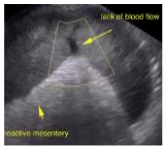
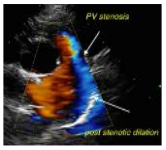
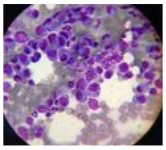
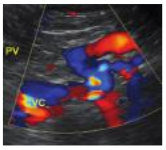
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

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

PATIENT
Abby Pampel

SPECIES
Canine

BREED
Terrier Mix

SEX
Female Spayed

AGE
10 years

WEIGHT
15lbs

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

IMAGING PERFORMED BY
Fred Gromalak, DVM

HOSPITAL NAME
SVS Imaging

REFERRING VET
Dr. Dolan

INVOICE
20941

DATE
9/8/21

PRESENTING CLINICAL SIGNS

History: Grade 4/6 systolic heart murmur. Presented for increased respiratory rate. Free fluid found within abdomen. Elevated liver enzymes noted.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with no prolapse into the left atrial lumen. Moderate eccentric mitral regurgitation with mild left atrial enlargement (LA/Ao falsely increased due to small aortic root). Mild LV dilation. The tricuspid valve appears normal with no obvious tricuspid regurgitation. The right heart is difficult to view extensively; however, there is not an obvious tumor associated with the right atrium. The RA and RV walls are both collapsing, consistent with tamponade. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No obvious aortic or pulmonic insufficiency. Moderate to large volume pericardial effusion. No obvious pleural effusion. Large volume peritoneal effusion is identified. No obvious cardiac masses.

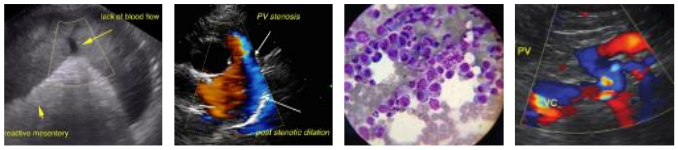
CARDIAC CHART

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	5.9	NA	1.75	1.6	29	57	0.25
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	204	1.3	0.9	6.8	1.9	3.5	2.5
*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

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the clinical signs is large volume pericardial effusion of unknown origin. Mild to moderate chronic degenerative disease is identified which is not suspected to be related to the effusion. The one instance where this can develop secondary to CVD is a left atrial rupture or right-sided CHF; however, this particular patient lacks severe left atrial dilation or right heart disease. No obvious cardiac or extra-cardiac tumors are identified; however, the right heart is not extensively visualized and this is certainly not ruled out in this image set. **Highly recommend immediate referral in this case for advanced echocardiography, pericardiocentesis and potentially advanced imaging to fully evaluate the surface of the heart.**



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Given these findings, no clear cause of the effusion is identified. The next step in this case would be an **immediate diagnostic and therapeutic pericardiocentesis to determine the type of effusion present and aleve clinical signs**. The patient is unstable with cardiac tamponade and is at high risk for associated signs in the near future (collapse, shock, etc.). A hemorrhagic effusion would suggest a small tumor or bleeding disorder, versus a transudate may support neoplasia, etc. Submitting the fluid for cytology and potentially a culture may also be useful, as in an atypical signalment there is no clear answer at this time. There is no clear cause for typical right-sided congestive heart failure seen here, such as severe right heart disease, history of rapid arrhythmias (tachycardia-induced cardiomyopathy), severe pulmonary hypertension, etc. and there is no indication for Lasix or Pimobendan at this time. Given the highly unusual signalment in this case (i.e., small breeds rarely get pericardial effusion), referral to a multispecialty center should also be considered. Pending results of the tap, further systemic evaluation/treatment may become indicated.

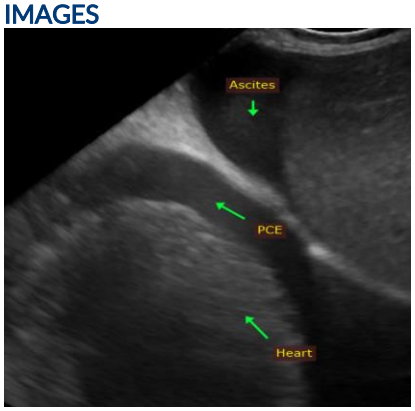
Prior to a tap, no additional cardiac medications are recommended. Discontinue Lasix and Pimobendan. A screening BP is recommended, as hypotension is suspected.

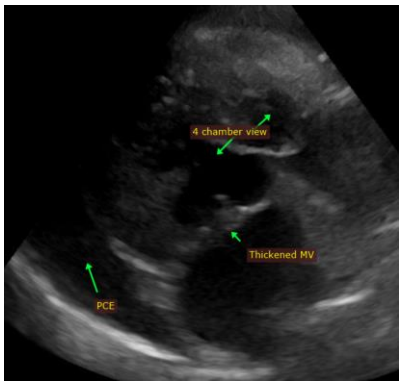
Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.

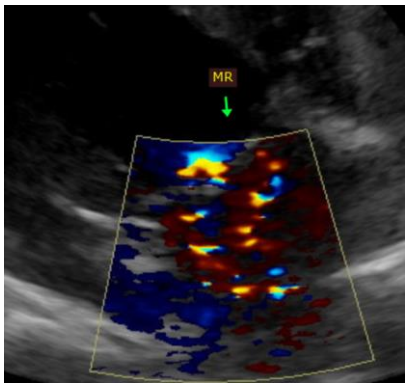
PLAN

Consider immediate referral as discussed. Immediate pericardiocentesis is highly recommended for both diagnostic and therapeutic purposes, with submission for cytology/culture. Full systemic evaluation may be indicated. Consider hospitalization, fluid therapy, CXR, etc.

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
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info@sonopath.com