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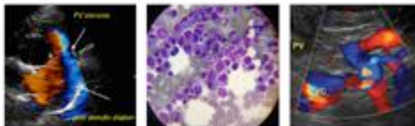

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
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PATIENT

Bo Muscat

SPECIES

Canine

BREED

Yorkie mix

SEX

Neutered Male

AGE

12 years

WEIGHT

21 Pounds

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Amy Mayhew, LVT

HOSPITAL NAME

SVS Imaging Michigan

REFERRING VET

Vet Select Animal Hospital of Dearborn

INVOICE

98173

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PRESENTING CLINICAL SIGNS

History: Patient has had progressive increases in liver values. Patient recently had a bout of pancreatitis. Patient also has proteinuria and visible renal calcification on x-ray.
Abnormal PE/Chem/CBC/UA Results: Pancreatitis has resolved; recent exam generally normal. Chem panel: ALT 862, alk phos 718, AST 96, GGT 14; triglycerides 733. UPC in December was 1.2.

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder is adequately filled. The wall is smooth and regular. No abnormalities are present with the trigone or proximal urethra, and there is no evidence of sediment, cystoliths, polyps or a mass.

The prostate is homogenous and measures 0.49 cm, which is within normal limits for a neutered male.

The aortic bifurcation is normal.

The left kidney measures 4.72 cm (within normal limits). The capsule is smooth. An anechoic structure within the cortex, consistent with a cyst, is present. It measures 0.26 cm. Its overall architecture, including the definition of the cortico-medullary junction, are well preserved for a dog of Bo's age. Multiple, punctate mineralizations are observed, as well as small nephroliths. Pyelectasia is not present. The largest nephrolith measures 3.1 mm. Pinpoint mineralizations are also noted throughout the cortex. The cortex is hyperechoic (it is isoechoic to the spleen). There is no evidence of an obstruction and the surrounding mesentery is not hyperechoic.

The right kidney measures 4.91 cm (within normal limits). The capsule is smooth. A cyst is noted in the cortex measuring 0.32 cm. The findings are similar to the left kidney.

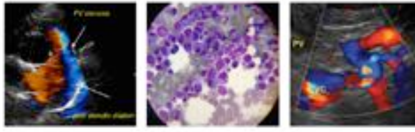
Adrenal Glands

The left adrenal gland measures 1.49 cm at the cranial pole, 0.79 cm at the caudal pole and 3.03 cm in length. A mass is present at the cranial pole with a loss of its normal shape and architecture. The mass is mildly heterogenous and not vascularized. The phrenico-abdominal vein, as well as the surrounding vasculature do not show any abnormalities. Differential diagnoses include an adenoma, adenocarcinoma or pheochromocytoma.

The right adrenal gland measures 0.52 cm at the cranial pole, 0.73 cm at the caudal pole and 2.16 cm in length. The caudal pole is enlarged, "plump" and rounded, however, no abnormalities are noted with the overall echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

Spleen

The spleen is within normal limits in size, echotexture, and echogenicity. The capsule is smooth. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified. Mild perivascular cuffing consistent with myelolipomas is observed, which is clinically insignificant.



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Liver

There are no obvious signs of hepatomegaly and its borders are smooth and sharp. An anechoic structure, most consistent with a cyst, is observed. It measures 0.59 cm. The liver's echotexture is homogeneous, but slightly granular. It is very mildly hyperechoic. A hypoechoic nodule, measuring 1.07 cm, is also noted mid liver on the transverse view. The hyperechogenicity is a non-specific change, which may be suggestive of a vacuolar hepatopathy, which may occur due to hyperadrenocorticism or stress (chronic illness). Other differential diagnoses include immune-mediated hepatitis or cholangitis/cholangiohepatitis with a secondary bacterial infection. The latter differentials are considered unlikely.

The gallbladder is moderately distended and there is a moderate amount of echogenic material/debris (sludge) present within the lumen. This is most likely clinically insignificant, however, cholestasis cannot be excluded. Signs of cholecystitis are not appreciated. No abnormalities are observed with the rest of the biliary tree.

