



PATIENT

Rocky Millevoi

SPECIES

Canine

BREED

Beagle Mix

SEX

Neutered male

AGE

10 years

WEIGHT

45 lbs

INTERPRETED BY

Eric Lindquist, DMV
DABVP, Cert. IVUSS

IMAGING PERFORMED BY

John Sampson

HOSPITAL NAME

Richboro VH

REFERRING VET

Dr. Hughes

INVOICE

73523

DATE

3/17/26

PRESENTING CLINICAL SIGNS

- Presented for coughing on 3/10, specifically in the morning
- Started on Vetmedin 5 mg BID, Cardalis 40/5 SID, Furosemide 40 mg BID
- PE - new grade 4/6 murmur, lungs normal Three view thoracic rads: cardiac enlargement with perihilar congestion and interstitial-alveolar pattern noted

ULTRASONOGRAPHIC EXAMINATION OF THE HEART

The echocardiogram in this patient demonstrated normal **left atrial** size based on 3 different LA measurement methods. Chamber volumes and echogenicity were normal. The cranial and caudal **mitral** valve leaflets presented vegetative thickening consistent with endocardiosis. Doppler indicated measurable insufficiency. The **left ventricle** presented thicknesses with linear contour and was not dilated nor restricted. The **myocardium** presented normal echogenicity without subjective evidence of significant fibrotic or ischemic disease. **Contractility** of the ventricular walls was adequate and in normal range for this patient evidenced by the fractional shortening measurement and subjective evaluation of the different regions of the myocardium. The **left ventricular outflow** tract demonstrated normal laminar flow and subjective structural integrity. The **right atrium** and auricle revealed normal size, structure and content. **Tricuspid** valvular assessment demonstrated adequate linear morphology. The **right ventricle** was of normal size (1/3 diameter of LV), chordae structure, myocardial echogenicity and thickness. **Pulmonic** tract assessment revealed normal valve structure, laminar flow, and diameter (approx.1:1 pa/ao ratio). Irregular, hypoechoic tissue accumulation was noted on the heart base in this patient. I am concerned for potential heart base mass. Periodic arrhythmia was noted in this patient.

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO	LA/AO (Heart Base)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	-	-	NM	1.4	56	88	0.1
CANINE CARDIAC PARAMETERS	HR (BPM)	AV VMAX (m/s)	PV MAX (m/s)	BODY WEIGHT	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	90	2.1	0.9	45 lbs	3.8	2.74	

ULTRASONOGRAPHIC FINDINGS

Minor mitral insufficiency.

Irregular, hypoechoic tissue in the region of the heart base.



