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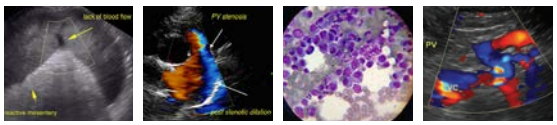

ANIMAL SOUNDS NW
MOBILE VETERINARY ULTRASOUND
IMAGING PERFORMED BY
AnimalSoundsNW.com 541-357-9423

PATIENT

Jasmine Campbell

SPECIES

Canine

BREED

Lhasa Apso

SEX

Spayed female

AGE

11 Years

WEIGHT

20 Pounds

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Jenna Walsh, CVT

HOSPITAL NAME

Santa Clara AH

REFERRING VET

Dr. Giddens

INVOICE

40108

DATE

8/2/22

PRESENTING CLINICAL SIGNS

Clinical Exam Findings: Severe injected sclera bi-lat 1/6 mild murmur on left side. Arrhythmia (o said she has felt previously - that it is not new). Firm cranial abdomen- enlarged liver and/or spleen? Blood Pressure Measurements 1) 168/101 (118) HR 109 RR 30 2) 146/96 (109) HR 107 RR 30 3) 168/89 (99) HR 95 RR 20 4) 175/136 (151) HR 107 RR 30 5) 189/129 (164) HR 80 RR 30 - Average 163/107 (119) HR 103 RR 26 Current Medications One day of ocular steroid drops for allergies Radiographic Findings Enlarged liver, enlarged heart, and either normal pylorus or mass effect in spleen? Primary Question/Differential to Be Answered in This Exam Cause of heart issue and arrhythmia and treatment needed ? Cause of enlarged liver? Mass in spleen or abdomen?
Abnormal PE/Chem/CBC/UA Results: ALP= Mildly elevated at 195; reticulocytes elevated at 160; Platelets elevated at 483; WNL otherwise for CBC/CHEM/T4

ULTRASONOGRAPHIC EXAMINATION OF THE HEART

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		1.83	1.12	1.4	47	NM	0.22
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	155 (sedated)	1.54	0.76	9.1	2.57	2.75	1.45

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

Electrocardiogram (lead II, AliveCor)

Bradycardia, followed by one or multiple escape beats after pauses of various lengths, and then followed by a more rapid heart rate (e.g. HR of approximately 120 bpm). No blocked P waves. Duration of PR interval within normal limits. High index of suspicion of early onset of sick sinus syndrome, without evidence of clinical signs.

Echocardiographic findings

Jasmine was sedated with alfaxalone and buprenorphine due to her fractious nature. Arterial blood pressures were performed with sedation as well

Mitral valve

- Very mild thickening and irregularity of the septal leaflet; consistent with myxomatous degeneration

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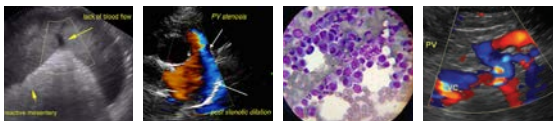

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- Trivial prolapse of the septal leaflet.
- Very mild to mild mitral regurgitation.
- Prominent left auricle, but not overtly enlarged.
- LA: Ao ratio: within normal limits (WNL)
- LA normalized for BW (LAN = 1.21); mild to moderate enlargement
- LVIDd normalized for BW (LVIDND = 1.4); WNL
- LVIDs normalized for BW (LVIDNs = 0.72); WNL

Aortic valve

- No abnormalities
- No aortic insufficiency

Tricuspid valve

- Very mild thickening of the septal leaflet; consistent with myxomatous degeneration
- No prolapse of leaflets.
- Mild to moderate tricuspid regurgitation.
- No right ventricular or atrial enlargement.

Pulmonic valve

- No abnormalities
- No pulmonary insufficiency.
- Subjectively, the main pulmonary artery is mildly dilated just cranial to the bifurcation. There are no other echocardiographic signs of pulmonary hypertension.
- Pulmonary artery: aortic ratio within normal limits
    - PA = 0.82 cm/Ao=1.03 cm; PA/Ao ratio = 0.80 (WNL)

Other

- No signs of pericardial or pleural effusion
- No evidence of pulmonary edema.
- Pulmonary veins, no abnormalities.
- No obvious signs of a mass.

