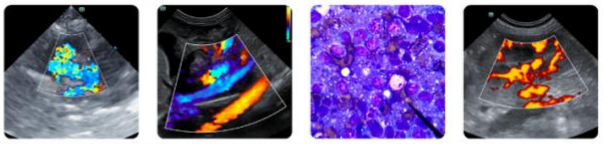

PATIENT

Maverick Mack

SPECIES

Canine

BREED

Shepherd Mix

SEX

Neutered Male

AGE

6 Years

WEIGHT

72 lbs

INTERPRETED BY

R. McKenzie Daniel, DVM, DABVP (Canine / Feline Practice)

IMAGING PERFORMED BY

Dr. Rodriguez

HOSPITAL NAME

Foxfield Veterinary Services

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PRESENTING CLINICAL SIGNS

Diarrhea. New dx heart murmur 3/6. Increased creat and liver values.

Abnormal PE/Chem/CBC/UA Results: Creat: 1.9, BUN:36, ALT: 109, ALK: 223, Fecal pending.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART & ABDOMEN

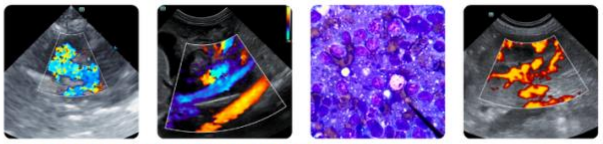
CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (M-Mode)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	Up to 1.6	28-40	40-100	<0.6
PATIENT	--	--	NM	1.1	32	60	0.3
CANINE CARDIAC PARAMETERS	**HR** (BPM)	**AV VMAX** (m/s)	**PV MAX** (m/s)	**BODY WEIGHT**	**LAD** LA MAX 4 Chamber	**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	1.1	0.65	72 lbs	3.6	3.4	--

Cardiac Presentation

The echocardiogram in this patient demonstrated normal **left atrial** dimension based on 2 methods of LA evaluation. The cranial and caudal **mitral** valve leaflets presented normal linear structure, extension in systole, and union in diastole with normal kinesis. Mild centralized to eccentric MR on doppler. 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. The **right atrium** and auricle revealed normal size, structure and content. No evidence of masses was noted. **Tricuspid** valvular assessment demonstrated adequate linear morphology and kinesis. The **right ventricle** was of normal size (1/3 diameter of LV), chordae structure, myocardial echogenicity and thickness. **Pulmonary outflow** tract assessment revealed normal valve structure, laminar flow, and diameter (approx.1:1 pa/ao ratio). Normal measured RVOT velocity. No visible **pericardial** or free pleura fluid was noted. The cranial **mediastinum and pericardial and extra-cardiac 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



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sediment. The ureteral papillae were normal. The ureters were not visible which is normal. No evidence of inflammatory or neoplastic change were noted.

The area of the residual prostate appeared normal and free of pathology.

Normal size and margination was present in the kidneys. A normal 1:3 cortex / medulla ratio and normal corticomedullary definition were maintained. The echogenicity of the cortex was similar to or slightly less than normal liver parenchyma while the medulla echogenicity was hypoechoic to the cortex with no evidence of pelvic dilation. The left kidney measured 5.9 cm in length. The right kidney measured 6.3 cm in length.

Adrenal Glands

The left adrenal gland was uniform in size and contour with a uniformly hypoechoic parenchyma. The left adrenal gland measured 0.61 cm width at the caudal pole.

The right adrenal gland was uniform in size and contour with a uniformly hypoechoic parenchyma. The right adrenal gland measured 0.47 cm width at the caudal pole.

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 revealed subjective mild hepatomegaly with symmetrical contour and homogenous hyperechoic parenchyma compared to the spleen exhibiting mild coarse echotexture. No mass or nodules were identified. Normal hepatic vascular volume.

The gallbladder was non distended in size with mild gravity dependent nonorganized biliary sludge. The cystic duct and common bile ducts were normal without evidence of dilation.

Gastrointestinal

The visible gastric walls exhibited intact wall layering without mural pathology or hypertrophy. The stomach contained mild/moderate progressively shadowing ingesta without overt evidence of obstruction to pyloric outflow.

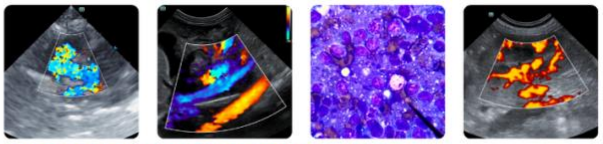
The small intestine presented intact wall layering with 1:3 muscularis/mucosa ratio. Segmental nonshadowing intestinal ingesta/chyme without obstructive pattern to the level of the colon.

Normal visible colon wall layers were present with semi formed to soft fecal matter subjectively.

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.

Free Abdomen



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No overt lymphadenopathy or peritoneal effusion was present.

