



PATIENT PRESENTING CLINICAL SIGNS

Koby Chavez

History: VT/VPCs and syncope. No medications.
BP: 125, 113mmHg

SPECIES ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip.

Canine

Morphology/MEA cannot be definitively commented on.

A brief video of a single lead ECG is available from an anesthesia monitor. The HR is inaccurate, with a sustained rapid VT identified.

BREED

Boxer

ECHOCARDIOGRAM FINDINGS

SEX

MI

2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve leaflets with no prolapse into the left atrial lumen. Mild central mitral regurgitation with severe left atrial dilation. The LV is volume contracted with decreased myocardial function. The tricuspid valve appears mildly thickened with mild tricuspid regurgitation. Mild right heart dilation. The pulmonic and aortic valves are normal in morphology and mobility. Decreased pulmonic and aortic outflow velocities with laminar flow. No obvious aortic or pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac masses. Tachycardia throughout.

AGE

7y

CARDIAC CHART

WEIGHT

70.8lbs

INTERPRETED BY

Maggie Machen
Lamy, DVM, DACVIM
(Cardiology)

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	2.5	13	28	0.3
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	222	0.85	0.6		3.3	3.4	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 <i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i> 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				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)
				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)				

IMAGING PERFORMED BY

Kelly Vazquez, CVT

HOSPITAL NAME

Westwood Regional
VH

REFERRING VET

Dr. Cattiny

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

INVOICE

24728

Four chamber dilation is identified with depressed systolic function. This likely reflects the rapid heart rate rather than true structural disease; however, some degree of primary dysfunction is certainly possible. Reassessing once the patient's rhythm is normalized is recommended to establish a baseline.

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Of much more concern, the ECG does confirm ventricular tachycardia (VT) as the likely cause of clinical signs. VT is a malignant arrhythmia generated from abnormal conductive or fibrotic tissue in the ventricles of the heart muscle, and when sustained can lead to symptoms such as lethargy and collapse. VT is considered a highly unstable rhythm, as there is great risk for fibrillation and sudden death.

VT can be a non-specific finding; however, a primary origin (ARVC) is suspected in this signalment. ARVC is a primary conduction disease common in Boxers, with the most common age of onset 6-8yo. ARVC can occur with or without systolic dysfunction and structural issues, however this should be monitored going forward for any progressive issues. It is always reasonable to rule out other differentials for VT (AUS, tick titers, troponin, etc.) however suspicion is low given the signalment of the patient. 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. ARVC carries a HIGHLY variable prognosis, with some dogs able to remain asymptomatic for extended periods of time, and others developing exercise intolerance, syncope episode, and refractory arrhythmias/sudden death imminently.

Based upon this ECG, immediate Lidocaine conversion and anti-arrhythmic therapy is strongly recommended. If this cannot be done safely in your facility with at least 12 hours of monitoring, immediate referral should be offered. Sotalol is the ideal oral option, however lidocaine should be utilized in the acute phase as below. Once the patient is stabilized and sotalol is on board, an extended time 6 lead ECG and/or holter monitor is a reasonable next step to allow monitoring of the rhythm throughout 24 hours of a normal day to ensure good rhythm control. Additionally it is reasonable to institute Pimobendan for the short term to maximize cardiac output. Depending on follow up echo results, this may be discontinued once stabilized.

Fish oil supplementation is recommended for dogs with arrhythmias (1000mg of omega 3 and 6 once to twice daily as tolerated).

Monitor at home for collapse, exercise intolerance, and/or lethargy. Anesthesia is not recommended until good arrhythmic control is achieved. Lifelong mild to moderate activity restriction is advised.

PLAN

Immediate hospitalization for Lidocaine and ECG monitoring. ASAP institute sotalol, give a loading dose of 80mg followed by ½ tab PO q12h. Institute lidocaine bolus/CRI to affect overnight. In 6-8 hours if well-controlled, wean lidocaine in hopes that a sinus rhythm persists due to sotalol being in effect. Institute Pimobendan 0.3mg/kg PO q12h. If stabilized, discharge on PO sotalol and Pimobendan. If rhythm is difficult to control, consider ancillary therapy with mexiletine as well (150mg PO q8h). If any change in RR/RE occurs in the short term, diuretic therapy may also be necessary until the rhythm is stabilized.

Recheck ECG in 1-2 weeks to assess response (goal is significant reduction in ectopy without a significant change in underlying sinus rate). Consider holter at this time if desired. Ideally a baseline echo should be repeated at this visit.

Recheck ECG and echocardiogram are recommended in 6 months to determine a baseline, progression/control, sooner if any development of associated clinical signs.



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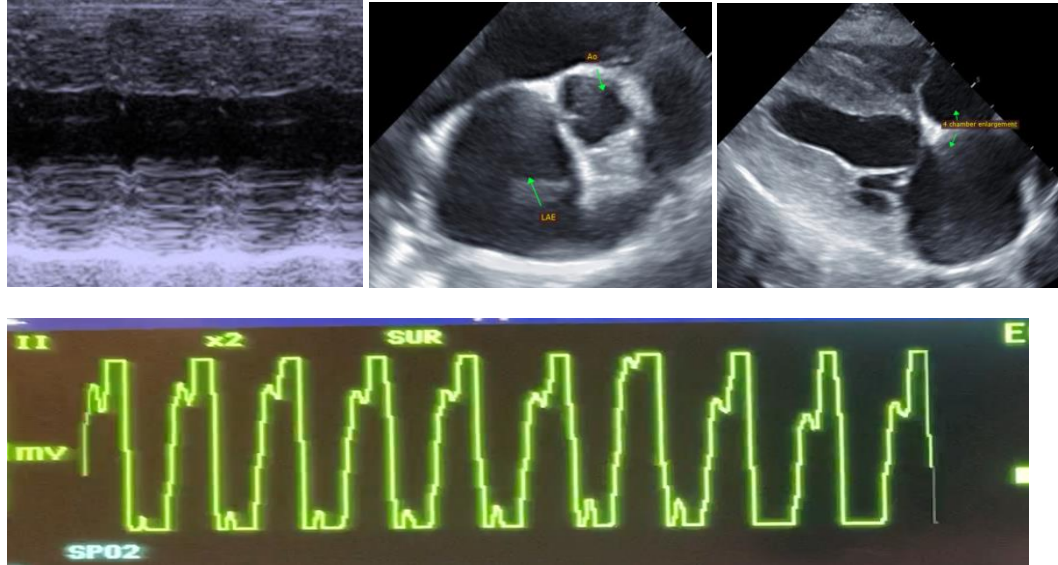
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IMAGES



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. 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
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