

PATIENT PRESENTING CLINICAL SIGNS

Starbucks Brander-
McCaffrey

SPECIES

Canine

BREED

Lab X

SEX

Spayed Female

AGE

7 Years

WEIGHT

56.6 Pounds

INTERPRETED BY

Eric Lindquist, DMV

DABVP, Cert. IVUSS

IMAGING PERFORMED BY

Jenn Walsh, CVT

HOSPITAL NAME

Banfield of South
Eugene

REFERRING VET

Dr. Wright

INVOICE

36779

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4/11/22

HEART/LUNGS: no murmurs nor arrhythmias, synchronous pulses, Lungs clear, No coughing. GI/UG: external genitalia is normal in appearance. somewhat distended appearance of abdomen, tense on palpation. Heart Rate and Respiratory Rates HR - 150, RR - Panting Blood Pressure Measurements 132/83, MAP 96. HR 198 (NIBP, questionable accuracy) Current Medications cerenia, entyce
Abnormal PE/Chem/CBC/UA Results: 04/07/2022 Diagnostics: CBC: - LYM 0.66k/uL LOW (r/o - stress v. acute inflammation v. disruption of lymphatic flow i.e. lymphangiectasia v. immunodeficiency) - Otherwise WNL. Chem: - ALT 178 U/L HIGH (r/o artifact v. hepatocellular injury - primary or secondary) - CHOL 90mg/dL LOW (r/o artifact v. chronic liver disease v. hypoadrenocorticism v. intestinal lymphangiectasia v. anorexia). - Otherwise WNL. Radiographs 3 view: abdomen: - Abnormal, generalized poor serosal detail (r/o effusion v. hemorrhage v. ascites v. others) Fluid analysis & Cytology via antech (light red, turbid): - Total Protein of abdominal fluid via refractometer - 3.7g/dL - 800 WBC/uL (mixture of macrophages, neutrophils, and small lymphocytes), 10,000 RBCs/uL. One slight contains low numbers of suspected reactive mesothelial cells. no infectious agents or atypical cells found. - Per Protein rich transudate of unknown origin per clinical pathologist.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART & ABDOMEN

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	5.0		1.04	1.0	28	--	0.38
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	--	1.3	0.96		3.83	3.0	

Cardiac Presentation

The cardiac presentation in this patient revealed a right auricle and heart base mass with secondary pericardial effusion causing tamponade effect and collapse of the right auricle. The mass measures 4.0 cm x 3.0 cm. Trivial mitral insufficiency noted. Left ventricular and left atrial volume were relatively normal. However, the right auricular volume was poor owing to the collapse and tamponade effect. The position of the mass would suggest hemangiosarcoma. Transmural infiltrative pattern noted in the right auricle. Portions of the right ventricular free wall were also irregular, suggestive for underlying neoplasia.



PATIENT *Urinary System*

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The **urinary bladder**, trigone, and pelvic urethra presented normal thicknesses and normal tone. The ureters were not visible which is normal. No uroliths or sediment were visualized and anechoic urine was present. No evidence of inflammatory or neoplastic changes were noted. Ureteral papillae were normal.

The **kidneys** revealed normal size and structure, corticomedullary definition and ratio for this age. The cortices presented largely uniform texture with normal echogenic relationship to liver and spleen. Medullary structure differed distinctly from the cortex and no evidence of pelvic dilation was present. The capsules were acceptably uniform without significant irregularities. The right kidney measured 6.4 cm. The left kidney measured 6.0 cm.

Adrenal Glands

Both **adrenal glands** were visualized and recognized as having normal shape, size, position and echogenicity for this breed. The phrenic vasculature, glandular echogenicity and detail were unremarkable. Capsule, cortex, and medullary definition were normal for this age patient. The right adrenal gland measured 2.32 cm x 1.35 cm at the cranial pole and 0.79 cm at the caudal pole. The left adrenal gland measured 2.0 cm x 0.50 cm.

Spleen

The **spleen** was volume contracted and displaced dorsally.

