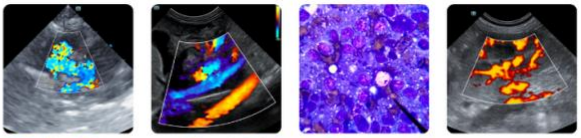

PATIENT

Rufus Duffey

SPECIES

Canine

BREED

Labradoodle

SEX

Neutered Male

AGE

14 Years 4 Months

WEIGHT

28 Pounds

INTERPRETED BY

Tam Mengine, DVM, DABVP (canine/feline practice)

IMAGING PERFORMED BY

Kerri Becker

HOSPITAL NAME

Wyckoff VH

REFERRING VET

Dr. Eisenberg

INVOICE

36397

DATE

3/27/26

PRESENTING CLINICAL SIGNS

Persistent elev. in liver/gallbladder values, chronic cough

Abnormal PE/Chem/CBC/UA Results: alt-241 alp-866 ggt-22 k-6.1 nak-25

ULTRASONOGRAPHIC EXAMINATION OF THE HEART & ABDOMEN

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (m-mode long axis)	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	5.9	2.4	NM	NM	45	NM	0.3
CANINE CARDIAC PARAMETERS	**HR** (BPM)	**AV VMAX** (m/s)	**PV MAX** (m/s)	**BODY WEIGHT** (kg)	**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	0.7	12.7	2.9	3.3	1.8

Cardiac Presentation

The **left atrium** is of normal size with no evidence of spontaneous echo contrast or thrombus formation. The **left ventricle** is normal in diameter with normal wall thickness and demonstrates good systolic function. The **right atrium** is subjectively of normal size and **right ventricular** dimensions, and systolic function are subjectively normal. There is mild to moderate **mitral valve** regurgitation and trivial **tricuspid valve** regurgitation noted, with irregular thickening of the mitral valve leaflets. There was no evidence of chordae tendineae rupture or valvular prolapse in either valve and no vegetative lesions were seen. The **aortic** and **pulmonary valves** both exhibit normal appearance and function. The **main pulmonary artery** appears normal. There is no evidence of pulmonary hypertension. No pericardial/pleural effusion or cardiac masses are seen. There is no evidence of a clinically significant arrhythmia.

Urinary System

The urinary bladder is moderately distended with anechoic urine, and no luminal sediment is present. The ureteral papillae, trigone and pelvic urethra are of normal appearance, and the ureters are not visible (normal). No masses, calculi or mucosal irregularities are noted. Urethra visualized to 3.0 cm.

The prostate is of appropriate size for patient age and neutering status, with a homogenous parenchyma and smooth capsule. The prostatic urethra is non-dilated with normal margins.

The kidneys are hyperechoic and exhibit mildly decreased cortico-medullary differentiation. There are small cortical cysts present within both kidneys. There is no evidence of nephrolithiasis, mineralization,

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pyelectasia or hydronephrosis. The proximal ureters are not visible (normal). The left kidney is 4.6 cm in length. The right kidney is 4.4 cm in length.

Adrenal Glands

The adrenal glands are both identified in their normal locations. They are normal in size and shape with appropriate parenchymal echogenicity and normal phrenic vasculature. The left adrenal gland height is 5.4 mm at the cranial pole and 6.8 mm at the caudal pole. The right adrenal gland height is 7.2 mm at the cranial pole and 2.4 mm at the caudal pole.

Spleen

The spleen is of appropriate size and has a normal, homogenous parenchyma with a smooth, continuous capsular surface. The splenic vasculature is normal with no evidence of congestion or thrombosis, and blood flow through the splenic hilus appears normal.

Liver

The liver is diffusely, markedly hyperechoic with complete loss of portal markings, with rounded borders and a mildly heterogenous echotexture. There is a 1.7 cm hypoechoic nodule noted in the mid caudal liver. The portal and hepatic vasculature are of normal size and appearance with no evidence of congestion or thrombosis.

The gallbladder is moderately distended with anechoic contents and a small amount of freely moveable echogenic sludge. The wall was thin and continuous with small focal polypoid lesions. The cystic and common bile ducts are normal / not visible.

Gastrointestinal

The stomach is moderately distended with ingesta. The gastric wall is 2.5 mm with normal deviations due to rugal folds and exhibits appropriate wall layering. The pylorus is of normal appearance.

The visualized portions of the duodenum, jejunum, and ileum are of normal thickness with intact wall layering that exhibits the appropriate 1:3 muscularis to mucosa ratio. Intestinal motility appears normal.

The visible portions of the colon are of normal thickness, up to 1.4 mm, with intact wall layering. The ileocecal junction is not visualized.

Pancreas

The areas of the limbs and body of the pancreas are isoechoic to the surrounding mesenteric fat, with normal capsular appearance. There is no evidence of peripancreatic inflammation. The pancreatic duct appears normal.

Free Abdomen

There is no evidence of free fluid within the peritoneal cavity. The omentum and intra-abdominal fat are of appropriate echogenicity. Enlarged abdominal lymph nodes are not observed. The aortic trifurcation has normal blood flow with no evidence of thrombosis.

