

**PATIENT**

Abby Campbell

**SPECIES**

Canine

**BREED**

Sheltie

**SEX**

Spayed Female

**AGE**

15 years

**WEIGHT**

9.8 kg

**INTERPRETED BY**

Lisa Carioto, DVM,  
DVSc, Diplomate  
ACVIM

**IMAGING PERFORMED BY**

Kelly Reshny, RVT

**HOSPITAL NAME**

Simcoe AH

**REFERRING VET**

Dr. Kennedy

**INVOICE**

30651

**DATE**

5/24/22

**PRESENTING CLINICAL SIGNS**

Sudden increases in liver enzymes after chronic benign hepatopathy has been holding at slightly above normal enzyme levels since 2017. She had a previous U/S with you May 22, 2019 Urine poorly concentrated and has 4+ blood Muscle condition score decreasing to 2/5 meds: Gabapentin 25mg q 12 hours, Tobradex 1 drop OS q 12-24 hours, Galliprant 20mg q 24 hours, Ursodiol 250mg- 1/4 tablet q 24 hours, Hepatosupport 1 capsule q 12 hours, On Royal Canin Gastro Low Fat diet  
Abnormal PE/Chem/CBC/UA Results: CBC is pretty normal. SDMA elevated at 16 (0-14)ug/dl and BUN 12.2 (3.2-11.0) mmol/l but creat is normal and mid range. ALT 221 (18-121)U/L up from 152 last time, ALP 2400 (5-160)U/L and was 1296 U/L last check. GGT is 50 U/L (0-13). Her triglycerides and Cholesterol are also increased, Triglycerides at 4.55 mmol/L and Cholesterol at 16.4 mmol/L TT4 is 11.2 nmol/L (13-53) and HWT4Dx is normal. On first morning urine, SG is 1.019 and there is 4+ blood

**ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**

**Urinary System**

The urinary bladder is adequately distended with anechoic contents. The wall is smooth and regular. No abnormalities are noted with the trigone, and there is no evidence of sediment, cystoliths, polyps or a mass. The ureteral papillae are visualized and unremarkable. The proximal urethra is not visualized in its entirety, but no abnormalities are observed with the portion evaluated.

**Kidneys**

The **left** kidney measures 5.64 cm. The capsule is smooth. The cortex is moderately hyperechoic and a moderate loss of the normal definition of the cortico-medullary junction is present. Mineralizations are present within the cortex, diverticulae and pelvis, as well as very small nephroliths. Minimal pyelectasia is present (2.34 mm). An accumulation of intrapelvic fat is noted. Blood flow is within normal limits. The surrounding mesentery is not hyperechoic.

The **right** kidney measures 6.19 cm. Findings are similar to the left kidney.

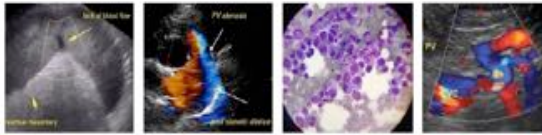
**Aortic bifurcation/trifurcation**

No abnormalities observed.

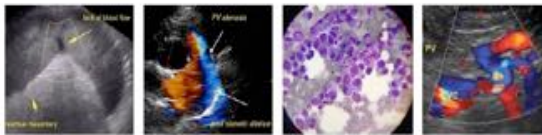
**Adrenal Glands**

The **left** adrenal gland measures 0.87 cm at the cranial pole, 0.92 cm at the caudal pole and 2.67 cm in length. The entire gland is enlarged and has lost its “kidney bean” shape. It is mildly heterogeneous with a granular echotexture and hyperechoic foci. The latter may be due to fat mixed with mineralization and/or fibrosis. A discrete mass or nodule is not visualized. The phrenico-abdominal vein does not appear as anechoic as it should be, however, this may be due to artefact. Laminar blood flow is present in the caudal vena cava, however, the area of the phrenico-abdominal vein is difficult to evaluate. Very mild hyperechoic enhancement surrounding the adrenal is present.