Liver

The **liver** presented generalized enlargement with hepatic vein congestion/passive congestion pattern. Secondary ascites noted. The gallbladder and common bile duct were unremarkable. Vena cava/aorta ratio was 1.5:1.0 at the diaphragm. Enhanced mesentery noted throughout the mid abdomen owing to the ascites.

Gastrointestinal

Examination of the **gastrointestinal tract** revealed a stomach and intestine free of stasis, of normal wall thickness, acceptable curvilinear mural detail, and peristaltic activity. Small and large intestine demonstrated normal luminal chyme and stool consistency respectively. No obstructive or overt infiltrative disease was noted. No associated abnormal lymphatic activity was noted.

Pancreas

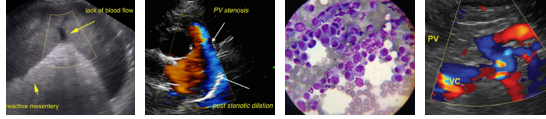
The base and limbs of the **pancreas** were observed to be largely isoechoic to surrounding omental fat. Pancreatic duct and capsular contour were acceptably normal and parenchyma respected normal curvilinear patterns. No overt evidence of active inflammatory or neoplastic disease was noted.

ULTRASONOGRAPHIC FINDINGS

- Pericardial tamponade effect with right auricular mass and pericardial effusion
- Passive congestion and abdominal ascites pattern without evidence of overt pathology

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Pericardiocentesis with adjunctive chemotherapeutic intervention recommended. No evidence of primary neoplasia in the abdomen.



