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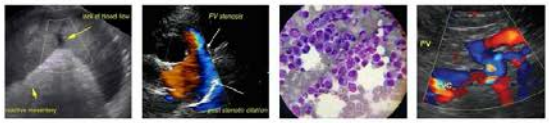

IMAGING PERFORMED BY
pawsonography@gmail.com 530-786-8340

PATIENT

Sophie Ferrari

SPECIES

Canine

BREED

Shih Tzu

SEX

Spayed Female

AGE

3 Years 7 Months

WEIGHT

8.74 Pounds

INTERPRETED BY

Kathleen Sennello DVM, MS, Diplomate ACVIM (Small Animal Internal Medicine)

IMAGING PERFORMED BY

Loetitia Saint-Jacques, RVT

HOSPITAL NAME

MountRose AH

REFERRING VET

Dr. Lori Burnham

INVOICE

24986

DATE

8/26/21

PRESENTING CLINICAL SIGNS

Sophie presented for routine dental on July 9, 2021 and the pre-anesthetic bloodwork showed an elevation of ALT at 218. The dental was postponed and a bile acids assay was performed. Resting bile acids on the high end of normal at 13.6; post-prandial elevated at 51.7. The owner elected to go ahead with a Denamarin trial and to retest bloodwork. While being on Denamarin, the ALT was rechecked on 8/17 and was found to be slightly high at 163. Repeat bile acids show a normal resting value at 9.3; the post prandial remained high at 41.3. The patient remains asymptomatic otherwise. Remainder of the pre-anesthetic panel run on 07/09 was normal except ALP slightly low at 13 and platelets slightly high at 556. **Bloodwork in Oct 2018 showed normal liver enzymes** PHYSICAL EXAM: Weight: 8.74 lbs T: 101.9 P: 160 R: shake BCS: 3/5 EENT: 2/4 dental disease CV/Resp: WNL GI: Abdomen palpates WNL, non-painful, no masses or organomegaly Musk: No joint abnormalities. Muscles are symmetrical. No pain elicited on manipulation/exam. Integ: WNL LN: Palpate WNL Neuro: WNL Urogen: WNL, no obvious visible or palpable abnormalities LABORATORY FINDINGS: See abnormalities detailed in history RADIOGRAPHIC FINDINGS (email radiographs if available): None taken REASON FOR ULTRASOUND: To try to determine cause for elevated liver enzymes and elevated post prandial bile acids assay. 0.01 dexdormitor/ torbugesic IV

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder is moderately distended with anechoic urine. The Bladder wall, trigone, ureteral papillae and visible urethra (to a depth of 2cm) appear normal with no evidence of wall thickening, mucosal irregularities, masses or cystic calculi.

The left kidney has a normal shape and size (3.0 cm). Overall echogenicity is normal with adequate corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of perinephric inflammation or effusion. There is no evidence of pyelectasia, nephroliths, infarcts or hydroureter. Renal vasculature is normal.

The right kidney has a normal shape and size (3.4 cm). Overall echogenicity is normal with adequate corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of perinephric inflammation or effusion. There is no evidence of pyelectasia, nephroliths, infarcts or hydroureter. Renal vasculature is normal.

Adrenal Glands

The left adrenal gland is normal in size measuring 0.26 cm at the caudal pole. It is observed in its normal position cranial to the left renal artery. It is normal in appearance (uniformly hypoechoic) and shape with no evidence of a mass effect.

The right adrenal gland is normal in size measuring 0.31 cm at the caudal pole. It is observed in its normal position between the cranial aspect of the right kidney and the caudal vena cava. It is normal in appearance (uniformly hypoechoic) and shape with no evidence of a mass effect.

Spleen

The spleen is subjectively normal in size, echotexture is homogenous, and the splenic capsule is smooth with no irregularities. The blood flow through the hilus and splenic parenchyma appears normal. No focal parenchymal abnormalities are visualized.

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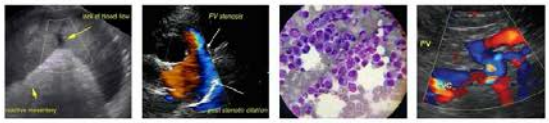

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Liver

The liver is subjectively normal in size, and echogenicity with smooth peripheral margins. The parenchyma is heterogenous in echotexture with subtle, indistinct focal mottling. There is mineralization evident in a linear pattern within the hepatic parenchyma, most consistent with mineralizations within the intrahepatic bile ducts. Severe dilation or inflammation is not associated with these areas. No focal masses or cystic lesions are observed.

