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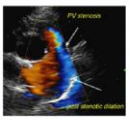
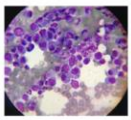
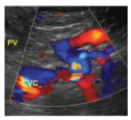

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PATIENT
Lucky Keys

SPECIES
Canine

BREED
Mix

SEX
Male Neutered

AGE
9 years

WEIGHT
28lbs

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

IMAGING PERFORMED BY
Amy Mayhew. LVT

HOSPITAL NAME
SVS Imaging MI

REFERRING VET
Union Lake Veterinary Hospital

INVOICE
24615

DATE
6/7/22

PRESENTING CLINICAL SIGNS
History: Recheck echo. Pleural and abdominal effusion.
Pertinent previous echo findings (7/2021 DACVIM Cardiology): Mild MR/TR. No LA/LVE or RA/RVE.
ECG at that time showed suspect SSS with 1st and 2nd degree AV block.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Cardiomegaly with pleural and abdominal effusion.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with no prolapse into the left atrial lumen. Mild eccentric mitral regurgitation with moderate left atrial dilation. Normal LV diameter with adequate myocardial function. The tricuspid valve appears normal with moderate tricuspid regurgitation. Velocity consistent with mild pulmonary hypertension. Marked right atrial and ventricular dilation. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No aortic or pulmonic insufficiency. No pericardial effusion. Large volume pleural effusion noted. Large volume ascites. No obvious cardiac masses. Highly irregular rate and rhythm throughout the study.

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	NM	3.2	NM	1.7	47	80	0.18
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	NM	1.0	1.1	12.7	2.6	3.1	1.6
*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				5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
**Note: All measurements based upon multi-modal images and methods. An average value is reported.*				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)

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

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS
Chronic degenerative valve disease persists with evidence of progression. Previously mild left-sided disease has become moderate with moderate left atrial enlargement. What is most significant is the right heart is markedly dilated with development of right-sided CHF (bicavitary

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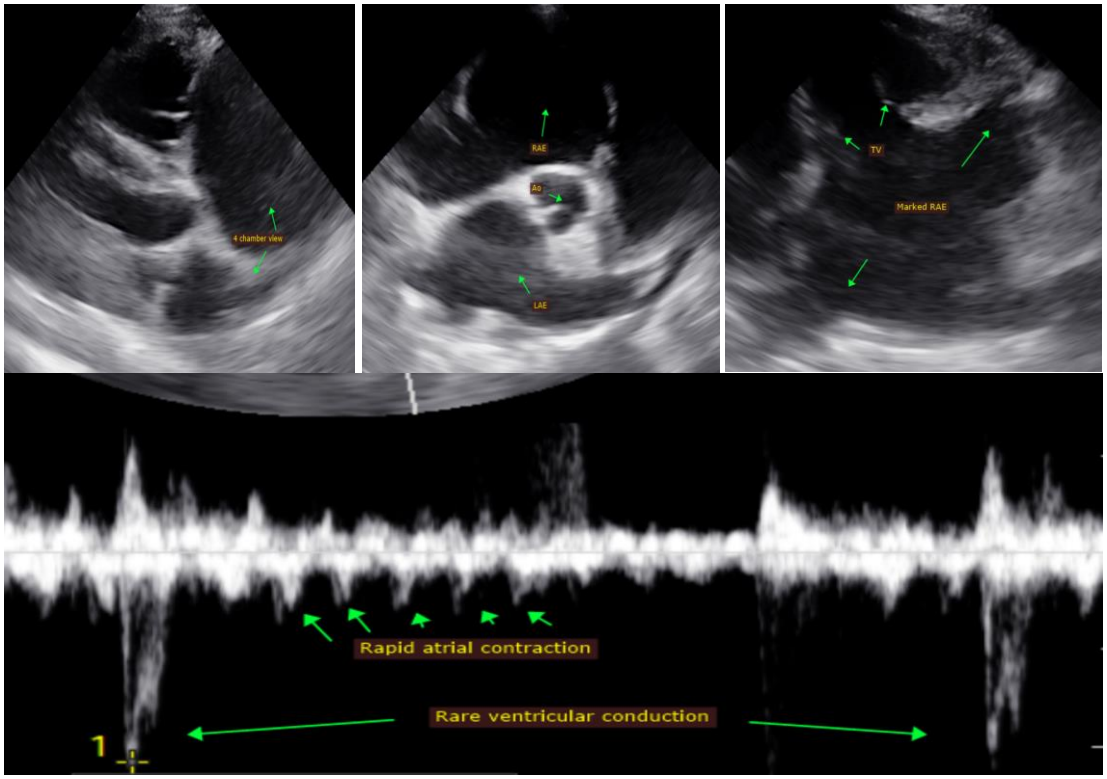
effusion). This is presumably secondary to the marked arrythmia, which needs to be further evaluated imminently.

The history of sick sinus syndrome in this patient is likely reflected here, with a highly irregular P to QRS relationship seen throughout the study. The P wave rate is extremely fast and may reflect flutter or other supraventricular abnormality. The conduction rate is low with rare QRS complexes and an overall ventricular bradycardia (rule out complete AV block versus high grade 2nd degree block v other). My assumption in this case is the arrythmia is the primary issue and **immediate referral to a local Cardiologist for emergency care, advanced evaluation and potentially pacemaker consultation is recommended.** No further comments can be made on the arrythmia without a six-lead ECG tracing. In the short term bicativary-centesis should be considered to improved patient stability with institution of full cardiac support as below. If referral is declined, euthanasia should be elected if QOL suffers as the prognosis is grave without advanced evaluation and treatment.

PLAN

Immediate referral to a 24-hour facility with a Cardiologist for ECG evaluation, consultation, etc. If declined, thoraco-and abdominocentesis should be performed. Institute Lasix 1-2mg/kg PO q12h. Institute Pimobendan 0.3mg/kg PO q12h. Institute Spironolactone 1-2mg/kg PO q12h. Do not use an ACE-I. If referral is declined and patient declines despite medical therapy, euthanasia should be elected.

IMAGES



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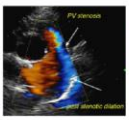
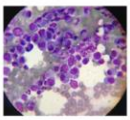
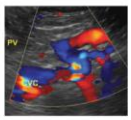

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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