Gastrointestinal

The gastric wall and pylorus are within normal limits in thickness. A moderate amount of gas is present within the stomach. There is no loss of definition of the normal architecture of the wall layers. No obvious abnormalities are observed with its peristalsis.

Very subtle "suggestions" of striations are noted in the duodenum. A minor amount of fluid is in the small intestine. The small intestinal wall thickness is within normal limits and the definition of the wall layers is preserved. However, mild stippling and fogging are present in some of the small intestines.

There is loss of definition of the mucosal layer of the colon, however, it is thickened. There are no obvious signs of a mass, foreign body, infiltrative disease or an obstruction.

Pancreas

The left limb of the pancreas has a coarse echotexture and is mildly heterogeneous. These changes are most likely due to nodular hyperplasia and areas of fibrosis. There are no signs of active pancreatitis or neoplasia.

Other:

Lymph nodes: No abnormalities are observed.

Abdominal effusion is not visualized.

The mesentery surrounding the right pancreas and duodenum is moderately hyperechoic.

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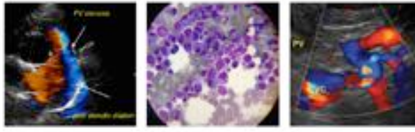

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ULTRASONOGRAPHIC FINDINGS

Sonographic signs of mild age related renal degeneration are present. Very mild nephrolithiasis is noted in both kidneys without signs of an obstruction. A component of the renal changes may be due to glomerulonephritis associated with hyperadrenocorticism. Other causes, such as leptospirosis, tick borne diseases and heartworm disease should be eliminated if Bo is at risk. Obvious signs of pyelonephritis are not visualized, however, it cannot be excluded despite the absence of sonographic signs.

Presence of a mass on the cranial pole of the left adrenal gland. It is avascular. The mass does not show criteria of malignancy. Despite its size, differential diagnoses include an adenoma and hyperplasia. The right adrenal gland is enlarged, therefore, bilateral, but asymmetrical hyperplasia due to pituitary dependent hyperadrenocorticism cannot be excluded.

The diffuse hyperechogenicity of the liver is highly suggestive of a vacuolar hepatopathy, which may occur due to stress (chronic illness) or hyperadrenocorticism. Hepatitis is considered less likely, however, cholangitis/cholangiohepatitis and cholestasis cannot be excluded. The hypoechoic nodules observed are most likely due to nodular regeneration, which is a benign age related change. There are no obvious signs of neoplasia. The presence of sludge in the gallbladder is most likely clinically insignificant; however, the client should be asked about signs of gastroesophageal reflux. Signs of cholecystitis are not appreciated.

The diffuse mucosal fogging of the intestinal tract, the possible striations of the duodenum, and the colonic thickening may occur due to inflammation secondary to inflammatory bowel disease, as well as inflammation caused by colitis. Infiltrative disease, such as lymphoma or other round cell tumour is not likely, but cannot be excluded without performing biopsies.

Both limbs of the pancreas show signs suggestive of nodular regeneration and fibrosis, most likely due to age related changes, and possible scar tissue associated with previous episodes of pancreatitis. There are no signs of neoplasia or active pancreatitis. The hyperechoic mesentery appears to be associated with the GI tract rather than the pancreas.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Evaluation for signs of GERD is suggested as this may be associated with gall bladder sludge and/or IBD. Ursodeoxycholic acid (Ursodiol) may be required.

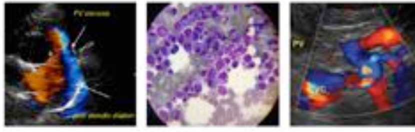
Bo has a history of hypertriglyceridemia, which may predispose an individual to multiple clinical signs and GB sludge. Treatment of hypertriglyceridemia is recommended.

Deworming with a broad spectrum dewormer, such as fenbendazole, is recommended.

A veterinary prescription brand low fat, hypoallergenic diet, whether hydrolyzed or novel protein, should be fed. Purina HA is suggested.

If there is no response to the above treatments, endoscopy and biopsies of the upper and lower GI tract may be pursued.

