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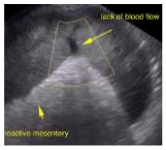
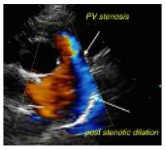
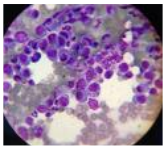
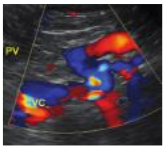
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

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

**PATIENT**
Penny Christensen

**SPECIES**
Canine

**BREED**
Boxer

**SEX**
Female Intact

**AGE**
13 months

**WEIGHT**
39.6lbs

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

**IMAGING PERFORMED BY**
Kim Liedberg

**HOSPITAL NAME**
SVS Imaging

**REFERRING VET**
Dr. Bittner

**INVOICE**
20430

**DATE**
8/9/21

## PRESENTING CLINICAL SIGNS

History: Fainting and staggering. Collapsed in July 14, after exercise, where she was gasping for air and then fell over. No murmurs or arrhythmias. CBC normal.

## 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.

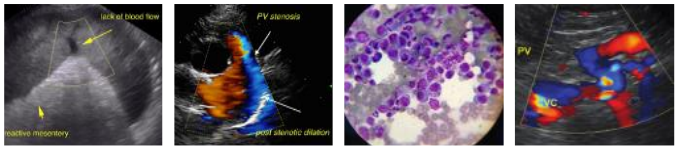
A single lead ECG is available; 25mm/s, 10mm/mV. The average heart rate is 150bpm with a largely regular rhythm. The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. No ectopic beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus tachycardia.

## ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Normal mitral valve structure and function with no obvious prolapse into the left atrial lumen. No mitral regurgitation; normal left atrial dimension. Normal LV diameter with adequate myocardial function. The tricuspid valve appears normal in form and function. Normal right atrial and ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension or significant right heart disease. The pulmonic and aortic valves are normal in morphology and mobility. Mildly elevated LVOT and normal RVOT velocity. No aortic insufficiency. No pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac tumors seen.

## 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 | 1.4 | 1.3 | 40 | 72 | 0.37 |
| **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** | 133 | 1.78 | 1.27 | 18.0 | 2.1 | 3.4 | 2.1 |
| *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 Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435 | | | | 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) |



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| | | | | |
|---|---|---|---|---|
| Hansson et al, Vet Rad and Ultrasound 2002 | 40 | 2.62 (5.2) | 5.48 (6.1) | 3.96 (5.4) |
| Bonagura et al. Echocardiography: principles of interpretation, Vet | 50 | 2.88 (7.1) | 6.07 (8.3) | 4.46 (7.4) |

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Overtly normal cardiac dimensions and function, with no obvious dysfunction or dilation of the left heart. No significant valvular leaks are visualized, and no evidence of pulmonary hypertension. The ECG is unremarkable with a normal sinus rhythm.

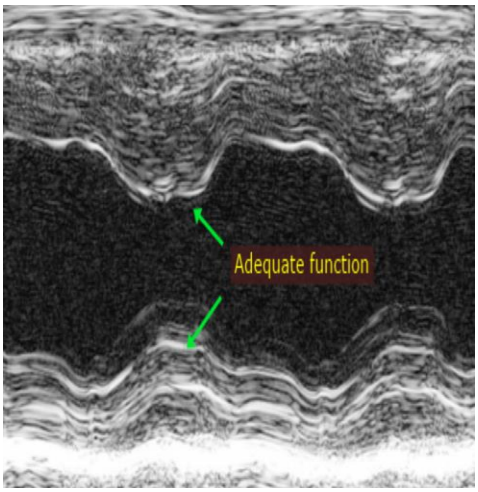
Syncopal episodes may be caused by a variety of underlying conditions in a Boxer. The first important delineation is cardiogenic syncope versus seizure, with the hallmark of syncope being of short duration and normal mentation immediately prior to and following the episode. Possible causes for cardiogenic syncope include vaso-vagal events, brady or tachyarrhythmias, or another underlying disease causing poor cardiac output (like dilated cardiomyopathy). Because it can be difficult to differentiate between syncope and seizures, the episodes may also be due to underlying neurologic causes.

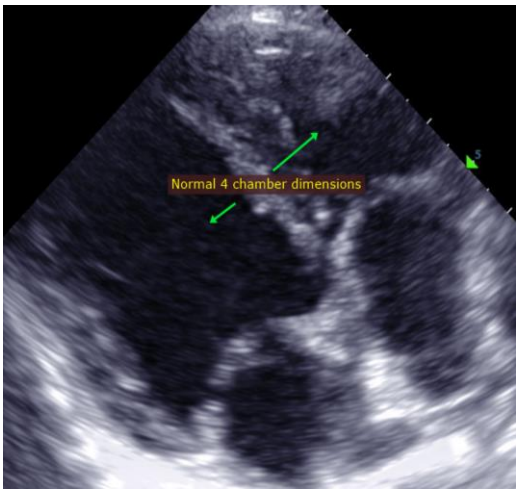
Today we were able to rule out several potential causes for the episode. The echocardiogram ruled out significant structural problems with the heart and along with a normal activity level and physical examination, underlying structural disease is very unlikely. The ECG was unremarkable, without obvious dysrhythmias. Additionally, no obvious cardiac neoplasia or effusions were seen in this study. Despite a normal ECG however, occasional bouts of increased or decreased heart rate are possible and may cause a syncopal episode. ARVC or Boxer Cardiomyopathy has both a structural and a purely arrhythmic form; however, this is unlikely in a juvenile boxer. A holter monitor can be considered pending results of further systemic evaluation and historical information on the episode.

No obvious cardiac medications are indicated. Monitor at home for any further episodes, cough/labored breathing and/or exercise intolerance.

Recheck in 1 year to screen for any progressive changes.

## IMAGES



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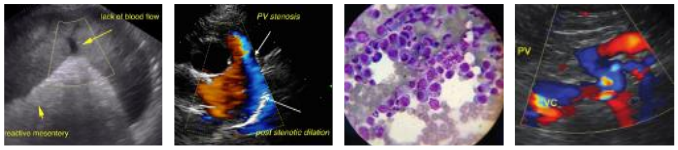

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**The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

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