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Clinical Sonography & Telecytology
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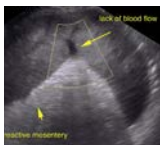
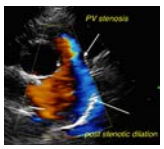
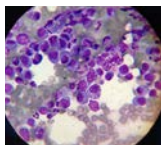
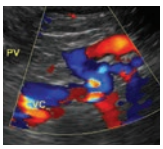





SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT

Zonk Taylor

SPECIES

Canine

BREED

German Shepherd

SEX

Intact Male

AGE

11 Years

WEIGHT

92.6 Pounds

INTERPRETED BY

R. McKenzie Daniel, DVM, DABVP (Canine and Feline)

IMAGING PERFORMED BY

Rachel Runnells, RVT

HOSPITAL NAME

SVS Imaging Kansas City

REFERRING VET

Dr. Warwick

INVOICE

33717

DATE

12/23/21

PRESENTING CLINICAL SIGNS

Came in for vomiting and diarrhea 12/17/21. Also had a seizure 11/20/21 (first one ever). Heavy, rapid breathing, groaning a lot. Started on pimobendan, lasix, enalapril, and diltiazem 3 days ago, and seems to be improving.
Abnormal PE/Chem/CBC/UA Results: Abdominal pain, low electrolytes. Irregular heart rate and premature beats. ECG sent off for interpretation 12/21: irregular supraventricular tachyarrhythmia without appreciable P waves. Consistent with atrial fibrillation and fast ventricular response rate. CBC, chem, T4: slightly elevated Phos, Sodium, Potassium, and Chloride. The rest, including T4 WNL. Rads sent off 12/17: small mineral opaque gastric and SI foreign bodies, likely incidental. Indistinct soft tissue opacity at pylorus- possible ingesta, collapsed gastric wall, or mural thickening. Focal caudal displacement of stomach (differentials - previous gastropexy, or focal hepatic enlargement). Chest showed L-sided cardiomegaly, loss of cardiac waist due to LA enlargement.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART & ABDOMEN

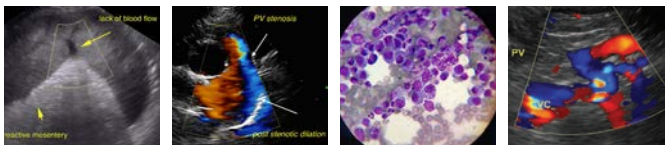
CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	5.2	2.3	2.1	2.1	22.6	44.4	0.7
CANINE CARDIAC PARAMETERS	**HR** (BPM)	**AV VMAX** (m/s)	**PV MAX** (m/s)	**BODY WEIGHT** (kg)	**LA** 2D short axis Base view (cm)	**LVIDd** Avg; 2D and m-mode short axis (cm)	**LVIDs** Avg; 2D and m-mode short axis (cm)
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6				
PATIENT	198	1.5	0.87		6.9	6.9	

Cardiac Presentation

There is severe left ventricular dilation with diminished systolic function. Increased EPSS and increased overall cardiac sphericity noted. Decreased LV wall thickness noted. Moderate to severe left atrial enlargement present. Minor thickening of the mitral valve was noted with no obvious prolapse or chordae tendineae rupture. Concurrent eccentric mitral valve regurgitation. Potential for subtle tricuspid valve thickening with concurrent mild tricuspid valve insufficiency. Right atrial enlargement noted with subtle right ventricular enlargement. The left ventricular outflow tract velocity was sonographically normal with laminar flow and outflow velocity. No evidence of aortic insufficiency. Normal pulmonic valve and normal outflow velocity with minor to trace pulmonic valve insufficiency. No overt pericardial or pleural effusion noted. No evidence of cardiac or pericardial tumors. Tachycardia/tachyarrhythmia present.

Urinary System

The urinary bladder, trigone, cystourethral junction, and visible pelvic urethra to a depth of 2.0 cm exhibited normal thickness and tone. Anechoic urine was present in the lumen with no uroliths or sediment. The ureteral papillae were normal. The ureters were not visible which is normal. No evidence of inflammatory or neoplastic changes were noted.



