



PATIENT

Simon Hollman

PRESENTING CLINICAL SIGNS

SPECIES

Canine

BREED

Beagle X

SEX

Neutered Male

AGE

10 Years

WEIGHT

29.2 Pounds

INTERPRETED BY

Lisa Carioto, DVM,
DVSc, Diplomate
ACVIM

IMAGING BY

Loetitia Saint-Jacques,
LVT

HOSPITAL NAME

South Reno VH

REFERRING VET

Dr. Schmitt

INVOICE

37977

DATE

5/25/22

Owner reports no vomiting diarrhea sneezing. Eating normal. Mobility normal. The patient was diagnosed with a heart murmur at previous veterinarian. Has been on 20 mg of Lasix 1-2 times a day based on signs at home. As of late has been on once a day. Also on 5 mg enalapril twice a day. Owner reports only x-rays have been completed. Owner noticed after moving here from Ohio that patient seemed to be acclimating, improved, and then got worse. Reportedly owner was treating seizures with phenobarbital up until February of this year at which time owner taper patient off and patient has been fine. Patient went under anesthesia for dental in November 2021 reportedly no problems. Other than dental extractions, 6 teeth. Patient also was on several rounds of antibiotics and was suggestive of possible bacterial endocarditis. Drinks a lot but owner is aware of the effects of Lasix and believes that is the cause. Recently has had exercise intolerance and really slows down and sometimes starts coughing at the halfway point of the usual walk. S: BAR O: Mucous membranes pink and moist, CRT less than 2 seconds Eyes, ears, nose and mouth: Moderate dental calculus. PLR and Menace are normal. Mild bilateral nuclear sclerosis and periocular structures are normal. What is seen of rest of oral cavity is normal. Ear canals, pinna and tympanic membrane are normal with no abnormal debris. Muzzle and nares are normal. Rest is within normal limits. Heart, Lungs and pulse: femoral pulses within normal limits. Lungs sculpt slightly harsh in bilateral all fields. There is a mild abdominal component to respiratory effort. Grade 1/6 left-sided systolic intermittent base heart murmur. Abdominal x-rays: There are feces in descending colon with small mineral opacities and also in rectum. Large intestine normally dilated. Small intestine predominantly ingesta filled with some amount of gas and normally dilated. In the caudal abdomen just cranial to urinary bladder there are 3 segments of small intestine that appear almost plicated and this was duplicated on both lateral views but not evident on the VD view. Urinary bladder is moderately distended and overlapping by small intestine. Spleen is not evident on left lateral view but appears normal on right lateral view and is enlarged on VD view. Liver edges taper and normal size. Stomach and normal position with some material. What is seen of kidneys is unremarkable. Musculoskeletal structures are unremarkable. Thoracic x-rays: There is dorsal deviation of trachea on left lateral view. Also severe loss of caudal waist on left lateral view. Narrowing of trachea on both lateral views with soft tissue overlaying dorsal trachea within thorax and cervical trachea. On right lateral view there is bulging of the cranial aspect of the heart. Subjectively heart looks enlarged and on vertebral heart sum method heart is enlarged. A: Possible plication of intestines from adhesions either iatrogenic or inflammation or infection. Mild splenomegaly on VD view. Moderate cardiomegaly. Likely age-related endocardiosis with mitral valve regurgitation. Rule out neoplasia. Plan: Recommend echocardiogram and abdominal ultrasound.

Abnormal PE/Chem/CBC/UA Results: Blood Pressure, Non-invasive Avg BP 121 L thoracic limb #3 cuff. Chemistry screen: No significant finding CBC: Hemogram values lower end of normal. Heartworm test antigen: Negative Fecal: No eggs or parasites seen Urinalysis: Decreased specific gravity and increased pH. Amorphous crystals. A: Hyposthenuric. Low normal hemogram. Possible renal disease. Possible anemia related to chronic disease, decreased production, hemorrhage, destruction, other.



