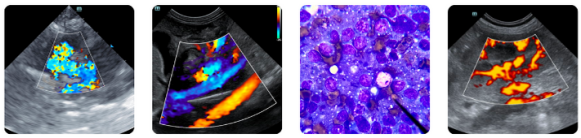


PATIENT

Dori Howerton

SPECIES

Canine

BREED

German Shepherd

SEX

Spayed Female

AGE

5 years

WEIGHT

32 kg

INTERPRETED BY

Bradley Harris, DVM, DACVECC, DACVIM (cardiology)

IMAGING PERFORMED BY

Loetitia Saint-Jacques, LVT

HOSPITAL NAME

Alpine AH

REFERRING VET

Molly Burbank

INVOICE

74661

DATE

4/20/26

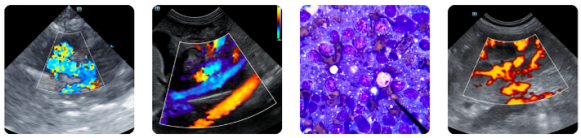
PRESENTING CLINICAL SIGNS

History: Chronic cough for the past 4 months with episodes of hemoptysis. On initial presentation, no increased respiratory effort or heart murmur present. Radiographs done in Dec 2025 showed diffuse unstructured interstitial to alveolar bronchial pattern. Soft tissue opaque bulge in the area of the main pulmonary artery, and multiple enlarged and tortuous pulmonary arteries. Pulmonary hypertension was suspected. Differentials included heartworm pneumonitis, pulmonary hemorrhage, and less likely infectious bronchopneumonia or acute lung injury. 4dx was neg. O was unable to pursue additional diagnostics at the time. Trial of Enrofloxacin and Panacur was initiated and pt seemed to improve. Hemoptysis resolved, but cough never fully went away. Pt presented again on 4/4/26 for recurrence of hemoptysis. Exam now revealed increased respiratory effort, possible s3 sound and intermittent weaker pulses. Concern is for chronic lung disease leading to pulmonary hypertension and possible secondary heart disease. Possible S3, no distinct murmur
Abnormal PE/Chem/CBC/UA Results: 12/18/25 CBC: Mild monocytosis, moderate neutrophilia, severe eosinophilia, mild basophilia, HCT 51, PLT 156K (RI 165-500) Chem: WNL 4dx= neg Baermann = neg

ULTRASONOGRAPHIC EXAMINATION OF THE HEART

The left atrium is normal in dimension. The left ventricle is normal in dimension with normal systolic function. The right atrium and ventricle are subjectively enlarged with adequate systolic function and mild right ventricular hypertrophy. Intraventricular septal flattening and paradoxical septal motion are identified. The anterior and posterior mitral valve leaflets presented normal linear structure, extension in systole, and union in diastole, without regurgitation, prolapse, or myxomatous changes noted. The tricuspid valve leaflets display mild regurgitation with evidence of at least mild to moderate pulmonary hypertension (likely higher, but not documented). The left ventricular outflow tract demonstrated normal laminar flow and the visible aorta is unremarkable. The right ventricular outflow tract assessment revealed normal laminar flow, with an increased main pulmonary artery diameter and reduced distensibility. There are linear hyperechoic structures within the right and main pulmonary arteries, which may represent heartworms. There is trace pulmonic insufficiency and no aortic valve insufficiency documented. There is no visible pericardial, pleural, or free peritoneal fluid noted. There is a hyperechoic structure at the heart base near the pulmonary artery, which likely represents an aortic fat pad, but mass lesion or thrombus cannot be excluded.

Imaging performed by
pawsonography@gmail.com
530-786-8340



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CANINE CARDIAC PARAMETERS	Body Weight kg	HR BPM	LAD 4 ch Long	RAD 4 ch Long	La/Ao Heart Base	LVIDd	LVIDs
NORMAL PARAMETER		50-100			<1.6		
PATIENT	32 kg	NM	3.72	2.39	1.24	3.27	1.68
CANINE CARDIAC PARAMETERS	**FS**	**EPSS**	**PV V MAX (m/s)**	**AV V Max (m/sec)**	**MR Vmax**	**TR Vmax**	**RPA distensibility (normal >30%)**
NORMAL PARAMETER	28-40	<0.6	0.7-1.6	0.7-1.7	4.5-5.5	< 2.7	
PATIENT	49	0.2	1.0	1.1	Not Present	3.3	26