Secondary ascending bacterial infections of the liver and bile are common. Although indiscriminate use of antibiotics is not recommended, one could start treatment with a broad-spectrum antibiotic and reassess liver enzyme activities, including a GGT, in a few weeks.



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A FNA of the liver may be considered, however, a tissue biopsy is required to evaluate the hepatic architecture.

An arterial blood pressure is recommended to rule out hypertension associated with hyperadrenocorticism.

Further diagnostics for hyperadrenocorticism may be considered if Bo is demonstrating clinical signs.

Bo has many different issues, and although some treatment recommendations have been described, an internal medicine consult an internal medicine consult may be requested to describe all possible options in further detail. This may be done by telephone or email.

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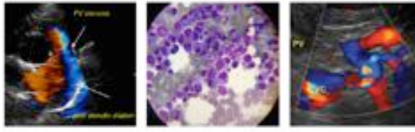

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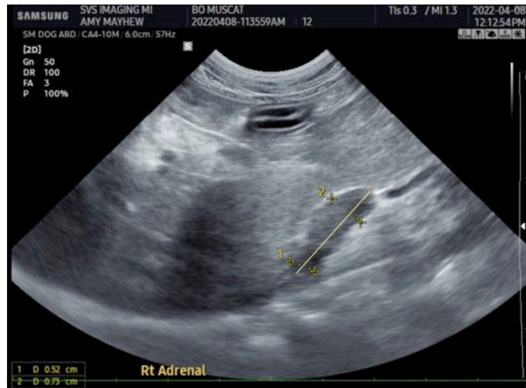