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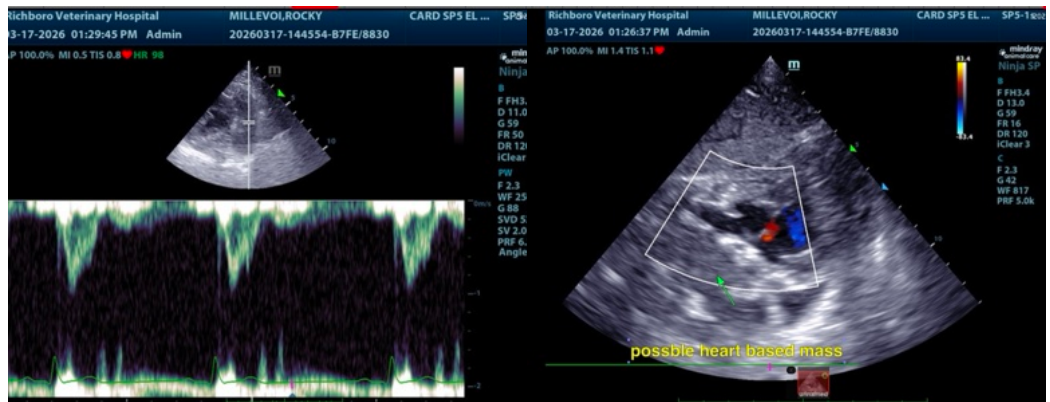
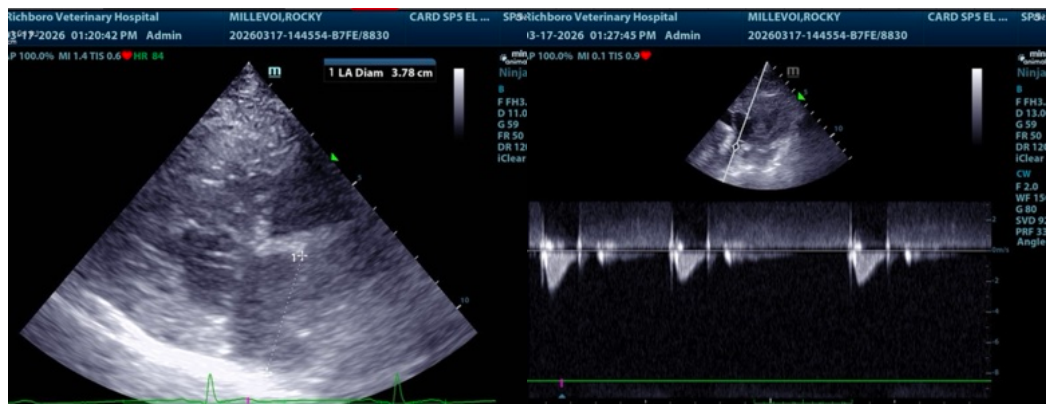
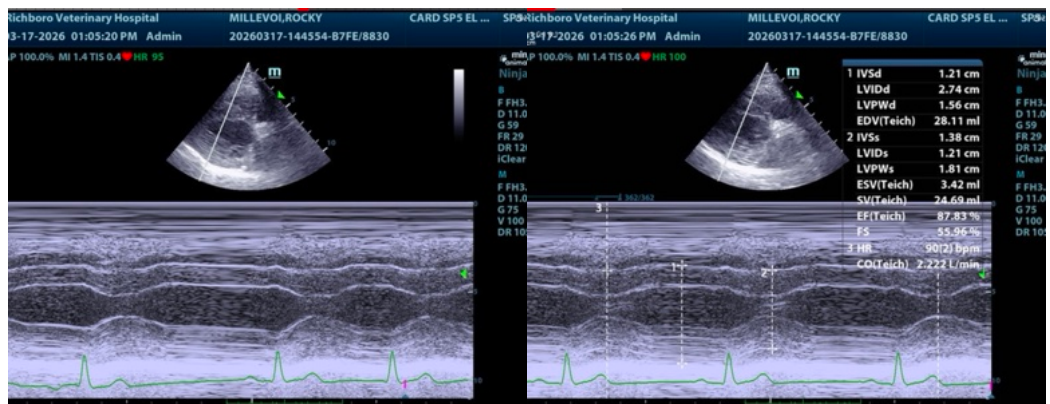
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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Further imaging is necessary with focus on the heart base. There was no evidence of volume overload in this patient at this time. I recommend reassessment of the radiographs to ensure the perihilar congestion is not a tissue density, which would correspond to potential isoechoic heart base mass noted in two views.





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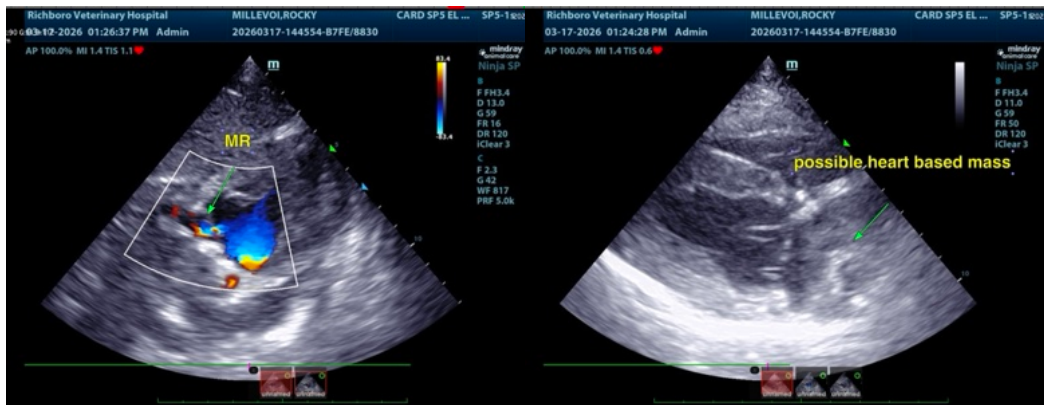
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ADDENDUM 3/19/26

Further views revealed a definitive heart base mass that measured 5.0 x 4.7 cm. This is also visible on the radiograph in the left lateral view. The mass appears to infiltrate into branching of the pulmonary artery and impinges upon or deriving from the aorta.