ULTRASONOGRAPHIC FINDINGS

These findings identify significant pulmonary hypertension (PH) in the absence of any clinically relevant left-sided disease. Therefore, cor pulmonale secondary to primary pulmonary disease/PH is the likely cause for morbidity. Pulmonary hypertension in dogs is most commonly secondary to primary respiratory disease (chronic bronchitis, pulmonary fibrosis, or other forms of pulmonary interstitial disease). Pulmonary hypertension can also develop in dogs with severe heartworm disease or secondary to pulmonary thromboembolism (PTE). Less commonly, pulmonary hypertension is identified in dogs as an idiopathic condition. The degree of PH has resulted in right sided cardiac enlargement (cor pulmonale).

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Given the degree of right sided cardiac enlargement, cardiac therapy is reasonable at this time. Treatment for the PH/presumed respiratory disease is also warranted, as clinical signs are present. Therapy should include Vetmedin (0.25-0.35 mg/kg BID), sildenafil (2 mg/kg BID), and enalapril (0.5 mg/kg BID assuming normotension and lack of renal insult). Baseline thoracic radiographs, blood pressure and chemistry panel should be performed now, and again in 1-2 weeks. A repeat heartworm antigen test, as well as microfilaria test is indicated. Heat treatment may be necessary for a definitive diagnosis and is available through most reference laboratories. If positive, therapy should be instituted according to the American Heartworm Society guidelines. A repeat echocardiogram, thoracic radiographs, blood pressure, and chemistry panel is indicated in another 3-6 months, or sooner if progression is suspected, clinical signs develop/worsen, or additional cardiac therapy is being contemplated.

Anesthesia considerations:
Anesthesia should be avoided if possible. If anesthesia is necessary, then alpha-2 agonists, ketamine, and Telazol should be avoided. If an ACE inhibitor (enalapril, benazepril) or spironolactone is being

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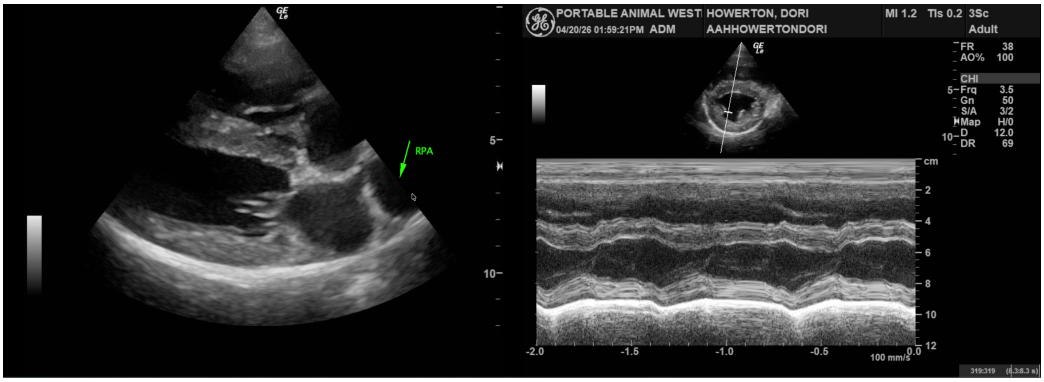
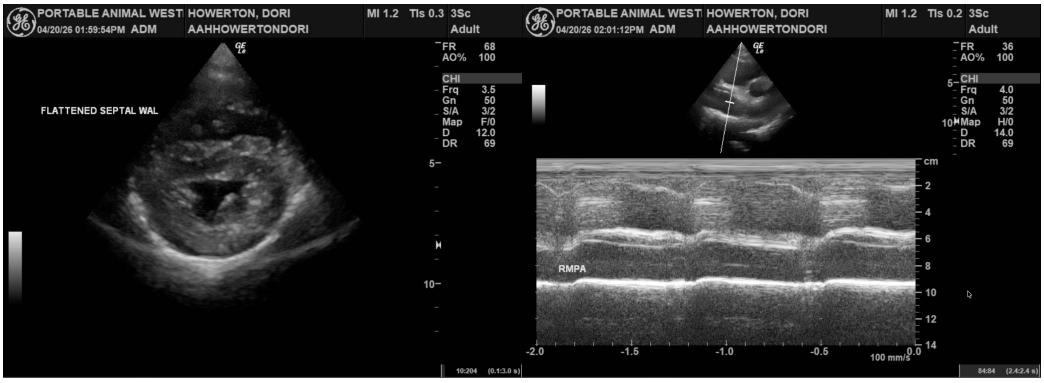
given, it should not be administered on the morning of general anesthesia. Other cardiac medications should be administered per the normal dosing schedule. Fluid therapy during anesthesia should be considered at a reduced rate (5 ml/kg/hour) if possible (i.e., if not hypotensive). A shorter anesthetic duration will reduce the risk of complications. Pre-oxygenation is mandatory. Premedication with an opioid (e.g., butorphanol, hydromorphone, oxymorphone) with or without a benzodiazepine is generally the safest protocol. An induction agent such as Propofol, alfaxalone, or diazepam/etomidate can be used to effect. Maintenance of anesthesia with isoflurane or sevoflurane is reasonable.