The **right** adrenal gland measures 1.25 cm at the cranial pole, 0.65 cm at the caudal pole and 2.00 cm in length. The cranial pole is enlarged and rounded. A mass or nodule cannot be excluded, however, interference due to gas in the surrounding intestinal tract prevents an in-depth evaluation. No abnormalities are noted with the gland’s echogenicity or echotexture. Although no major abnormalities



<b>PATIENT</b>	are observed with the phrenico-abdominal vein and surrounding vasculature, a re-evaluation is recommended to ensure subtle changes have not been overlooked due to gas in the GI tract.
Abby Campbell	
<b>SPECIES</b>	<b>Spleen</b>
Canine	Multiple hyperechoic punctate foci dispersed throughout the parenchyma are observed; they are suggestive of mineralization or dystrophic calcification. The spleen is within normal limits in size, architecture, echotexture, and echogenicity. The capsule is smooth. Mild perivascular cuffing consistent with myelolipomas is observed, which is not considered clinically significant. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified. The mesentery surrounding the stomach, liver and spleen is hyperechoic.
<b>BREED</b>	
Sheltie	
<b>SEX</b>	<b>Liver</b>
Spayed Female	The liver appears mildly enlarged and is diffusely hyperechoic. Its borders are smooth and sharp, to mildly rounded. A diffuse, mildly coarse or granular echotexture is observed. A hypoechoic nodule, measuring 5.0 mm in diameter x 6.9 mm in length is noted, as well as other hypoechoic nodules of variable size. No abnormalities are observed with the hepatic vessels visualized. The mesentery surrounding the stomach, liver and spleen is hyperechoic.
<b>AGE</b>	
15 years	
<b>WEIGHT</b>	The gallbladder (GB) is moderately distended with a moderate to marked amount of free floating, gravity depended, and inspissated echogenic material (sludge), much of which is immobile. The GB wall is within normal limits in thickness and echogenicity, however, the walls of the cystic duct are thicker than normal (2 mm) and severely hyperechoic. The duct is dilated (5.9 mm) and it is filled with sludge. The cystic and common bile duct cannot be followed due to gas in the surrounding GI tract, however, an obvious obstruction is not observed. Edema and free fluid are not visualized surrounding the GB. An emerging mucocele is suspected (see below).
9.8 kg	
<b>INTERPRETED BY</b>	<b>Gastrointestinal</b>
Lisa Carioto, DVM, DVSc, Diplomate ACVIM	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 mesentery surrounding the stomach, liver and spleen is hyperechoic.
<b>IMAGING PERFORMED BY</b>	
Kelly Reshny, RVT	
<b>HOSPITAL NAME</b>	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.
Simcoe AH	The colonic wall is not thickened and mural detail is considered normal.
<b>REFERRING VET</b>	There are no obvious signs of a mass, foreign body, infiltrative disease or an obstruction in the gastrointestinal tract.
Dr. Kennedy	
<b>INVOICE</b>	<b>Pancreas</b>
30651	The pancreas has a mildly coarse echotexture, which is considered secondary to age related changes, however, previous episodes of pancreatitis cannot be excluded. There are no signs of active pancreatitis or neoplasia.
<b>DATE</b>	
5/24/22	



**PATIENT**

Abby Campbell

*Other*

*Lymph nodes*

No abnormalities are observed

**SPECIES**

Canine

*Abdominal effusion* is not visualized.

**BREED**

Sheltie

**ULTRASONOGRAPHIC FINDINGS**

**SEX**

Spayed Female

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- The appearance of Abby's gallbladder is not consistent with a classical mucocoele, however, it may be a mucocoele in its early development or a mucocele that will not have a typical appearance. cholecystitis with a secondary bacterial infection cannot be excluded. Dogs with hyperadrenocorticism are more predisposed to gallbladder sludge and developing mucocoeles, as are Shetland sheep dogs. Also, some dogs may show clinical signs of gastroesophageal reflux disease as a result of the sludge, 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.

- Bilateral adrenomegaly is present. Pituitary dependent hyperadrenocorticism is suspected, however, adrenal hyperplasia secondary to chronic illness (stress), cannot be excluded. Bilateral non-functional adenomas are also possible. Although rare bilateral adrenal neoplasia can occur. Artefact was present in the region of the phrenico-abdominal vein of the left adrenal gland, and gas interference from the GI tract affected evaluation of the vasculature surrounding the right adrenal gland. Therefore, a re-evaluation of the vasculature is recommended to ensure subtle changes have not been overlooked.

