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Clinical Sonography & Telecytology
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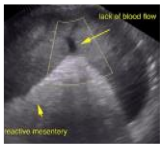
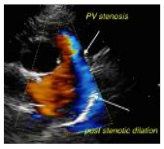
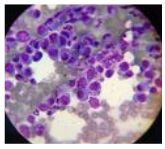
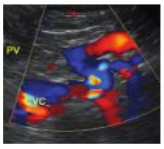




SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT

Callie Precourt

SPECIES

Canine

BREED

Shih Tzu

SEX

FS

AGE

11 years

WEIGHT

14 lbs.

INTERPRETED BY

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

IMAGING PERFORMED BY

Dr. Ebersole

HOSPITAL NAME

Scanvet

REFERRING VET

Dr. Sheridan

INVOICE

15364

DATE

11/3/22

PRESENTING CLINICAL SIGNS

Frequent panting reported by owner. Heart murmur, gallop rhythm noted on exam. Pulmonary edema noted on chest rads. Persistent neutrophilia.

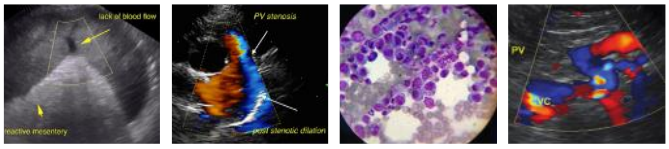
Abnormal PE/Chem/CBC/UA Results: PE: heart murmur, gallop rhythm and panting. Thin, dry skin noted when shaved. RADS: perihilar pulmonary edema, VHS (7/2022) 10.1. Chem (7/2022) ALP 791, ALT 86. CBC: WBC 26.8k, Neut 23.8k.

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	<1.3	28-40	40-100	<0.6
PATIENT			N1.4	1.34	41	74.4	0.2
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	NM	1.8	1.3		2.2	2.2	

Cardiac Presentation

The echocardiogram in this patient demonstrated normal **left atrial** size based on 3 different LA measurement methods. Chamber volumes and echogenicity were normal. The cranial and caudal **mitral** valve leaflets presented mild thickening suggestive of mild endocardiosis. No evidence of valvular prolapse was noted. Doppler indicated mild eccentric insufficiency. The **left ventricle** presented thicknesses with linear contour and was not dilated nor restricted. The **myocardium** presented normal echogenicity without subjective evidence of significant fibrotic or ischemic disease. **Contractility** of the ventricular walls was adequate and in normal range for this patient evidenced by the fractional shortening measurement and subjective evaluation of the different regions of the myocardium. The **left ventricular outflow** tract demonstrated normal laminar flow and subjective structural integrity. Normal measured LVOT velocity was noted. The **right atrium** and auricle revealed normal size, structure and content. No evidence of masses was noted or chamber overload. **Tricuspid** valvular assessment demonstrated concurrent mild thickening with mild TR on Doppler. The **right ventricle** was of normal size (1/3 diameter of LV), chordae structure, myocardial echogenicity and thickness. **Pulmonic** tract assessment revealed normal valve structure, laminar flow, and diameter (approx.1:1 pa/ao ratio). Normal measured RVOT velocity was noted. No visible **pericardial** or free



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pleura fluid was noted. No echographically detectable evidence of infiltrative disease was visible. The cranial **mediastinum and pericardial regions** were free of masses in the visible window.

Urinary System

The urinary bladder, trigone, cystourethral junction, and visible pelvic urethra to a depth of 3.0 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 was noted.

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 mild loss of corticomedullary symmetry and definition expected for the age of the patient. No evidence of pelvic dilation was present. The left kidney measured 4.0 cm in length. The right kidney measured 4.4 cm in length.

Adrenal Glands

A well-defined, hyperechoic nodule was present in the left adrenal gland with mild associated symmetrical capsule expansion. The nodule did not exhibit signs of mineralization or vascular invasion. The nodule measured 1.7 cm x 1.3 cm. The left adrenal gland was mildly enlarged. The overall left adrenal gland measured 2.5 cm length x 1.5 cm width at the cranial pole and 0.44 cm width at the caudal pole.

A well-defined, hyperechoic nodule was present in the right adrenal gland with mild associated symmetrical capsule expansion. The nodule did not exhibit signs of mineralization or vascular invasion. The nodule measured 1.1 cm x 0.9 cm. The right adrenal gland was mildly enlarged. The overall right adrenal gland measured 2.4 cm length x 1.1 cm width at the caudal pole. No overt evidence of vascular invasion was noted.

Spleen

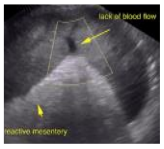
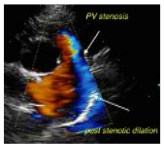
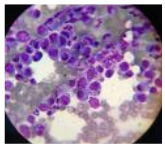
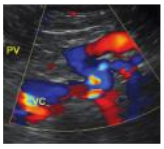
The spleen exhibited a finely textured and homogenous parenchyma which was hyperechoic to the liver and renal cortical parenchyma. The capsule was smooth and regular without apparent expansion. The splenic vasculature at the hilus was normal in volume with no evidence of congestion or thrombosis. Acute to chronic inflammatory, neoplastic, or benign parenchyma changes were not noted.