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ULTRASONOGRAPHIC EXAMINATION OF THE HEART

SPECIES

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CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swedish)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	5.8	2.73		1.58	41	73	0.41
CANINE CARDIAC PARAMETERS	HR (BPM)	AV VMAX (m/s)	PV MAX (m/s)	BODY WEIGHT (kg)	LA 2D long 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	1.61	0.85	13.3	3.51	4.12	2.42

Adapted from June Boon, Veterinary Echocardiography, 1998
Sisson D et al. JVIM 1991; 5: 232, and Jacobs et al. Am J Vet Res 1985; 46:1705

WEIGHT

29.2 Pounds

ECG

Sinus respiratory arrhythmia with occasional dysrhythmia
Wandering atrial pacemaker
One premature ventricular contraction originating from the right ventricle
Occasional supraventricular and atrial premature contractions

INTERPRETED BY

Lisa Carioto, DVM,
DVSc, Diplomate
ACVIM

Echocardiographic findings

Occasional arrhythmia noted during the echocardiogram with intermittent bigeminy of the abnormal beat

IMAGING BY

Loetitia Saint-Jacques,
LVT

Mitral valve: very mild to mild degeneration of both leaflets. The septal leaflet is more severely affected compared to the posterior leaflet.

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- Mild prolapse of the septal leaflet.
- Mild to moderate mitral regurgitation.
- Moderate left atrial enlargement
- Left auricle: very mild enlargement.
- Mild increase of LA: Ao ratio
- LA normalized for BW (LAN = 1.45); moderate enlargement
- LVIDd normalized for BW (LVIDND = 1.92); moderate enlargement
- LVIDs normalized for BW (LVIDNs = 1.07); WNL

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Simon Hollman *Aortic valve:* no abnormalities
• Aortic insufficiency: intermittent and trivial

SPECIES *Tricuspid valve:* trivial myxomatous degeneration of the septal leaflet
• Prolapse of leaflets: absent.

Canine
• Trivial tricuspid regurgitation

BREED • No right ventricular (0.60 cm), atrial or auricular enlargement.

Beagle X *Pulmonic valve:* no abnormalities
• Trivial pulmonary insufficiency (0.82 m/s)

SEX • Main pulmonary artery within normal limits

Neutered Male
• Pulmonary artery - bifurcation, no abnormalities.
• Pulmonary artery: aortic ratio: no obvious abnormalities.

AGE • No signs of heart worm.

10 Years
• No signs of pericardial or pleural effusion
• No evidence of pulmonary edema.

WEIGHT • No obvious signs of a mass.

29.2 Pounds
• Mild to moderate hyperechogenicity of the endocardium of the left ventricle and papillary muscles

INTERPRETED BY • Focal hyperechoic areas of the myocardium of the left ventricle

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ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder is adequately distended with anechoic contents. The wall is smooth and regular. A trivial amount of free floating sediment is present, however, there is no evidence of cystoliths, polyps or a mass.

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Prostate

The prostate is not visualized.

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Kidneys

The **left** kidney measures 5.86 cm. The capsule is smooth. The cortex is mildly hyperechoic (i.e., it is isoechoic to the spleen), and a mild loss of the normal definition of the cortico-medullary junction is present. Mineralizations of the diverticulae and pelvis are present, without evidence of nephroliths or pyelectasia. The surrounding mesentery is not hyperechoic.

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The **right** kidney measures 6.58 cm. The capsule is smooth. The cortex is mildly hyperechoic (i.e., it is isoechoic to the spleen), and a mild loss of the normal definition of the cortico-medullary junction is present. Mineralizations of the diverticulae and pelvis are present, without evidence of nephroliths or pyelectasia. In addition the above, a round, anechoic structure, with a smooth, thin

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Simon Hollman wall, measuring 2.81 cm in diameter x 4.19 cm in length, is visualized at the cranial pole. It is most consistent with a benign cyst.

SPECIES

Aortic bifurcation/trifurcation

No abnormalities observed.

