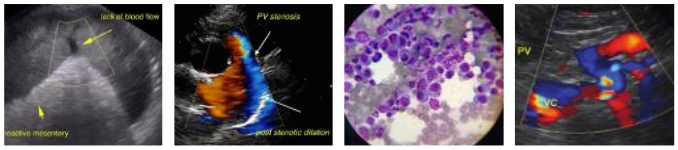
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Ayita Herges

SPECIES
Canine

BREED
Cocker Spaniel Mix

SEX
Female Spayed

AGE
9 years

WEIGHT
23lbs

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

IMAGING PERFORMED BY
G. Ferrer, DVM

HOSPITAL NAME
Paseos Veterinary Center

REFERRING VET
Dr. Carrasquillo

INVOICE
20648

DATE
8/19/21

PRESENTING CLINICAL SIGNS

History: Presented today to evaluate a heart murmur and ascites. Also, this pt had an anemia and transfusion was done 6 days ago and pt is doing much better. The heart murmur is a grade 4/6 with PMI on right side, but a grade 2/6 was auscultated on left side. An abdominal u/s was done and no major abnormalities were noticed except for moderate amount of abdominal effusion. Pt is currently on Furosemide 2mg/kg BID, Pimobendan 0.25mg/kg BID, Enrofloxacin 5mg/kg SID, Vit K 2mg/kg and famotidine 1mg/kg BID. 4DX: was all negative (HW, Erhlichia, anaplasma etc)
-Abnormal PE/Chem/CBC/UA Results: Last PCV after transfusion 36% CBC: RBC 4.17 M/µL 5.65 - 8.87 LOW HCT 23.1 % 37.3 - 61.7 LOW HGB 9.2 g/dL 13.1 - 20.5 LOW MCV 55.4 fL 61.6 - 73.5 LOW MCH 22.1 pg 21.2 - 25.9 MCHC 39.8 g/dL 32.0 - 37.9 HIGH RDW 18.6 % 13.6 - 21.7 %RETIC 1.8 % RETIC 75.9 K/µL 10.0 - 110.0 RETIC-HGB 25.4 pg 22.3 - 29.6 WBC 23.03 K/µL 5.05 - 16.76 HIGH %NEU 80.9 % %LYM 5.7 % %MONO 13.1 % %EOS 0.0 % %BASO 0.3 % NEU 18.60 K/µL 2.95 - 11.64 HIGH LYM 1.32 K/µL 1.05 - 5.10 MONO 3.02 K/µL 0.16 - 1.12 HIGH EOS 0.01 K/µL 0.06 - 1.23 LOW BASO 0.08 K/µL 0.00 - 0.10 PLT 240 K/µL 148 - 484 MPV 13.3 fL 8.7 - 13.2 HIGH PDW 12.5 fL 9.1 - 19.4 PCT 0.32 % 0.14 - 0.46 Chem GLU 121 mg/dL 70 - 143 112 mg/dL CREA 0.9 mg/dL 0.5 - 1.8 0.9 mg/dL BUN 106 mg/dL 7 - 27 HIGH --.-- mg/dL BUN/CREA 123 PHOS 6.9 mg/dL 2.5 - 6.8 HIGH --.-- mg/dL CA 8.9 mg/dL 7.9 - 12.0 9.2 mg/dL TP 5.3 g/dL 5.2 - 8.2 5.4 g/dL ALB 2.6 g/dL 2.2 - 3.9 2.8 g/dL GLOB 2.6 g/dL 2.5 - 4.5 2.6 g/dL ALB/GLOB 1.0 1.1 ALT 159 U/L 10 - 125 HIGH 173 U/L ALKP 110 U/L 23 - 212 107 U/L GGT 0 U/L 0 - 11 0 U/L TBIL 0.4 mg/dL 0.0 - 0.9 0.3 mg/dL CHOL 130 mg/dL 110 - 320 --.-- mg/dL AMYL 931 U/L 500 - 1500 --.-- U/L LIPA 781 U/L 200 - 1800 --.-- U/L Na 139 mmol/L 144 - 160 LOW 140 mmol/L K 3.8 mmol/L 3.5 - 5.8 4.3 mmol/L Na/K 37 33 Cl 108 mmol/L 109 - 122 LOW 105 mmol/L Osm Calc 311 mmol/k

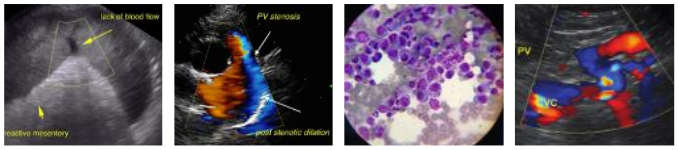
RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.

