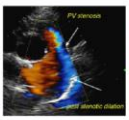
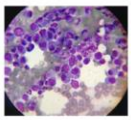
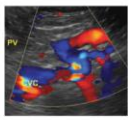
IMAGING PERFORMED BY
svsmobileimaging.com 309 - 737 - 3070

SVS IMAGING

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

PATIENT
Jilly Frommelt

SPECIES
Canine

BREED
Lab

SEX
FS

AGE
8years

WEIGHT
48.7lbs

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

IMAGING PERFORMED BY
Sarah Pender, CVT

HOSPITAL NAME
SVS Imaging QC

REFERRING VET
Dr. Neumeister

INVOICE
21711

DATE
10/26/21

PRESENTING CLINICAL SIGNS

History: Sudden onset of lethargy, anorexia.
Abnormal PE/Chem/CBC/UA Results: NMA, HR 130bpm, RR 36. Chest films revealed a globoid shaped heart. She was presented on Sat. with dehydration. Her urine sp. gravity at that time was 1.058. A maintenance level flow of LRS was started during the day on Sat. afternoon. She was started on vetmedin 10mg BID. Sunday she began drinking. Her a.m. urine sp. gravity was 1.068. By afternoon that had decreased to 1.005. Her abdomen began looking larger and ultrasound revealed fluid in the abdomen Sun. afternoon. Radiographs revealed loss of clarity of the abdominal organ silhouette and the cardiac silhouette had become ill defined. Furosemide was started at 1mg/kg i.v. and benazepril 10mg p.o. in addition to the vetmedin. 10/26/21 The current meds are vetmedin 10mg p.o. BID, Furosemide 20mg p.o. TID, Benazepril 20mg p.o. SID in the p.m. The patient has begun to eat canned Hill's i/d and is drinking water on its own. BP: 123/91 (105), 127/93 (108), 127/94 (109) 10/23/21 NaCl 136, Chloride 99, CA 8.9, BUN 40, AST 168, TP 5.1. CBC unremarkable

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.

Globoid cardiomegaly. No obvious evidence of CHF.

ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.

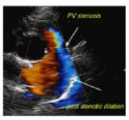
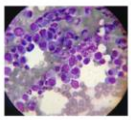
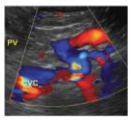
A single lead ECG is available; 25mm/s, 20mm/mV. The average heart rate is 166bpm with a largely regular rhythm. The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. No ectopic beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with respiratory variation.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild thickening of the anterior leaflet of the mitral valve with no obvious prolapse into the left atrial lumen. Mild mitral regurgitation with mild left atrial dilation. Normal LV diameter with adequate myocardial function. Normal to mildly increased LV wall thickness. Tricuspid valve appears mildly thickened; mild TR; normal velocity. Diastolic collapse of the RA consistent with tamponade. No obvious tumor in the RA or right AV groove. Suspicious hypoechoic lesion associated with the right auricular appendage (see below). The pulmonic and aortic valves are normal in morphology and mobility. Normal aortic and pulmonic outflow velocities; laminar flow. Large volume pericardial effusion. No pleural effusion 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	5.4	2.4	NM	1.6	27	54	0.3l
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	166	1.4	1.2	22.2	2.9	3.0	2.2
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)

PATIENT

Jilly Frommelt

SPECIES

Canine

BREED

Lab

SEX

FS

AGE

8years

WEIGHT

48.7lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

Sarah Pender, CVT

HOSPITAL NAME

SVS Imaging QC

REFERRING VET

Dr. Neumeister

INVOICE

21711

DATE

10/26/21

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
Hansson et al, Vet Rad and Ultrasound 2002
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995

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)
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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the symptoms is large volume pericardial effusion. The cardiac structure and function are largely normal in this patient, without evidence of significant structural disease. Mild chronic degenerative valve disease causing MR and TR is present, which is comparatively hemodynamically insignificant. The patient is suspected to be in early cardiac tamponade (diastolic collapse of the RA, ascites on exam), and an **emergency pericardiocentesis is warranted**. No definitive tumors are seen in this study, however a suspicious lesion is identified associated with the right auricle. The ECG is unremarkable with a sinus tachycardia.