Diet:
A high-quality food from Hills, Royal Canin, Science Diet, Eukanuba, Iams, or Purina that is highly palatable with adequate protein and calories for maintaining optimal body condition with mild dietary sodium restriction (<100 mg/100 kcal) is recommended. Consider omega-3 fatty acid supplementation. Ensure the patient is not currently receiving a boutique, exotic, or grain-free diet.

Activity:
Moderate physical activity (meandering walks, exploring the backyard, playing with toys inside, getting excited when family gets home, etc.) is encouraged, but periods of strenuous aerobic activity (jogging, strenuous outdoor ball play, prolonged play at the dog park, etc.) should be avoided, especially during periods of high heat (> 80 F) and humidity. Dogs with heart disease tend to tolerate cool and cold temperatures much better than high temperatures. Avoid sudden increases in activity (e.g. 2 block walks during the week but 2 mile walks followed by 30 minutes at the dog park on the weekends) as this may be difficult for the cardiovascular system to deal with.





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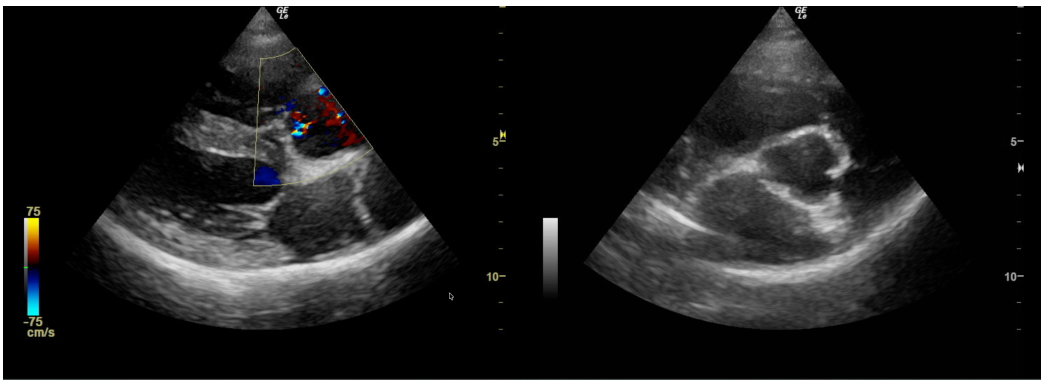

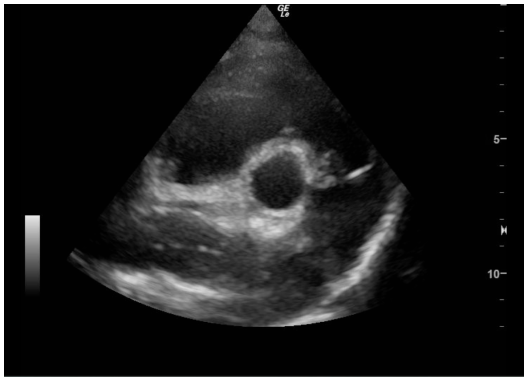

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Bradley Harris, DVM, DACVECC, DACVIM (cardiology)

info@SonoPath.com