**INTERPRETED BY**

Lisa Carioto, DVM,  
DVSc, Diplomate  
ACVIM

- Vacuolar and reactive hepatopathies are suspected, in addition to nodular hyperplasia and cholestasis. The latter is a benign, age-related change. Hepatitis is considered less likely. cholangitis/cholangiohepatitis and cholecystitis with a secondary bacterial infection cannot be excluded. There are no obvious signs of neoplasia.

**IMAGING PERFORMED BY**

Kelly Reshny, RVT

- Bilateral renal changes, which are suggestive of age related degeneration, however, glomerulonephritis associated with hyperadrenocorticism may also be present. Pyelonephritis cannot be excluded despite the absence of sonographic signs.

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- Splenic mineralizations or dystrophic calcification, as well as myelolipomas are suspected, which are not considered clinically significant.

**REFERRING VET**

Dr. Kennedy

- Age related pancreatic changes are observed. There are no signs of active pancreatitis or neoplasia.

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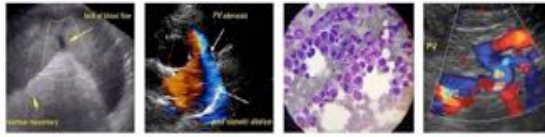
**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

A re-evaluation of the phrenico-abdominal veins and caudal vena cava in the regions of the adrenal glands is recommended to ensure subtle changes have not been overlooked.

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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.



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Ursodeoxycholic acid (Ursodiol) should be administered judiciously, at a very low dose, and slowly up-titrate to decrease the risk of GB rupture. For example, 3 mg/kg PO once a day for 5-7 days, then 5 mg/kg PO once a day for 5-7 days, then 7.5 mg/kg PO once a day for 5-7 days, then 10 mg/kg PO once a day for 5-7 days. The dose should be divided BID and given with a meal to decrease the risk of nausea, cramps, vomiting and diarrhea.

Other suggestions/recommendations include

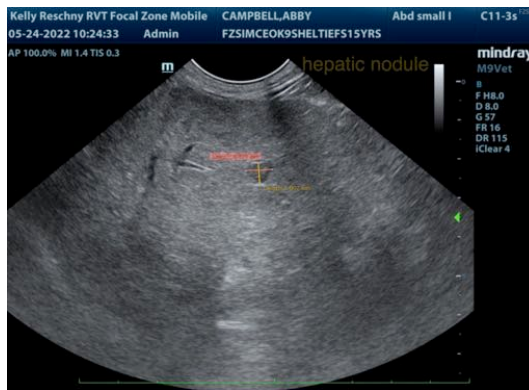
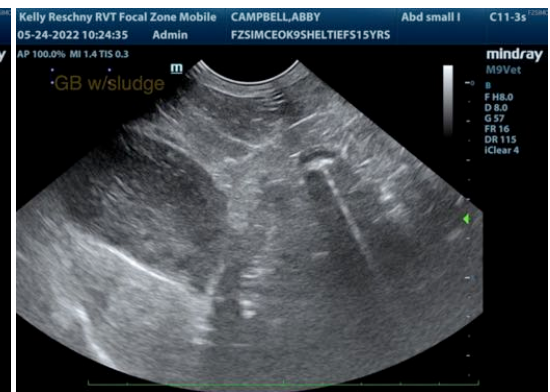
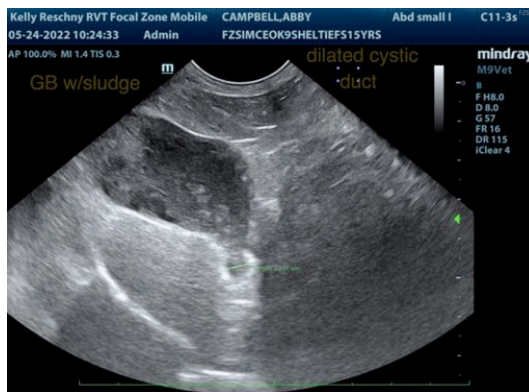
A urine culture and sensitivity

If negative, a urine protein: creatinine ratio is suggested.

An arterial blood pressure is recommended to rule out hypertension

A decision to pursue further diagnostics for hyperadrenocorticism should be correlated with Abby's clinical signs or whether she has proteinuria and/or hypertension.

