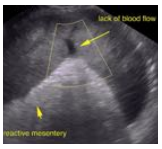

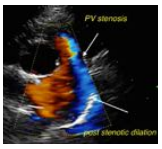

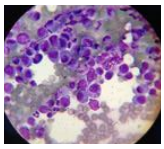
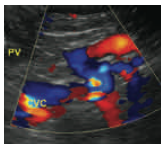

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PATIENT

Squirt Lawrence

SPECIES

Canine

BREED

Labrador Mix

SEX

Spayed Female

AGE

11 years

WEIGHT

32.9 kg

INTERPRETED BY

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

IMAGING PERFORMED BY

Dr. Trudeau

HOSPITAL NAME

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PRESENTING CLINICAL SIGNS

History: controlled hypothyroid disease March 2021 - present for increased drinking and found elevated liver enzymes; owner monitored and it did not persist; in Aug 2021 at annual she has been vomiting after drinking and we rechecked the liver enzymes and they increased; meds: Thyro-tabs Mar; ALT 177 U/L ALP 238 U/L Chol 11 mmol/L Glob 46 g/: - remainder chem and CBC WNL

Aug: ALT 211 U/L ALP 277 U/L Chol 10.5 mmol/L Glob 47 g/L- remainder chem and CBC WNL TT4 - WNL

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 (6.07 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 (6.58 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 0.38 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 enlarged in size measuring 0.95 cm at the cranial pole, 0.45 cm at the caudal pole and the length is 1.6 cm. It is observed in its normal position between the cranial aspect of the right kidney and the caudal vena cava. It is somewhat irregular in appearance and the cranial pole is prominent and hyperechoic as opposed to the hypoechoic, caudal pole, which appears more typical. This is most consistent with a cranial right adrenal nodule.

Spleen

The spleen is subjectively normal in size The spleen echotexture is heterogenous and mottled, 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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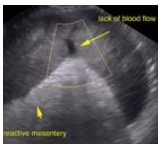
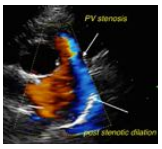
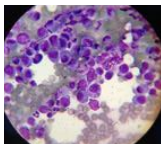
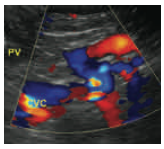

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Liver

The liver is subjectively large in size, and echogenicity with smooth peripheral margins. The parenchyma is heterogenous in echotexture with subtle, indistinct focal mottling. The visible portions of the vasculature and biliary tract appear normal. There are numerous, ill-defined, hypoechoic nodules visualized in the hepatic parenchyma varying in size from 0.5-1.5 cm. The gallbladder lumen is moderately distended. The wall of the gallbladder is not thickened and has a smooth mucosal surface. There is a moderate amount of non-organized echogenic debris. The cystic and common bile ducts are normal/not visible.

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. The duodenum measured as normal (0.5 cm) and the jejunum measured as normal (0.28 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.

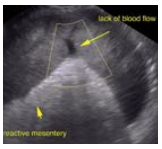
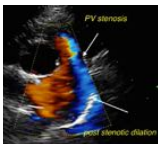
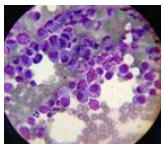
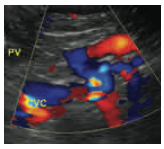
Free Abdomen

Evaluation of the peritoneal cavity did not reveal any evidence of effusion, The omentum is of normal uniform echogenicity. There is a round, hypoechoic structure measuring 2.23 x 2.89 cm in the cranial abdomen. The primary differential for this would be a mesenteric cyst, but a very hypoechoic mass/lymph node cannot be excluded. No other enlarged lymph nodes are visualized.

ULTRASONOGRAPHIC FINDINGS

PRIMARY FINDINGS:

- Large, heterogenous liver with numerous, hyperechoic, ill-defined nodules. 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.
- Mottled spleen. The diffuse splenic changes are non-specific and could be consistent with lymphoid hyperplasia, extramedullary hematopoiesis, infiltrative neoplasia, inflammation,

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other. Cytology or histopathology would be necessary to get a definitive diagnosis.

- Hyperechoic, enlarged, right pole of the right adrenal gland. Right adrenomegaly could be consistent with neoplasia (e.g., adenoma, carcinoma, pheochromocytoma), hyperplasia, inflammation, other.

- Hypoechoic structure in the cranial abdomen, most consistent with a mesenteric cyst. I cannot rule out a hypoechoic lymph node/mass.

SECONDARY FINDINGS:

- Gallbladder sludge. The significance of the aggregated gallbladder debris is unclear. This could represent an early mucocele, cholestasis, or may be secondary to fasting.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The liver is somewhat mottled and irregular, which gives concern for possibly a primary hepatopathy. Additionally the right adrenal gland is irregular, which could introduce the possibility of some hormonal influence over the liver. The liver enzymes reported are more consistent with a primary hepatopathy. This is the way I generally approach this situation:

- Consider close evaluation of history for possible toxic changes examine medications, diet, dietary indiscretion etc...
- Consider PCR on urine/serum for leptospirosis (if not on antibiotics)/serology if recent antibiotic history
- If not already done, consider pre and post prandial bile acids to evaluate liver function
- If the ALP is significantly elevated relative to the ALT and symptoms consistent with Cushing's are present, consider adrenal function testing (ACTH stim)
- Consider Fine needle aspirate if round cell neoplasia is on your differentia list (25 g needle, normal coags)
- If no response to supportive care (Denamarin, fluids, antibiotics,+/- Ursodiol etc...) Consider liver biopsy with samples obtained for histopathology, culture, and copper levels.

