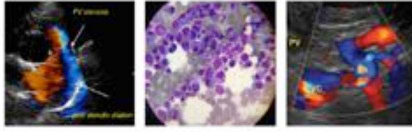



**PATIENT**

River Jackson

**SPECIES**

Canine

**BREED**

Mix

**SEX**

Spayed Female

**AGE**

4 years

**WEIGHT**

60 Pounds

**INTERPRETED BY**

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

**IMAGING PERFORMED BY**

Rachel Runnells, CVT

**HOSPITAL NAME**

SVS Imaging Kansas City

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Dr. Lyle

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31414

**DATE**

7/1/22

## PRESENTING CLINICAL SIGNS

History: Presented 6/27 with dripping bloody urine and not eating in 24 hrs. Hospitalized overnight and gave IV fluids and gave ampicillin IV. Went home on 6/28 on enrofloxacin, Ursodiol, and metronidazole. In process of sending out repeat bloodwork. Serum from blood draw on day of scan was slightly icteric.

6/27: Chem: AST 271 (15-66), TBILI 1.0 (0.1-0.3), NA/K ratio 39 (27-38), AMY 1646 (290-1125), Precision PSL 422 (24-140). T4 <0.5 (0.8-3.5). CBC: WNL. UA: pH 8.5 (5.5-7), Protein 2+, occult blood 1+, WBC 4-10 (0-3), Bacteria- cocci and rods >100, amorphous phosphate crystals >50. Rest WNL. Microalbuminuria 27.7 (<2.5). T- 103.0. Abd palp NSF, non-painful. 6/28: Mildly icteric sclera.

## 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.

**Uterine stump**

The **uterine stump** is visualized; it is homogenous and does not demonstrate any abnormalities.

**Kidneys**

The **left** kidney measures 6.79 cm. The capsule is smooth. Its overall architecture, including the definition of the cortico-medullary junction, is preserved. There are no signs of nephroliths or pyelectasia. Blood flow is within normal limits. The surrounding mesentery is not hyperechoic.

The **right** kidney measures 6.71 cm. Its overall architecture, including the definition of the cortico-medullary junction, is preserved. There are no signs of nephroliths or pyelectasia. The surrounding mesentery is not hyperechoic.

**Aortic bifurcation/trifurcation**

No abnormalities observed.

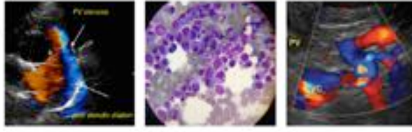
### *Adrenal Glands*

The **left** adrenal gland measures 0.50 cm at the cranial pole, 0.49 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 0.68 cm at the cranial pole, 0.65 cm at the caudal pole. The cranial pole is mildly "plump" and nodular, however, a discrete mass is not observed. No abnormalities are noted with the gland's overall 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. The capsule is smooth. Its echotexture is mildly miliary throughout. A well-defined hypoechoic, yet homogeneous, mass effect is noted mid-body. It measures approximately 1.34 cm in diameter x 2.40 cm in length. It appears slightly heterogeneous in other angles due to interference from the rib. It is vascularized, but does not disrupt the integrity of the capsule. The mass is visualized at a different angle, it appears encapsulated and almost isoechoic to the surrounding splenic parenchyma. It measures 1.48 cm in diameter x 1.69 cm in





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length. No abnormalities are observed with the vasculature of the spleen, i.e. congestion and thrombi are not identified.

### *Liver*

Although there are no obvious signs of hepatomegaly, the liver appears "swollen". Its borders are smooth, but vary between sharp to rounded.

A diffuse, mildly coarse or granular echotexture is observed. It appears somewhat miliary and similar to the spleen in certain views. It is hypoechoic to the spleen, but isoechoic to the falciform fat. Focal lesions are not observed and no abnormalities are observed with the hepatic vessels.

