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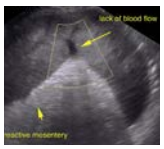
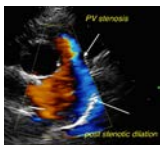
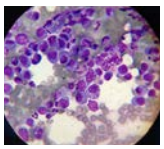
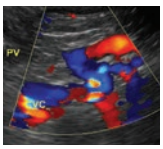

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1-800-838-4268 info@sonopath.com

PATIENT
Stella Cordner

SPECIES
Canine

BREED
Mix

SEX
Spayed Female

AGE
12 Years

WEIGHT
30 Pounds

INTERPRETED BY
Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY
Dr. Kitz

HOSPITAL NAME
Woodlands AH

REFERRING VET
Dr. Kitz

INVOICE
38821

DATE
6/16/22

PRESENTING CLINICAL SIGNS

Patient initially presented back in April for exam due to skin issues. At that time, an irregularly irregular arrhythmia and Grade III murmur were noted. A BNP test was elevated at 60 (0-6). Recommended xrays, ECG, and echo at that time, but owner elected not to pursue at that time. The dog re-presented with recent onset of changes in breathing and weight loss.
Abnormal PE/Chem/CBC/UA Results: On PE, the dog had lost several pounds and was muscle wasted with distended abdomen. HR was 120 and significant Grade III murmur and arrhythmia detected. RR within normal range but significant abdominal effort noted. MM pale pink. BP-122/94 Pulse ox 94% Afast showed significant ascites, fluid clear and serous as with CHF. No masses observed. TFAST showed severely enlarged LA and poor function of LV with swirling of blood in chamber. Submitted xrays of thorax for stat review, confirmed enlarged heart, suspected heart failure. See attached ECG reading. Started her on 5 mg BID Pimo and 20 mg BID lasix on Tuesday. She was better today when she presented for the echo.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO	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	2.87	NM	Short axis M mode 2.47; Boon 2.26	2.37	See below	See below	0.40
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		1.22	0.8	13.6	5.97	4.96	3.49

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 (Kardia (AliveCor))

Convincing P waves are not appreciated, except for two possible heart beats. However, the R to R interval between the "more normal" appearing beats is quite regular.

Right sided premature ventricular contractions occurring as singlets, doublets and triplets, as well as intermittent ventricular tachycardia are observed.

High index of suspicion of slow atrial fibrillation with right sided premature ventricular contractions.

Echocardiographic findings

Irregularly irregular heart rhythm during echocardiogram

Mitral valve

- Thickened and irregular valve leaflets; Moderate myxomatous degeneration of both leaflets.

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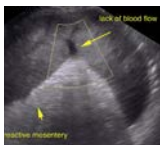
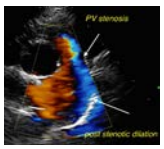
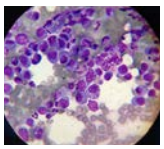
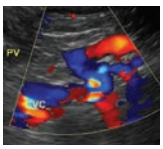

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- Mild (posterior) to moderate (septal) prolapse.
- Moderate to marked mitral regurgitation.
- Extremely severe left atrial enlargement
- Spontaneous echo contrast (“smoke”) within left atrium
- Marked left auricular enlargement.
- Rounding of the interventricular septum, i.e. left ventricular enlargement is present
- Marked increase of LA: Ao ratio
- LA normalized for BW (LAN = 2.46); very severe left atrial enlargement
- LVIDd normalized for BW (LVIDND = 2.31); marked left ventricular enlargement
- LVIDs normalized for BW (LVIDNs = 1.53); moderately increased

Aortic valve

- No abnormalities
- No aortic insufficiency

Tricuspid valve

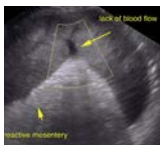
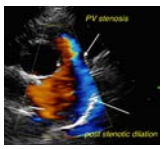
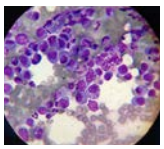
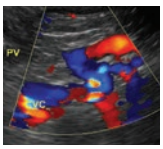
- Thickened and irregular valve leaflets; Moderate (septal) and mild (posterior) myxomatous degeneration.
- Moderate prolapse of septal leaflet.
- Mild tricuspid regurgitation.
- Subjectively, mild atrial enlargement.
- No right ventricular enlargement.

Pulmonic valve

- No abnormalities
- No pulmonary insufficiency.
- Main pulmonary artery within normal limits.
- Pulmonary artery: aortic ratio within normal limits.