Canine

Adrenal Glands

BREED

The **left** adrenal gland measures 0.61 cm at the cranial pole, 0.60 cm at the caudal pole. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

Beagle X

The **right** adrenal gland measures 0.53 cm at the cranial pole, 0.57 cm at the caudal pole and 2.29 cm in length. A nodule is present at the cranial pole. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

SEX

Neutered Male

Spleen

Splenomegaly. A hypoechoic, homogenous nodule, 0.89 cm in diameter x 1.15 cm in length, is noted mid-body. A second hypoechoic nodule is noted (0.29 cm in diameter).

AGE

10 Years

A nodule with ill-defined, irregular contours is noted in the longitudinal view. Although it is similar in size to the mass noted above, it is heterogeneous in comparison, i.e. it has a hypoechoic "halo" and a hyperechoic "central region". When evaluated with the linear probe, a single blood vessel feeds the area. The nodule has scalloped edges. The parenchyma is more diffusely miliary or mottled in appearance. The capsule is smooth. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

WEIGHT

29.2 Pounds

Liver

INTERPRETED BY

There are no obvious signs of hepatomegaly and its borders are smooth and sharp to mildly rounded. It is homogeneous, but mildly hyperechoic, i.e. it is slightly hyperechoic to the spleen. Focal lesions are not observed. No abnormalities are observed with the hepatic vessels visualized.

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The gallbladder (GB) is moderately distended with a moderate amount of free floating, gravity-dependent, and inspissated echogenic material (sludge). The sludge varies in degrees of echogenicity. The GB wall is within normal limits in thickness and echogenicity. The portions of the cystic and/or common bile ducts observed are not dilated or tortuous, i.e. there are no signs of an obstruction. The parenchyma surrounding the GB is hyperechoic.

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LVT

Gastrointestinal

HOSPITAL NAME

The lumen of the stomach is filled with gas and ingesta. The gastric wall is within normal limits in thickness and the wall layers are well defined. No obvious abnormalities are observed with its peristalsis.

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The small intestinal wall thickness, including the duodenum, is within normal limits and the definition of the wall layers is preserved. A moderate amount of ingesta, fluid and gas are noted within the jejunum.

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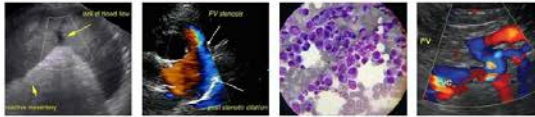
The colonic wall is not thickened and mural detail is considered normal.

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Pancreas

The pancreas has a mildly coarse echotexture, suggestive of age related changes, and possible fibrosis. The latter may be due to age, previous episodes of pancreatitis, and/or mineralization. There are no signs of active pancreatitis or neoplasia.

SPECIES

Canine

Other

Lymph nodes

No abnormalities are observed

BREED

Beagle X

Abdominal effusion is not visualized.

ULTRASONOGRAPHIC FINDINGS

SEX

Neutered Male

- Myxomatous degeneration of the mitral and tricuspid valves, ACVIM stage B2, with moderate left atrial and left ventricular enlargement.

AGE

10 Years

- Intermittent arrhythmia consisting of a premature ventricular contraction originating from the right ventricle and occasional supraventricular (atrial) premature contractions
- The hyperechogenicity of the endocardium, and focal hyperechoic areas of the myocardium of the left ventricle, in conjunction with the arrhythmia, may be due to inflammation, ischemia and/or fibrosis. Myocarditis cannot be excluded.

WEIGHT

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- **Spleen:** Splenomegaly. Causes of splenomegaly include splenitis due to antigenic stimulation, including immune mediated induced inflammation secondary to infectious organisms. Other differential diagnoses include extramedullary hematopoiesis, hypersplenism and reactive hyperplasia. A few hypoechoic to heterogeneous nodules are noted mid-body. The more homogeneous nodules are suggestive of nodular or lymphoid hyperplasia and extramedullary hematopoiesis. The differential diagnoses for the mildly heterogeneous nodule are similar to the above. One of the nodules has a more "target-like lesion", and a focal miliary to mottled area of the body are also noted, therefore, neoplasia cannot be excluded.