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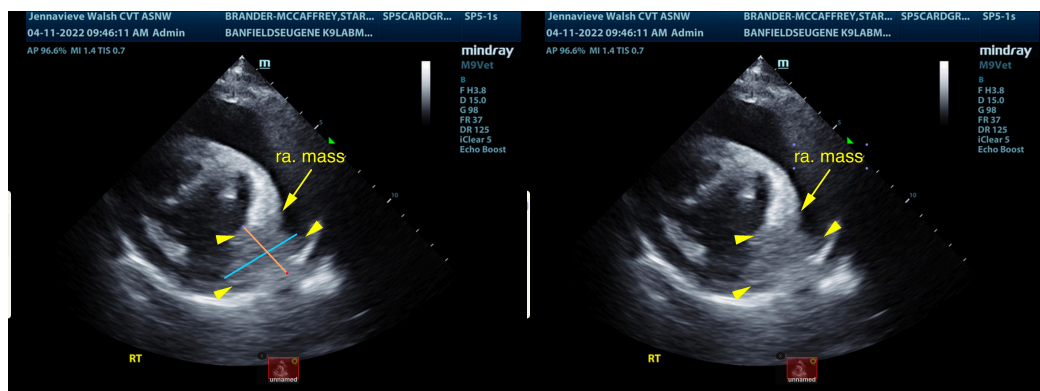
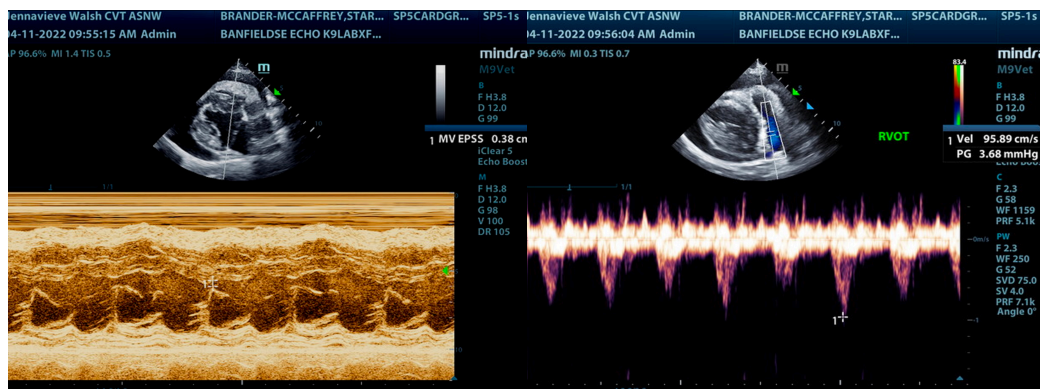
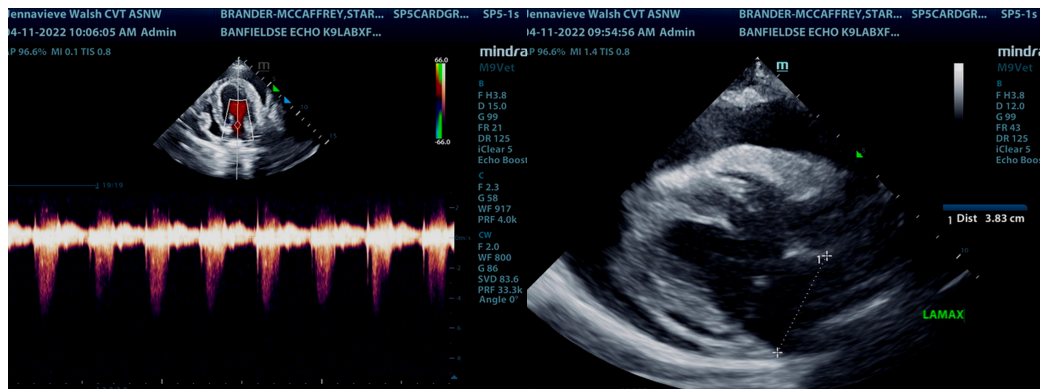
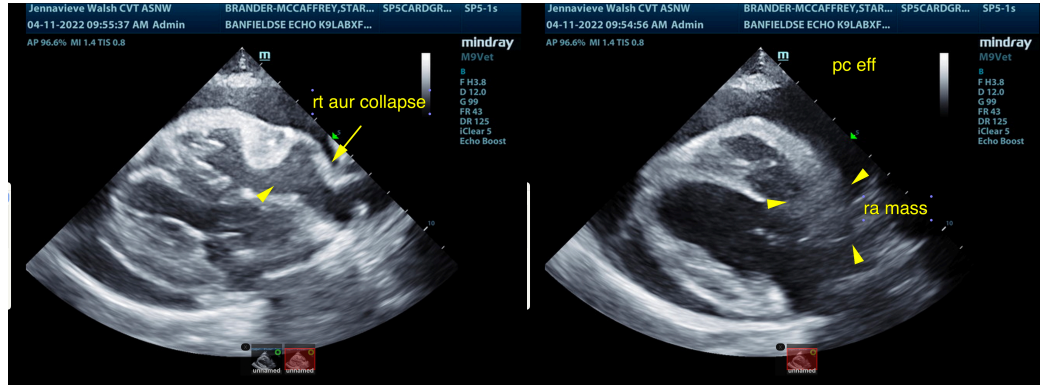
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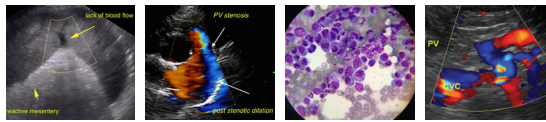
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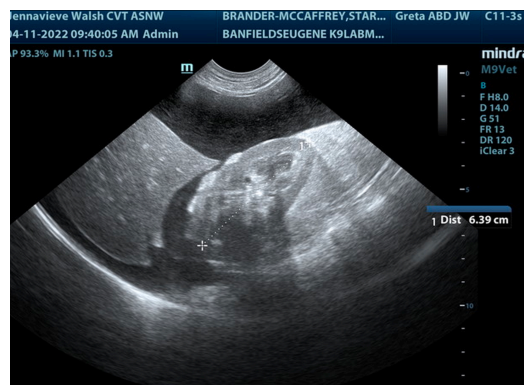
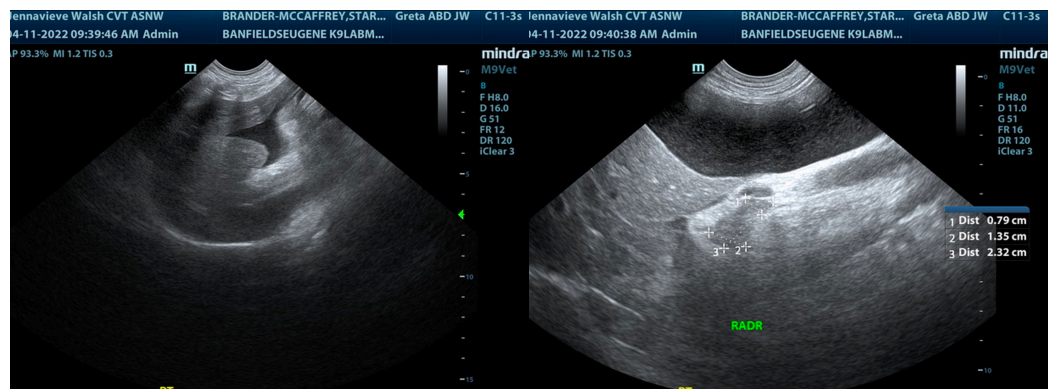
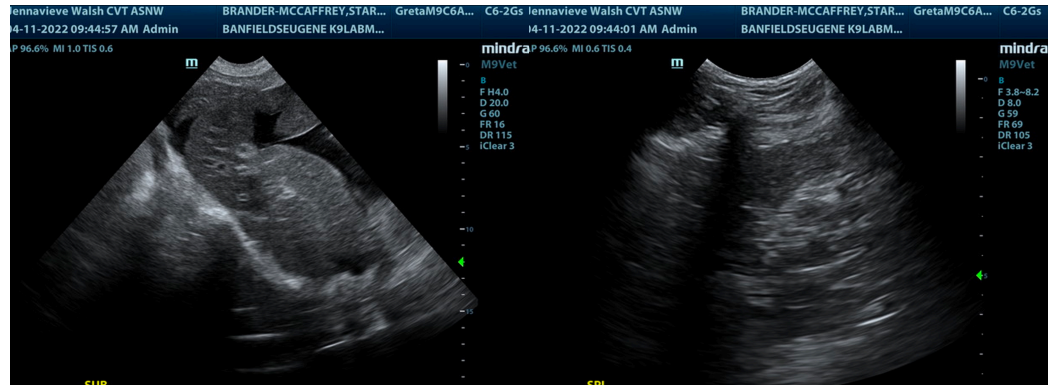
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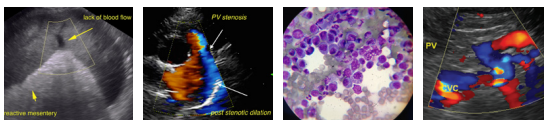