The gallbladder lumen is moderately distended. The wall of the gall bladder is not severelyl thickened and it appears to have a smooth mucosal surface. There is a moderate amount of non-organized echogenic debris. Mineralization within the intrahepatic and post-hepatic bile ducts is shadowing the right caudal quadrant of the liver, but there are apparent minerlaizations within the extrahepatic bile ducts. There is no evidence of severe dilation or complete obstruction. There is no evidence of mass effect.

Gastrointestinal

The stomach contains minimal luminal contents. It measures at a normal thickness of <0.7cm with some variability due to the presence of rugal folds. The distinction of the gastric wall layers is adequate and there is no impression of reduced peristaltic activity. No masses or focal lesions were observed.

The visualized areas of duodenum, jejunum and ileum have a relatively uniform diameter with minimal fluid distension. Wall thickness is normal. Bowel loops follow a curvilinear path with distinct wall layering maintaining the typical 1:3 muscularis:mucosa layer ratio. Jejunum measures 0.32, 0.34, 0.35 cm. Visualized peristalsis appears appropriate. There were no focal lesions consistent with obstruction or a mass effect observed.

The ileocecal junction was visualized and exhibited normal intact wall layering and is subjectively of normal thickness. Sections of colon are visualized with formed fecal material and gas shadowing distally. There is no observed focal or generalized colon wall thickening or loss of layering.

Pancreas

The pancreas is normal and isoechoic to surrounding mesentery. There is no evidence of nodules or cystic lesions. There is no evidence of regional mesenteric inflammation or fluid.

Free Abdomen

Evaluation of the peritoneal cavity did not reveal any evidence of effusion, or subjective lymphadenomegaly. The Medial iliac nodes appear normal and there was no evidence of a caudal aortic thrombus at the bifurcation. The omentum is of normal uniform echogenicity.

ULTRASONOGRAPHIC FINDINGS

- Mineralizations visualized within the intra- and extrahepatic bile ducts
- Heterogeneous liver – The diffuse hepatic changes are non-specific and could be consistent with vacuolar hepatopathy, nodular hyperplasia, inflammatory/immune-mediated disease, fibrosis, extramedullary hematopoiesis, toxic hepatopathy (e.g., copper), infiltrative neoplasia (less likely) or other hepatopathy.

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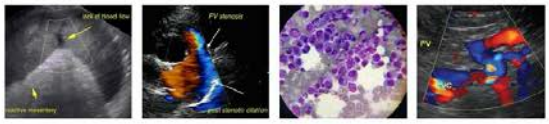

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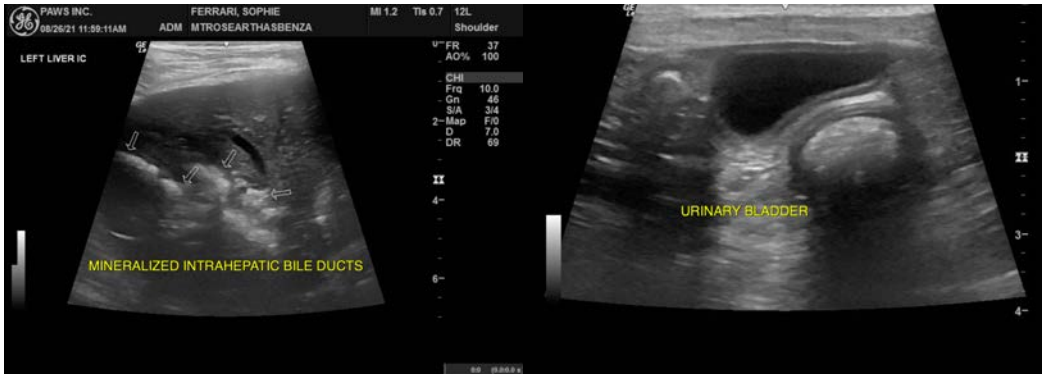
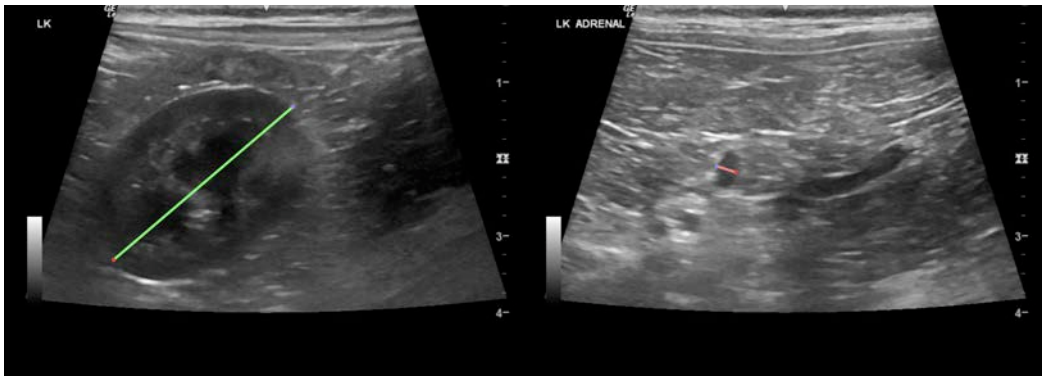
INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