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- **Liver:** A vacuolar hepatopathy is suspected, which may occur due to stress (chronic illness) or hyperadrenocorticism. Differential diagnoses, such as hepatitis, is considered less likely, Cholestasis, cholangitis/cholangiohepatitis and cholecystitis are considered less likely, but cannot be excluded.

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- **Gallbladder:** Most likely clinically insignificant, however, gastroesophageal reflux disease (GERD), may occur in some patients. Obtaining a history regarding signs of GERD from the client is suggested, as treatment with an anti-acid, proton pump inhibitor or ursodeoxycholic acid may be required depending on Simon's history.

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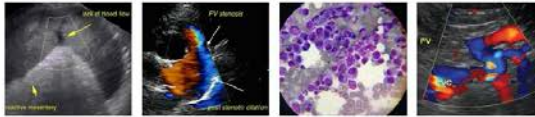
- **Bilateral renal changes** are suggestive of age-related degeneration. Glomerulonephritis may be contributing to the cortical hyperechogenicity. A benign-appearing **cyst** is present in the cranial pole of the **right** kidney. The fluid within the cystic structure is not suggestive of an abscess.

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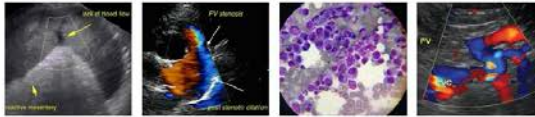
- **Pancreas:** age-related changes are noted, including signs of fibrosis, which may be due to age, previous episodes of pancreatitis, and/or mineralization. There are no signs of active pancreatitis or neoplasia.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

- Treatment with pimobendan is recommended (see below).

Other suggestions/recommendations include:

- A troponin I concentration may be considered to exclude myocarditis, in addition to the other tests mentioned in the abdominal recommendations. However, the other tests should be prioritized if finances are a concern.
- Treatment with pimobendan at 0.25-0.30 mg/kg PO every 12 hours, however, the dose should be started at 0.10 mg/kg PO every 12 hours for 3 days prior to increasing to the full dose to assess Simon's response to the medication.
- In approximately 1 week, the dose of furosemide may be decreased by 25% and evaluate for changes in frequency and severity of the cough.
- Spironolactone may be considered in the future to help decrease the progression of myocardial fibrosis. Its use may also help decrease the overall dose of furosemide, however, a decision should be made depending on blood work results, including a SDMA.
- If the cough persists, treatment with hydrocodone, codeine, or butorphanol may be tried. Since chronic bronchitis is also suspected, inhalant therapy with fluticasone (Flovent) may also be considered in the future depending on response to therapy.
- Monitoring of the resting (sleeping) respiratory rate (RRR) is highly recommended once a day. The RRR should NOT EXCEED 30 breaths per minute (bpm). If the respiratory rate is greater than 30 bpm, or if there is a gradual increase (over a day or two) toward 30 bpm, the patient should be evaluated immediately for congestive heart failure and the appropriate treatment initiated.
- Other clinical signs clients should monitor for include coughing (particularly at night), fatigue, lethargy, decreased exercise tolerance (i.e., not being able to walk for as long before becoming tired, or "running out of breath" while playing, or going up and down stairs, as well as syncope (collapsing or fainting spells). Restlessness, or agitation during the night, or being unable to find a comfortable position to sleep are also very common clinical signs.
- Mild to moderate salt restriction is suggested (less than 0.9 grams/1000 kcal of food, and ideally 0.4-0.5 grams/1000 kcal of food).



PATIENT

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- Monitoring for progression of heart disease with a re-evaluation of an echocardiogram every 6 to 8 months, or sooner if clinical signs develop, is recommended.

