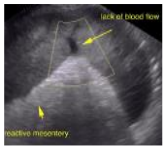
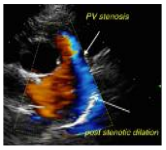
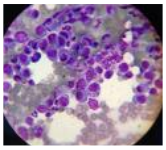
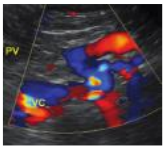
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

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

PATIENT
Shiloh McGhee

SPECIES
Canine

BREED
Lab Mix

SEX
Female Spayed

AGE
11 years

WEIGHT
61lbs

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

IMAGING PERFORMED BY
Dr. Karen Ebersole

HOSPITAL NAME
Scanvet

REFERRING VET
Dr. Golden

INVOICE
26863

DATE
10/12/22

PRESENTING CLINICAL SIGNS

History: Increasing exercise intolerance and episodes of near syncope/collapse with mild exercise. Frequent syncopal episodes started in 2017 after exploratory surgery at specialty clinic for partial gastric torsion, splenectomy and LN/GI biopsies. Echo, ECG, Holter monitor with cardiologist revealed no obvious cause. Theophylline was started, and episodes improved to far fewer with moderate exercise restriction (no running in the woods, etc.). Recently there was an episode of collapse while on leash and ran toward a squirrel. Also not wanting to go on longer walks.
-Current medications: Gabapentin 300mg BID, Galliprant 60mg SID and Theophylline 100mg BID.
-Radiographs: There is a large soft tissue bulge of the 11-2 o'clock position in the region of the aortic arch and main pulmonary arterial segment. The remainder of the cardiac silhouette is normal. The right caudal lobar artery is distended tortuous, may abruptly narrow at the level of the 9th rib. The cranial lobar vessels are normal to slightly thin. The mild diffuse bronchial pattern is normal for the age.
Pertinent prior eval notes (Dr. MacGregor 2017): Normal echo, suspect high vagal tone

ELECTROCARDIOGRAPHIC FINDINGS

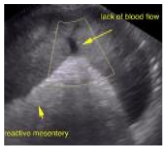
A six lead ECG is available at 25mm/s; 10mm/mV. The average heart rate is 110bpm (range 100-115bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P wave morphology is positive with a normal dimension. Normal PR. The QRS morphology is positive with normal dimension. MEA is normal. No ectopic beats, pauses or dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with respiratory variation.

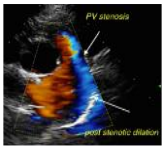
ECHOCARDIOGRAM FINDINGS

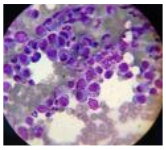
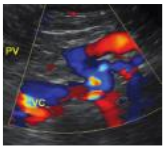
2D, m-mode, color flow and doppler imaging is available. Mild mitral valve thickening with no obvious prolapse into the left atrial lumen. Mild mitral regurgitation. Minimal left atrial enlargement. Normal LV diameter with adequate myocardial function for this breed. The LV wall thickness is normal. The tricuspid valve appears normal in form and function with trace TR. No right atrial dilation. Mild right ventricular prominence with mild hypertrophy. Mild elevation of pulmonic outflow velocities. The PV appears mildly thickened; however, a region of narrowing is seen in the supravalvular region as well (see below). Exuberant, soft tissue is noted along the border of the MPA (rule out fat versus abnormal soft tissue). Mild pulmonic insufficiency. The aortic valve appears to have normal morphology and mobility. Normal LVOT velocity. Mild AI. No pericardial or 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	NA	NM	1.2	1.4	26	51	0.25
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	1.7	2.8	27.7	3.1	4.3	2.2
*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

**Note: All measurements based upon multi-modal images and methods. An average value is reported.*

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 primary abnormality identified is mildly elevated flow velocity through the pulmonary artery with a thickened pulmonic valve. A narrowing is noted in the supravalvular region, which is highly unusual as well in a senior dog. A supravalvular stenosis is possible (i.e., congenital issue); however, this was not mentioned previously and exuberant, soft tissue is noted along the region. This may suggest a compressive lesion; however, no mention of this abnormality is seen in the CXR report. Finally, a small aortic leak is noted, and a blood pressure is recommended. Finally, mild early chronic degenerative valve disease is present with mild mitral regurgitation. This appears hemodynamically insignificant at this time. The ECG is unremarkable with a normal sinus rhythm.