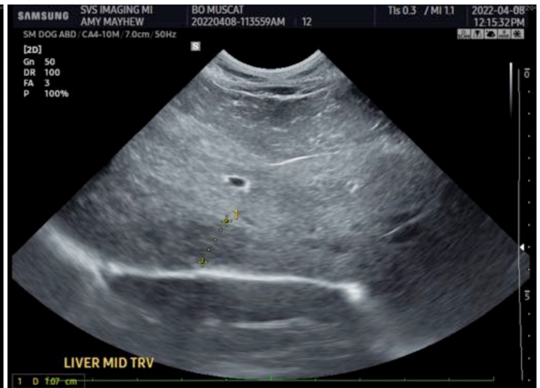

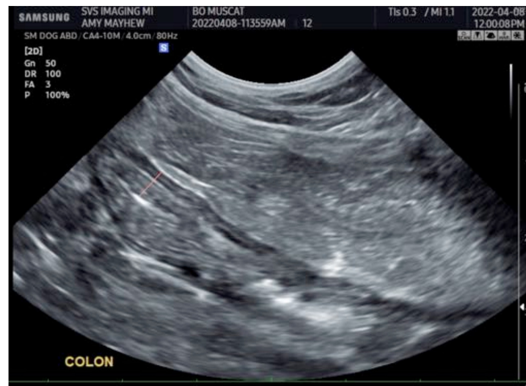

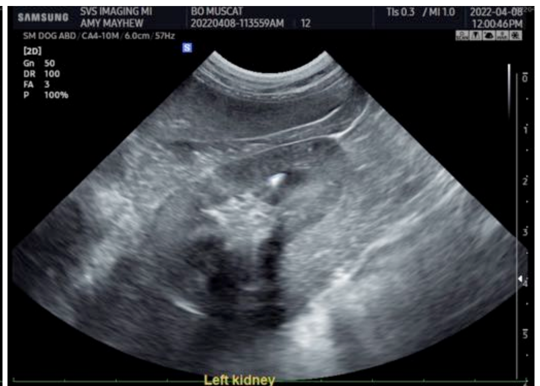

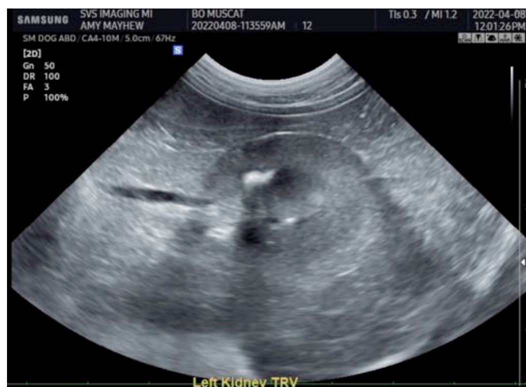

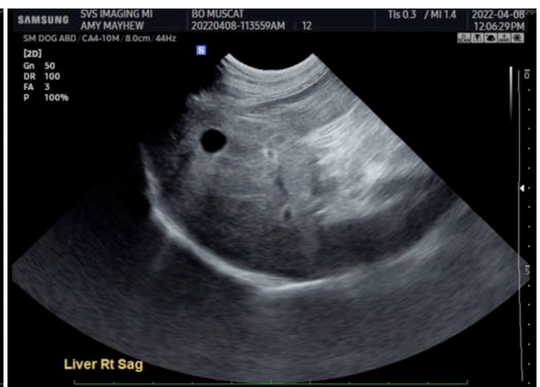

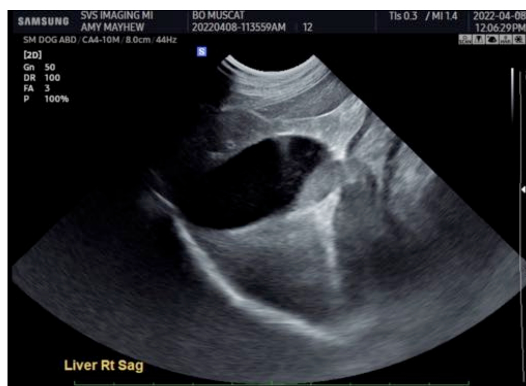

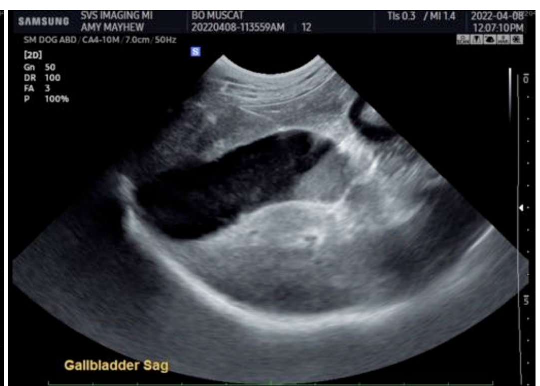

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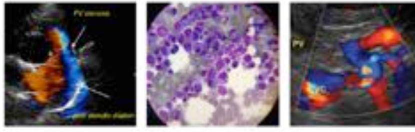

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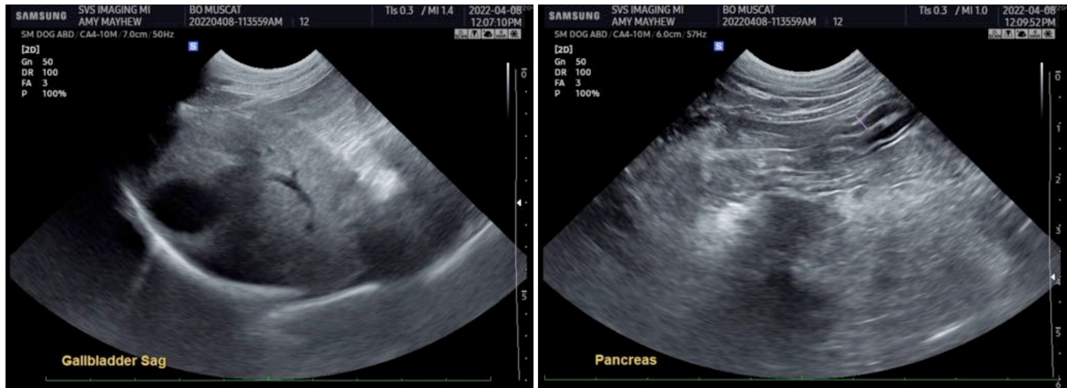

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

Lisa.Carioto@sonopath.com