SPECIES

Canine

- Fine needle aspirates of the spleen and the splenic nodules are suggested to obtain a definitive diagnosis. Although not usually necessary, a coagulation profile would be prudent prior to performing the procedure.

BREED

Beagle X

- A SNAP 4Dx to exclude tick borne diseases is suggested, as well as PCR for *Leptospira* spp., +/- *Bartonella* spp. testing depending on Simon's travel history.

SEX

Neutered Male

- Redundant tracheal membrane noted radiographically, therefore, a component of Simon's cough may be caused by tracheal collapse.

AGE

10 Years

- A diffuse peribronchiolar and interstitial lung pattern is present radiographically, which may be attributed to chronic bronchitis, which could be contributing to Simon's cough and exercise intolerance.

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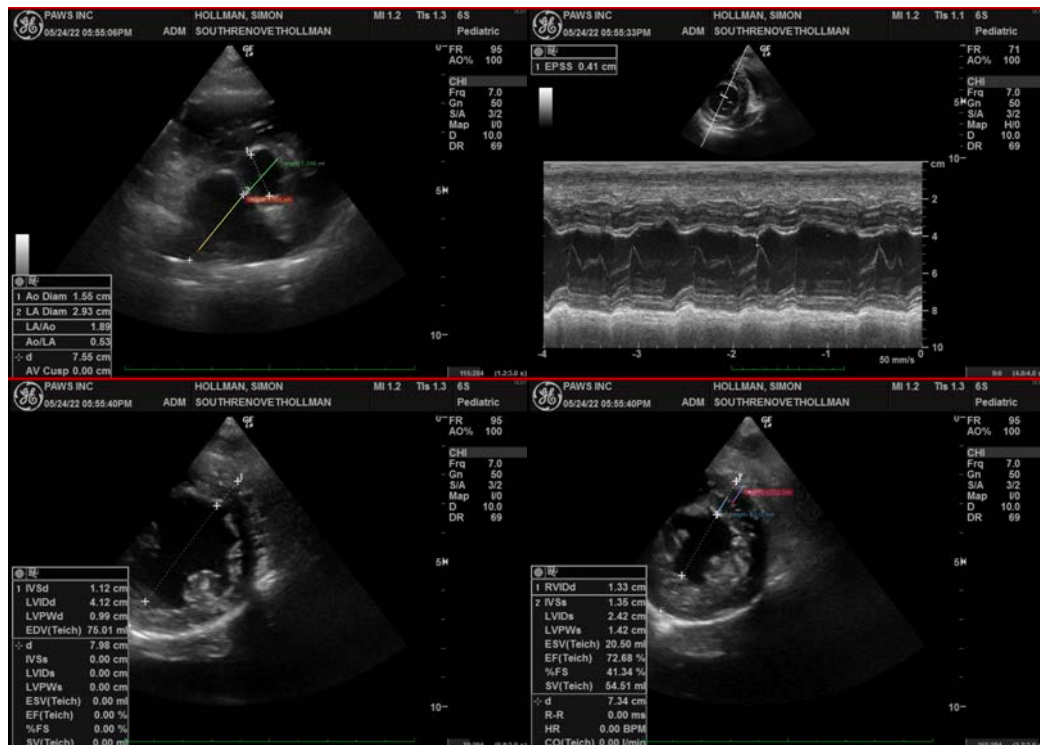
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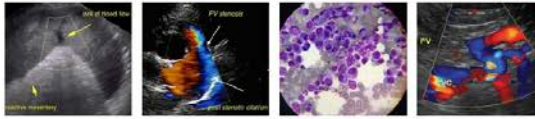