The right adrenal gland appears somewhat irregular. This can be consistent with a nodule on the cranial pole of the right adrenal gland. Although in some dogs the cranial pole of the right adrenal gland can be much bigger than the caudal pole. Correlate this with clinical signs and I recommend monitoring of the adrenal gland with ultrasound. If the liver function is normal and signs for primary hepatopathy seem less likely. If Cushing's symptoms are present, these are my recommendations for a dog with an adrenal nodule:

- If signs of Cushing's are present, consider adrenal function testing. I prefer an ACTH stimulation test combined with an adrenal panel to the University of Tennessee's endocrine lab to look for atypical adrenal hormones as well as cortisol. (other testing can suffice)
- If adrenal dependent Cushing's is suspected and supported by adrenal function testing consider medical therapy with Lysodren or Trilostane or consider surgical removal (recommend referral to a board certified veterinary surgeon and possible pre op CT)
- Recommend blood pressure evaluation-if hypertensive consider testing catecholamine levels for a possible pheochromocytoma
- If no symptoms of Cushing's are present, consider either referral for surgery or continued monitoring with ultrasound (in 3-4 months).
- Many of these nodules can be benign and incidental in nature, unfortunately that is difficult to determine with a single ultrasound.

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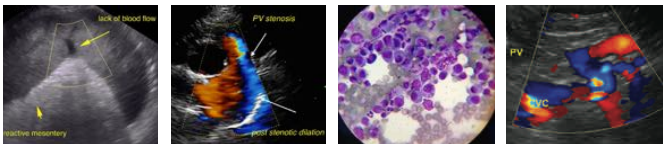

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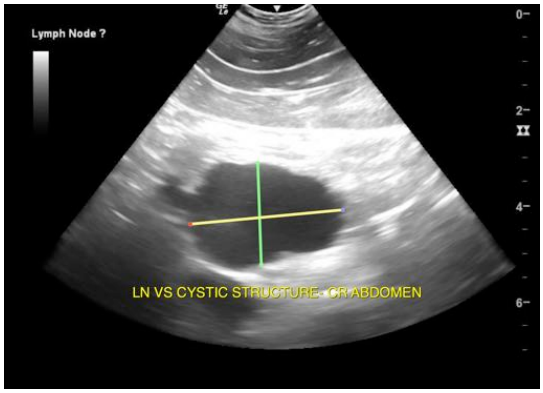
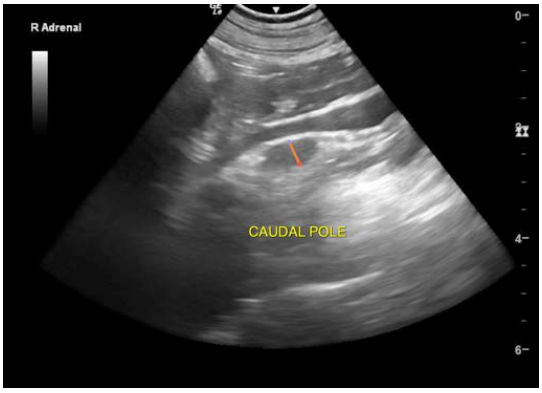
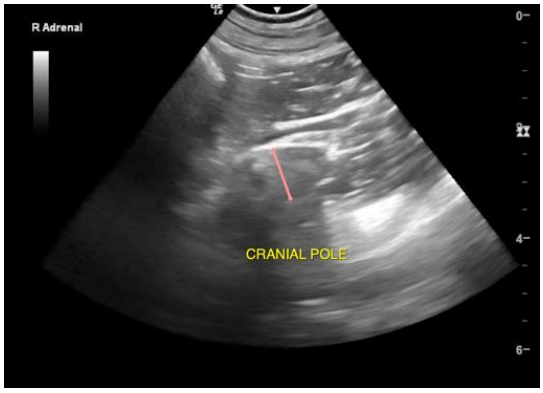
Additionally the spleen appears somewhat mottled. Consider a FNA of the spleen.

There is a hypoechoic structure in the cranial abdomen. Based on the images provided it appears almost cystic in nature (very rounded and hypoechoic), but I cannot exclude the possibility of a lymph node. You can consider a FNA of this nodule if you can get a safe angle for sampling (avoiding local vasculature). I do not see evidence of other enlarged lymph nodes that additionally supports the possibility of a mesenteric cyst. I recommend either sampling or continued monitoring with ultrasound.







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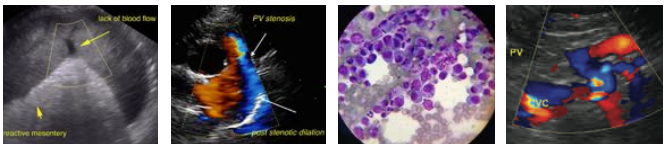

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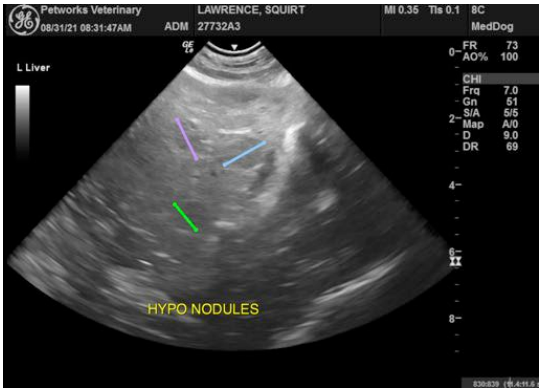

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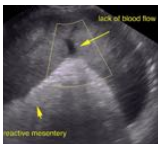

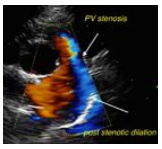

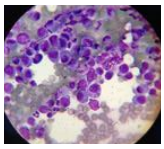
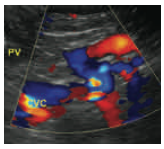

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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