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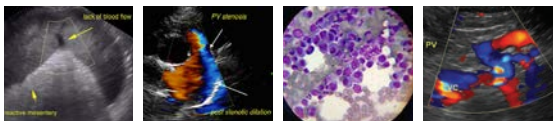

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CARDIAC FINDINGS

- Myxomatous degeneration of the mitral (very mild) and tricuspid (very mild) valves, ACVIM stage B2, with moderate left atrial enlargement. Note, the severity of the myxomatous degeneration and mitral regurgitation does not appear severe enough to be causing moderate left atrial enlargement. That is, the arrhythmia, which is not a new finding (as per the client), is suggestive of sick sinus syndrome, which is likely playing a role. Therefore, the ACVIM stage is not likely representative of Jasmine's myxomatous degeneration alone.
- The ECG is suggestive of sick sinus syndrome. A Holter monitor may be indicated, although most cardiologists will likely not place a pacemaker in a patient who is not demonstrating clinical signs, particularly with such mild cardiac changes.
- The results of Jasmine's echocardiogram do *not* meet the criteria of the EPIC study, i.e. the administration of pimobendan (Vetmedin) is not indicated at the moment. However, a re-evaluation of the echocardiogram is strongly suggested in 6-8 months (see recommendations, below).

CARDIAC INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Suggestions/recommendations include:

- Evaluation of arterial blood pressure – performed and within normal limits.
- A SNAP 4Dx is suggested to exclude causes of potential pulmonary hypertension (heartworm disease) and a mildly dilated pulmonary artery (subjective finding).
- Monitoring Jasmine's heart rate and heart rhythm at home, while at rest and following exercise is suggested to obtain a baseline and determine how severe (frequent) she is experiencing the arrhythmia. The client may purchase an inexpensive stethoscope at the pharmacy or use the palm of her/his hand on the left and right thorax as a means of monitoring.
- 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 salt restriction is suggested (less than 0.9 grams/1000 kcal of food). Monitor salt content in treats.
- Monitoring for progression of heart disease with a re-evaluation of an echocardiogram in 6 to 8 months, or sooner if clinical signs develop, is recommended.

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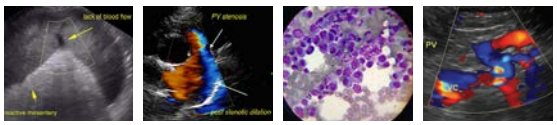

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ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The **urinary bladder** is inadequately filled, thereby affecting the ability to accurately measure wall thickness. However, the wall is very mildly irregular. Although free floating sediment is not observed, hyperechogenic sediment is present within the proximal urethra. The sediment does not cast acoustic shadows, but cast "dirty" shadows and scintillates. There are no obvious cystoliths, polyps or a mass and no other abnormalities are noted with No abnormalities are noted with the trigone or proximal urethra. There are no signs of obstructive disease. Note, the urinary bladder was re-evaluated at the end of the exam with the linear probe, which showed the sediment within the lumen, i.e. it is mobile and not isolated to the urethra.

Kidneys

The **left** kidney measures 4.73 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. A large number of mineralizations and small nephroliths of the diverticulae and pelvis are noted. There is no evidence of pyelectasia. Blood flow is within normal limits. The surrounding mesentery is not hyperechoic.

The **right** kidney measures 5.58 cm. The capsule is smooth. The cortex is hyperechoic (i.e., it is hyperechoic to the liver) and a mild loss of the normal definition of the cortico-medullary junction is present. A large number of mineralizations and small nephroliths of the diverticulae and pelvis are noted. There is no evidence of pyelectasia. Blood flow is within normal limits. The surrounding mesentery is not hyperechoic.

Aortic bifurcation/trifurcation No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.45 cm at the cranial pole, 0.37 cm at the caudal pole and 1.91 cm in length. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

The **right** adrenal gland measures 0.69 cm at the cranial pole, 0.45 cm at the caudal pole and 2.50 cm in length. The cranial pole is mildly plump, however, a well-defined mass or a nodule is not visualized. No abnormalities are noted with the gland's echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

Spleen

The spleen is within normal limits to mildly increased in size, however no abnormalities are noted with its architecture, echotexture, and echogenicity. The capsule is smooth. Mild perivascular cuffing, consistent with myelolipomas is observed; these are not considered clinically significant. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

Liver

Mild hepatomegaly is suspected, which was confirmed radiographically. The liver's borders are smooth and vary between sharp to very mildly rounded. It is homogeneous, with a diffuse, mildly coarse or granular echotexture. Focal lesions are not observed and no abnormalities are noted with the hepatic vessels.