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SPECIES

Canine

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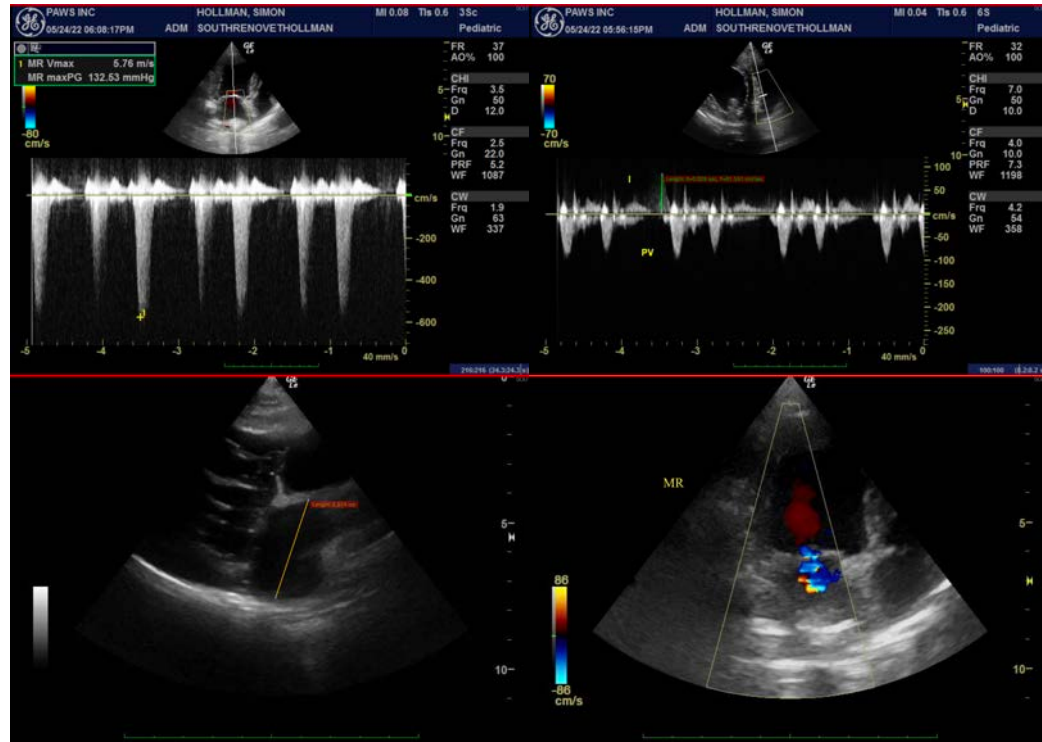
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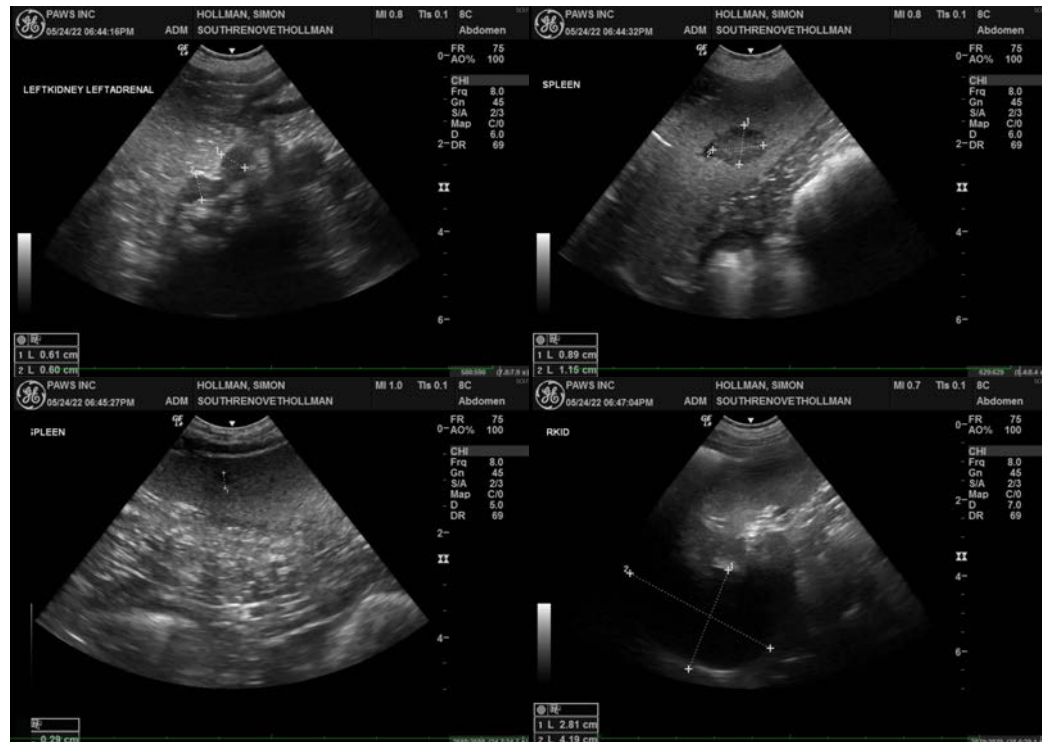