ULTRASONOGRAPHIC FINDINGS

- Normal cardiac structure/function.
- Mild mitral valve insufficiency (B1).
- Overall, sonographically normal gastrointestinal tract with gastrointestinal ingesta and semi formed to possible soft fecal matter in colon.
- Hepatopathy exhibiting parenchyma hyperechogenicity.
- Nonorganized gallbladder debris (non-mucocele).
- Sonographically normal bilateral kidneys/adrenal glands.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur is most consistent with mild mitral valve insufficiency. Regardless of classification, the hemodynamic effects of the murmur appear low, given lack of left or right heart chamber enlargement. No indication for cardiac medications.

Conservative monitoring of the murmur going forward is advised with recheck echoes suggested in six to twelve months, sooner if clinically indicated. Cardiac anesthetic risk is considered low. If required, the following protocol is suggested. Suggested anesthetic protocol may include opioid or Benzodiazepine pre-med, induction with Propofol or Alfaxalone, and appropriate gas anesthesia with avoidance of alpha 2 agonists.

Correlation with pending fecal testing and suggested GI panel to include PLI, TLI, cobalamin and folate and screening cortisol level is suggested. The appearance of the liver was nonspecific but may indicate steroid or other vacuolar hepatopathies, chronic hepatitis/cholangiohepatitis, lipidosis, or fibrosis while round cell hepatic neoplasia cannot be excluded. Assuming normal coagulation parameters, ultrasound guided FNA of the liver using a 25-gauge needle would be warranted for cytology, primarily to assess for evidence of inflammatory cells and to rule out round cell neoplasia. Vitamin K administration would be suggested prior to FNA if elected. Leptospirosis titers/PCR may be considered if clinically indicated.

Correlation with urinalysis +/- renal staging to include culture/sensitivity or UPC level is suggested. Hepatorenal support, including Denamarin and Ursodiol with clinical monitoring and recheck sonogram if progressive hepatopathy or azotemia is recommended.

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), and as needed gastroprotectants is suggested with clinical monitoring. Note that recent research has shown that indiscriminate use of antibiotics may actually cause harm. Cobalamin supplementation, pending assessment of cobalamin level is recommended.

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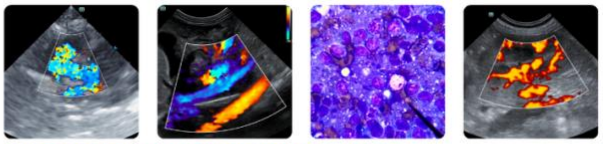

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Educational Teleconsultation Services™

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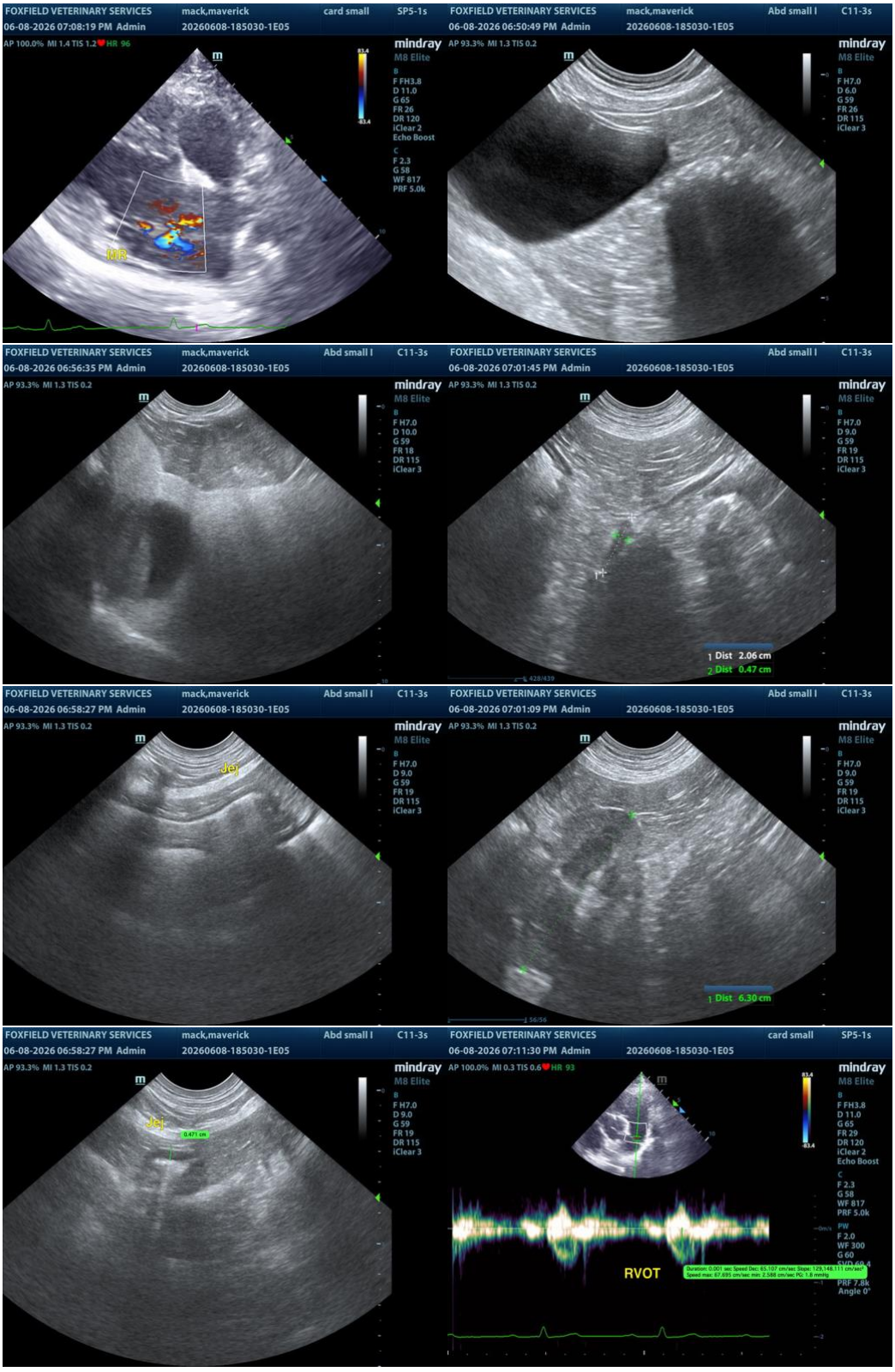