The gallbladder (GB) wall is within normal limits in thickness and echogenicity. A small amount of gravity dependent and free floating 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*

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

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. Formed stools are present in the colon.

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

### *Pancreas*

No abnormalities are observed with the architecture, contours, echogenicity or echotexture of the pancreas. 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

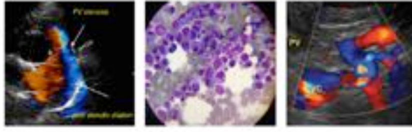
**Abdominal effusion** is not visualized.

### *Heart*

A brief video clip of the heart was submitted. Pericardial and pleural effusion are not identified. A obvious mass is not observed on evaluation of the right side of the heart, including the right auricle or the left ventricle. Abnormalities are not evident with contractility or chamber size of the right heart or left ventricle (sedated and measurements not performed). Note, a mass may be overlooked in the absence of pericardial effusion.

## ULTRASONOGRAPHIC FINDINGS

- **Liver**: A mild reactive hepatopathy may be present based on the mildly coarse or granular echotexture. Cholestasis is likely. Other differential diagnoses for the sonographic abnormalities observed include cholangitis/cholangiohepatitis with a secondary bacterial infection or a copper hepatopathy). Hepatitis cannot be excluded, both primary or secondary. Leptospirosis must be considered a differential diagnosis. Inquiries regarding travel history, exposure to tick





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or other vector-borne diseases are recommended, in addition to medications and *natural supplements*, raw-meat diets (bacterial hepatopathies). Target lesions are not visualized, therefore neoplasia is unlikely.

- **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, proton pump inhibitor or ursodeoxycholic acid may be required. Suppurative cholecystitis cannot be excluded, despite the absence of classical sonographic signs.

- **Spleen:** The diffuse miliary pattern may be due to splenitis, reactive hyperplasia or extramedullary hematopoiesis. The appearance of the splenic nodule is suggestive of a benign process, such as nodular or lymphoid hyperplasia and extramedullary hematopoiesis. Neoplasia is considered much less likely.

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Exclude *Leptospira* spp. using PCR (serum and urine) on sample prior to administration of ampicillin, or serology.

SNAP 4Dx

Arterial blood pressure

Can pursue further diagnostics now (fine needle aspirate or preferably a tissue biopsy of the liver, see below), or continue medical management that has already been started and assess response.

Administer amoxicillin-clavulanic acid for 2 weeks or doxycycline to treat for possible leptospirosis, other vector borne disease.

Analgesics (not NSAIDs), for example, gabapentin

Anti-emetics

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

Continue enrofloxacin, 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.

Vitamin K (0.5 mg/kg SQ for 1 dose). A dose is suggested due to cholestasis.

+/- hepatoprotectant, although may cause nausea in some patients

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

ursodeoxycholic acid (Ursodiol) initiate at a low dose, and slowly up-titrate to decrease the risk of GI side effects, especially if administering with other medications. The dose may be divided BID and should be given with a meal to decrease the risk of nausea, cramps, vomiting and diarrhea.

If no improvement with above treatments, fine needle aspirate or preferably a tissue biopsy of the liver is suggested, including tissue copper levels (not staining alone) pending coagulation profile. Note, vitamin K (0.5 mg/kg SQ q8-12h for 1-3 doses) is suggested, even if PT/PTT within normal limits.

Fine needle aspirates of the splenic mass and splenic parenchyma are required to obtain definitive diagnoses, however, additional information may be present on today's CBC results. Resolution or a decrease in the size of the mass may be present if the spleen is sonographically re-evaluated in a few

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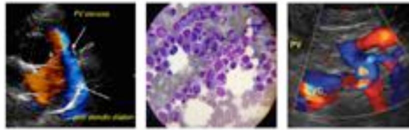