Right-sided cardiomegaly. Diffuse military pattern.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve leaflets with no obvious prolapse into the left atrial lumen. No mitral regurgitation with small left atrial dimension. Small LV diameter with normal myocardial function. Increased LV wall dimensions most consistent with pseudohypertrophy. The tricuspid valve appears thickened with moderate tricuspid regurgitation; velocity consistent with moderate PAH (suspected to be an under-estimation). Severe right atrial enlargement; severe right ventricular dilation and hypertrophy consistent with **severe pulmonary arterial hypertension**. Systolic flattening of the IVS consistent with pressure overload. The pulmonic and aortic valves are normal in morphology and mobility. Mild to moderate pulmonic insufficiency. Significant MPA/branch dilation. Adequate pulmonic and aortic outflow velocities. No obvious pleural effusion. No pericardial effusion noted. No cardiac tumors observed.

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Ayita Herges

SPECIES
Canine

BREED
Cocker Spaniel Mix

SEX
Female Spayed

AGE
9 years

WEIGHT
23lbs

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

IMAGING PERFORMED BY
G. Ferrer, DVM

HOSPITAL NAME
Paseos Veterinary Center

REFERRING VET
Dr. Carrasquillo

INVOICE
20648

DATE
8/19/21

CARDIAC CHART

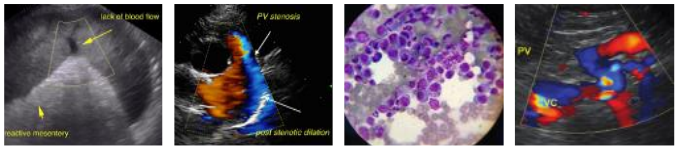
CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT		4.1	NM	1.3	71	97	0.1
CANINE CARDIAC PARAMETERS	**HR** (BPM)	**AV VMAX** (m/s)	**PV MAX** (m/s)	**BODY WEIGHT** (kg)	**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	158	0.9	0.7	10.4	1.8	1.5	0.5
*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)
Adapted from June Boon, Veterinary Echocardiography, 1998				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
Hansson et al, Vet Rad and Ultrasound 2002				40	2.62 (5.2)	5.48 (6.1)	3.96 (5.4)
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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Severe pulmonary hypertension (PAH) present, as evidenced by an elevated TR velocity and marked right heart changes. The estimated systolic pulmonary arterial pressure is >80mmHg, with normal being <25mmHg. This is causing severe hypertrophy and dilation of the right ventricle (indicating severe right-heart pressure overload). The left heart is normal, although there is evidence of pseudohypertrophy (small LVIDd, increased wall thickness) which is not surprising in an anemic azotemic animal. No additional issues are identified.

The underlying genesis of PAH is poorly understood in cases other than active or historical heartworm infestation, though it occurs with increased frequency in a variety of forms of chronic lung disease and in patients with idiopathic pulmonary fibrosis. A heartworm test is always recommended if not recently performed. Additionally the radiographs are highly concerning for either metastatic or fungal process which may be related (although no respiratory signs are noted in the history which is unusual); highly recommend a radiologist review of the films. A final point is that the right heart changes/PAH seen here are NOT acute; this is a chronic process that likely experienced an acute exacerbating issue such as a respiratory infection.

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Ayita Herges

SPECIES
Canine

BREED
Cocker Spaniel Mix

SEX
Female Spayed

AGE
9 years

WEIGHT
23lbs

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

IMAGING PERFORMED BY
G. Ferrer, DVM

HOSPITAL NAME
Paseos Veterinary Center

REFERRING VET
Dr. Carrasquillo

INVOICE
20648

DATE
8/19/21

Clinical signs of weakness, heavy breathing, cyanosis, ascites and syncope are attributed to severe PAH. The cough in this patient likely represents a primary airway issue that has led to PAH over time. Patients with this degree of PAH can develop **right-sided congestive heart failure (ascites, pleural effusion) as seen in this case,** debilitating cyanosis/labored breathing and exertional syncope if poorly controlled.

In total, this is an exceedingly complicated case with a poor to grave prognosis based upon the severity of cardiac changes, right-sided CHF, anemia/azotemia and concerning pulmonary pattern. It is unclear at this time how these findings all fit together, and further evaluation is advised. Overall this case likely has a poor to grave prognosis and humane euthanasia should be considered if response to medical management is poor and QOL suffers. If you elect to go forward, referral to a multi-specialty center for further evaluation/treatment should be offered in an attempt to balance the issues and improve QOL for the short term.