ULTRASONOGRAPHIC FINDINGS

Primary Findings

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- Myxomatous mitral valve disease – Stage B1
- Hyperechoic liver, with one small hypoechoic nodule

Secondary Findings

- Mild bilateral chronic renal changes

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

- There is no apparent cardiac cause for the patient's cough. Thoracic radiographs are recommended, if not already performed, to assess for upper airway and pulmonary parenchymal disease. Endotracheal wash and/or bronchoscopy may ultimately be needed for definitive diagnosis.
- No cardiac medication is warranted at this time.
- MMVD is a progressive disease and so congestive heart failure is possible in the future. Daily monitoring of the sleeping respiratory rate at home is recommended, and if the sleeping respiratory exceeds 35 breaths per minute, then a prompt recheck physical examination and chest radiographs to assess for pulmonary edema would be warranted.
- The patient may benefit from a cardiac diet such as Purina's "CardioCare" veterinary diet. Omega-3 Fatty acid supplementation may also be of benefit.
- Extremely vigorous exercise should be avoided, but there are no restrictions on moderate exercise, such as leash walking.
- Recheck echocardiogram is recommended in 6-8 months. Because MMVD is a progressive disease, medication such as pimobendan may be beneficial in the future.
- If anesthesia is needed, the following recommendations are suggested:
    - Avoid a-2 agonists such as dexmedetomidine and xylazine.
    - Pre-medication with an opiate and a benzodiazepine is recommended. Additionally, Gabapentin 10mg/kg PO and trazodone 5mg/kg PO given first thing in the morning on the day of the procedure can further reduce inhalant anesthetic requirements.
    - Pre-oxygenation, followed by induction with propofol or alfaxalone is recommended, followed by maintenance with isoflurane or sevoflurane.
    - When feasible, the use of local anesthetic blocks can decrease maintenance anesthetic requirements.
    - Moderate use of IV fluids throughout the procedure is recommended, with a starting dose of 3-5ml/kg/hr, with modest increases as needed to support blood pressure, but not to exceed a total volume of 20-30ml/kg for the procedure. The minimum volume necessary to maintain adequate blood pressure is desirable.
    - Use atropine, if necessary, to maintain a HR > 90 throughout the procedure. If available, a dopamine or dobutamine CRI can be used for additional blood pressure support if the patient experiences hypotension.

The markedly hyperechoic liver parenchyma could be associated with hepatic lipidosis, infiltrative neoplasia, chronic infectious or inflammatory disease, or less likely a benign reactive hepatopathy. The hypoechoic nodule may represent a benign regenerative nodule, or less likely emerging neoplasia. Liver biopsy would be necessary for definitive diagnosis of both the diffuse parenchymal changes, as well as

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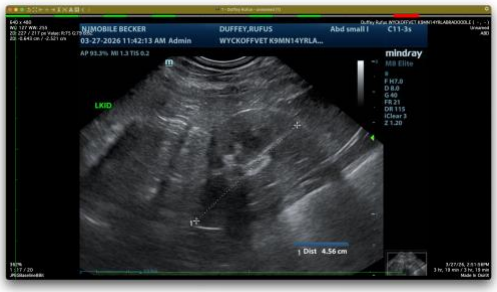
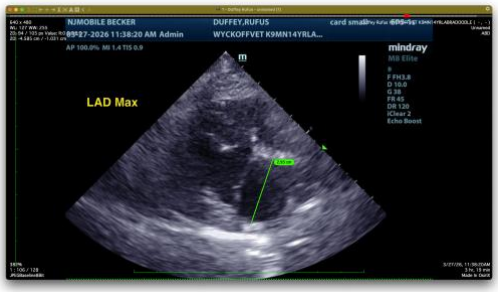
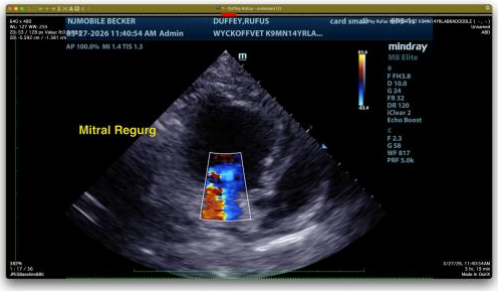
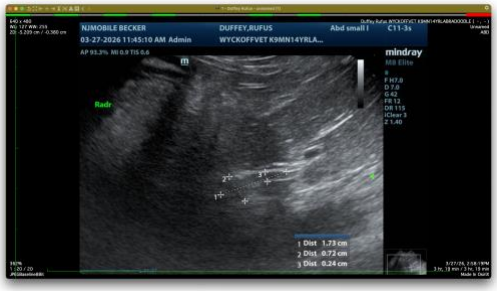
the nodule. If coagulation parameters are normal, liver fine needle aspirate could also be performed for cytology but may or may not provide a definitive diagnosis as compared to biopsy.

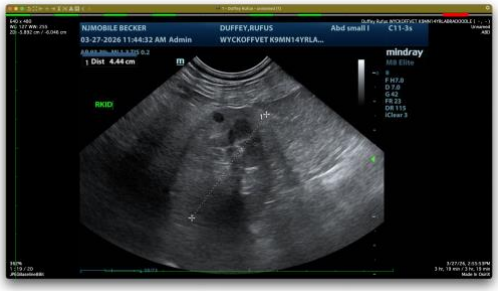
The changes in the kidneys are consistent with chronic renal disease. Findings should be correlated with laboratory values, IRIS staging and clinical signs.











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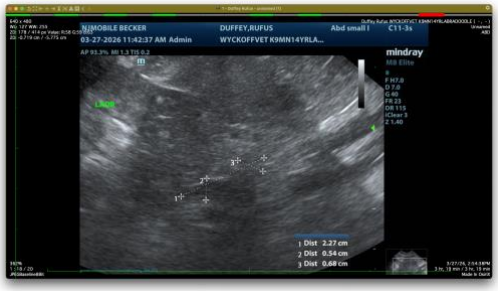

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Tam Mengine, DVM, DABVP (canine/feline practice)

info@SonoPath.com