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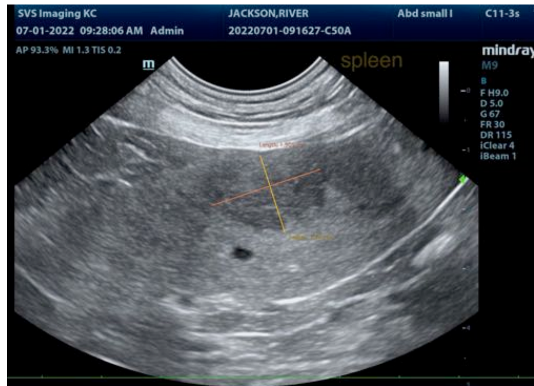
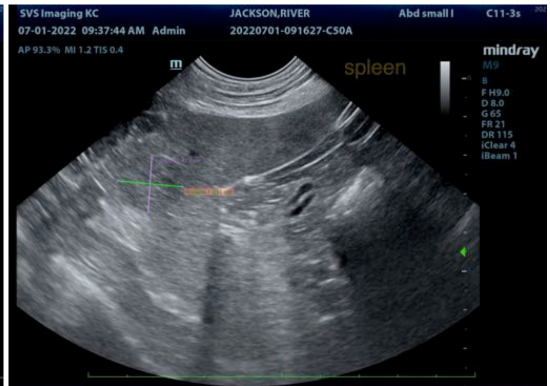
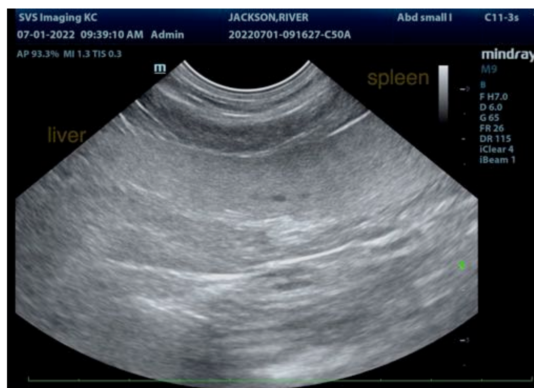
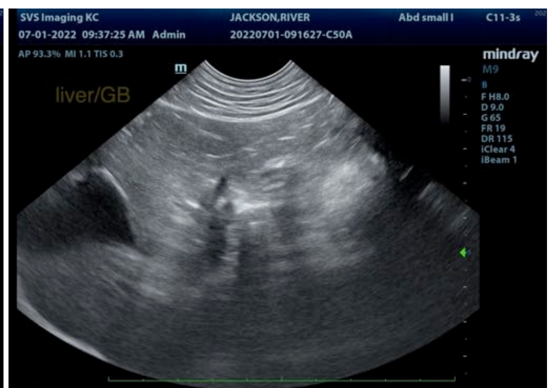
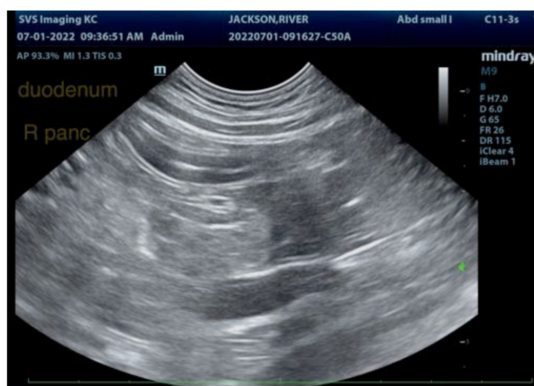
weeks. Fine needle aspirates may be performed if liver aspirates or biopsies are pursued as there will be little difference in cost.

