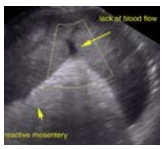
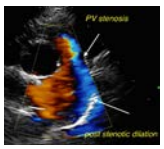
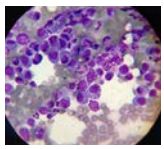
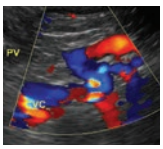
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

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

PATIENT
Santiago Murphy

SPECIES
Canine

BREED
Havanese

SEX
Intact Male

AGE
12 Years

WEIGHT
15.2

INTERPRETED BY
Eric Lindquist, DMV
DABVP, Cert. IVUSS

IMAGING PERFORMED BY
JK

HOSPITAL NAME
Hamburg Vet Clinic

REFERRING VET
Dr. Branning

INVOICE
46857

DATE
4/21/23

PRESENTING CLINICAL SIGNS

Vomiting, lethargic, tense on abdominal palpation. Heart murmur, elevated liver and pancreatic values

Abnormal PE/Chem/CBC/UA Results: ALT 130, AST 126, ALK PHOS 320, GGT 32, LIPASE >1000, TRIG 273, WBC 23.5. BP 110/92(94), 114/89(94)

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			1.0		42	77	0.1
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	202	1.48			2.11	1.23	

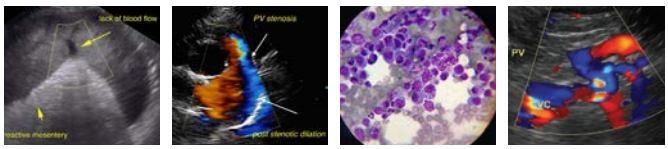
Cardiac Presentation

The **left atrium** was subnormal in size, likely owing to volume contraction. The cranial and caudal **mitral** valve leaflets presented normal linear structure, extension in systole, and union in diastole with normal kinesis. The **left ventricle** presented minor pseudohypertrophy and volume contraction, likely owing to systemic volume contraction. 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. No evidence of masses was noted. **Tricuspid** valvular assessment demonstrated adequate linear morphology and kinesis. The **right ventricle** was of normal size (1/3 diameter of LV), chordae structure, myocardial echogenicity and thickness. **Pulmonary outflow** tract assessment revealed normal valve structure, laminar flow, and diameter (approx.1:1 pa/ao ratio). No visible **pericardial** or free pleura fluid was noted. The cranial **mediastinum and pericardial and extra-cardiac regions** were free of masses in the visible window. Tachycardia noted.

Urinary System

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 largely normal size and structure, corticomedullary definition and ratio (cortex 1/3 of medulla) were essentially maintained with some age-related loss of curvilinear patterns regarding



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the capsule and C/M junction. The cortices presented largely uniform texture with some increased echogenicity expected for his age patient. Medullary structure differed distinctly from that of the cortex and no evidence of pelvic dilation was present. The left kidney was deviated owing to a mass effect from the adjacent left adrenal mass.

Adrenal Glands

A **left adrenal** mass was noted measuring 4.11 cm x 2.7 cm, with phrenic vein invasion and peripheral inflammation. I was not able to assess if caval invasion is noted. However, given the free fluid present, there is concern for hemorrhage associated with the phrenic vein and/or the vena cava. CT evaluation would be necessary to assess surgical potentials.

The **right adrenal gland** was visualized and recognized as having normal shape, size (0.57 cm), 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.

Spleen

The **spleen** was normal size and relatively normal contour with multifocal hyperechoic areas of mineralization. This is a benign change; however, can be related to Cushing's disease or other endocrinopathies.

Liver

The **liver** images from right and left intercostal as well as subcostal views revealed subjectively normal liver size, contour, and structure. Some age-related parenchymal remodeling was noted but likely not clinically significant at this time. Vascular and biliary tracts were of normal volume and no evidence of congestion was noted. The gallbladder presented some dependent debris with essentially normal contour. The cystic and common bile ducts were normal. No overt evidence of active inflammatory, infiltrative or regenerative pathology was noted but should be paired with current or past LE elevations regarding any clinical significance to this presentation. The hepatic lymph nodes were unremarkable.

Gastrointestinal

Examination of the **gastrointestinal tract** revealed small intestinal stasis followed by empty small intestine, creating an obstructive pattern. However, the exact cause could not be found.

Pancreas

The base and limbs of the **pancreas** were observed to be largely isoechoic to surrounding omental fat. Some parenchymal remodeling, however, with mild deviation from curvilinear normalcy was observed. Pancreatic duct and capsular irregularities were present consistent with age related changes. If pain upon imaging (+ Murphy sign) was present or if the patient is focally painful in subxyphoid palpation then low-grade smoldering chronic pancreatitis should be suspected.

