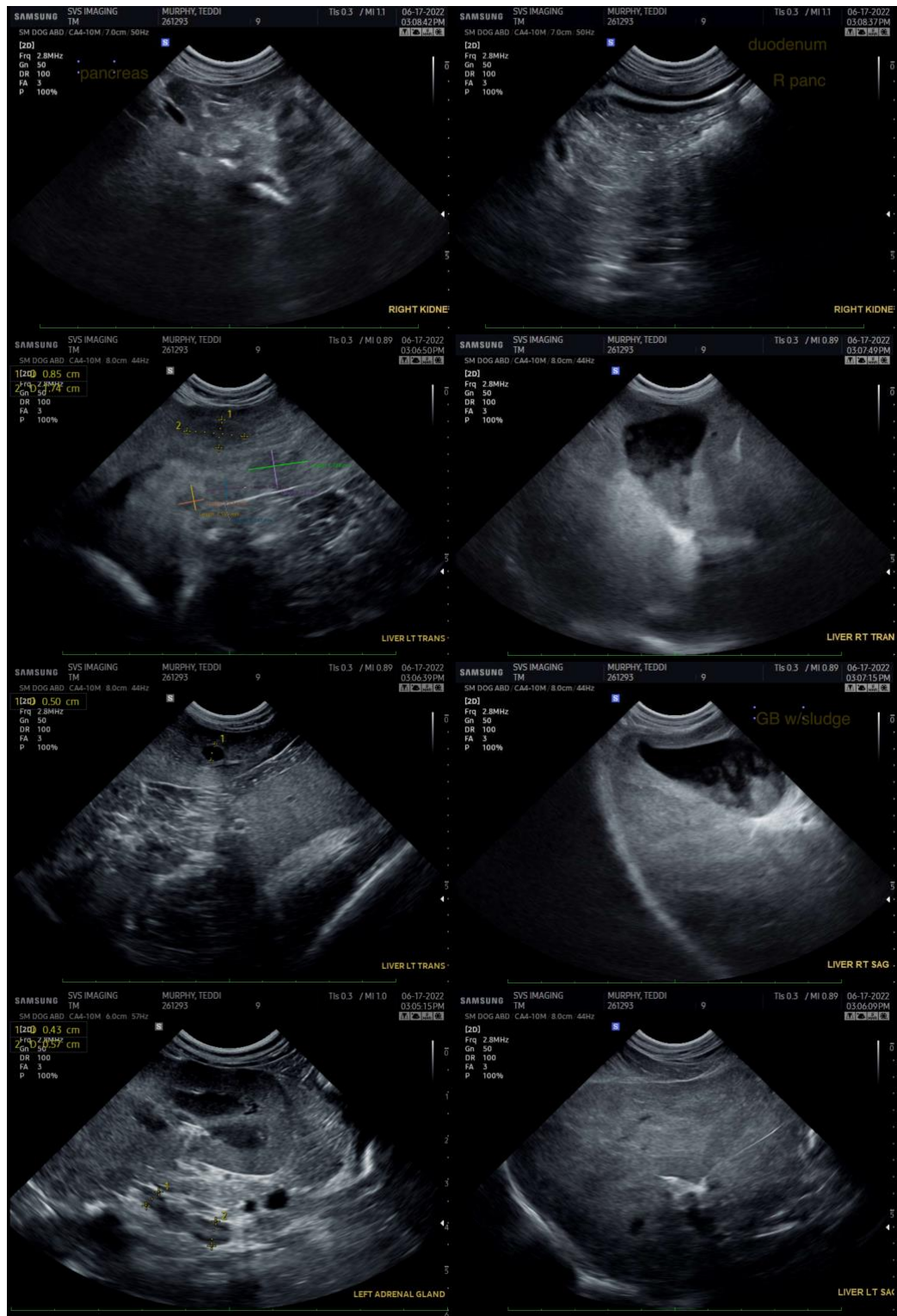
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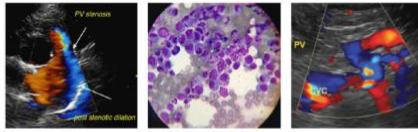
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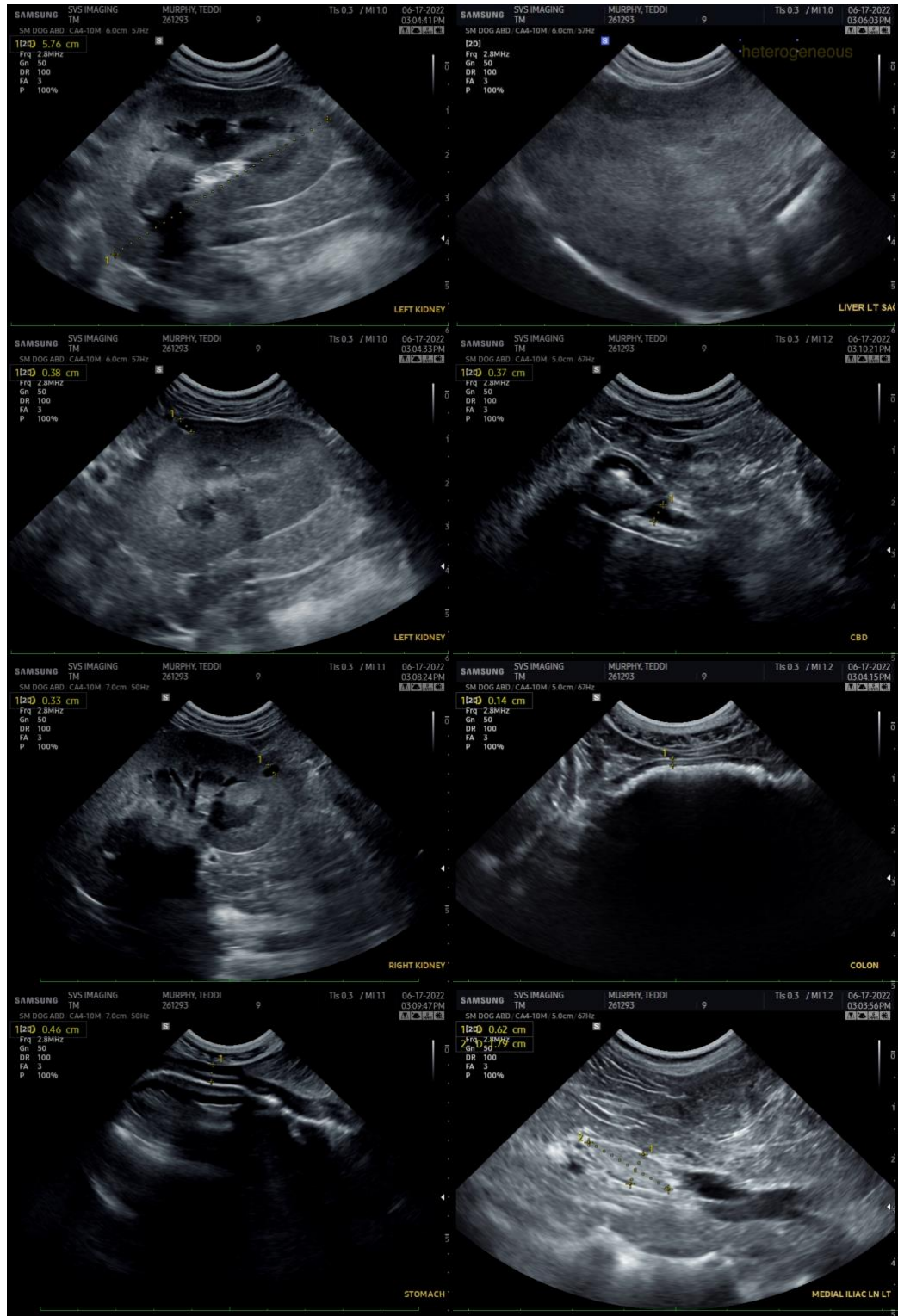
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