Assuming the effusion is hemorrhagic (most likely), the two most common causes of pericardial effusion in older large breeds dogs are idiopathic and neoplastic. Less commonly, pericarditis (an inflammatory condition), a left atrial tear, or a bleeding disorder should also be considered. Idiopathic by definition means that a cause cannot be found. If diagnosed (a rule out diagnosis), the long-term prognosis with idiopathic effusion has the potential to be fair.

Regarding neoplasia, the most common types of cardiac cancer causing pericardial effusion include hemangiosarcoma (HSA), chemodectoma, or mesothelioma. The prognosis varies a great deal depending on the underlying type of cancer. Based on the findings of today's echocardiogram, there is not definitive evidence of a clear tumor. There is however an atypical region associated with the right auricle which is suspicious (rule out tumor versus fat deposition) and should be monitored. A reevaluation is recommended in the next 1-2 months, as often small masses will become apparent in that period of time. **An echocardiogram by an attending Cardiologist** and/or thoracic CT may also be reasonable to further screen the external surface of the heart. Additionally full systemic evaluation is recommended to screen for ancillary tumors (AUS, etc). Even without definitive identification, one should always be suspicious for neoplasia given the signalment.

Given the large volume of effusion and evidence of tamponade, a pericardiocentesis is necessary ASAP for both diagnostic and therapeutic purposes in this case. If this is not ideal at your facility, referral to a multi-specialty center is highly recommended for the procedure. Once a sample is obtained, follow up diagnostics to screen for underlying causes is recommended to determine treatment/follow up plan (fluid cytology, AUS, etc).

Regardless of underlying cause, it is impossible to predict if and when pericardial effusion will reoccur. Some patients with idiopathic effusion need to be tapped between 1 to 3 times then never again. Other patients may experience frequent recurrence with either HSA or idiopathic disease. If the effusion reoccurs frequently, a surgical procedure called a pericardectomy can be discussed.

No cardiac medications are clearly indicated at this time and **Lasix/ACEI/Pimobendan should be discontinued with fluid resuscitation continued.** Over the counter herbal supplement Yunnan Baiyao (aka Yunnan Paiyao) may help decrease risk of bleeding, however true benefit is speculative (1 capsule PO BID). Please monitor at home for signs of recurrent pericardial effusion including pale gums, difficulty breathing, lethargy/collapse, exercise intolerance, abdominal distention,

PATIENT

Jilly Frommelt

SPECIES

Canine

BREED

Lab

SEX

FS

AGE

8years

WEIGHT

48.7lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

Sarah Pender, CVT

HOSPITAL NAME

SVS Imaging QC

REFERRING VET

Dr. Neumeister

INVOICE

21711

DATE

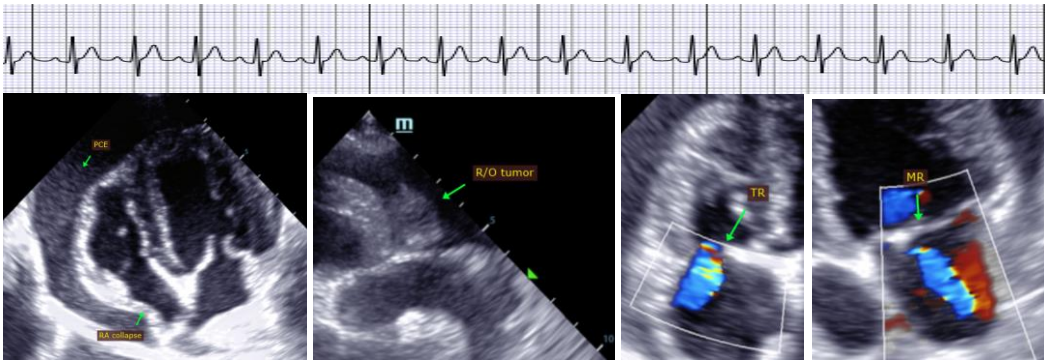
10/26/21

vomiting, and/or inappetance. If you notice any of these symptoms, patient should be evaluated immediately by a veterinarian.

Plan: D/C cardiac medications. Continue volume resuscitation. Emergent pericardiocentesis with referral if indicated/elected. Full systemic evaluation. Ideally hospitalize for 12-24 hours following the tap to monitor for arrhythmias, screen for reeffusion, etc.

A recheck echocardiogram is recommended based upon results of discussed pericardiocentesis and work up. If the patient does well, reassess AV groove in 1-2 months.

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. 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