Other

- No signs of pericardial
- Scant pleural effusion
- Ascites surrounding liver
- No evidence of pulmonary edema.

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- No obvious signs of a mass.
- Unable to assess fractional shortening and ejection fraction accurately due to the arrhythmia.

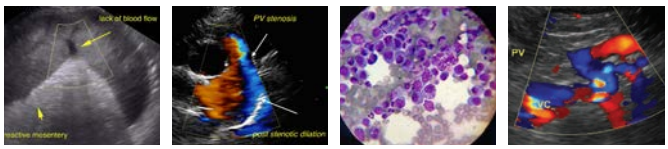
ULTRASONOGRAPHIC FINDINGS

- Myxomatous degeneration of the mitral (moderate) and tricuspid (mild) valves, ACVIM stage C, with marked left atrial and left ventricular enlargement. Subjectively, the right atrium is mildly enlarged.
- The size of the right atrium does not appear large enough to be causing such severe signs of right sided heart failure (ascites), however, chamber size may have been larger prior to initiation of pimobendan and furosemide.
- High index of suspicion of slow atrial fibrillation with right sided premature ventricular contractions. However, an electrocardiogram of longer duration is recommended to confirm that P waves are truly absent.
- Stella may have both slow atrial fibrillation and myxomatous degeneration of both the mitral and tricuspid valves, which have led to left and right sided congestive heart failure (assuming the original radiographs showed pulmonary edema).
- Sudden death is possible due to the arrhythmia.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Other suggestions/recommendations include:

- Evaluation of blood pressure
- An antiarrhythmic, such as sotalol, is suggested depending on Stella's arterial blood pressure and heart rate. It is not necessary if she is not tachycardic, hypertensive or suffering from syncopal episodes.
- Pimobendan. Continue treatment at 0.25-0.30 mg/kg PO every 12 hours.
- furosemide. Continue administration with the goal of finding the minimum dose effective in controlling clinical signs.
- spironolactone (0.5-1 mg/kg) is helpful in decreasing the dose of furosemide and is potassium sparing. It also has anti-fibrotic effects.
- benazepril is suggested depending on Stella's clinical status by Tuesday next week (appetite, energy level, etc.). Consider beginning at 0.25 mg/kg PO once a day for 3 days, then 0.25 mg/kg PO every 12 hour thereafter.



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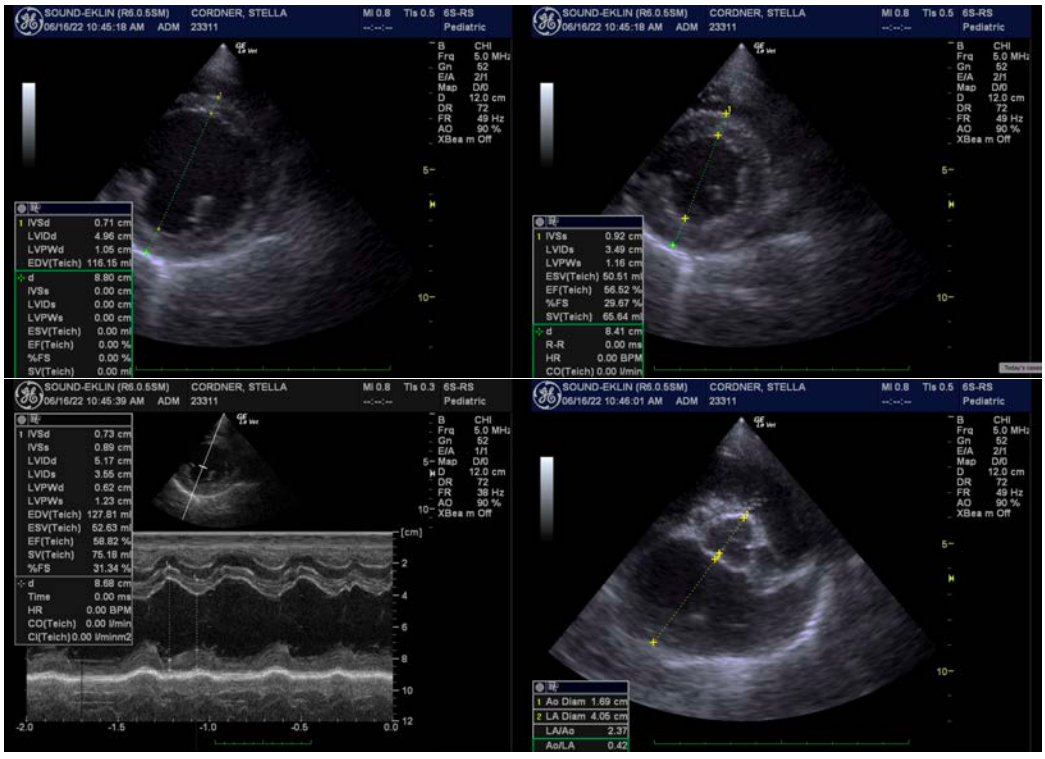
- Monitoring of the resting (sleeping) respiratory rate (RRR) is highly recommended once a day. The RRR should NOT EXCEED 30 breaths per minute (bpm). If the respiratory rate is greater than 30 bpm, *or* if there is a gradual increase (over a day or two) toward 30 bpm, the patient should be evaluated 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.
- Moderate salt restriction is suggested (between 0.4-0.5 grams/1000 kcal of food). Monitor salt content in treats.
- Omega-3 fatty acids may be helpful (EPA = 40 mg/kg/day and DHA = 25 mg/kg/day); gradual uptitration of the dose is suggested to decrease risk of gastrointestinal effects. However, they should not be introduced at the same time as other medications.
- Blood work PCV/TS, renal profile, SDMA and arterial blood pressure, are recommended 10-14 days after initiation of medications.
- Blood work, CBC, serum biochemical profile, including a SDMA, and arterial blood pressure, are recommended at least twice a year to monitor renal parameters. If cost prohibitive, a PCV/TS may be performed instead of a full CBC.
- Re-evaluation of an echocardiogram is suggested in 6 months, or sooner depending on clinical signs.