DIAGNOSIS: Heart base mass involving the pulmonary artery, left atrium and aorta. This is not resectable. Aortic body tumor is likely. Oncological referral is recommended along with serial blood pressure measurements and EKG or Holter monitor to monitor any arrhythmia or hypertension associated with the mass. Holter monitor can be obtained from our office.

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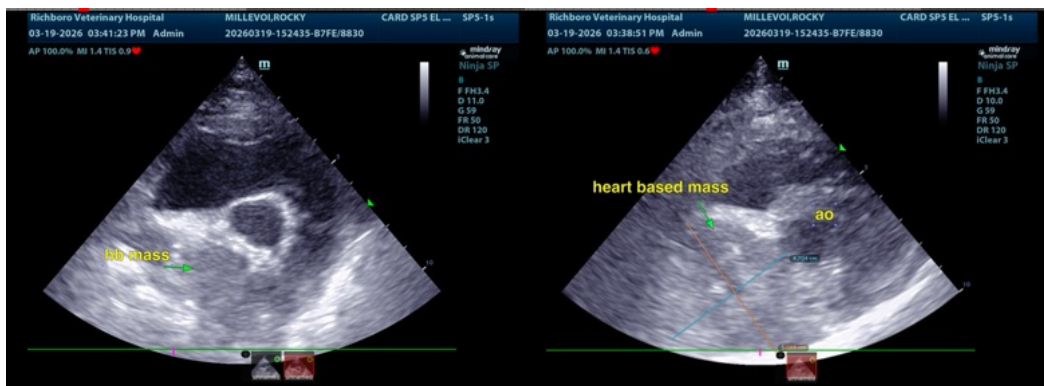
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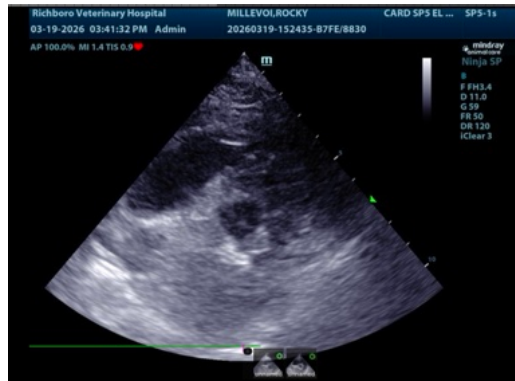
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS, CEO of SonoPath.com

info@SonoPath.com

Pericardial Effusion and Cardiac Neoplasia

<http://www.sonopath.com/CardiacNeoplasiaEffusion>

Description: The pericardium is a fibrous sac that encloses the heart and the great vessels—aorta, pulmonary artery, proximal pulmonary veins, and vena cava—located at the heart's base. It is attached caudally to the diaphragm and under normal circumstances contains 1-15 mL of fluid. The latter is comprised of phospholipids that lubricate the heart and allow it to expand and contract without generating friction. The pericardium also fixes the heart, prevents excess motion, and links the diastolic distensibility of the ventricles, thus limiting the degree to which either the left or the right ventricle will distend during diastole. When there are acute changes in venous return (i.e., during exercise), the pericardium plays a critical role in limiting ventricular filling. In cases of chronic cardiac enlargement, the pericardium also becomes distended, and its ability to limit ventricular filling, especially when the heart is at rest, becomes compromised. Pericardial tamponade occurs when there is a rapid accumulation of fluid and the pressure inside the pericardium increases significantly. With tamponade, ventricular filling is restricted and cardiac output is decreased. The right atrium and ventricle are the most vulnerable to this condition as these compartments have thinner walls and a lower pressure.