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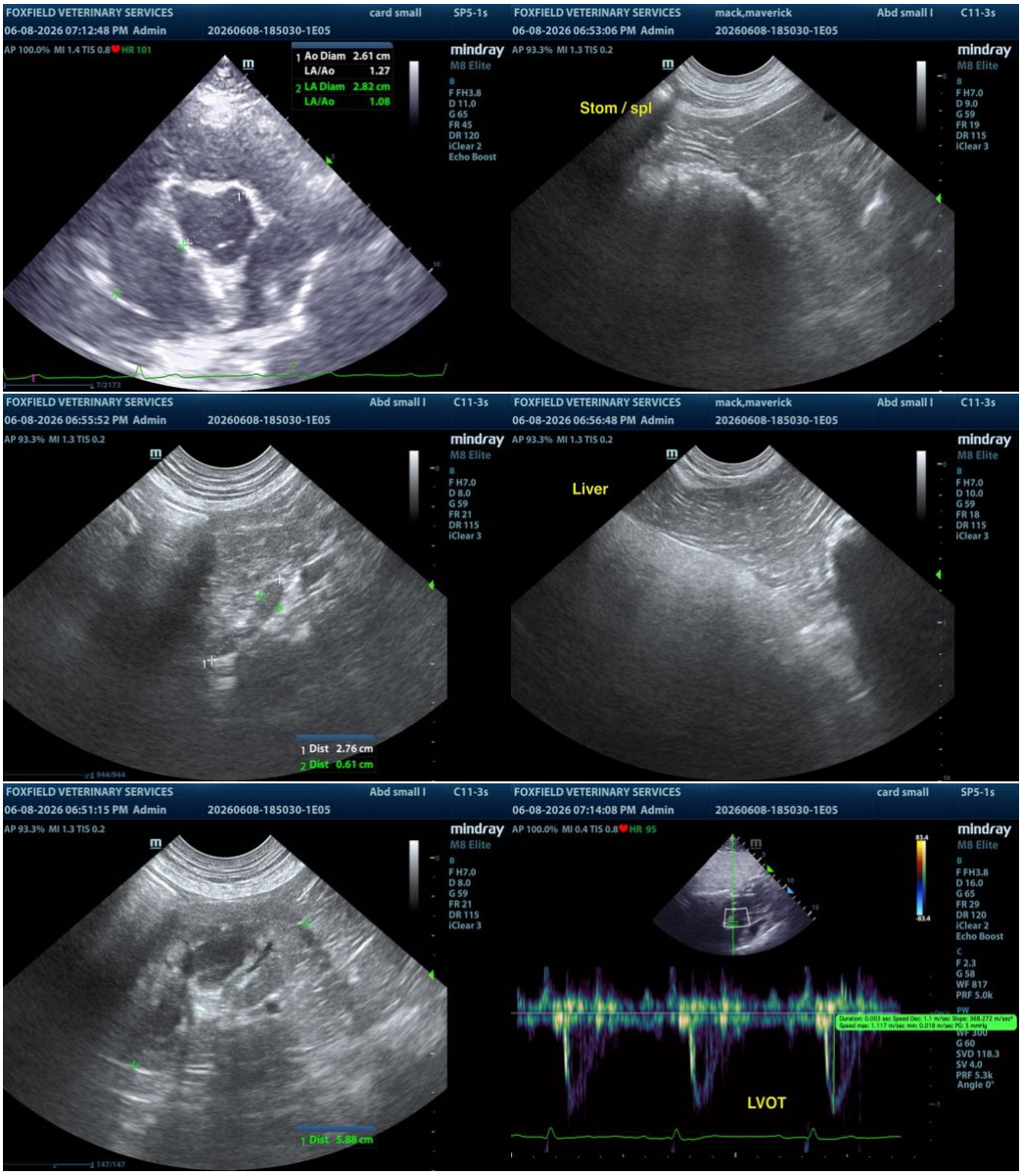

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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