Liver/ Gallbladder

The liver was mild to possibly moderately enlarged. The parenchyma of the liver exhibited generalized mild uniform increased parenchyma echogenicity compared to the spleen and renal cortices. The echotexture of the liver parenchyma was uniform with a mild coarse echotexture. The capsule of the liver was symmetrical in margination. The hepatic and portal vasculature were normal in appearance without signs of congestion. The gallbladder was non-distended in size with mild, hyperechoic, nonorganized debris. The cystic and common bile ducts were normal.

Gastrointestinal

The stomach presented intact wall layering with a normal wall layer ratio. The lumen of the stomach was empty with no signs of ileus, obstruction, or foreign material.

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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.

Normal visible colon wall layers were present with apparent formed feces in lumen.

Pancreas

The pancreas was normal in size and contour with isoechoic to heterogeneous parenchyma compared to adjacent omentum. No signs of active inflammation or neoplasia.

Free Abdomen

No overt lymphadenopathy or peritoneal effusion was present.

ULTRASONOGRAPHIC FINDINGS

- Overtly normal cardiac structure and function
- Mild MR / TR - no evidence of LA enlargement, left heart volume overload, or overt clinical pulmonary hypertension
- Bilateral nodular adrenomegaly - functional vs. nonfunctional adenoma, benign hyperplasia, lipogranuloma, neoplasia such as pheochromocytoma, adenocarcinoma, or other, all potentials
- Hepatopathy exhibiting mild uniform parenchyma hyperechogenicity - vacuolar hepatopathy suspected, potential for inflammatory / immune-mediated disease, lipidosis, hyperplasia, hematopoiesis, early fibrosis, or other hepatopathy possible, neoplastic criteria considered unlikely
- Mild gallbladder debris (non-mucocele)
- Bilateral chronic renal changes
- Heterogeneous pancreas - suspect age-related pancreatic and incidental, potential for remodeling owing to previous or low-grade pancreatitis possible

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur was not overtly evident as the mild MR and TR may not be audible. Aside from the mild MR and TR, potential for benign physiologic / flow murmur or alternative small flow abnormality is possible. Regardless, the hemodynamic effects of the murmur appear to be minimal given the lack of left or right heart chamber enlargement. The overall cardiac presentation was not overtly consistent with cardiogenic pulmonary edema or respiratory abnormalities. No overt indication for cardiac medications at this stage. Recheck echocardiogram is suggested in 6 months, sooner if clinical signs consistent with heart disease arise.

Full adrenal workup with LDDST, if clinical signs consistent with Cushing's Syndrome are present, as well as assessment and monitoring of systemic BP for evidence of hypertension which may allude to left, right or bilateral pheochromocytoma, are suggested. Sonographic monitoring of the bilateral adrenal glands for evidence of progressive nodular changes or enlargement is recommended. Hepatosupportive medications may prove beneficial. Pending adrenal workup and assuming normal clotting status, screening hepatic FNA cytology could be considered primarily to assess for potential inflammatory cells and rule out the unlikely potential for neoplasia.

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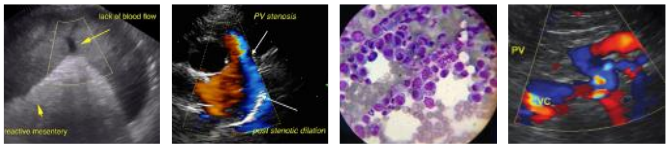

