

**DATE PRESENTING CLINICAL SIGNS**

10/20/22 Elevated ALT; liver dysfunction.

PATIENT Current Medications: Denamarin SID.

Oso Lazo Lab Results: Postprandial levels were greater than 25 umol/L indicating possible abnormal liver function.

Date of Previous IntraPet Ultrasound: No previous.

Sedation: Torbugesic/Midazolam.

Stat Report: Not requested.

SPECIES

Canine

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**BREED** *Urinary System*

Havanese

The urinary bladder is moderately distended with anechoic contents. No masses, inflammatory changes, echogenic sediment or cystoliths are observed. The urinary bladder, trigone and visible pelvic urethra are normal in thickness with a smooth mucosal surface.

SEX

Intact Male

Prostate is normal in size (2.0 cm wide) for an intact male. Parenchyma is diffusely homogenous and relatively hyperechoic. Normal distinct margins and symmetrical bilobed shape are maintained.

AGE

2/28/19

The right kidney is normal in size (3.8 cm), shape and echogenicity. It has smooth peripheral margination. There is a normal 1:3 cortex to medulla ratio with appropriate corticomedullary distinction. There is no evidence of pyelectasia, mineral or infarcts observed.

WEIGHT

10.82 Pounds

The left kidney is normal in size (3.65 cm), shape and echogenicity. It has smooth peripheral margination. There is a normal 1:3 cortex to medulla ratio with appropriate corticomedullary distinction. There is no evidence of pyelectasia, mineral or infarcts observed.

INTERPRETED BYBeth Johnson, DVM
DACVIM**Adrenal Glands**

The right adrenal gland is normal in size (1.33 cm long x 0.55 cm at the cranial pole and 0.47 cm at the caudal pole), shape and contour. Corticomedullary structure is unremarkable. Visible surrounding vasculature appears normal.

IMAGING PERFORMED BYStephanie Warga
RDCS, RVT

The left adrenal gland is normal in size (1.4 cm long x 0.38 cm at the cranial pole and 0.45 cm at the caudal pole), shape and contour. Corticomedullary structure is unremarkable. Visible surrounding vasculature appears normal.

HOSPITAL NAME

Banfield White Marsh

Spleen

The spleen is subjectively normal in size with a normal smooth capsular contour. Parenchyma is appropriately finely textured and homogenous with normal echogenicity relative to surrounding tissue (hyperechoic to liver). No focal nodules or masses are observed. Splenic vasculature appears normal.

REFERRING VET

Dr. Esdaile

Liver

The liver is subjectively normal in size with normal smooth curvilinear peripheral contour. Parenchyma is appropriately hypoechoic to the spleen in echogenicity and appropriately mildly coarse and homogenous in echotexture. No focal lesions are observed. Visible vasculature and biliary tree appear normal without distension or congestion. Portal vein to vena cava ratio is 0.7:0.9, which is normal.

INVOICE

42243

Gallbladder is moderately distended with anechoic bile as well as suspended and gravity dependent echogenic debris. The wall is smooth without visible thickening. There is no evidence of cystic or CBD dilation. There is no evidence of effusion or inflammation.

Gastrointestinal

The stomach wall is normal in thickness (canine < 0.5 cm and feline < 0.4 cm) and layering. The lumen of the stomach is empty with no evidence of obstruction, foreign material or infiltrative disease. Pyloric outflow tract appears patent.

The visible small intestines are normal in wall thickness and layering (canine duodenum < 0.5 cm and feline duodenum < 0.4 cm; other < 0.3 cm). Small intestinal motility appears adequate (1-3 contractions per min). The lumen of the small intestine is empty with no evidence of obstruction, foreign material or infiltrative disease.

The visible colon is normal in wall thickness (< 0.2 cm) and layering. Contents are consistent with normal formed feces and gas.

Pancreas

The pancreatic parenchyma is appropriately isoechoic to surrounding tissue. Visible capsule is smooth and normal in contour. There is no visible pancreatic duct dilation. There is no evidence of active peripancreatic inflammation.

Free Abdomen

There is no evidence of free peritoneal effusion noted in these images.

There is no apparent lymphadenopathy noted in these images.

Both testicles are visualized without evident pathology.