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The prostate was enlarged in size with intact, symmetrical capsule contour. The margins of the gland were intact and able to be differentiated from the surrounding tissue. The prostatic parenchyma was mildly echogenic to heteroechoic without parenchymal mineralization. The prostate measured 5.7 cm in diameter.

The area of the aortic trifurcation was free of pathology.

Normal size and margination were present in the kidneys. A normal 1:3 cortex / medulla ratio was maintained. The medulla and cortices were uniform in texture with some increased echogenicity and loss of corticomedullary symmetry and definition expected for the age of the patient. No evidence of pelvic dilation was present. The left kidney measured 9.3 cm. The right kidney measured 8.3 cm.

Adrenal Glands

Both left adrenal glands were small in size with flattened contour and a uniformly hypoechoic parenchyma. The left adrenal gland measured 3.0 cm x 0.41 cm at the caudal pole. The right adrenal gland measured 2.3 cm x 0.34 cm at the caudal pole.

Spleen

The spleen exhibited primarily finely textured parenchyma which was hyperechoic to the liver and renal cortical parenchyma. Mild generalized parenchyma heterogeneity was present without evidence of nodular changes. The capsule was smooth and regular without apparent expansion. The splenic vasculature at the hilus was normal in volume with no evidence of congestion or thrombosis. The parenchymal heterogeneity is likely consistent with benign changes such as extramedullary hematopoiesis or age related remodeling with minor potential for inflammatory or neoplastic disease.

Liver

The liver was subjectively normal in size, structure, and contour. The liver parenchyma was mildly nonuniform and hypoechoic to the spleen with a moderate coarse echotexture and subjective mild to benign parenchymal remodeling. The hepatic and portal vasculature were normal in appearance without signs of congestion. The gallbladder was non-distended in size with thin walls and primarily anechoic luminal content. The cystic and common bile ducts were normal.

Gastrointestinal

The stomach presented wall thickening secondary to echogenic mucosa hypertrophy. Intact wall layering was maintained and distinct. Mild gastric distension with primarily anechoic fluid was present. Gastric body wall measured 0.94 cm.

The small intestine presented intact wall layering with 1:3 muscularis/mucosa ratio. The lumen of the small intestine was empty with no signs of ileus, obstruction or foreign material. Jejunum wall measured 0.40 cm.

The colon walls presented intact yet mildly prominent wall layering with mild thickened to echogenic submucosa. Semiformed fecal matter was present in the colon lumen with lumen dilation.

Pancreas

The parenchyma of the left limb, body and right limb of the pancreas presented isoechoic to the adjacent omental fat. A normal curvilinear capsule contour of the pancreas was present. The visible pancreatic duct was normal. No signs of active inflammation or neoplastic disease was evident.

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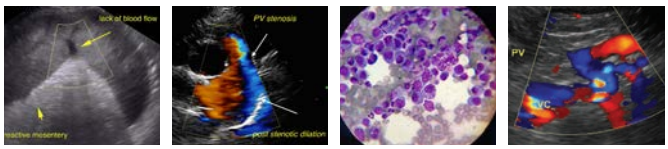

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Free Abdomen

No omental masses, lymphadenopathy or effusion.

ULTRASONOGRAPHIC FINDINGS

- Moderate to severe LA/LV enlargement
- Mild RA/RV enlargement
- Tachycardia/tachyarrhythmia
- MR/TR
- Gastroenterocolitis pattern
- Benign prostatic hyperplasia, minor potential for prostatitis
- Subjective subnormal bilateral adrenal glands – non-specific