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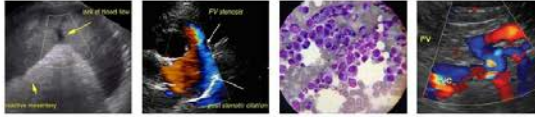
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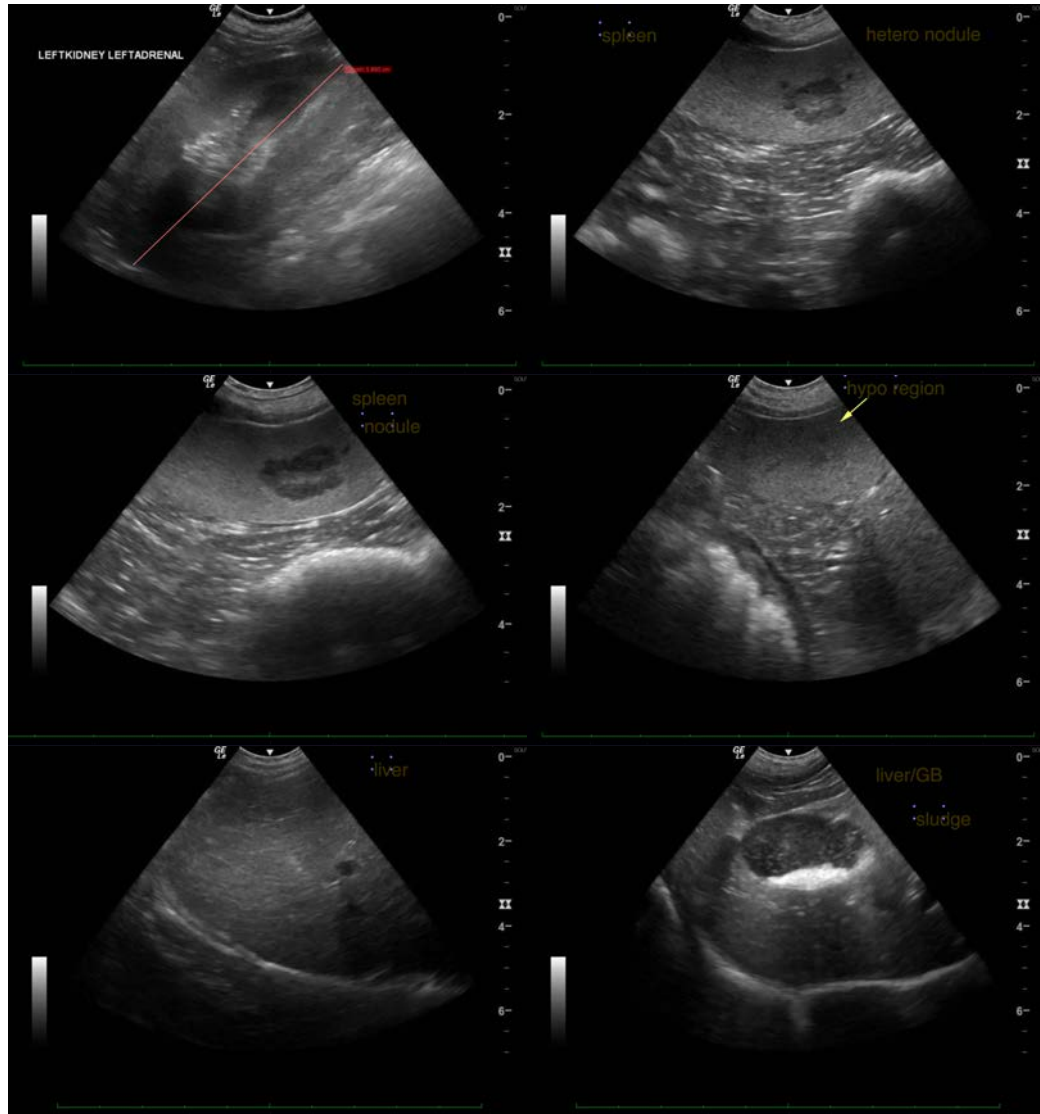
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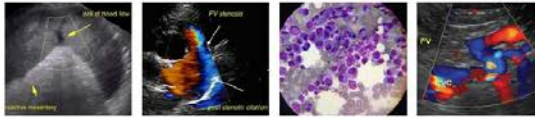
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SPECIES

