SonoPath
Clinical Sonography & Telecytology
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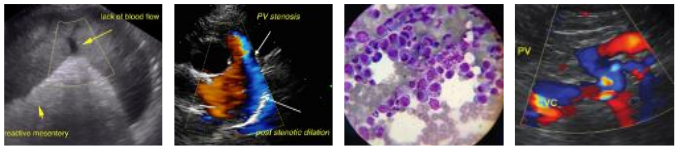

SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Dakota Sweerus

SPECIES
Canine

BREED
Lab

SEX
Male

AGE
1.7 years

WEIGHT
49lbs

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

IMAGING PERFORMED BY
Jessica Miller

HOSPITAL NAME
Blairstown Animal Hospital

REFERRING VET
Dr. Zeliff

INVOICE
28985

DATE
2/14/23

PRESENTING CLINICAL SIGNS

History: Recheck echo. Irregular arrythmia. Grade 4/6 heart murmur. Labs: WNL. Sedated with Torb.
-Current medications: Pimobendan, Furosemide, Benazepril, Spironolactone.
-Pertinent previous echo findings (3/2022 MML): Severe TV dysplasia, marked TR, marked RHE. PFO suspected. Small LH. Hepatic congestion, ascites, and suspicion for rapid AF on this exam.

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

A brief single lead ECG is available; 50mm/s, 10mm/mV. The average heart rate is 230bpm (range 166-300bpm). P waves cannot be visualized throughout with an irregularly irregular rhythm. The QRS is inverted.
ECG diagnosis: Rapid atrial fibrillation.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Severe anatomic distortion makes extensive visualization difficult, however, the TV leaflets are abnormal with thickening and lack of coaptation in systole. Tethered septal leaflet. Some degree of stenosis is not ruled out. Distorted RV papillary musculature. Marked tricuspid regurgitation with marked right atrial and ventricular dilation distorting normal views. TR velocity consistent with moderately elevated pulmonary pressures. Bowing of the interatrial septum. The LV diameter is normal with adequate myocardial function. LA dimension is normal. The mitral valve appears normal with no mitral regurgitation. Normal aortic and pulmonic outflow velocities. The aortic valve is normal with no aortic insufficiency. No obvious congenital shunts. No pleural or pericardial effusion. Rapid irregular rate/rhythm 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	NA	3.5	NM	1.0	33	60	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	NM	1.4	0.7	22.2	2.9	3.9	2.6
*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 *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)
				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

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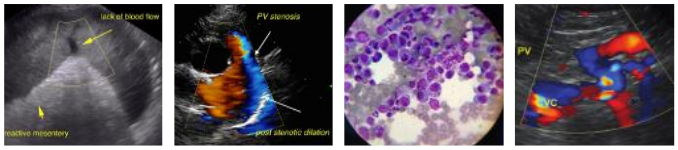

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Compared to the prior study, structural disease appears similar with severe TV dysplasia, marked TR and marked right heart enlargement. The left heart remains normal, and no additional issues are identified.

As a complicating factor, the patient has also developed rapid atrial fibrillation (AF) secondary to atrial dilation. This was suspected on the prior exam and is now a chronic issue. Development of the arrhythmia leads to congestion due to a drop in cardiac output. AF is characterized by disorganized contractions of the atria leading to an irregular heart rhythm. The irregular heart rhythm rarely causes clinical signs in dogs; however, atrial fibrillation also usually causes an increase in the heart rate, and this can lead to clinical signs and CHF as we see in this patient. Once a patient is in AF, this will likely never convert back to sinus rhythm, however they typically do well with simply rate control. The structural disease and development of AF requires additional medical management with rate control medications. Close monitoring going forward is advised.

It is important to note that this is considered an end-stage case and sudden death is a possibility at any time. If quality of life suffers, euthanasia should be elected.

Monitoring of sleeping respiratory rates will be paramount to screen for recurrent congestive heart failure at home in the future. Cough suppression to improve QOL can also be considered once diuretics are on board for any residual mechanical cough in the face of normal sleeping respiratory rates.