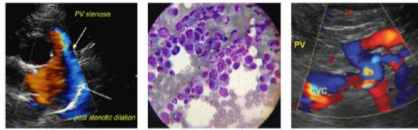
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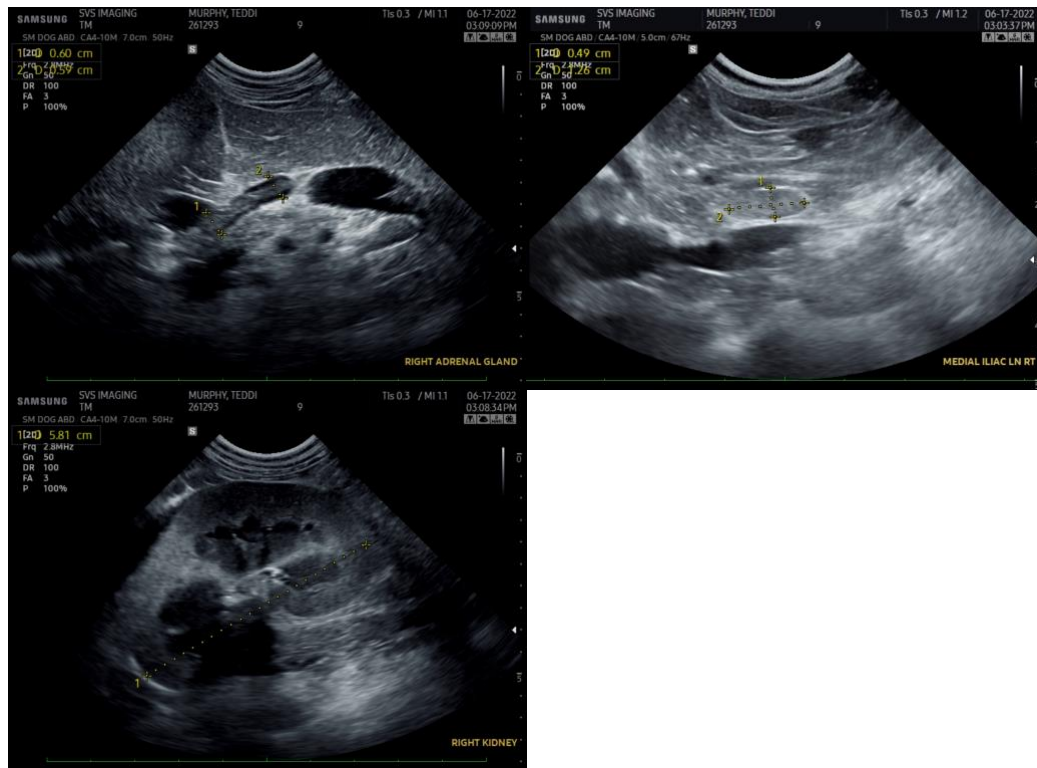
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Eric Lindquist, DMV, DABVP, Cert. IVUSS, CEO of SonoPath.com
Eric.Lindquist@SonoPath.com