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Etiology: Causes of pericardial effusion include:

- Neoplasia
 - Right atrial (RA) hemangiosarcoma
 - Heart base (aortic body) tumors
 - Mesothelioma
 - Rhabdomyosarcoma
 - Ectopic thyroid carcinoma
 - Metastatic neoplasia
- Idiopathic
- Congestive heart failure
- Peritoneal-pericardial diaphragmatic hernia
- Pericardial cyst
- Hypoalbuminemia
- Infectious pericarditis (bacterial, *Coccidioides immitus*)
- Feline infectious peritonitis
- Left atrial tear secondary to valvular disease
- Coagulopathy

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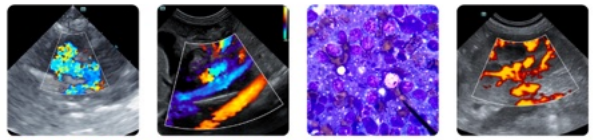
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The majority of neoplastic masses consist of hemangiosarcoma and heart-based tumors (chemodectomas or ectopic thyroid adenocarcinoma). Idiopathic pericardial effusion is a diagnosis of exclusion; the effusion is typically hemorrhagic. Approximately 50% of dogs will be cured with a single pericardiocentesis, while some dogs will require multiple pericardiocenteses as well as surgery. A peritoneal-pericardial diaphragmatic hernia is a congenital hernia seen in dogs and cats in which the abdominal contents (i.e., liver, small intestine, spleen, stomach) herniate into the pericardial sac. Constrictive pericarditis is an uncommon condition in which a non-distensible, thickened, fibrotic pericardium develops over time.

Clinical Signs: One will observe the following clinical signs, which often present in combination: ascites, lethargy, exercise intolerance, pale mucous membranes, weak pulses, *pulsus paradoxus*, and respiratory distress.

Diagnostics: Survey radiographs will reveal hepatomegaly, cardiomegaly (generalized or sectorial globoid), and small pulmonary vessels. Pulmonary edema is typically not found, although one may discover concurrent pulmonary metastatic disease. An ECG will show electrical alternans or small complexes, but often the changes are very subtle and difficult to detect.

Echocardiography is usually considered the gold standard for diagnosing pericardial effusion. Findings include:



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- Anechoic space between the heart and the pericardium.
- Abnormal side-to-side cardiac motion.
- Decreased chamber size (right ventricle [RV] and left ventricle [LV]).
- Presence of a pericardial or cardiac mass.
- Tamponade with early diastolic RA and RV collapse.

Cytology is helpful in the diagnosis of lymphoma, septic pericarditis, and idiopathic effusion, but not in cases of neoplasia.

According to a study that found troponin I levels to be higher in dogs with neoplastic pericardial effusion, the cardiac troponin I assay can be helpful in the diagnosis hemangiosarcoma.

Prognosis:

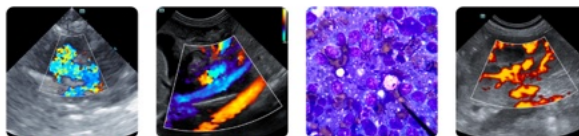
- Cardiac hemangiosarcoma: < 8 months with surgical debulking and chemotherapy.
- Chemodectoma (aortic derived): MST 730 days post pericardectomy.
- Idiopathic: 50% complete resolution post cardiocentesis; curative with pericardectomy, which can be done via thoracotomy, or thoracoscopy, or using a balloon to tear the pericardium.
- Mesothelioma: Poor.
- Restrictive pericarditis: Poor, especially when the pericardium has not been surgical stripped.

References:

Cagle LA, Epstein SE, Owens SD, et al. Diagnostic yield of cytology analysis of pericardial effusion in dogs. *J Vet Int Med* 2014;28:66-71.

Feigenbaum H. Pericardial disease. In: Feigenbaum H, ed. *Echocardiography, 5th ed.* Philadelphia, PA: Lippincott, Williams & Wilkins; 1994:556-588.

Jackson J, Richter KP, Launer DP. Thorascopic partial pericardectomy in 13 dogs. *J Vet Int Med* 1999;13:529-33.



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AGE	Shaw SP, Rozanski EA, Ruhs JE. Cardiac troponins I and T in dogs with pericardial effusion. <i>J Vet Int Med</i> 2004;18:322-24.
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IMAGING PERFORMED BY	Sisson D, Thomas WP, Reed J, et al. Intrapericardial cysts in the dog. <i>J Vet Int Med</i> 1993;7:364-69.
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