Omega fatty acid supplementation (1000mg once to twice daily) and mild salt restriction may be of some long-term benefit.

PLAN:

If the patient appears unstable, recommend referral for 24-hour monitoring/supportive care and IV rate control/diuretics. Current dosages are not provided, and standard dosing is as follows: Pimobendan 0.3mg/kg PO q12h, Lasix 1-2mg/kg PO q8-12h (depending on current dose and chronicity), Spironolactone 1-2mg/kg PO q12h, and ACE-I 0.5mg/kg PO q12 pending BP assessment. Institute Diltiazem 1-2mg/kg PO q8h.

Recheck BP, heart rate/ECG and renal values in 5-7 days to ensure tolerance of medications. Target HR is 140-160bpm in hospital/stressed. Up-titrate diltiazem to effect. If difficult to control, can also consider Digoxin (0.005mg/kg PO q12h with close monitoring of blood dig levels) due to synergistic effect with diltiazem.

Monitor renal values/BP/HR every 3-4 months lifelong.

A recheck echocardiogram is recommended in 6 months to screen for progression.

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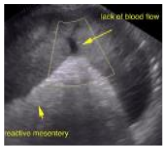
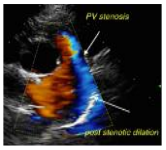
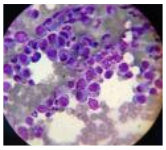
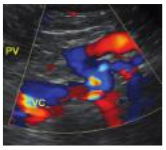

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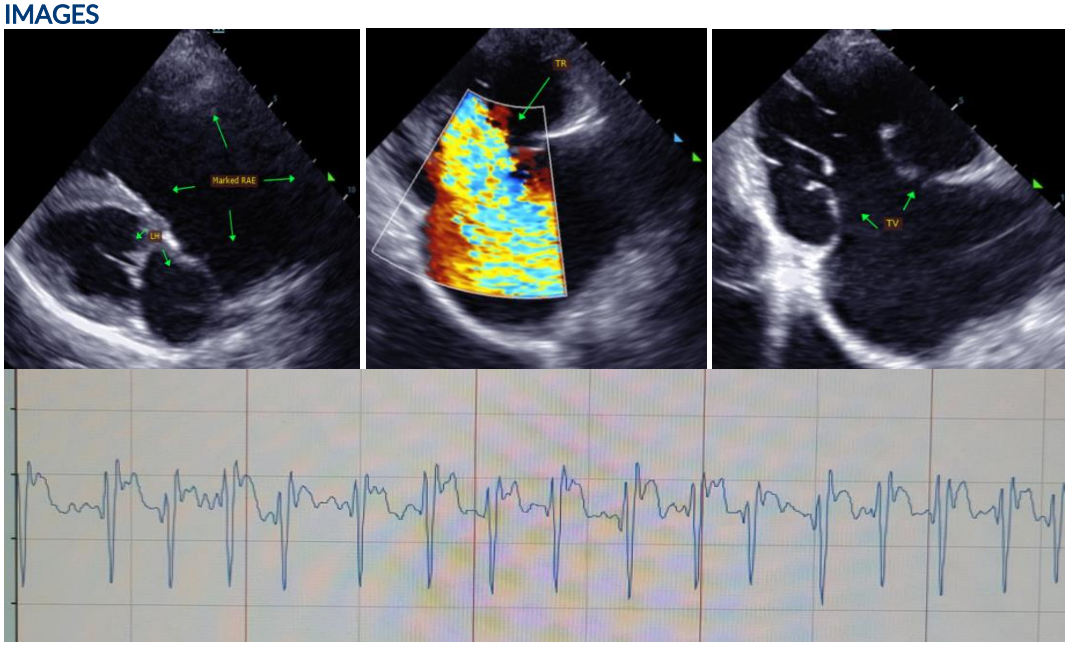
IMAGES



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