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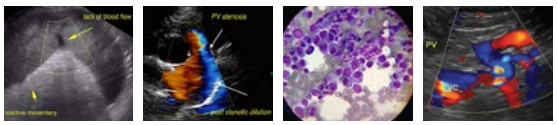

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The **gallbladder** (GB) is moderately distended with a moderate amount of free floating and gravity-dependent echogenic material (sludge). The GB wall is mildly thickened and hyperechoic. The cystic duct is not dilated, but is mildly tortuous. The common bile duct is within normal limits 0.31 cm. Despite the latter findings, the walls of the cystic duct and CBD are moderately to severely hyperechoic, which is suggestive of inflammation. The parenchyma surrounding the GB, cystic and CBD is not hyperechoic. An obvious obstruction is not visualized.

Gastrointestinal

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

Duodenum: wall thickness is within normal limits and the definition of the wall layers is preserved. However fogging of the mucosa is present.

Jejunum: wall thickness is within normal limits and the definition of the wall layers is preserved.

Gas is present in the transverse colon.

The colonic wall is not thickened and mural detail is considered normal. Gas and formed stools are present in the colon.

There are no obvious signs of a mass, foreign body, infiltrative disease or an obstruction in the gastrointestinal tract.

Pancreas

No abnormalities are observed with the architecture, contours, echogenicity or echotexture of the pancreas. There is no evidence of hyperechogenicity of the surrounding mesentery, i.e., signs of active pancreatitis are not present.

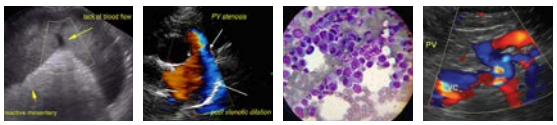
Other

Lymph nodes No abnormalities are observed

Abdominal effusion is not visualized.

ULTRASONOGRAPHIC FINDINGS

- **Urinary bladder:** Multiple, very small mineralized sediment and cystoliths are present. Obstructive disease is not present.
- **Gallbladder**: Gallbladder sludge is often clinically insignificant, however, gastroesophageal reflux disease (GERD), can occur in some patients. Obtaining a history regarding signs of GERD from the client is suggested. Treatment with an anti-acid, proton pump inhibitor or ursodeoxycholic acid may be required. Mild signs of cholecystitis are suspected, however, there are no signs of an obstruction. A mucocoele is not evident.
- **Liver**: An obvious cause for the hepatomegaly is not identified. A reactive hepatopathy may be the cause of the mildly granular echotexture, however, no other obvious abnormalities are visualized.



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- **Kidneys:** Mineralizations and nephroliths may occur secondary to diet and genetics. They can also be due to age-related degenerative changes, which are also present. There are no signs of an obstruction.

- **Spleen**: No abnormalities are noted. If splenomegaly is "real", splenitis or reactive hyperplasia due to an underlying immune-mediated cause may be present.