Regardless of academic diagnosis, the clinical impact of this degree of disease is typically low. In other words, even if acquired stenosis of the pulmonary artery has developed, syncope due to a mild obstruction is considered highly unlikely. That being said, potentially a dramatic increase in heart rate may worsen the hemodynamic consequence during times of activity. This is contradictory to a patient who initially improved on theophylline, which is a heart rate stimulant.

Given the highly unusual progression in this case, there are a few ways to proceed. First would be to consider referral to a multi-specialty center for advanced thoracic imaging such as a CT/angiogram. The goal would be to further evaluation the region, screen for peripheral issues/extra-cardiac tumors, etc. An alternative would be to attempt discontinuing theophylline, as heart rate stimulation may be worsening a stenosis. A holter monitor could also be considered; however, no arrythmias are seen on the included ECG (nor were seen previously). Discussion with the owner is advised. If further work up is declined and collapse persists undiagnosed, it is difficult to suggest further medical options and euthanasia may have to be considered.

Monitor for worsening clinical signs (exertional collapse, abdominal distention, cough, labored breathing). Omega fatty acid supplementation may have some long-term benefit, given that these cases are predisposed to development of arrhythmias going forward. Breeding is not advised as this condition is genetically linked.

Plan: Consider discontinue theophylline and assess response versus a holter monitor/event recorder versus referral for advanced imaging.

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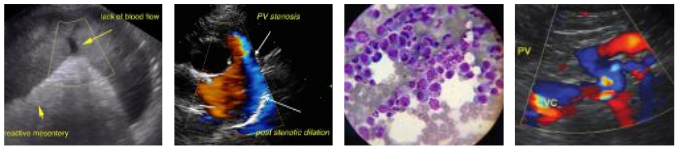

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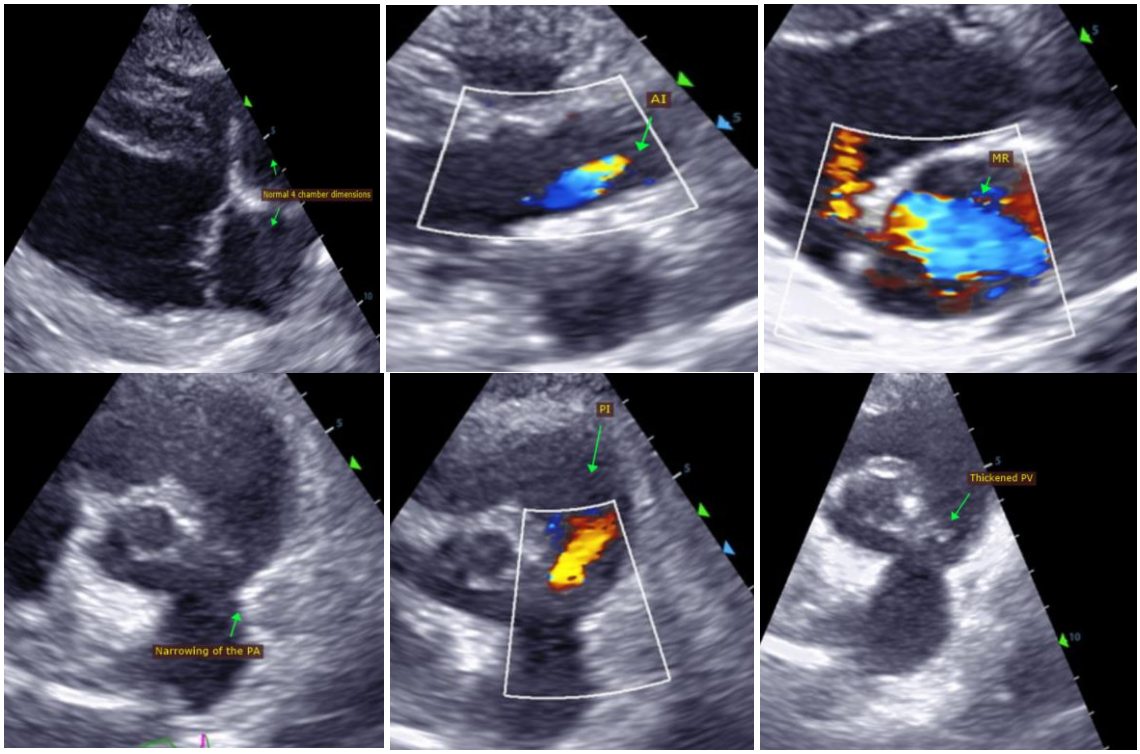
IMAGES



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