

**PATIENT**  
Ace Veitenheimer

**SPECIES**  
Canine

**BREED**  
Toy Fox Mix

**SEX**  
Male Neutered

**AGE**  
1.8 years

**WEIGHT**  
12.8lbs

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

**IMAGING PERFORMED BY**  
Pamela Harrigan,  
RDCS

**HOSPITAL NAME**  
Mass Veterinary Services

**REFERRING VET**  
Dr. Masloski

**INVOICE**  
29758

**DATE**  
3/22/23

**PRESENTING CLINICAL SIGNS**

History: Ace is referred to evaluate a heart murmur. He is presently doing well at home, is eating well with normal activity level. On exam: NSR, Grade IV/VI murmur with continuous component, radiating to right, PSS, lung fields clear, mm pink, moist, CRT<2. \*Sedated with propofol for study.

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and Doppler imaging is available.

**Left ventricle:** The LV diameter is increased with increased sphericity. Adequate myocardial function with evidence of volume overload. LV wall thicknesses are mildly decreased. A small perimembranous VSD is visualized on multimodal imaging. The shunt is left to right; max velocity is 4.6m/s.

**Left atrium:** The left atrium is mild to moderately dilated.

**Mitral valve:** The mitral valve is normal with no mitral regurgitation.

**Aortic valve/Aorta:** The aortic valve is normal in morphology and mobility. Normal aortic outflow velocity; laminar flow. No aortic insufficiency.

**Right ventricle:** The RV is prominent.

**Right atrium:** The RA is prominent.

**Tricuspid valve:** The tricuspid valve appears mildly thickened with trivial tricuspid regurgitation.

**Pulmonic valve/Pulmonary artery:** The pulmonic valve is thickened and tethered, consistent with stenosis. Flow through the region is mildly increased with mild to moderate insufficiency. The MPA is significantly dilated. Continuous flow detected with color Doppler in the distal pulmonary artery in the region of the ductus arteriosus. Max velocity is 4.8m/s (L-R).

**Pericardium/other:** No pericardial or pleural effusion noted. No obvious cardiac masses.

**Heart rhythm:** ECG reveals a sinus rhythm with an average HR of 90bpm.

**2-Dimensional Measurements**

Ao diam (cm)	1.9
LA diam (cm)	3.0
LA:Ao (Swe)	1.6
IVS thickness (cm)	0.6
LVID diastole (cm)	3.6
PW thickness (cm)	0.6
LVID systole (cm)	2.1
FS (%)	42

**Doppler Measurements**

PV Vmax (m/s)	3.4
AoV Vmax (m/s)	1.7
MR Vmax (m/s)	NA
TR Vmax (m/s)	NA
TR PG (mmHg)	NA

**INTERPRETATION OF THE FINDINGS**

Complex congenital heart disease is present. First, there is a patent ductus arteriosus (PDA). This is a congenital condition where a blood vessel present in the fetus remains open after birth. When patent, this allows blood to recirculate through the lungs inappropriately and volume overloads the left heart chambers as is seen here. The LA is mild to moderately dilated indicating relatively low risk for imminent complication; however, this degree of volume overload at such a young age is certainly concerning. In addition to the PDA there is a small left to right VSD present. There is likely further contributing to volume overload of the left heart, although is comparatively hemodynamically insignificant. Finally, pulmonic stenosis is appreciated with a thickened abnormal pulmonic valve. Flow velocity through the region is in the mild to moderate



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category; however, some degree is likely due to increased volume. No obvious additional defects are visualized.

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Given the complexity of the findings, **consider referral in this complicated case** for lifelong management and discussion of possible surgical options. The good news is despite a variety of issues the overall cardiac enlargement is mild suggesting a relatively balanced situation. Medical options are complicated; however, Pimobendan is recommended due to left-sided volume overload appearing to be the most significant abnormality. No additional medications are indicated at this time.

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Going forward the patient will be at risk for progression to CHF, development of arrhythmias, PDA reversal due to development of pulmonary hypertension, exertional syncope, and/or sudden death at home.

**AGE**

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**RECOMMENDATIONS**

- Institute Pimobendan 0.2-0.3mg/kg PO q12h.
- Referral for evaluation and surgical consultation is recommended.
- Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.
- Mild activity restriction is advised.
- Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.