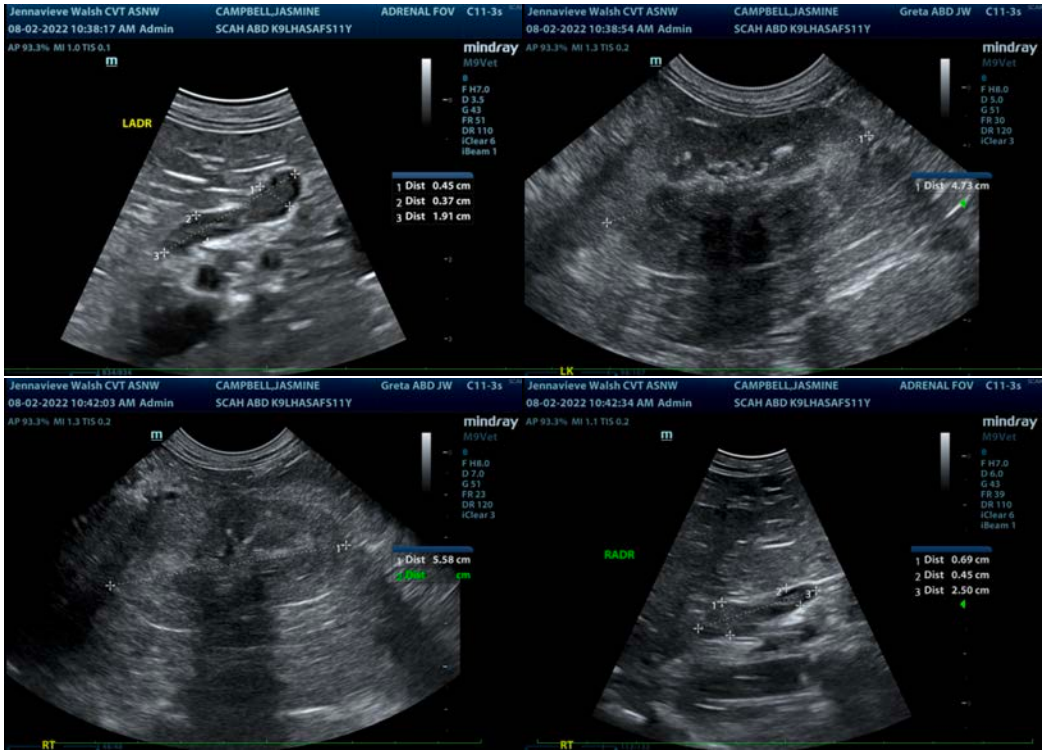
INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

A urinalysis and urine culture and sensitivity are recommended to exclude a urinary tract infection.

A random (baseline) cortisol is suggested as Jasmine's clinical signs are vague, which often occur with hypoadrenocorticism. The cortisol should be performed 3 weeks after having weaned her off the steroid ophthalmic drops.

An evaluation of Jasmine's diet is suggested.

Evaluation of conformation - vulva and perivulvar region; if abnormal, consider basic hygiene if a urinary tract infection is present.



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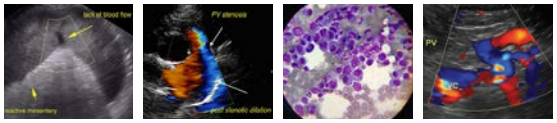

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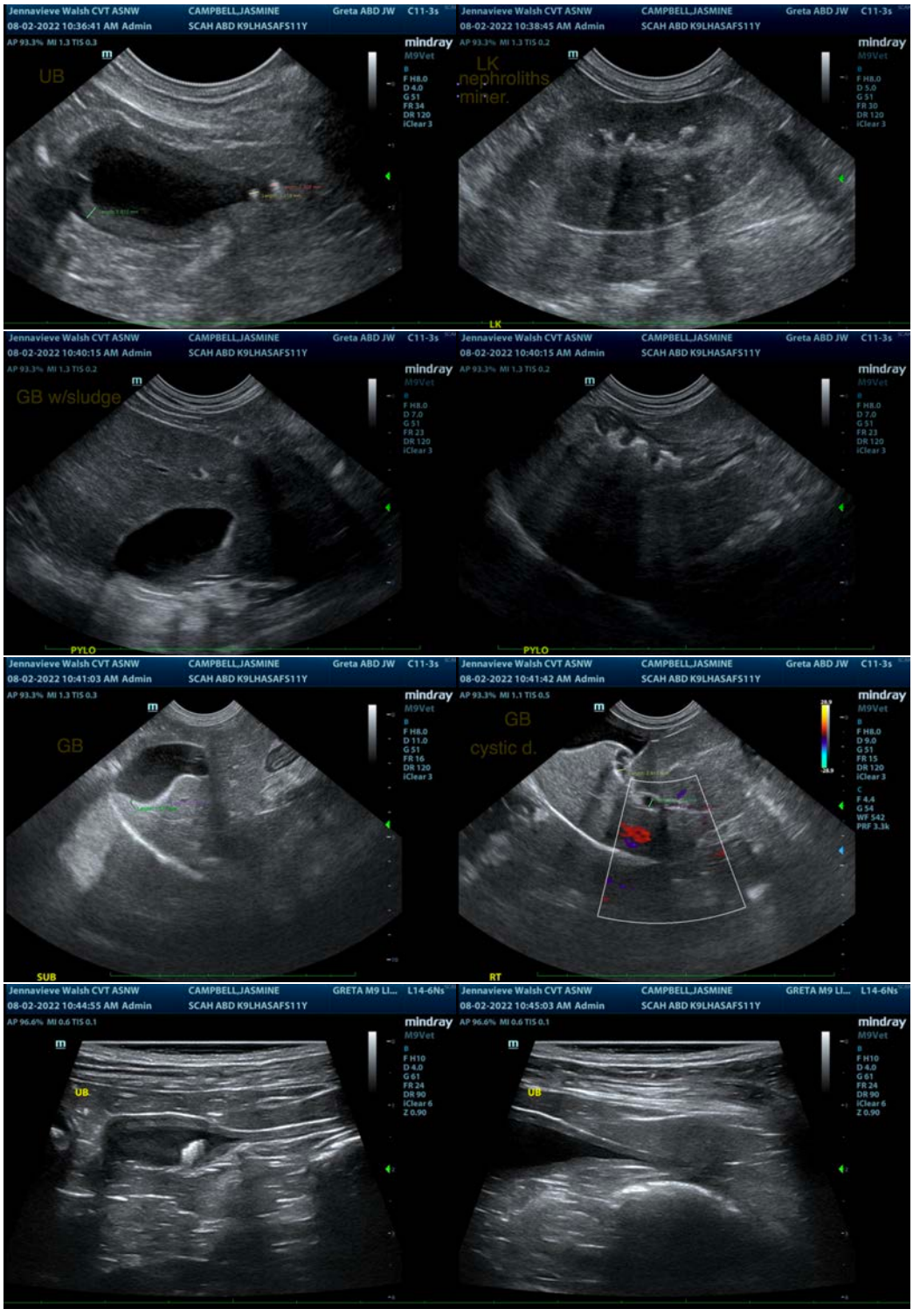