The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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, Cert. IVUSS, CEO of SonoPath.com

info@SonoPath.com


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Pericardial Effusion and Cardiac Neoplasia

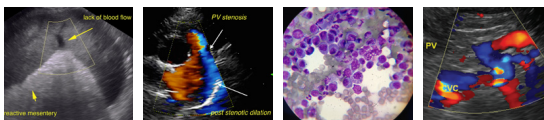
<http://www.sonopath.com/CardiacNeoplasiaEffusion>

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.

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

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



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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:

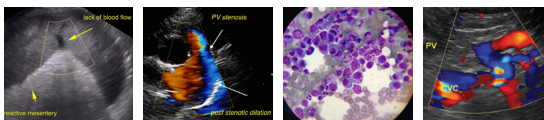
- Anechoic space between the heart and the pericardium.
- Abnormal side-to-side cardiac motion.
- Decreased chamber size (right ventricle [RV] and left ventricle [LV]).
- Presence of a pericardial or cardiac mass.
- Tamponade with early diastolic RA and RV collapse.

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.



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- 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:

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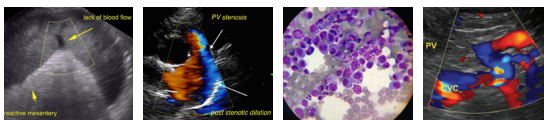
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