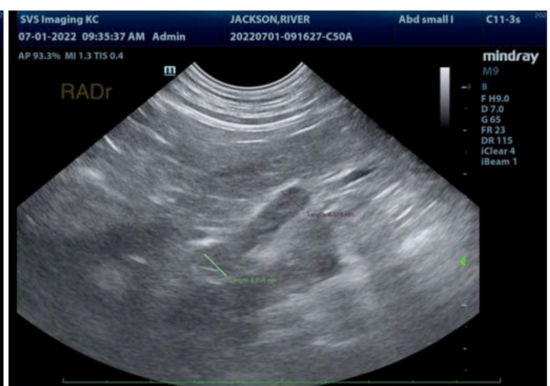


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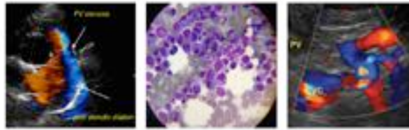

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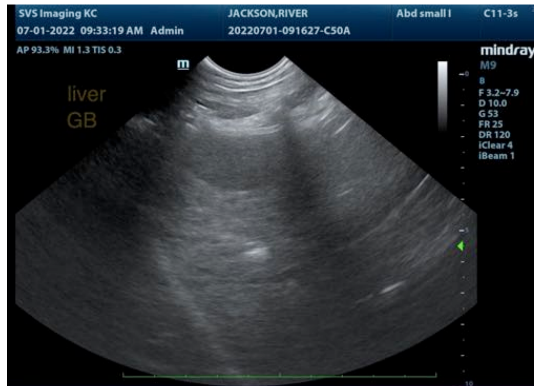