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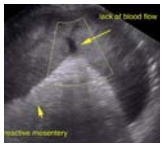
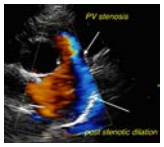
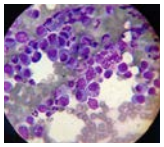
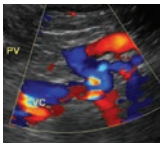

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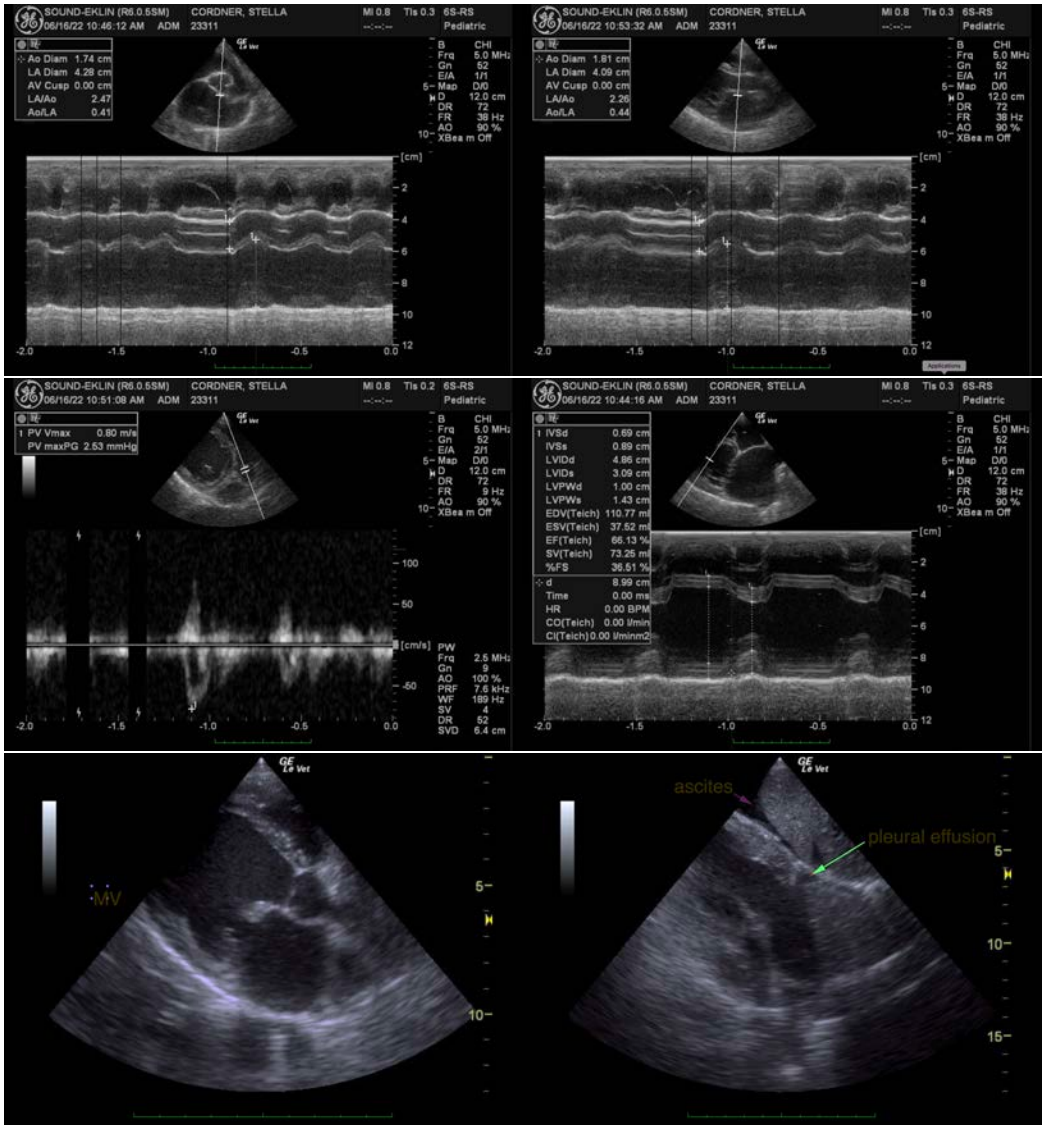

