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Clinical Sonography & Telecytology
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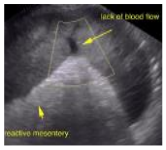
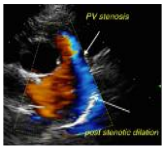
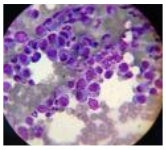
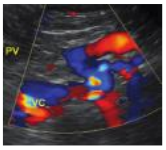

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1-800-838-4268 info@sonopath.com

PATIENT
Julie Aleman

SPECIES
Canine

BREED
Labrador Retriever

SEX
Female Spayed

AGE
7 years

WEIGHT
48.6lbs

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

IMAGING PERFORMED BY
G. Ferrer, DVM

HOSPITAL NAME
Paseos Veterinary Center

REFERRING VET
Dr. Martes

INVOICE
27635

DATE
11/28/22

PRESENTING CLINICAL SIGNS

History: Presented for evaluation of lethargy and respiratory problems. Patient was diagnosed with heartworm at another veterinary clinic. She was initially presented at Paseos Veterinary Center on August 2022 for spay and mass removal. At the time, patient was on prednisone and doxycycline. CBC showed mild anemia and fecal was negative. Patient was pregnant at time of spay. She was administered her first Diroban injection on 9/20/2022. CBC and chemistry was WNL. Her second Diroban injection was administered on 10/20/2022. On 11/5/2022, she was non weight bearing on right front limb; radiographs showed moderate soft tissue inflammation and severe hip dysplasia. She was given rimadyl.
-Abnormal PE/Chem/CBC/UA Results: CBC: non-regenerative anemia with Hct 23.7% (37.3 - 61.7), RBC 3.92 (5.65 - 8.87) and Hgb 8.3 (13.1 - 20.5); leukocytosis 37.54 K/uL(5.05 - 16.76), neutrophilia 31.09 K/uL(2.95 - 11.64), monocytosis 2.95 K/uL(0.16 - 1.12) Chemistry: azotemia with creatinine 2.0 (0.5 - 1.8) and BUN 55 (7 - 27), hyperphosphatemia 8.8(2.5 - 6.8), increased amylase 1711 (500 - 1500).
-Radiographs: Cardiomegaly; globoid cardiac shape; increased pulmonary opacity at caudodorsal lung field TFAST - minimal pericardial effusion.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Hypoechoic soft tissue lesion with mixed echogenicity is visualized within the right atrium. A compressive lesion is not ruled out as the stalk cannot be visualized. The mass appears to be occluding flow through the right heart with concern for caval infiltration. No significant mitral regurgitation with mild thickening of the mitral valve. The LV is normal with dimension with adequate function. Left atrium is normal. No obvious TR. The pulmonic and aortic valves are normal in appearance. Normal LVOT and RVOT velocities. No obvious pleural effusion. Small volume pericardial effusion. Bradycardia throughout with suspicion for high grade AV block on the attached ECG (see below).

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	NA	NM	1.0	51	83	0.7
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	55	1.0	0.9	22.0	2.4	3.9	1.9
*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

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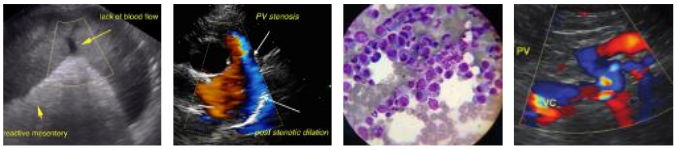

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Unfortunately there is cardiac neoplasia present that appears to be infiltrating the right atrium. The mass is quite large and is occluding flow through the right heart. The exact origin of the mass cannot be visualized, and compression rather than infiltration remains a possibility. Regardless, this is leading to scant pericardial effusion, likely due to right-sided/caval congestion. Once a mass is obstructing normal flow, the patient is at extremely high risk for congestive signs as are seen here. The left heart is essentially normal, and no additional structural issues are identified.

The attached ECG shows a bradycardia with at least 2nd degree AV block present; however, 3rd degree (complete) AV block is highly suspected. This is likely secondary to the mass affecting electrical conduction through the AV node. A complete 6 lead tracing is recommended to confirm the diagnosis and consider treatment options. A pacemaker is likely warranted, which may not be reasonable given concurrent neoplasia.