Medical management of PAH and CHF is indicated as below and initial therapeutic dosages are indicated. A therapeutic abdominocentesis is recommended if or when the patient is inappetant or uncomfortable. Omega fatty acid supplementation and mild salt restriction may be of some long term benefit.

Monitor for development of a labored breathing, exercise intolerance or collapse episodes. Patient will always be at risk for acute decompensation, worsening azotemia, malignant arrhythmias and/or sudden death.

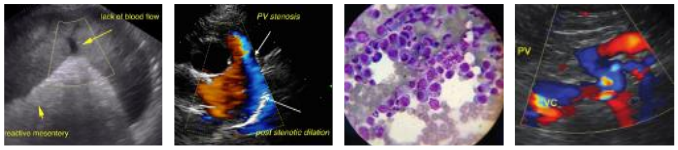
PLAN: Consider humane euthanasia versus referral versus treatment as below. Therapeutic abdominocentesis if needed. Consider HW test if not recently performed. Radiologist review of the films is strongly recommended in addition to full systemic evaluation, reassessment of PCV/renal values, etc.

Institute sildenafil 1-2mg/kg PO TID. Institute spironolactone 25mg tablets 1mg/kg PO BID. Institute pimobendan 0.3mg/kg PO BID. Recommend Lasix 1-2mg/kg PO q12h pending renal value follow up. Consider respiratory therapy as dictated by clinical signs/picture (hydrocodone, continued Baytril, etc).

Recommend renal panel in 5-7 days, then every 3-4 months lifelong on diuretics. Recommend recheck pulmonary pressures in 2-3 months to assess response to medications. Going forward, abdominocentesis is recommended PRN to maintain comfort and appetite. If effusion continues to recur with speed, consider change to alternative diuretic (torsemide) for better GI absorption.

Once stabilized, recommend recheck echocardiogram in 6 months to reassess structure and function, sooner if any development of clinical signs.

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Ayita Herges

SPECIES
Canine

BREED
Cocker Spaniel Mix

SEX
Female Spayed

AGE
9 years

WEIGHT
23lbs

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

IMAGING PERFORMED BY
G. Ferrer, DVM

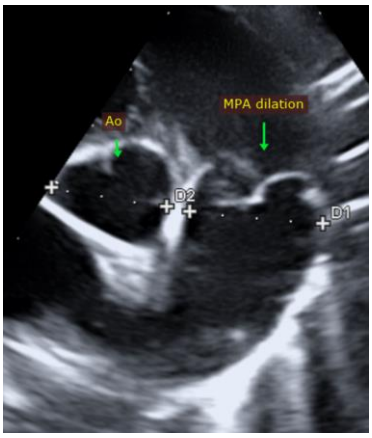
HOSPITAL NAME
Paseos Veterinary Center

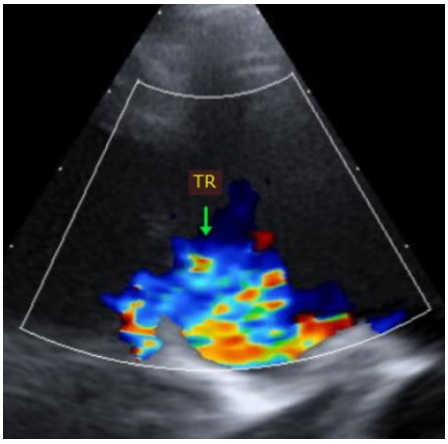
REFERRING VET
Dr. Carrasquillo

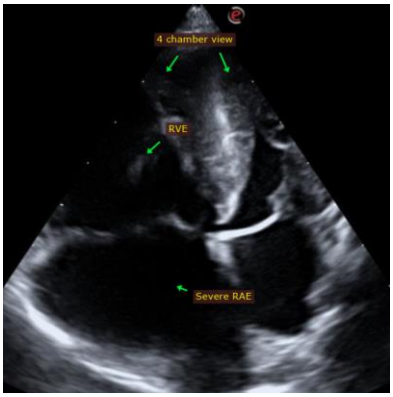
INVOICE
20648

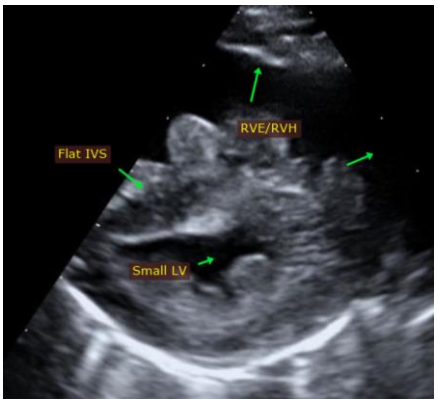
DATE
8/19/21

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