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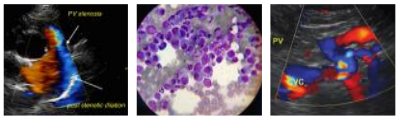

SonoPath
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PATIENT
Jack Bastian

SPECIES
Canine

BREED
Shih Tzu

SEX
Male Neutered

AGE
4.9.07

WEIGHT
6.1lbs

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

HOSPITAL NAME
North Laurel Animal Hospital

REFERRING VET
Dr. Steere

INVOICE
24056

DATE
5.5.22

PRESENTING CLINICAL SIGNS

History: Chronic renal disease (IRIS stage 2) and historical heart murmur. Recent syncopal episodes increasing in frequency and duration. Poor appetite. Possible hypoglycemia.
-Pertinent abnormal PE/Chem/CBC/UA Results: 4/27/22: CBC - Retic 116 (H), WBC 22.1 (H), Neut 17.26 (H), Mono 1.945 (H). Chem - Glu 59 (L), SDMA 39 (H), Creat 2.0 (H), BUN 96 (H), k 5.6 (H), Na:k 26 (L), ALB 2.5 (L), ALT 165 (H), AST 84 (H), Chol 119 (L), CK 427 (H). T4 - WNL
-Current medications: Vetmedin 1.25mg PO AM, 0.625mg PO PM.
-Sedation used: Declined.
-Pertinent previous ultrasound results: No previous.
-STAT: Not requested
-Imaging performed by: Stephanie Pearce RDCS, RVT.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. The mitral valve appears mildly thickened with mild prolapse into the left atrial lumen. Moderate mitral regurgitation with mild to moderate left atrial dilation. Normal LV diameter with adequate myocardial function. Septal flattening in systole. The tricuspid valve appears thickened with moderate tricuspid regurgitation. TR velocity consistent with severely elevated pulmonary arterial pressures. Moderate to severe right atrial enlargement; significant right ventricular dilation and hypertrophy consistent with severe pulmonary arterial hypertension. Mild MPA and branch dilation. The pulmonic and aortic valves are normal in morphology and mobility. No obvious pulmonic insufficiency. Normal pulmonic and aortic outflow velocities. No pericardial or pleural effusion is visualized. No cardiac tumors observed. Ascites noted on brief abdominal scan.

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	5.7	4.4	NM	1.6	54	88	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	120	0.54	0.64	2.8	1.6	1.6	0.8
*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

Severe pulmonary hypertension (PAH) present, as evidence by an elevated TR velocity and right heart compensatory 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). Clinical signs of weakness, heavy breathing, cyanosis, ascites and syncope are attributed to severe PAH. Given these findings, the peritoneal effusion is due to right-sided CHF. There is also mild mitral valve regurgitation which appears well compensated for.

The underlying genesis of PAH is poorly understood in cases other than heartworm infestation, though it occurs with increased frequency in a variety of forms of chronic lung disease and in patients with idiopathic pulmonary fibrosis. Without a chronic history of coughing or heartworm disease, the etiology remains open. A heartworm test should be performed if not recently evaluated.

Patients with this degree of PAH can develop syncope and right-sided congestive heart failure (ascites, pleural, and/or pericardial effusion) as is seen in this case. The prognosis is poor with an MST of < 1 year after the onset of CHF, however a reasonable quality of life is expected once controlled.

Medical management of PAH and CHF is indicated as below and initial therapeutic dosages are indicated. If needed a therapeutic abdominocentesis is recommended to improve comfort and/or appetite. Of great concern, this patient is azotemic with CKD. Concurrent renal disease will certainly limit therapy and prognosis. Because fo this recommend only low dose spironolactone and do not utilize Lasix unless the ascites/symptoms worsen. Close follow up of renal values is advised.

Omega fatty acid supplementation may be of some long-term benefit.

Elective anesthesia is not advised.

Monitor for development of a labored breathing, exercise intolerance or collapse episodes.

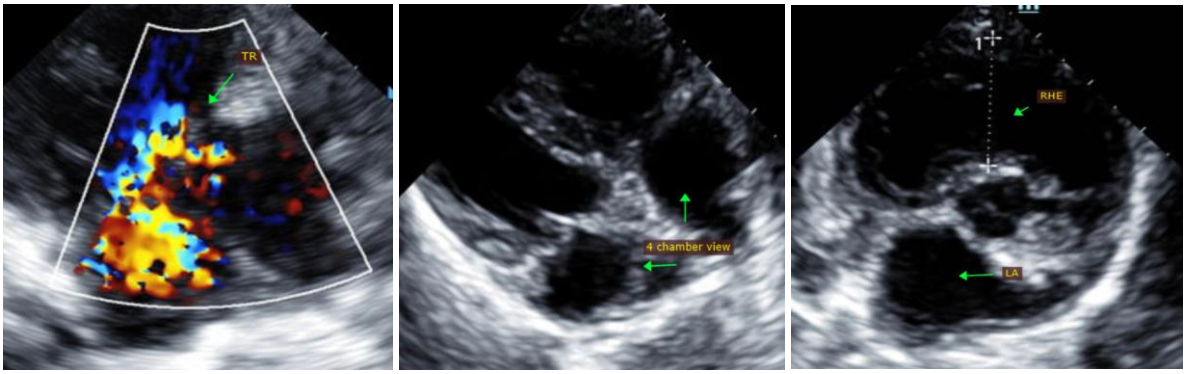
PLAN:

Consider therapeutic abdominocentesis if uncomfortable and/or inappetant. Screening BP recommended. Institute sildenafil 1-2mg/kg PO q8h. Institute pimobendan 0.3mg/kg PO q8h. Institute spironolactone 6.25mg PO q24h. Do not use an ACE-I in this case.

Recommend renal panel in 10-14 days, then every 3-4 months lifelong.

Recommend recheck echocardiogram in 6 months to screen for progression, sooner if clinical signs develop in the interim.

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.

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