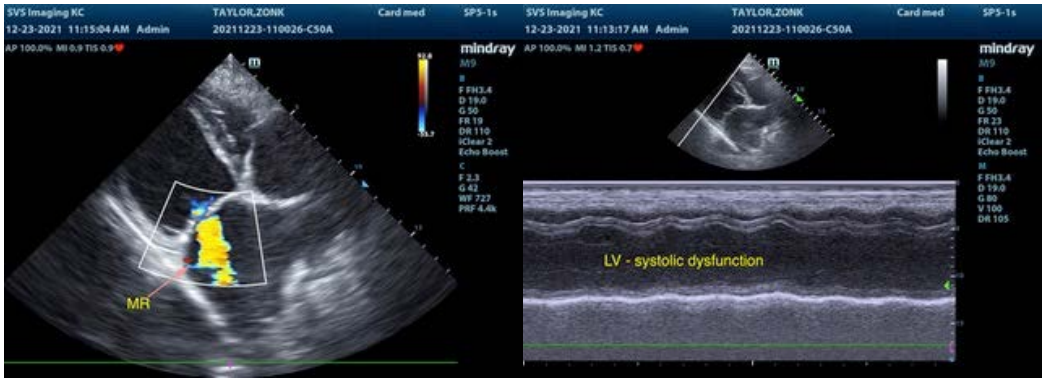
INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Significant cardiomyopathy, systolic dysfunction and tachyarrhythmia were present, resulting in dilation and volume overload of the left and somewhat right heart including biatrial enlargement. Eccentric MR and mild TR were present. The estimated pulmonary pressure gradient based on TR velocity was not consistent with overt clinical pulmonary hypertension. This may be primary in nature (chronic large breed MVD or DCM-like cardiomyopathy) or possibly secondary to taurine deficiency, metabolic disease (hypothyroidism or other), myocarditis, tachycardia induced cardiomyopathy, or infiltrative disease such as lymphoma. No overt evidence of left or right heart congestion at this time, yet going forward this patient is at increased risk for CHF, further malignant arrhythmias and potential for sudden death.

Continued current cardiac medications with monitoring of renal parameters, blood pressure, and ECG advised. Recheck echocardiogram recommended in 4-6 months, sooner if clinical signs consistent with progressive CHF are noted.

Dysbiosis, food intolerance/dietary hypersensitivity, structurally insignificant inflammatory bowel disease, or less likely intestinal neoplasia or pancreatitis may be playing a role in the patient's gastrointestinal signs. Fresh fecal analysis and GI panel to include PLI, TLI, cobalamin and folate may be considered. The subjective subnormal bilateral adrenal glands may be a normal patient variant, yet resting cortisol to assess for or rule out occult Addison's disease (given the gastrointestinal signs) would be warranted.

Empirically, a limited antigen or hydrolyzed diet trial with potential long term dietary therapy, prophylactic deworming (Panacur 50 mg/kg SID x 5 consecutive days with repeat protocol in 3 weeks even if fecal testing is negative), high colony count probiotic (Proviable or Visbiome), antibiotic trial and as needed gastrointestinal support with assessment of clinical response may prove beneficial.



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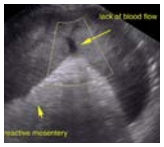
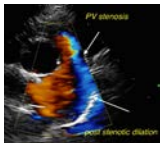
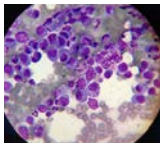
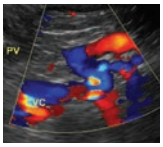

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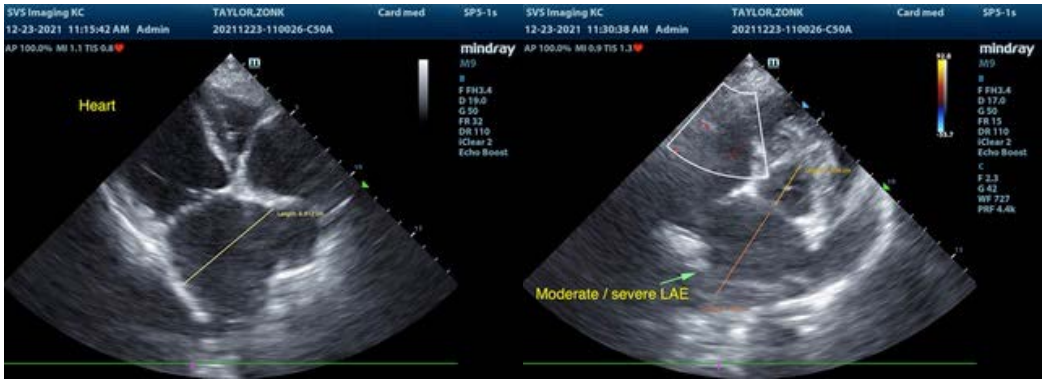