Clopidogrel may be necessary depending on the re-evaluation of the phrenico-abdominal veins and caudal vena cava in the regions of the adrenal glands.

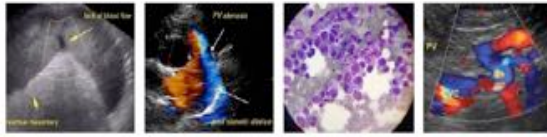


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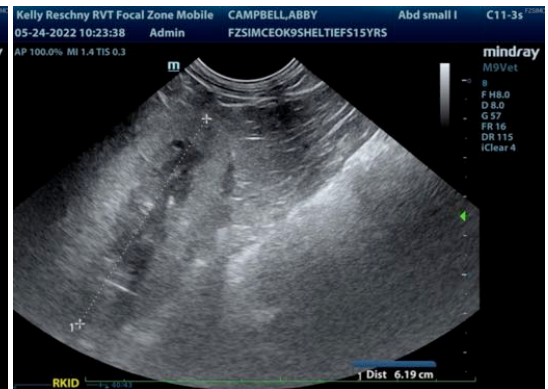
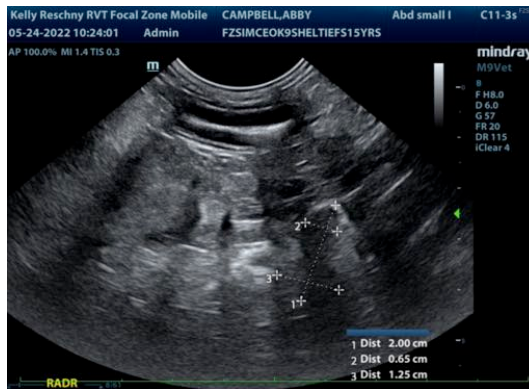
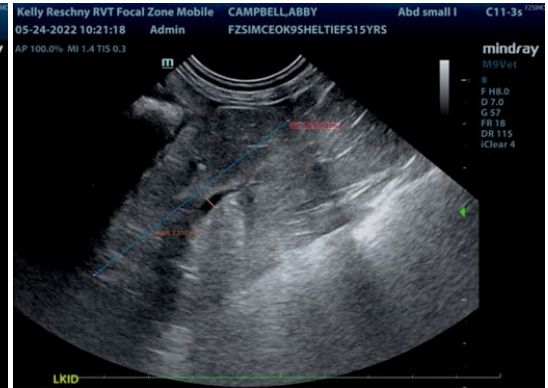
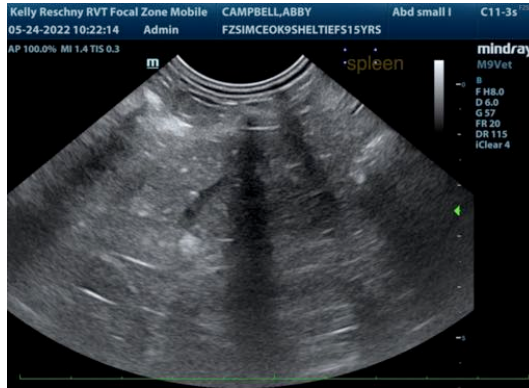
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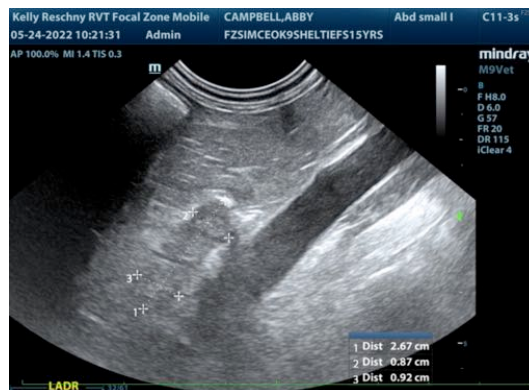
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**REFERRING VET**

Dr. Kennedy

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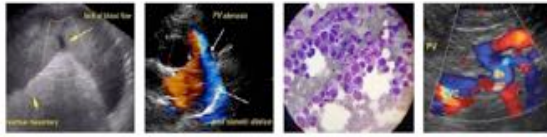
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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



**PATIENT**

[Lisa.Carioto@sonopath.com](mailto:Lisa.Carioto@sonopath.com)

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