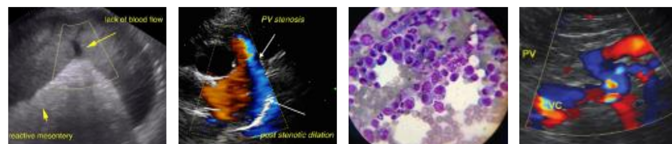


SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

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

PATIENT
Jackson Karlsen

SPECIES
Canine

BREED
Mix

SEX
Male Neutered

AGE
7.5 years

WEIGHT
85.1lbs

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

IMAGING PERFORMED BY
Kelly Romero, DVM

HOSPITAL NAME
FC Veterinary Emergency Hospital

REFERRING VET
Dr. Huval

INVOICE
28313

DATE
1/13/23

PRESENTING CLINICAL SIGNS

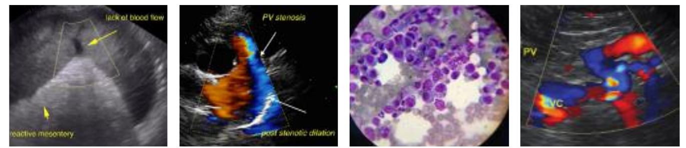
History: Patient transferred as possible pericardial effusion based on radiographs. Owners were out of town and J. was boarded until 12/18/22. About a week after owner returned, J. developed a cough. Antibiotics were started and just finished 1/12. The cough never fully went away. Has been lethargic for 2 weeks with progressively decreasing appetite. Muffled heart sounds on presentation without an obvious murmur. Some abdominal distention. Initial HR 120 prior to pericardiocentesis. Femoral pulses initially synchronous, but then developed some VPCs after pericardiocentesis - his HR also went up to 168. By the time he was sent home about 7 hours after presentation, his HR was back to 120. TFAST/AFAST - confirmed tri-cavitary effusion, sample taken from abdomen. Abdominal effusion tapped - clear fluid. Pericardiocentesis - frank non-clotting blood, 84 mls removed. No sample of pleural effusion taken. Blood work from rDVM - low normal albumin, normal HCT, mildly elevated liver enzymes, rest WNL Blood pressure - initially 200 systolic, then 180 systolic after pericardiocentesis. Abdominal ultrasound - no abdominal masses found. Spleen is large/folded on itself, effusion in all 4 quadrants, but very mild in diaphragmatic-hepatic and hepato-renal (moderate amount remaining two quadrants). Discharged on Clavamox and furosemide to help with the pleural effusion and abdominal effusion. Also gabapentin.

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. No mitral regurgitation with normal left atrial dimension. Normal LV diameter with adequate myocardial function. Normal LV wall thickness. Tricuspid valve appears mildly thickened. No obvious TR. No obvious tumor in the RA or right auricle. No obvious tumor in the right AV groove or heart base. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic outflow velocities; laminar flow. Trivial 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			1.4	1.2	35	85	0.68
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		1.9	1.0	38.6	2.9	5.2	3.5
*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)
Adapted from June Boon, Veterinary Echocardiography, 1998				20	2.02 (1.9)	4.14 (2.2)	2.80 (2.0)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Hansson et al, Vet Rad and Ultrasound 2002				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)



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Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995	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 2 most common causes of hemorrhagic pericardial effusion in an older large breed dog without structural disease are idiopathic and neoplastic. Less commonly, pericarditis (an inflammatory condition) 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 good.

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. In a senior dog, HSA should be considered above all other differentials, as this is the most common cause. Cardiac HSA carries a poor to grave prognosis, with a mean survival time of 3-6 months.

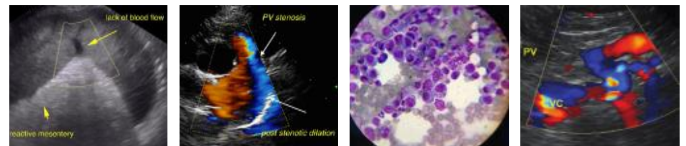
Based on the findings of today's echocardiogram, there is no definitive evidence of a clear tumor. The right atrium and ventricle are clear, and the right AV groove is unremarkable. That being said, ultrasound is quite insensitive for small masses (particularly in the absence of active effusion), and it is important to note that there may be a definitive mass not identified here. A reevaluation is recommended in the next 1-2 months, as often small masses will become apparent in that period of time. Even without definitive identification, I am highly suspicious for neoplasia in this case given the signalment. Prognosis is guarded, and any dog with effusion carries risk for development of malignant arrhythmias and sudden death at home.

Further evaluation may also help shed light on a definitive diagnosis. Submission of the effusion for cytology can yield a diagnosis in rare cases, and often the result is inconclusive. The AUS was reportedly unremarkable; however, screening CXR are recommended to look for metastasis. Advanced imaging with an attending Cardiologist can be considered, as well as discussion of a thoracic CT/MR to screen the external surface of the heart.

Regardless of underlying cause, it is impossible to predict if and when pericardial effusion will recur/increase and potentially cause clinical signs. Some patients with idiopathic effusion need to be tapped between 1 and 3 times then never again. Other patients may experience frequent recurrence with either HSA or idiopathic disease. If the effusion reoccurs frequently and no malignancy remains identified, a surgical procedure called a pericardectomy can be discussed. Finally, dogs with effusion are at risk for malignant ventricular arrhythmias, and a baseline ECG is recommended. Sudden death is always a possibility in these cases unfortunately.

No cardiac medications are clearly indicated at this time. 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 worsening pericardial effusion including pale gums, difficulty breathing, lethargy/collapse, exercise intolerance, abdominal distention, vomiting, and/or inappetance. If you notice any of these symptoms, patient should be evaluated immediately by a veterinarian.

Recommend a recheck echocardiogram in 1 month to reassess the surface of the heart and screen for recurrent effusion, sooner if any recurrence of clinical signs. **If acute PCE occurs again, if possible, recommend imaging prior to removal for increased sensitivity.**



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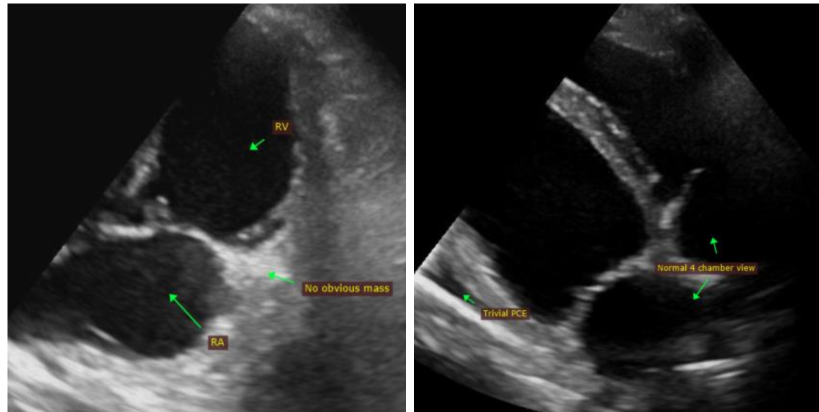

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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