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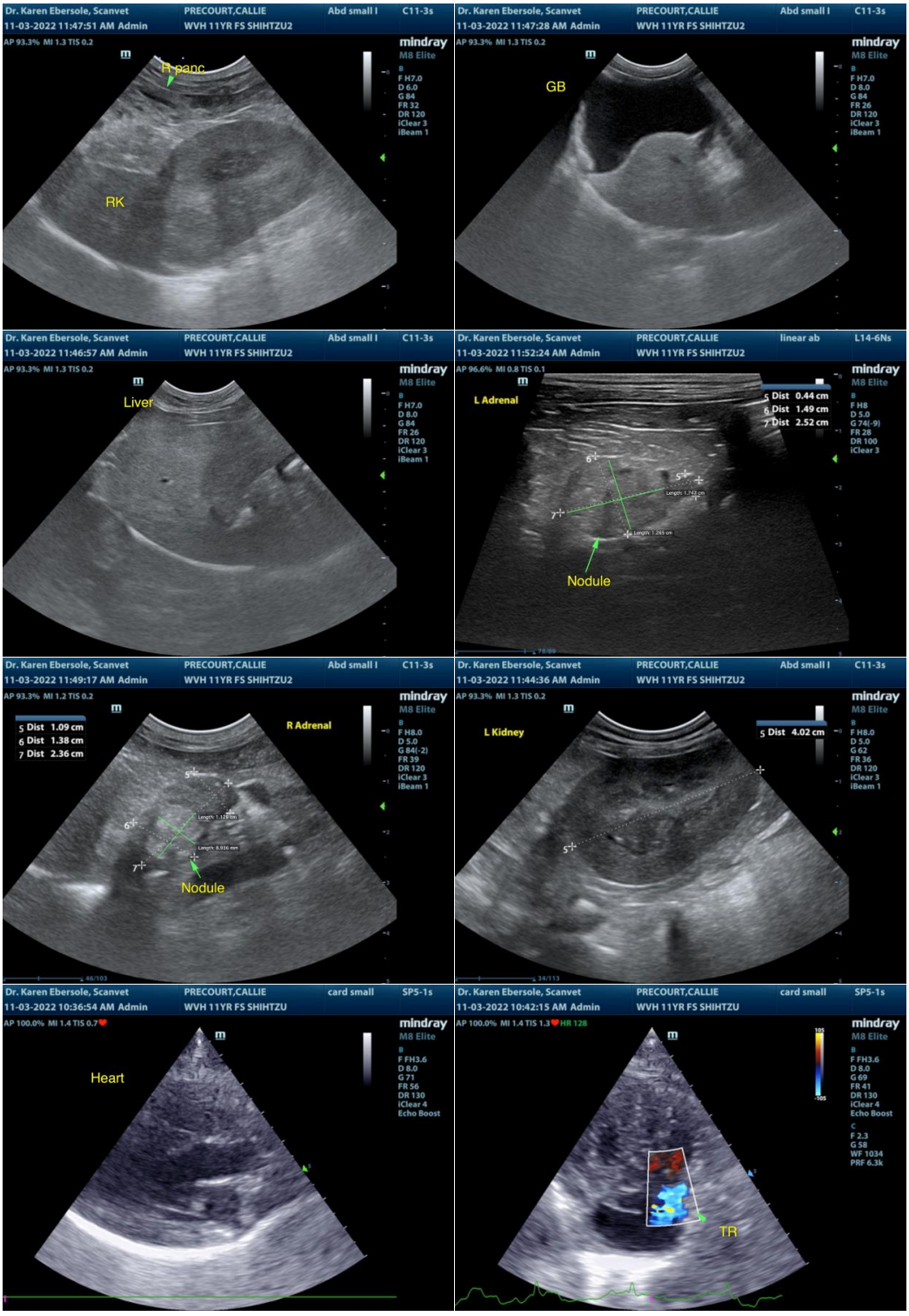

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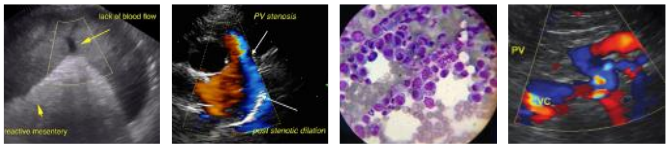

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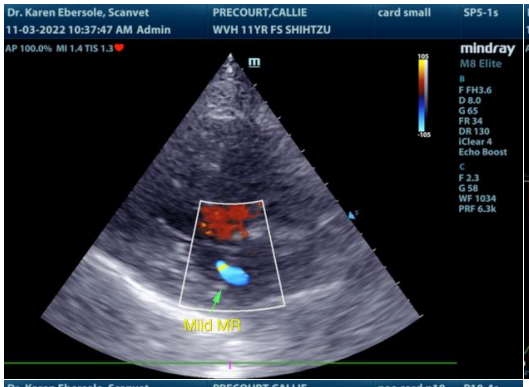

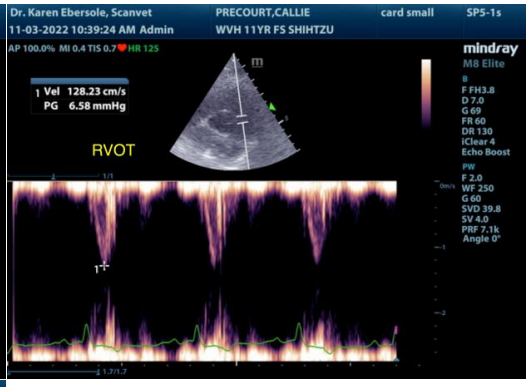

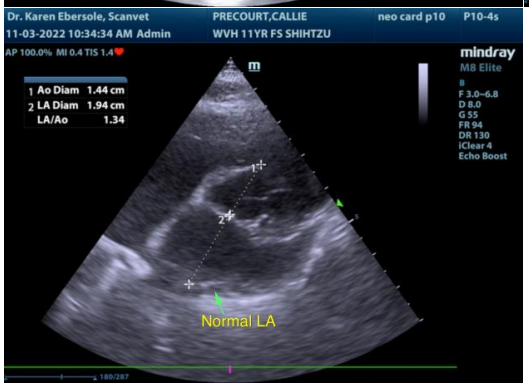

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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