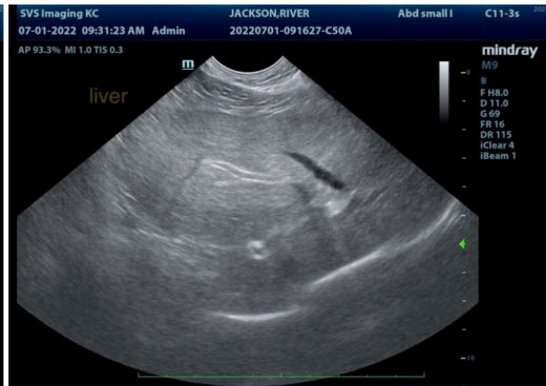


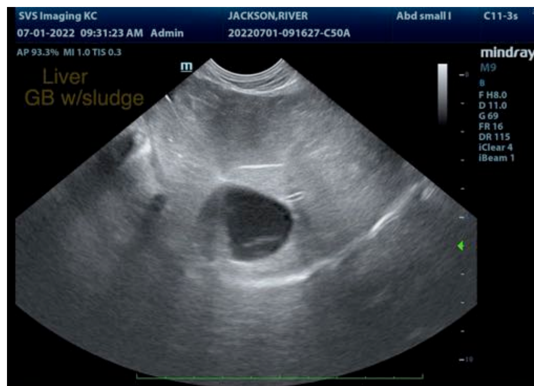


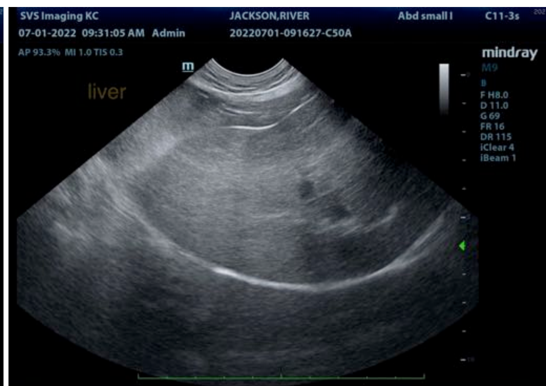


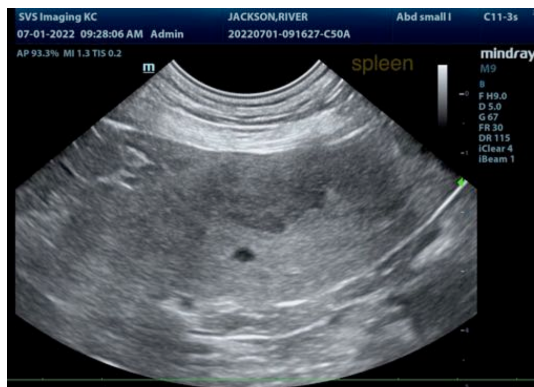


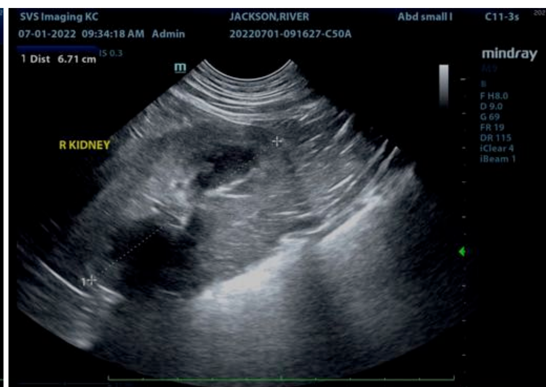


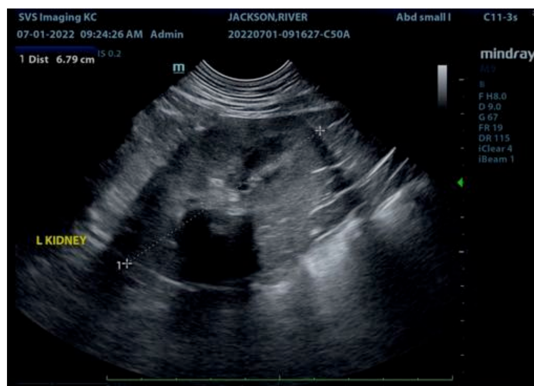


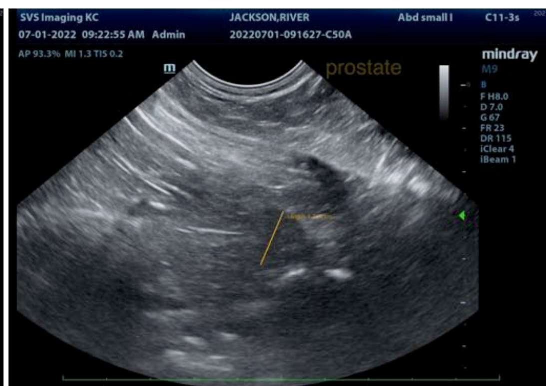

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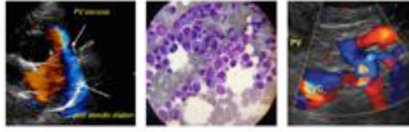

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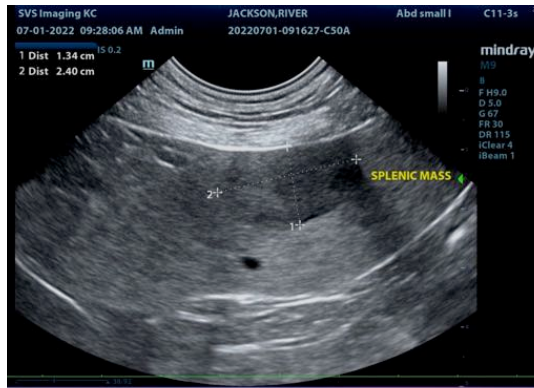


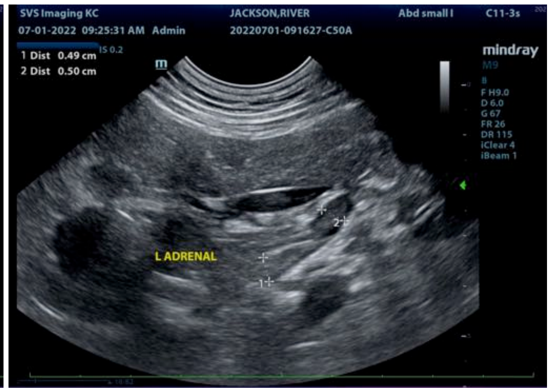


**The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

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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