The most likely rule outs for this type of mass include hemangiosarcoma or a chemodectoma as the exact origin is difficult to pinpoint; however, the former is suspected. Regardless of tumor type, the issue is due to the mechanical obstruction, and reflects a poor to grave prognosis. The best we can do is remove effusions as they occur and use medications for congestive heart failure to help slow development of fluid accumulation. The size of the mass should be relayed as a grave prognosis, as the patient is already experiencing clinical signs that are certainly related. care can be attempted; however, diuretics and cough suppressants are a band aid over a much bigger issue as the tumor continues to grow. **Euthanasia should be considered if quality of life suffers.**

Going forward there are some options for obtaining more information and palliating this type of cancer. Should the client elect to proceed, radiation and/or chemotherapy can be discussed with an Oncologist. Additionally full systemic work up including CXR review by a Radiologist, AUS, etc. is recommended.

High risk will always remain for recurrent effusions (pericardial, pleural or abdominal) and development of arrhythmias/sudden death at home. Monitor at home for progressive abdominal distention, labored breathing and/or lethargy and collapse. Significant activity restriction is advised.

PLAN

Immediate referral should be strongly considered in this complicated case for ECG evaluation, hospitalization, etc. If declined, administer Furosemide 1-2mg/kg PO q12h. Administer spironolactone 1-2mg/kg PO q12h. Administer Pimobendan 0.3mg/kg PO q12h. Administer Hydrocodone if needed. Thoracocentesis +/- abdominocentesis should be performed as needed for patient comfort.

A renal panel is recommended in 5-7 days, then every 2-3 months going forward. Consider referral for further diagnostics and/or Oncology consult. Euthanasia should be considered if quality of life suffers.

A recheck echocardiogram to reassess mass dimension and heart size is recommended in 2-3 months.

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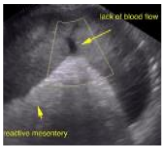
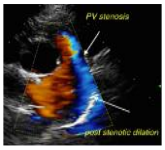
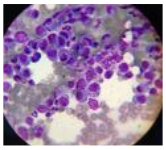
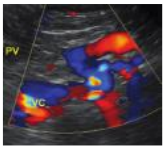

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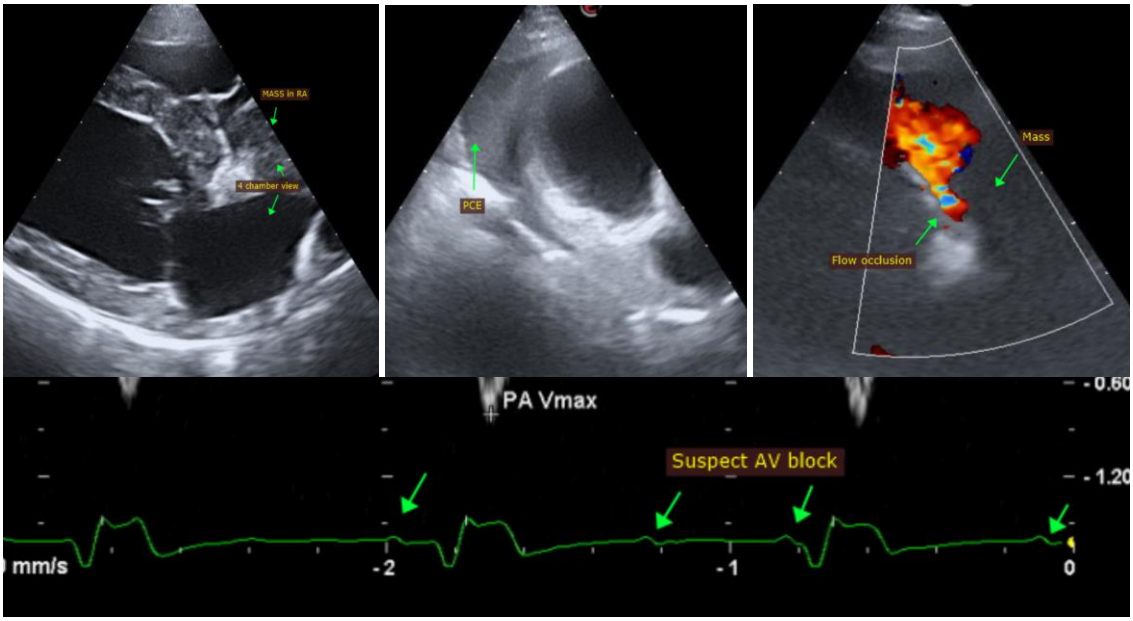
IMAGES



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