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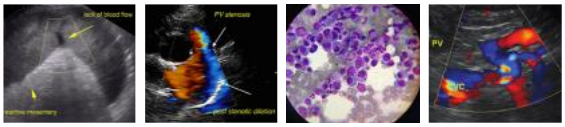


ANIMAL SOUNDS NW
MOBILE VETERINARY ULTRASOUND
IMAGING PERFORMED BY
AnimalSoundsNW.com 541-357-9423

PATIENT
Roxie Abundis

SPECIES
Canine

BREED
Mix

SEX
Female Spayed

AGE
12 years

WEIGHT
57.8lbs

INTERPRETED BY
Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY
Heidi Putnam, SDEP Clinical Sonographer

HOSPITAL NAME
The Veterinary Hospital

REFERRING VET
Dr. Berman

INVOICE
20654

DATE
8/19/21

PRESENTING CLINICAL SIGNS

History: Grade 4 bilateral heart murmur. Frequent dry/hacking cough.
-Current Medications Benazepril 10mg - 1 T SID, Furosemide 20mg - 3 T BID (~4.5 mg/kg/day), TCVM Breathe Easier .5mg 2 C BID, Doxycycline 100mg - 1 T BID; Vetmedin 5mg TID; Hydrocodone 5-10mg TID PRN.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.

Significant cardiomegaly. No obvious evidence of CHF.

ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.

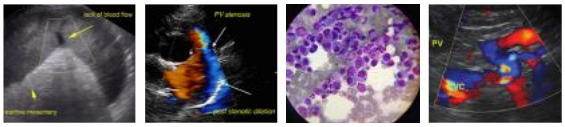
A single lead ECG is available; 50mm/s, 20mm/mV. The average heart rate is 130bpm (range 107-150bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. Frequent VPCs throughout in a bigeminal pattern; singles only, monomorphic. No supraventricular premature beats, pauses or other dysrhythmias observed. ECG diagnosis: Intermittent ventricular bigeminy.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with prolapse into the left atrial lumen. Severe eccentric mitral regurgitation with severe left atrial dilation. Normal MR velocity. Moderate LV dilation with depressed myocardial function. The tricuspid valve appears thickened, with mild to moderate TR. Mildly elevated velocity. Mild right atrial and ventricular dilation. The pulmonic and aortic valves are normal in morphology and mobility. Normal aortic and pulmonic outflow velocities with laminar flow. Mild to moderate AI. No PI. Scant pericardial and no pleural effusion noted. No obvious cardiac masses.

CARDIAC CHART

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	5.4	3.3	2.2	2.0	30	56	NM
CANINE CARDIAC PARAMETERS	**HR** (BPM)	**AV VMAX** (m/s)	**PV MAX** (m/s)	**BODY WEIGHT** (kg)	**LA** 2D short 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	BELOW	BELOW	BELOW	BELOW
PATIENT	150	1.7	1.5	26.2	4.1	6.1	4.3
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)



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BODY WEIGHT DEPENDENT PARAMETERS

Adapted from June Boon, Veterinary Echocardiography, 1998
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435
Hansson et al, Vet Rad and Ultrasound 2002
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995

5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
10	1.50 (3.8)	3.27 (3.5)	2.06 (3.1)
15	1.83 (2.0)	3.71 (2.4)	2.43 (2.1)
20	2.02 (1.9)	4.14 (2.2)	2.80 (2.0)
25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
40	2.62 (5.2)	5.48 (6.1)	3.96 (5.4)
50	2.88 (7.1)	6.07 (8.3)	4.46 (7.4)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur is chronic degenerative valve disease causing severe mitral and mild to moderate tricuspid regurgitation. Severe left atrial enlargement indicates the risk for spontaneous congestive heart failure is elevated. Early pulmonary hypertension is noted, which is likely secondary to chronic LA pressure elevation. A significant aortic leak is noted, and lifelong BP monitoring is advised. No additional issues are identified.

As an imminent complicating factor there is small volume pericardial effusion present. The two most likely rule outs include a LA tear or right-sided CHF. The only way to definitively know the difference is a diagnostic pericardiocentesis; however, in small volume situations like this the risk far outweighs the benefit. Given that the pulmonary pressures are only mildly elevated the former is considered more likely. A left atrial tear indicates a highly unstable patient and hospitalization is recommended.

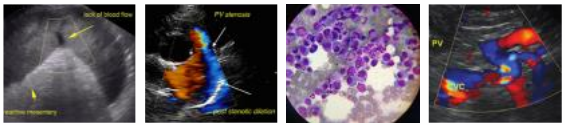
Ideally, I would treat this patient with aggressive diuretic therapy and supportive care and monitor the amount of effusion in hopes of stabilizing the situation. If the amount of effusion increases or the patient further decompensates, a pericardial tap or humane euthanasia may become indicated.

