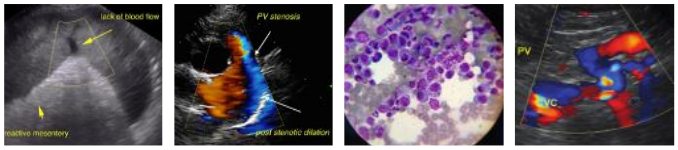
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Chief Jackson

SPECIES
Canine

BREED
Boxer

SEX
Male Neutered

AGE
11 years

WEIGHT
1.1lbs

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

IMAGING PERFORMED BY
Dr. Karen Ebersole

HOSPITAL NAME
Scanvet

REFERRING VET
Dr. Sheridan

INVOICE
23775

DATE
4/20/22

PRESENTING CLINICAL SIGNS

History: Screening echo for needed anesthesia for oral mass removal. Occasional irregular beat noted on physical exam. No heart murmur auscultated. Large epulis type mass in his mouth, and a mass on his LR paw. BW: WNL.

ELECTROCARDIOGRAPHIC FINDINGS

A six lead ECG is available at 25mm/s; 10mm/mV. The average heart rate is 150bpm with a largely regular underlying sinus rhythm. 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. Frequent ventricular arrythmias throughout with periods of bi- and trigeminy; multi-form couplets noted. No runs of VT appreciated.
ECG diagnosis: Normal sinus rhythm with unstable ventricular arrythmias.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Uniform echogenicity mass associated with the heart base; 4.7 x 4.3cm in best viewed cross section. The mass is well encapsulated and overlying the left atrium. No obstruction to blood flow or imposition on cardiac chambers is seen at this time. There is mild mitral regurgitation, thickened mitral valve with no prolapse. LV function is adequate. Left atrium is mildly dilated. LV is normal in diameter. Mildly thickened TV with no TR. Normal right heart chamber dimensions. 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	6.1	NA	NM	1.5	31	60	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	NM	2.3	1.2	45.8	4.1	5.1	3.5
*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)
				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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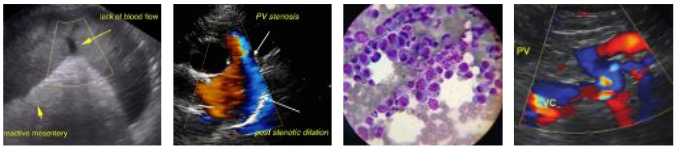

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Chronic degenerative valve disease causing mild mitral regurgitation. Mild left atrial enlargement indicates the current risk for complication is low. Of potentially more clinical relevance, a mass is identified 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 as is suspected to be the case here, 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 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. Consider baseline CXR and an abdominal ultrasound to screen for metastatic lesions.

The ECG does confirm frequent VPCs are the cause of the arrhythmia. VPC's are generated from abnormal conductive or fibrotic tissue in the ventricles of the heart muscle, and even frequent single VPCs will often cause no clinical signs in dogs. When sustained however, ventricular tachycardia can lead to symptoms such as lethargy and collapse.

VPCs are a very non-specific finding. They can be primary in origin such as ARVC, due significant cardiac disease (cardiac neoplasia identified in this study), or be extra-cardiac in origin, i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. In a senior boxer with cardiac neoplasia, primary disease is possible; however, the mass can also lead to this development. Unfortunately, there is always an elevated risk for collapse and sudden death in any arrhythmic patient, and even on medications this risk unfortunately still persists.

Based upon the amount of VPC's and couplets seen on today's ECG, Sotalol is recommended as below. This is based upon the breed as well risk for sudden death going forward. A holter monitor can and should also be considered to know the full extent of the arrhythmia outside of a stressful environment. Further work up should be completed prior to going forward with general anesthesia.

In a dog with no significant left atrial enlargement, Pimobendan is not clearly indicated at this time. 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.

Anesthesia is not advised prior to adequate rhythm control. Once deemed controlled, anesthetic risk is moderately elevated, cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas) are recommended. Pre-oxygenate for 5-10 minutes prior to induction. Avoid alpha-2 agonists, ketamine and telazol. Close monitoring for arrhythmias is advised with use of lidocaine CRI if sustained malignant arrhythmias develop. Mild IV fluid restriction is recommended to avoid fluid overload. Avoid heart rate stimulating drugs such as atropine unless clinically indicated.

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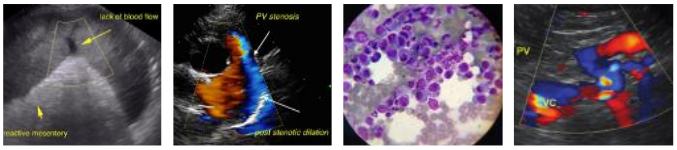

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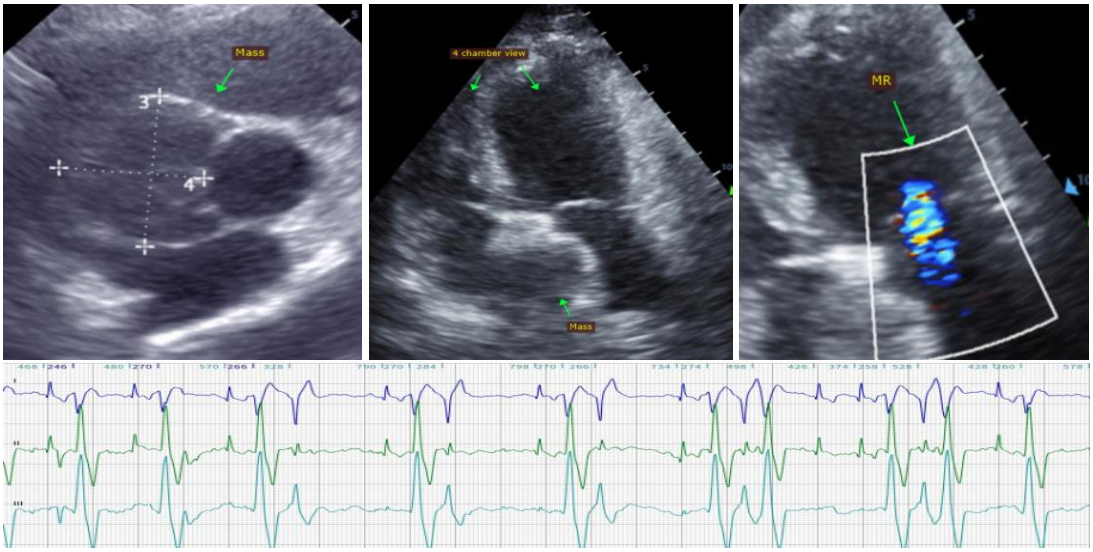
PLAN

Institute Sotalol 1-2mg/kg PO q12h. Further systemic evaluation is warranted as discussed. Consider further tumor evaluation if elected. Consider consultation with an Oncologist if desired. Metastatic screening (AUS, CXR) recommended. Recheck ECG and/or holter monitor in 1-2 weeks to understand arrhythmia control.

Recommend conservative monitoring with a recheck echocardiogram and ECG in 6months,

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