ULTRASONOGRAPHIC FINDINGS

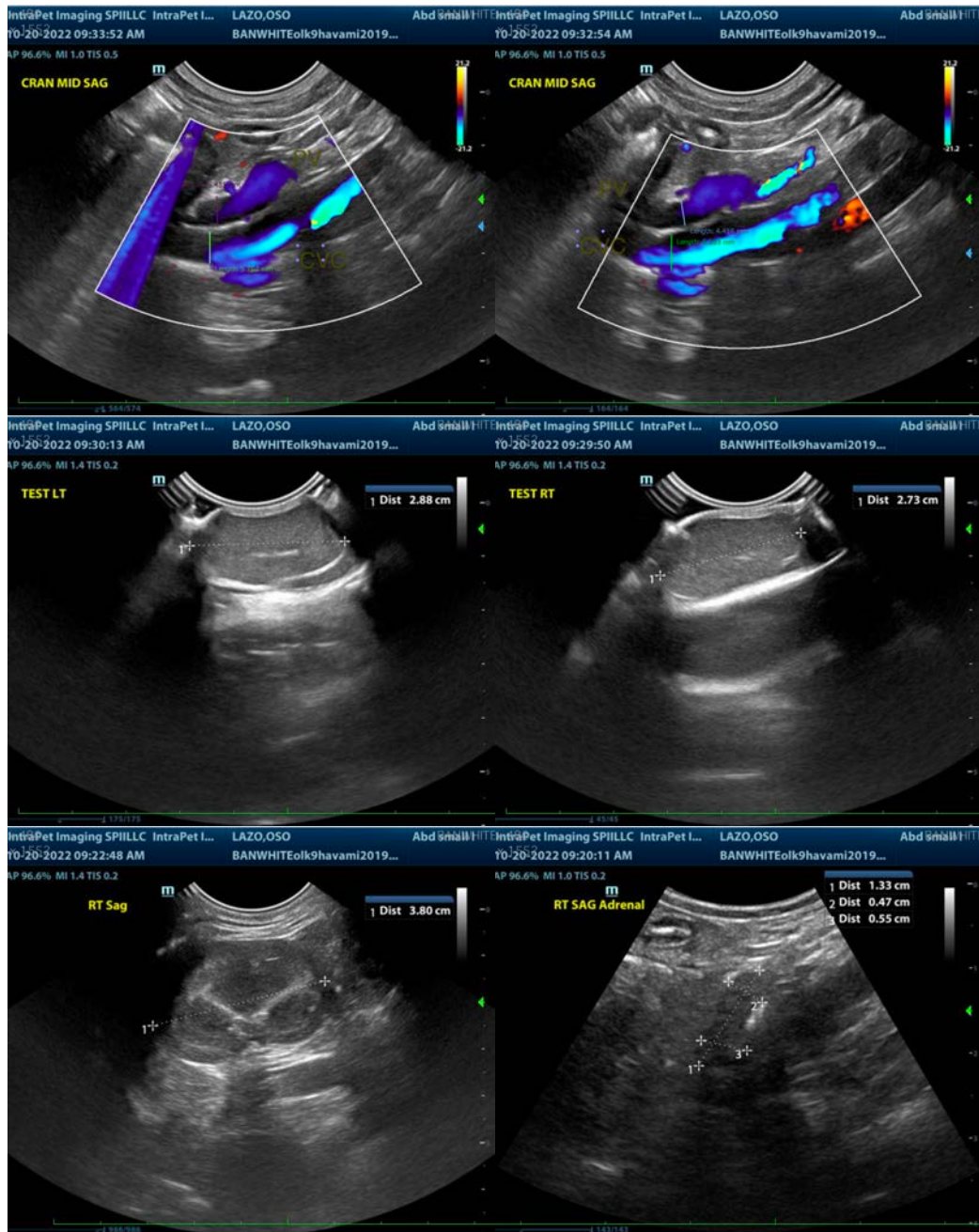
- **Gallbladder debris** - Cholecystic debris is of unknown clinical significance. It can be seen with biliary stasis from fasting or illness. Cholecystic debris is not necessarily related to hepatobiliary disease. Echogenic bile is most commonly an incidental finding in dogs and should be interpreted in combination with clinical signs such as nausea, inappetence, cranial abdominal discomfort and/or laboratory changes such as increased ALP and/or increased Tbili.
- Otherwise, normal/unremarkable abdomen with no visible evidence of extra- or intrahepatic portosystemic shunting.
- An obvious cause for the reported increased liver enzymes is not identified in these images. Microscopic disease such as Leptospirosis, bacterial cholangiohepatitis, chronic active hepatitis, copper-associated hepatotoxicity, other hepatotoxicity, infiltrative neoplasia (considered unlikely), etc. cannot be definitively ruled out.