Strict activity restriction is advised until the fluid is able to reabsorb, as there is a high risk for decompensation if the clot/healing is disrupted. If any syncope/decompensation occurs acutely in the future, then the amount should be reassessed.

The ECG shows frequent VPCs with intermittent bigeminy. This indicates the VPCs are firing every other beat, which is concerning. Given that this patient is in an acute crisis, I would not institute therapy at this time; however, follow up is advised once the patient is stabilized. If there is any syncope in the future, immediate reassessment of the rate and rhythm is recommended.

Unfortunately, even if we are able to stabilize the situation, the long-term prognosis is poor to grave given the severity of disease and complexity of issues, with risk for recurrent spontaneous decompensation, fulminant heart failure, development of arrhythmias and/or sudden death in the future.

Monitoring of sleeping breathing rates is recommended as the best way to screen for CHF at home. Omega fatty acid supplementation and mild salt restriction may also be of some long-



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term benefit. Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.

PLAN

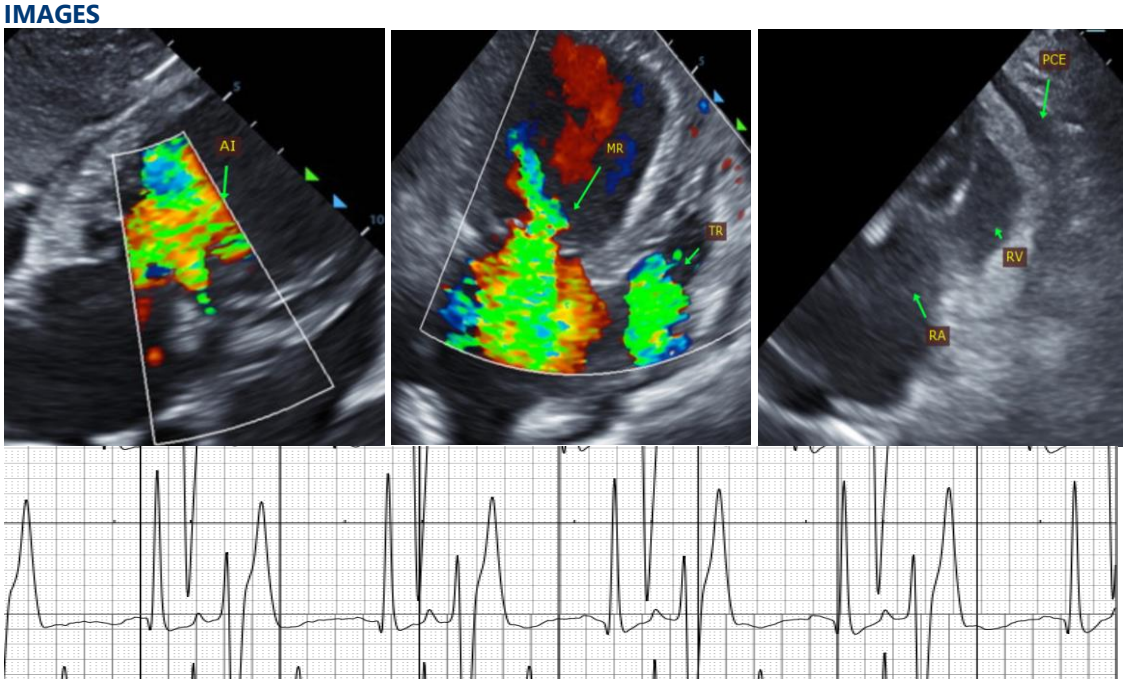
Consider hospitalization for supportive care as discussed, with close monitoring of degree of pericardial effusion/need for centesis, continuous ECG evaluation, blood pressure monitoring, diuretic therapy and O2 support if needed.

Once stabilized, discharge on the following: Discontinue Benazepril for the short-term. Continue Lasix as prescribed. Continue Pimobendan with a dose change: administer 7.5mg PO q12h. Continue Hydrocodone as needed for quality of life. Institute spironolactone 1-2mg/kg PO q12h.

A renal panel, blood pressure and (if possible) reassessment of effusion status is recommended in 1-2 weeks following discharge, then every 3-4 months going forward. Once stable and doing well at home, reinstitute ACEI 0.5mg/kg PO q12h. Consider hydrocodone if needed for QOL.

A recheck echocardiogram is recommended in 6 months to screen for progression, sooner if clinical signs arise.

IMAGES



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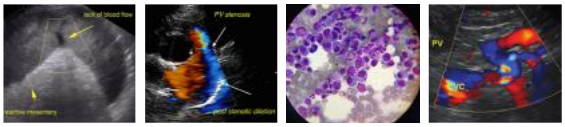

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. This report was generated using transcription software, and minor dictation errors may be present. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance, please contact me.

Maggie Machen Lamy, DVM
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
info@sonopath.com