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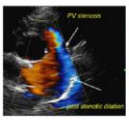
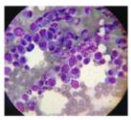
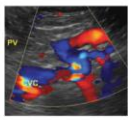
SVS IMAGING

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

PATIENT
Jack Hansen

SPECIES
Canine

BREED
Boxer

SEX
Male Neutered

AGE
10 years

WEIGHT
57lbs

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

IMAGING PERFORMED BY
Sarah Pender, CVT

HOSPITAL NAME
SVS Imaging QC

REFERRING VET
Dr. Gilspie

INVOICE
28514

DATE
1/23/23

PRESENTING CLINICAL SIGNS
History: Diagnosed with ventricular arrhythmias 10/31/22 and sotalol initiated (asymptomatic at that time). Syncope noted 1/6 and 1/21/23. Mostly at night.
-Current medications: Sotalol 80mg 1/2 tab BID, Carprofen 100mg 1/2 tab BID.
-ECG (10/31/22 IDEXX): NSR with single and couplet VPCs; sotalol recommended, started 11/1/22
-ECG (1/18/23 IDEXX): Showed sinus arrhythmia with occasional single VPCs. Sotalol was already prescribed in the history.

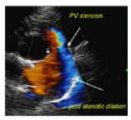
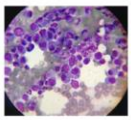
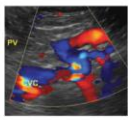
RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Normal cardiac silhouette. No obvious evidence of CHF.

ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.
A single lead ECG is available; 25mm/s, 10mm/mV, 1 minute duration. The average heart rate is 90bpm (range 71-107bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. No ectopic beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with respiratory variation.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Relatively large homogeneous echogenicity mass associated with the aortic root; 3.7 x 4.4cm in best viewed cross section. The mass is well encapsulated and near the bifurcation overlying the aorta. No obstruction to blood flow is seen or imposition of cardiac chambers. There is moderate eccentric mitral regurgitation, thickened mitral valve with no prolapse. LV function is borderline depressed. Left atrium is mildly dilated. The LV is normal in dimension. Mildly thickened TV with mild TR; normal velocity. Mild right heart dilation. The pulmonic and aortic valves are normal in appearance. Normal LVOT and RVOT velocity. No AI or PI identified. No pericardial or pleural effusion.

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	5.6	2.6	NM	1.4	26	50	0.4
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	86	1.2	0.9	25.9	3.2	3.9	2.9
*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 *Note: All measurements based upon multi-modal images and methods. An average value is reported.* Adapted from June Boon, Veterinary Echocardiography, 1998				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)

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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	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

Several abnormalities are identified. First is chronic degenerative valve disease causing moderate mitral and mild tricuspid regurgitation. Mild left atrial enlargement indicates the current risk for complication is low but may progress in the future. The TR velocity is normal; however, the right heart is mildly enlarged, which may suggest elevated pulmonary pressures. The submitted ECG is normal with no ventricular arrythmias appreciated.

Of equal importance, there is suspect cardiac neoplasia associated with the heart base. The most likely tumor type given this location and the breed is a chemodectoma; however, other more malignant differentials cannot be ruled out. Chemodectomas are often incidental findings only causing clinical signs if blood flow is obstructed, pericardial effusion occurs, or a metastatic lesion causing systemic issues. It is difficult to definitively evaluate the mass peripherally (i.e., cannot rule out peripheral obstruction of flow through distal PA's) and a CT may be helpful to screen for true extent.

The prognosis with cardiac chemodectomas is typically fair. The limiting factor is often hemorrhage into the pericardium, impingement of cardiac blood flow secondary to tumor growth, or metastasis to the thorax or abdomen. **Chemotherapy and/or radiation therapy can also be discussed with an Oncologist.**

Given the totality of findings, it is unclear as to the cause of rare nocturnal syncope. Certainly, the chemodectomas is of some concern and may be causing peripheral compression, which could lead to exertional hypoxia. We must also consider that the patient has historical ventricular arrhythmias that are being treated with Sotalol. While no persistent arrythmias are seen here, VT is still a possibility and this should be revisited through a holter monitor. **In total, advanced evaluation is recommended in this case, as peripheral congestion by the mass would be the most concerning issue at this time. Highly recommend a referral to a multi-specialty center for advanced thoracic imaging, such as a CT scan and evaluation of syncope.**

Given the totality of the findings, consider Pimobendan in this case as below. Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.
Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes. Prognosis is guarded long-term.

Anesthesia is not advised at this time.

PLAN

Consider referral in this complicated case for advanced thoracic imaging and evaluation. If declined, institute Pimobendan 0.3mg/kg PO q12h. Baseline BP recommended. Consider more extensive arrythmia evaluation, such as a holter monitor. Full systemic screening is recommended to assess for metastasis. Consultation with an Oncologist may be beneficial.

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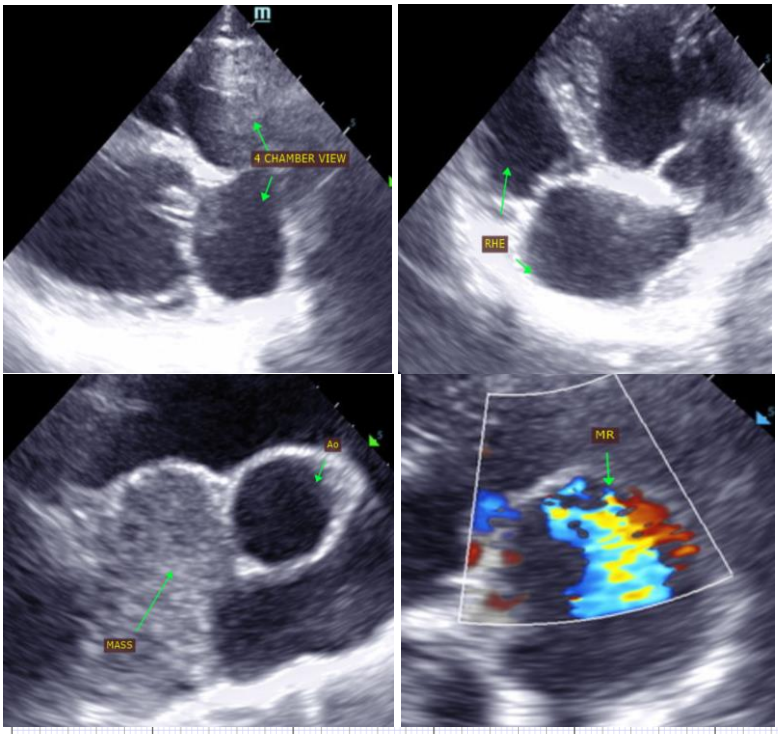
If referral is declined a recheck echocardiogram and ECG are recommended in 3-4 months to assess rate of tumor growth.

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. 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