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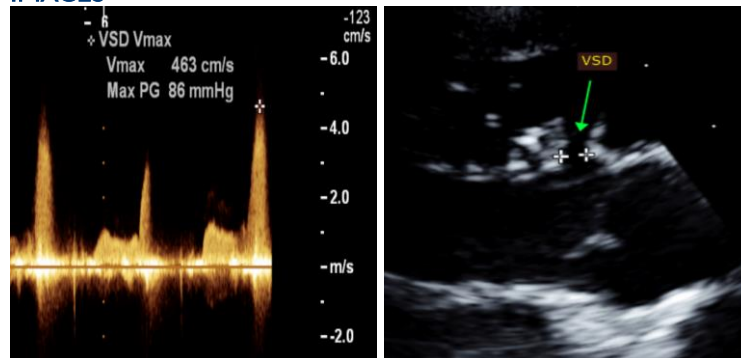
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DACVIM (Cardiology)

**PLAN**

- If referral is declined, recommend a recheck exam and echocardiogram in 6 months to screen for progression and need for additional medications, sooner if clinical signs arise (progressive cough, labored breathing, syncope, etc.).

**IMAGING PERFORMED BY**  
Pamela Harrigan,  
RDCS

**IMAGES**

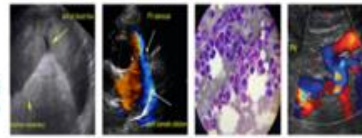


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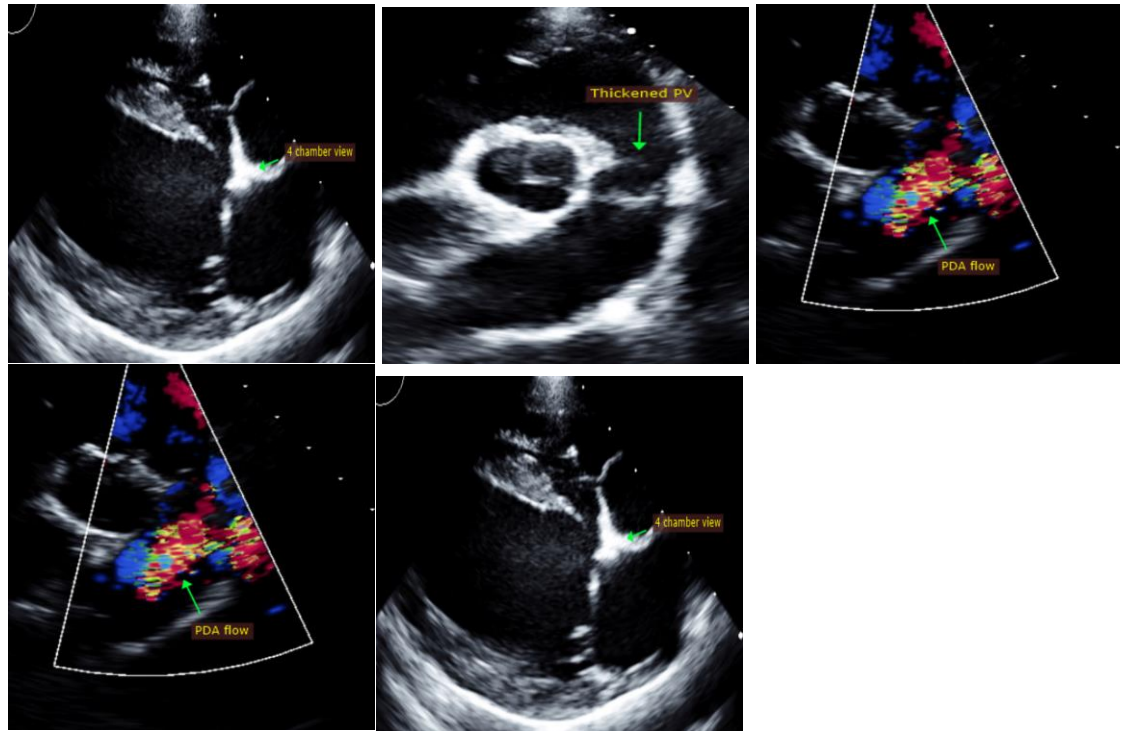
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

**IMAGING PERFORMED BY**

Pamela Harrigan, RDCS

Maggie Machen Lamy, DVM  
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)  
info@sonopath.com

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**Echocardiogram performed by:** Pamela Harrigan, RDCS  
Pet Animal Ultrasound Service (4paus.com)

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