



PATIENT

Rylee Kelley

SPECIES

Canine

BREED

Terrier Mix

SEX

Neutered Male

AGE

13 Years 2 Months

WEIGHT

40.8 Pounds

INTERPRETED BY

Tam Mengine DVM,
DABVP Canine/Feline
Practice)

IMAGING PERFORMED BY

Graham Sager-Gellerman, DVM

HOSPITAL NAME

Back Bay VC

REFERRING VET

Graham Sager-Gellerman, DVM

INVOICE

36025

DATE

2/28/26

PRESENTING CLINICAL SIGNS

- Historical elevated liver enzymes
- Historical intermittent GI upset (none at this time)
- Historical DMVD ACVIM B1 (no cardiac meds)
- Grade II/VI systolic murmur (left apical), no other cardiac CxS
- Abnormal PE/Chem/CBC/UA Results: 11/15/25: CBC wnl CHEM: ALT 201 U/L, ALP 1996 U/L T4: wnl UA: wnl

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	5.6	NM	1.9	1.9	32	62	0.6
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	104	1.6	0.9	18.6 kg	4.5	3.8	2.6

Cardiac Presentation

The **left atrium** is mildly enlarged, 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 MV-EPSS is overestimated, due to cursor placement proximal to the valve tip, and so is considered within normal limits. 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 mild **tricuspid valve** regurgitation noted, with irregular thickening of the 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 an arrhythmia.



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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 2.0 cm.

The prostate is not distinctly visualized, likely due to its intrapelvic location.

The kidneys are of normal size and shape and exhibit appropriate corticomedullary differentiation with a normal 1:3 cortex to medulla ratio. There is no evidence of nephrolithiasis, mineralization, pyelectasia, cystic change or hydronephrosis. The proximal ureter is not visible (normal). The left kidney is 5.5 cm in length. The right kidney is 5.4 cm in length.

Adrenal Glands

The left adrenal gland is identified in its normal location. It is of normal size and shape with appropriate parenchymal echogenicity and normal phrenic vasculature. The left adrenal gland height is 6.4 mm at the cranial pole and 5.3 mm at the caudal pole. The right is not distinctly visualized, but the region appears unremarkable.

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 hyperechoic and subjectively enlarged, with sharp borders and a homogenous echotexture. 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. There is a cholelith present within the gallbladder lumen measuring 8.0 mm in diameter. The wall was thin and continuous with no focal lesions. The cystic and common bile ducts are normal / not visible.

Gastrointestinal

The stomach is mildly distended with shadowing ingesta. The gastric wall is 4.6 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 1.7 mm, with intact wall layering. The ileocecal junction is not visualized.

Pancreas



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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.

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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.

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ULTRASONOGRAPHIC FINDINGS

SEX

Neutered Male

- Myxomatous mitral valve disease – Stage B1 (approaching B2).
- Diffusely hyperechoic liver, consistent with nonspecific or reactive hepatopathy
- Small gallbladder cholelith, which is usually an incidental finding in the dog

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

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- Using the full EPIC study criteria for initiating pimobendan, no medication is warranted at this time, as there is not yet left ventricular dilation (LVIDDn = 1.61). However, because the left atrium is enlarged, it would be reasonable to recheck an echocardiogram sooner than the ACVIM would typically suggest (perhaps in 2-3 months) to assess whether the patient has progressed to Stage B2. Alternately, there is no evidence that starting pimobendan now, at 0.25mg/kg BID, would cause harm, and there is one small recent study that suggests there may be benefit (Klein S., *et al*, 2021).

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- 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.

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- 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.

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- Extremely vigorous exercise should be avoided, but there are no restrictions on moderate exercise, such as leash walking.

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- If anesthesia is needed, the following recommendations are suggested:

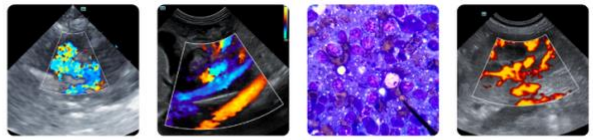
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- Avoid a-2 agonists such as dexmedetomidine and xylazine.
- Pre-medication with an opiate and a benzodiazepine is recommended. Additionally, Gabapentin 10mg/kg PO and trazodone 5mg/kg PO given first thing in the morning on the day of the procedure can further reduce inhalant anesthetic requirements.
- Pre-oxygenation, followed by induction with propofol or alfaxalone is recommended, followed by maintenance with isoflurane or sevoflurane.



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- 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.

Reference:

Klein, S., Nolte, I., Rumstedt, K. *et al.* The effect of treatment with pimobendan in dogs with preclinical mitral valve disease – a placebo-controlled double-blinded crossover study. *BMC Vet Res* **17**, 310 (2021)

Gallbladder choleliths are usually incidental in dogs and given the lack of inflammation associated with the gallbladder, it is likely to be incidental in this patient.

The changes in the liver are non-specific and could be attributed to endocrine disease, other vacuolar hepatopathies, reactive hepatopathy, storage hepatopathy, chronic infectious or inflammatory disease, or less likely neoplasia. Additional recommendations include:

- Screening for hyperlipidemia with a fasted triglyceride level is recommended, if not already performed
- Testing for Cushing's disease is recommended only if clinical signs support the diagnosis. The appearance of the left adrenal gland does not support a diagnosis of Cushing's disease, and the lack of visible right adrenal gland makes it unlikely that this gland was enlarged either.
- Bile acid testing is recommended to further assess severity of hepatic disease - if elevated then liver biopsies are strongly recommended
- If bile acids are normal, then initiation of liver support therapies such as SAMe, Vitamin E and ursodiol, along with serial monitoring of liver enzyme levels every 2-3 months, could be initiated
- Ultrasound-guided or laparoscopic biopsies would be needed for definitive diagnosis. Fine needle aspirate for cytology could also be performed, but is less likely to yield a definitive diagnosis.



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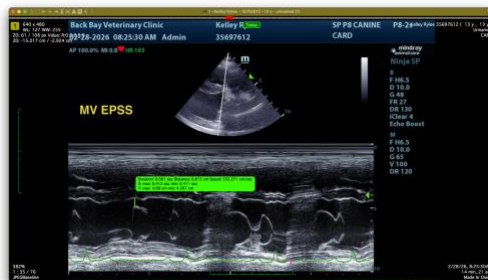
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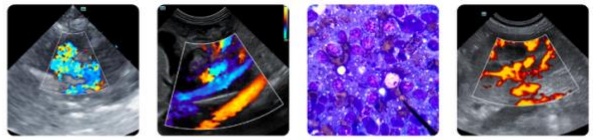
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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



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