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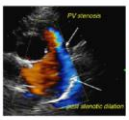
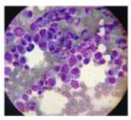
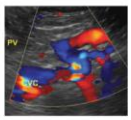

SonoPath
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PATIENT
Alfie Knudson

SPECIES
Canine

BREED
Boston Terrier

SEX
Male Neutered

AGE
9.7 years

WEIGHT
31.6lbs

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

IMAGING PERFORMED BY
Rachel Runnells, RVT

HOSPITAL NAME
SVS Imaging KC

REFERRING VET
Dr. Renfro

INVOICE
24203

DATE
5/16/22

PRESENTING CLINICAL SIGNS
History: Recheck echo. Lethargy, labored breathing.
-Current medications: Theophylline BID, gabapentin, Hydrocodone and meloxicam as needed.
-Pertinent previous echo findings (3/2021 MML): RSA, mild MR, normal dimensions.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Mild cardiomegaly. No obvious evidence of CHF. The left lateral view is concerning for possible pulmonary mass(es); however, the RL and DV are more concerning for mediastinal abnormalities.

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; 25mm/s, 10mm/mV. The average heart rate is 230bpm with a regular rhythm. Wide complex QRS morphology. No identifiable P waves.
ECG diagnosis: Tachyarrhythmia. Rule out VT versus SVT with a bundle branch block.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve leaflets with no prolapse into the left atrial lumen. Mild central mitral regurgitation with moderate left atrial dilation. Normal MR velocity. Increased LV diameter with depressed myocardial function. The tricuspid valve appears mildly thickened with moderate tricuspid regurgitation. Normal velocity. The right heart is moderate to severely enlarged with subtle septal flattening. The MPA appears prominent. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No obvious aortic or pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac masses. Tachycardia throughout.

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	4.8	2.6	1.7	1.8	20	36	0.33
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	212	1.1	0.6	14.3	2.7	4.0	3.2
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
BODY WEIGHT DEPENDENT PARAMETERS **Note: All measurements based upon multi-modal images and methods. An average value is reported.*				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)

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

	50	2.88 (7.1)	6.07 (8.3)	4.46 (7.4)

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Unusual case. Chronic degenerative valve disease persists with mild mitral and moderate tricuspid regurgitation. There is significant progression compared to the prior study, with moderate to severe four chamber dilation and development of systolic dysfunction. Four chamber dilation is frequently seen secondary to rapid arrythmias, which are noted in this case. No obvious pulmonary hypertension is observed; however, the right heart does show evidence of pressure overload. This is unusual to see and there is **concern for some extra cardiac mass,** potential compressing peripheral vasculature (particularly in light of included CXR). No obvious lesion is seen in this image set; however, **a full Radiologist review of the films and advanced thoracic evaluation (such as a CT scan) is strongly recommended.**

The brief submitted ECG shows a sustained tachycardia with a heart rate of 230bpm. The QRS morphology is wide, which is most consistent with a ventricular origin; however, a SVT remains a possibility. This is likely the primary issue in this case, which is leading to 4 chamber enlargement as previously mentioned, and potentially alone explains clinical signs. While a six-lead tracing would be ideal, it appears the most important next step is instituting treatment and getting the arrythmia under control. Highly recommend immediate referral to an emergency facility for further ECG evaluation, potentially Lidocaine conversion if sustained and oral medications. If this is declined, oral Sotalol can be attempted; however, there is high risk in this case for acute collapse and sudden death. Discission with the owner is advised.

Based upon the structural changes, Pimobendan is also recommended. Prognosis is guarded to poor; however, further workup is advised to help further explain the clinical picture. Referral to a multi-specialty center is recommended in this complicated case.

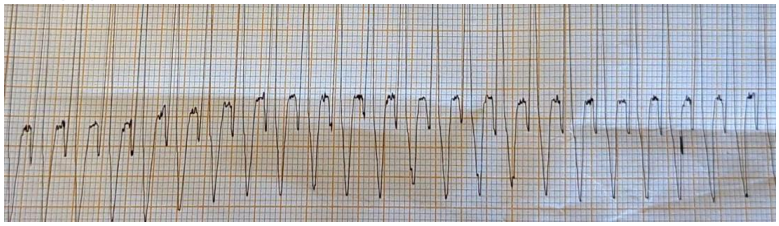
PLAN

Immediate referral to an ER or ideally specialty facility for advanced thoracic imaging, reassessment of a six-lead ECG and potentially Lidocaine conversion is advised. Full systemic evaluation should be sought as well. If declined, consider Radiologist review of the films. Institute Pimobendan 0.3mg/kg PO q12h. Additionally, if declined and the patients heart rate remains >200bpm, consider Sotalol 1-2mg/kg PO q12h.

Reassess ECG and/or holter monitor in 1-2 weeks, or sooner if any clinical compromise is noted at home.

Recommend conservative monitoring with a recheck echocardiogram in 6 months, sooner if any development of clinical signs.

IMAGES



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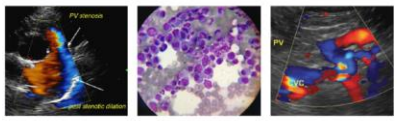

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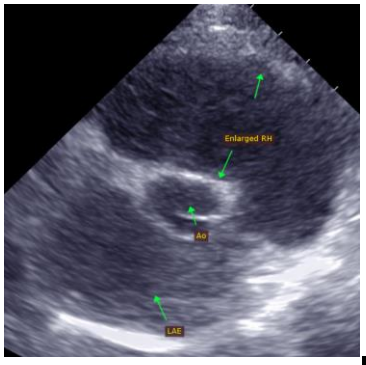

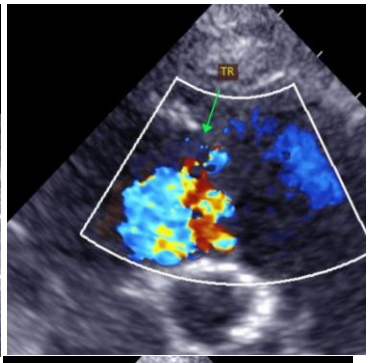

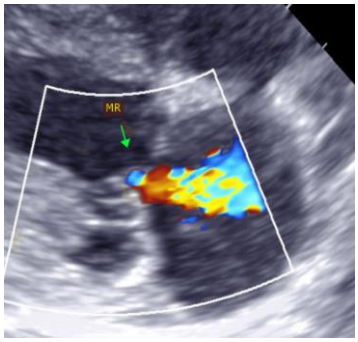

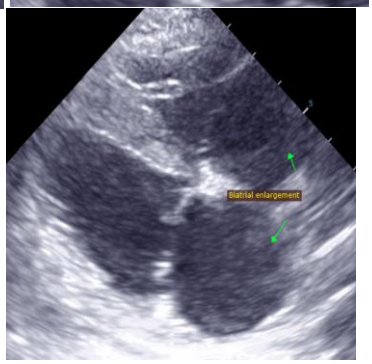

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. 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