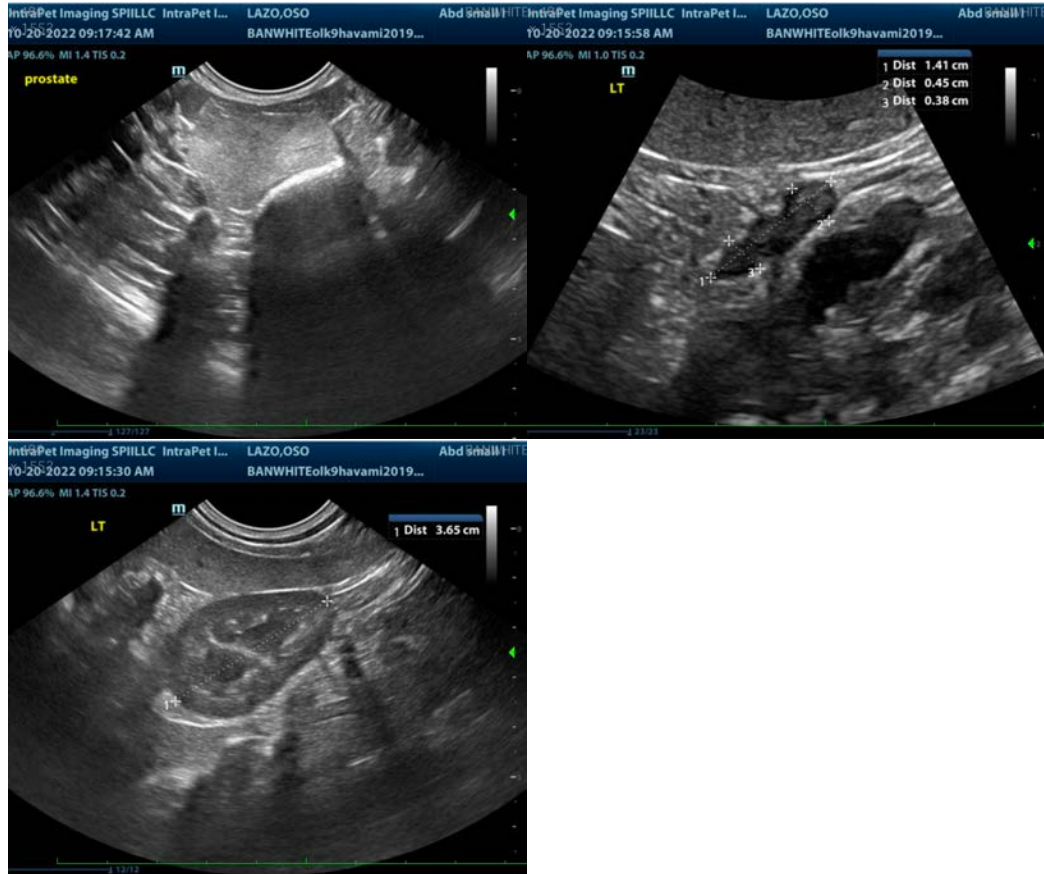
INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Definitive recommendations depend partially on the level of bile acid increase. It is reportedly >25 without an exact value provided. If not already evaluated, specific bile acid numbers are recommended. These ultrasound images make the presence of a portosystemic shunt exceedingly unlikely. However, if bile acids are >100, given patient breed, further advanced imaging would be recommended. If bile acids are only mildly increased at <100, other differentials including microvascular dysplasia or portal vein hypoplasia versus even non-hepatobiliary diseases such as gastrointestinal disease are all differentials.

In that case, recommendations include testing for Leptospirosis if not recently evaluated, a fecal exam if not recently evaluated, followed by empirical deworming with a 5-day course of Panacur and a course of hepatic

nutraceuticals with monitoring of ALT for improvement. If liver enzymes continue to increase and not respond to supportive care, liver sampling in the form of a fine needle aspirate of the liver and/or liver biopsy may be necessary if patient's coagulation status is appropriate.





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.

Beth Johnson, DVM, DACVIM
Beth.Johnson@sonopath.com