There appears to be a large amount of mineralization (most likely stones) visualized within the hepatic parenchyma and hepatic bile ducts, and also within the extrahepatic bile ducts. There are no stones evident within the gallbladder, and surprisingly there is no evidence of severe bile duct dilation or inflammation. This correlates with a lack of ALP elevation and bilirubin elevation, as would be expected with cholestasis and biliary obstruction. This is likely a chronic finding and will need to be monitored. I would recommend lifelong Ursodiol and Denamarin in this patient. There may be the need for periodic antibiotics if an acute exacerbation in liver values occurs. The liver is heterogeneous. This could be due to chronic inflammation, previous or current infection, or less likely neoplastic change, etc.

Options are to consider a fine needle aspirate of the liver (provided coagulation parameters are normal) or biopsy of the liver to obtain histopathology and culture, or lastly continued medical management and monitoring with blood work +/- ultrasound. There is no way to easily remove these stones, and if they are not currently causing a significant problem I would not intervene. If an obstruction occurs, then the situation would need to be reevaluated. Additionally, a CT scan could be considerd to obtain more detailed images with less artifact due to mineralization, shadowing, etc.





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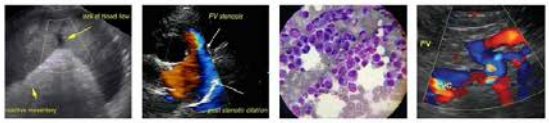

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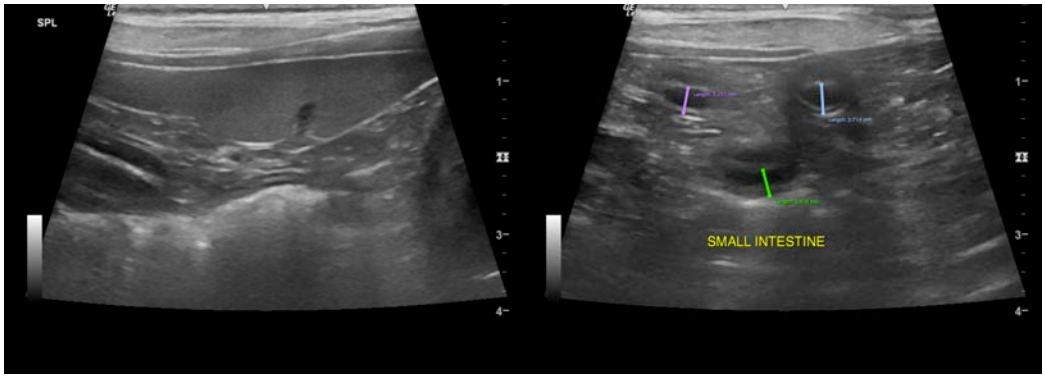