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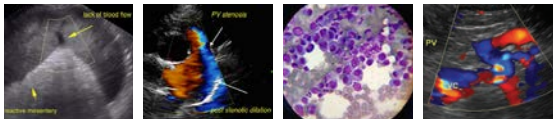

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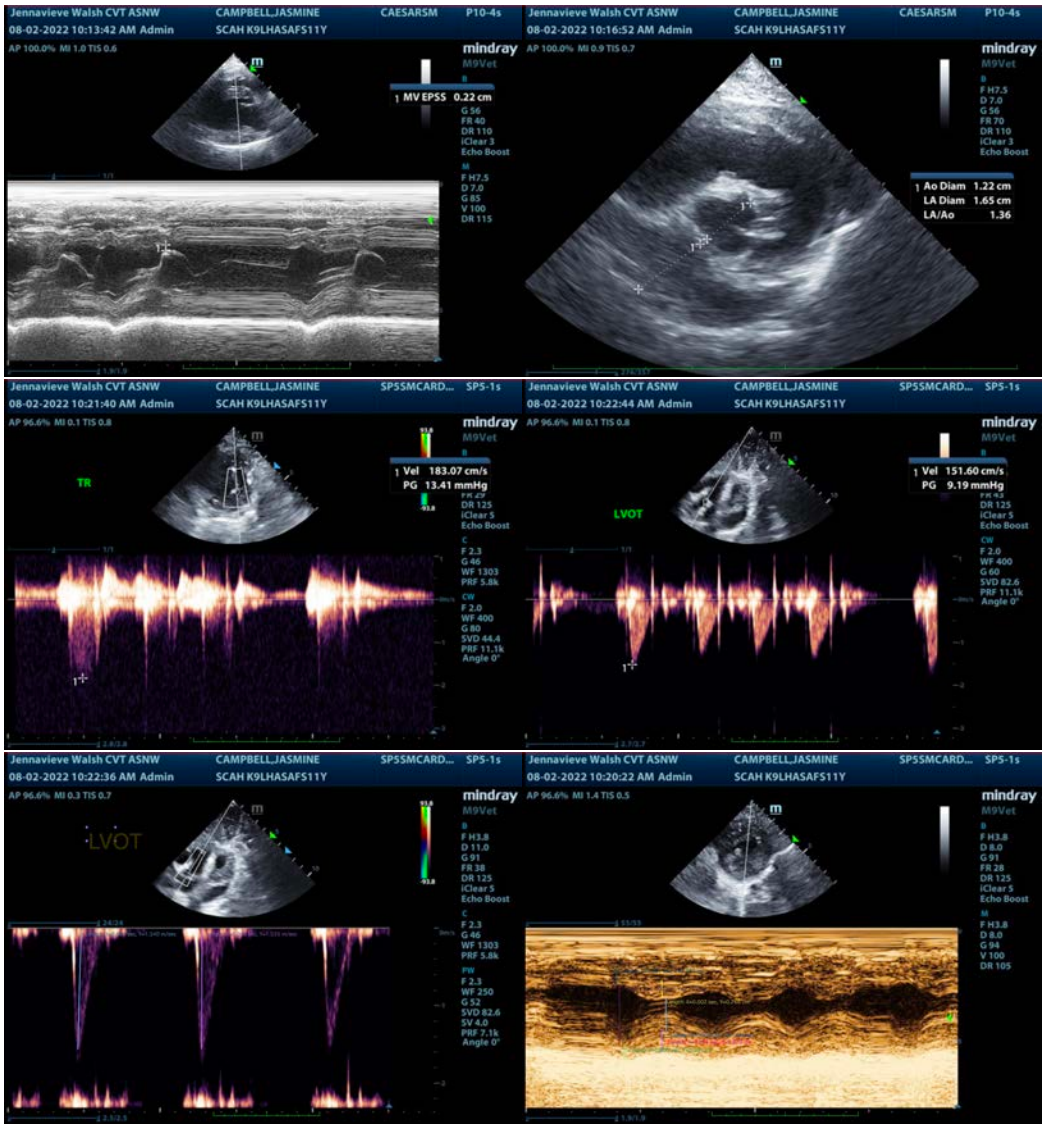