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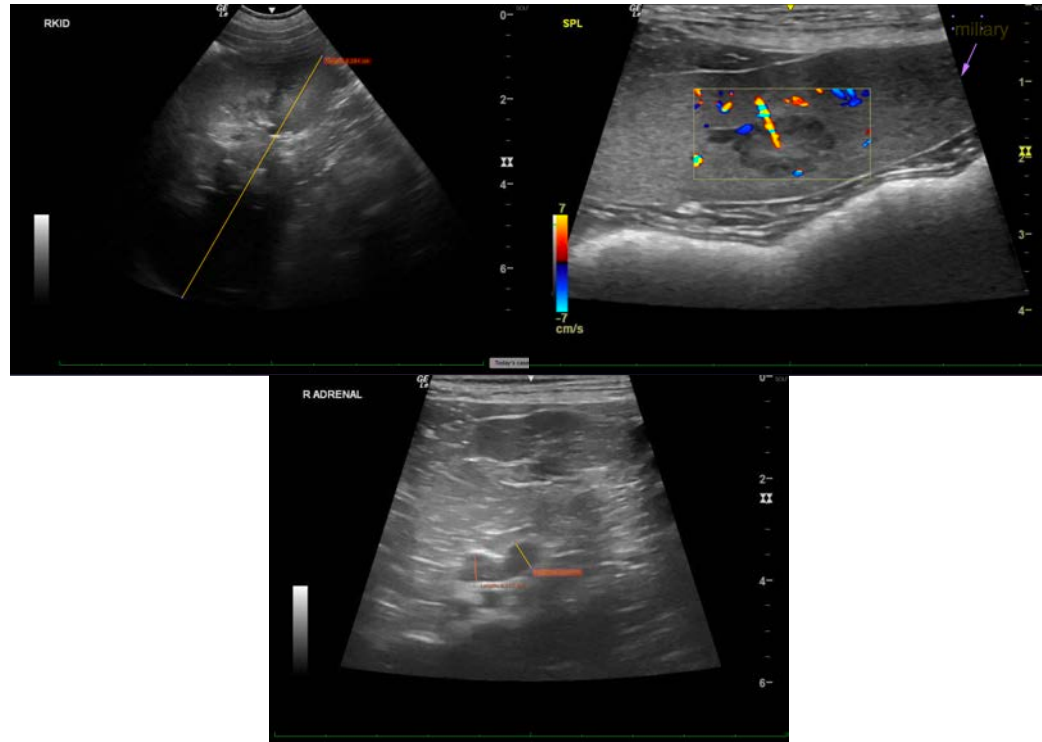
Neutered Male

AGE

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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.

IMAGING BY

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