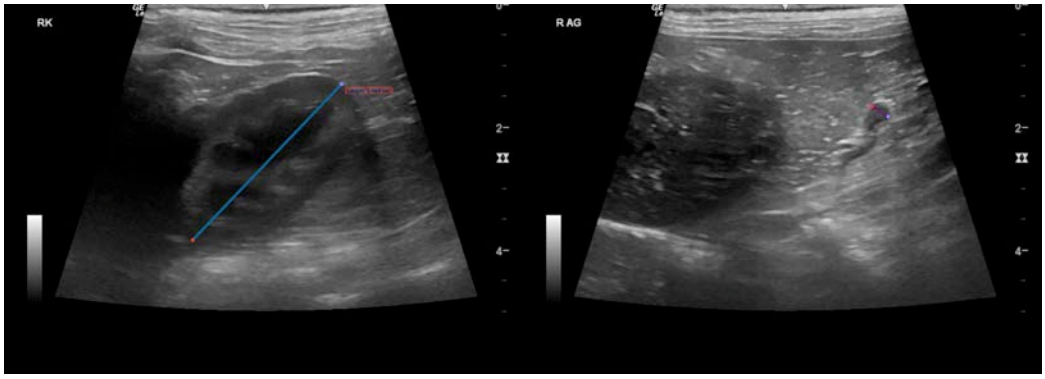

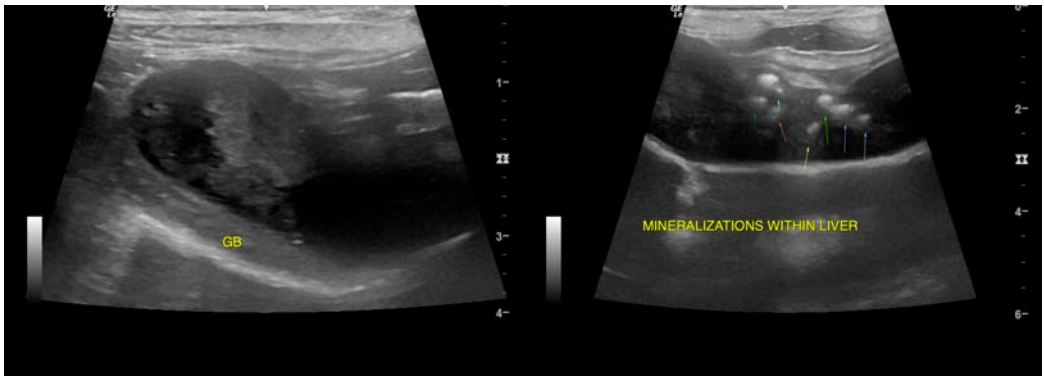

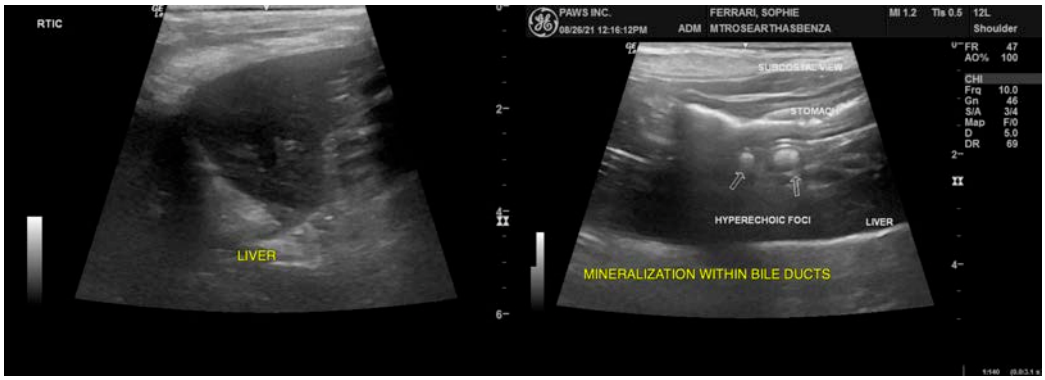

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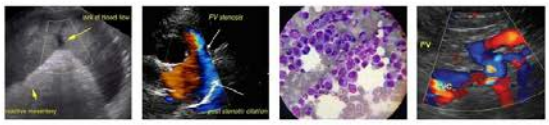

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Kathleen Sennello DVM,MS, Diplomate ACVIM (Small animal Internal Medicine)

kathleen.sennello@sonopath.com