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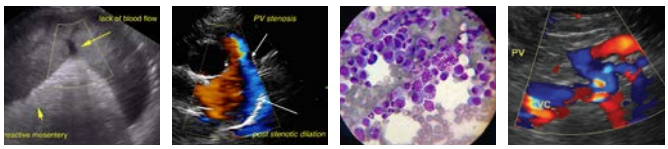

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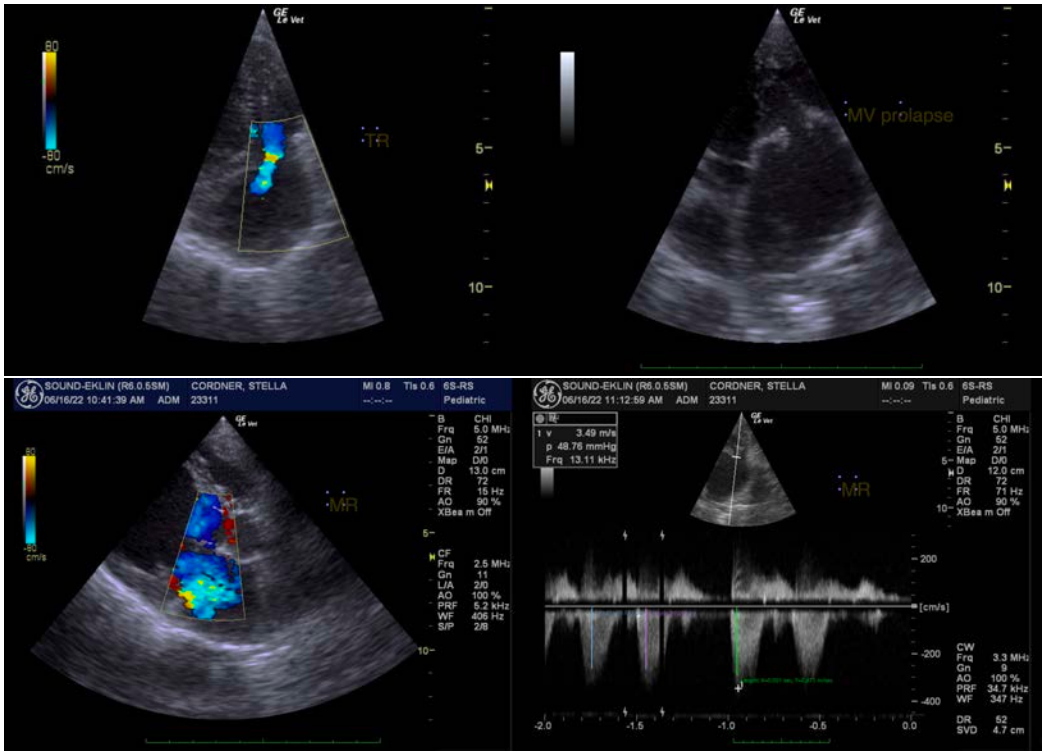

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

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