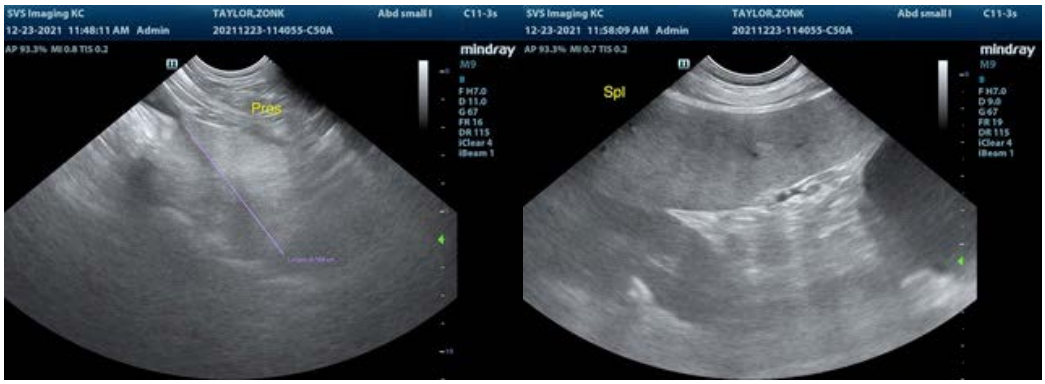

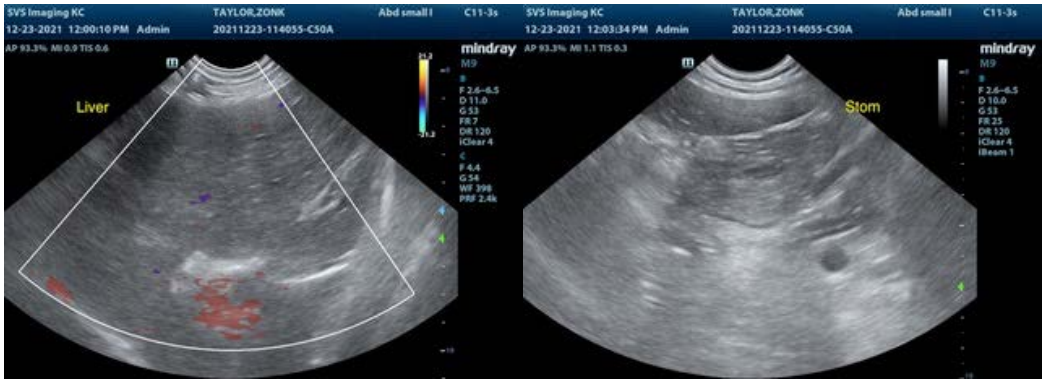

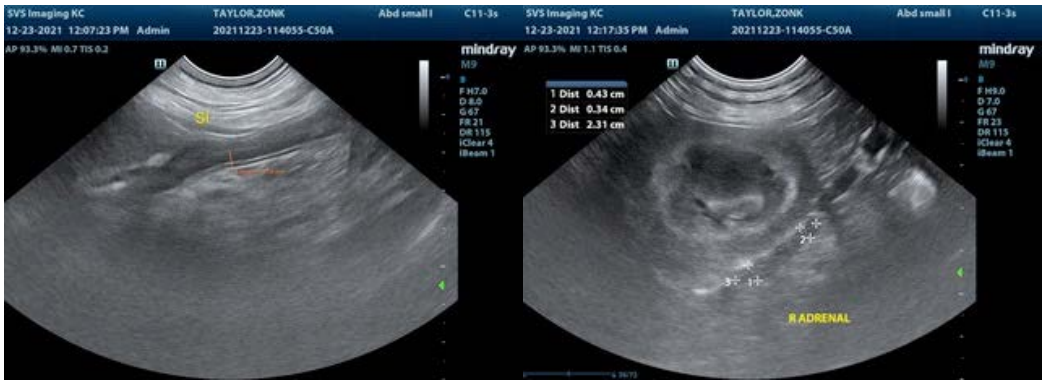

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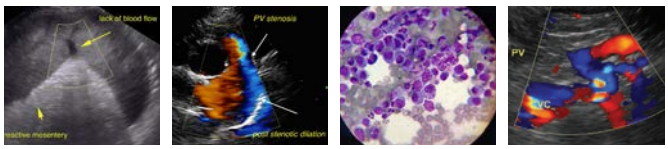

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

R. McKenzie Daniel, DVM, DABVP (Canine / Feline Practice)
info@SonoPath.com