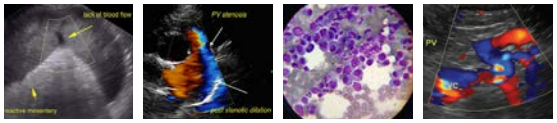

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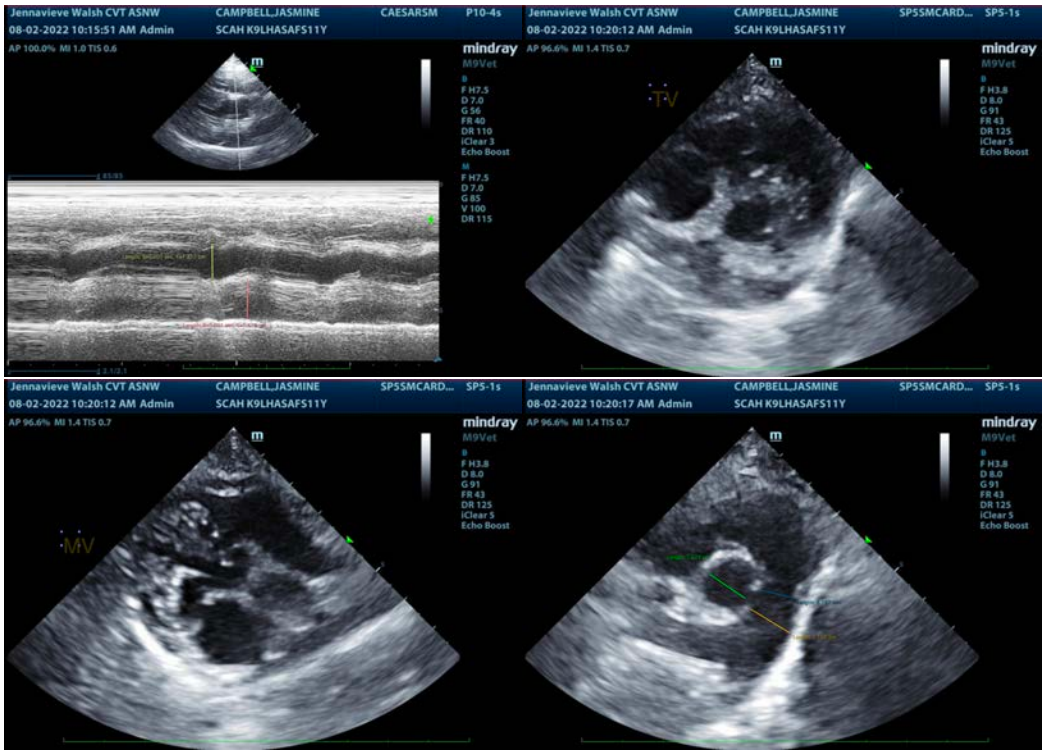

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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