ULTRASONOGRAPHIC FINDINGS

- Volume contracted tachycardic heart
- Invasive, expansive left adrenal mass – differentials include pheochromocytoma or adenocarcinoma.
- Free fluid – suspect hemorrhage or paraneoplastic effusion
- Small intestinal obstructive pattern, cause not evident
- Splenic mineralization
- Age related renal, hepatic, and pancreatic changes

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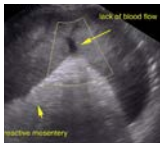
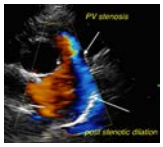
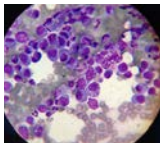
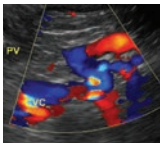

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

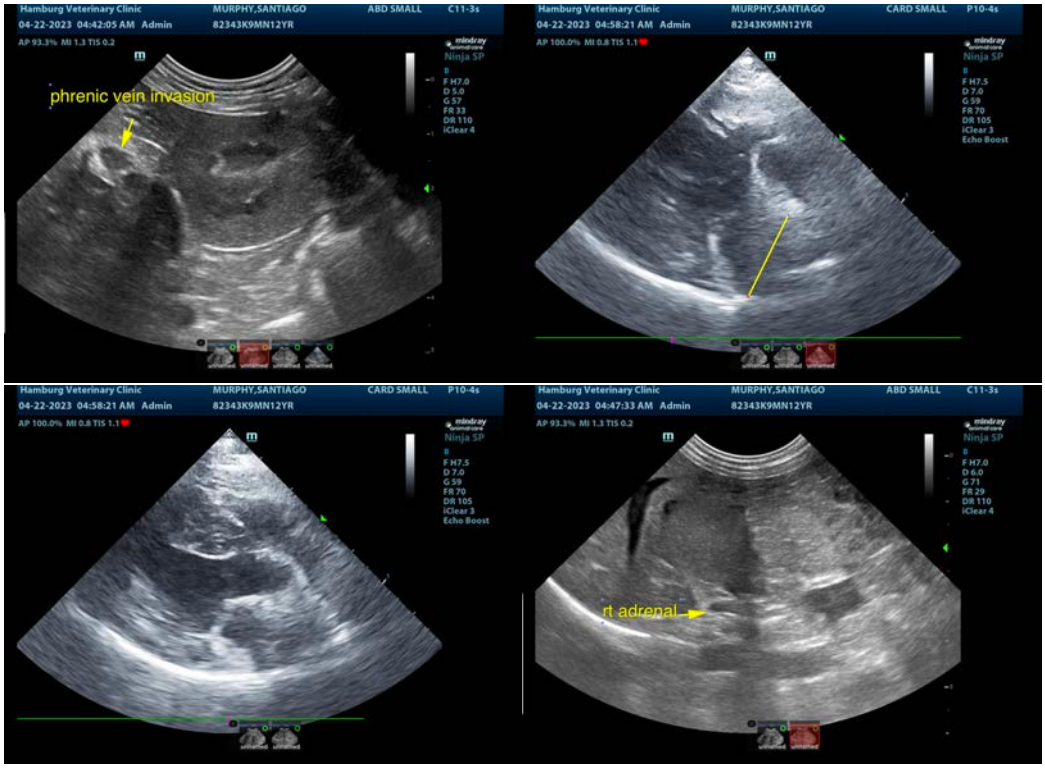
Abdominocentesis and cytospin recommended to assess the nature of the free fluid as well as blood pressure measurements. IV fluid support recommend and treat for shock. The patient is likely in stage 1 shock, given the tachycardia and volume contraction. Prognosis is extremely guarded. Supportive care to stabilize the patient, assessment for hypertension, urine catecholamine all indicated. CT evaluation recommended for surgical assessment.

SonoPath CT Services are offered at the SonoPath Imaging and Veterinary Education Center, 141 Main St (rt 206), Andover, New Jersey, a 20-minute drive west on route 80/206 North from the route 80/287 interchange/Parsippany, New Jersey. More information can be found at

https://sonopath.com/services/sonopath-ct-services

Come join us for the SonoPath Summit on Cardiology July 10-12, 2023

https://sonopath.com/sonopath-2023-summit/



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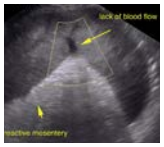
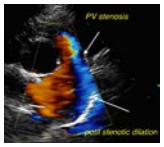
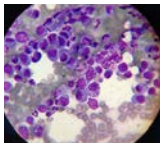
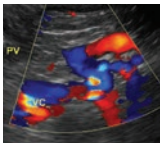

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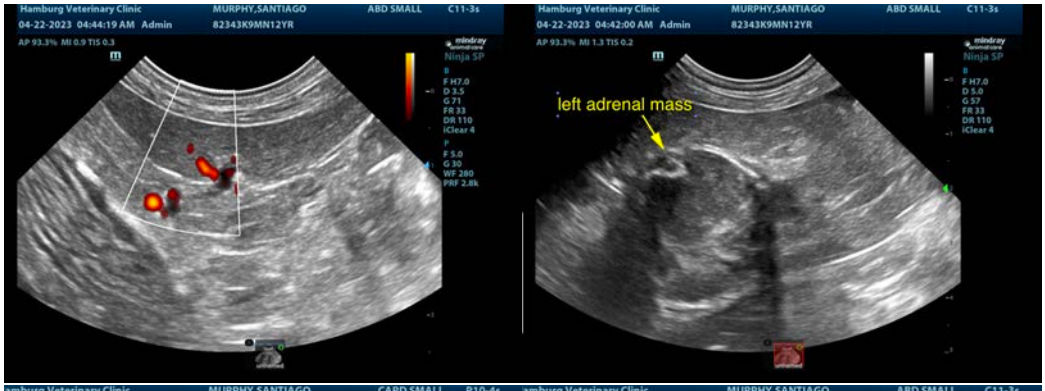

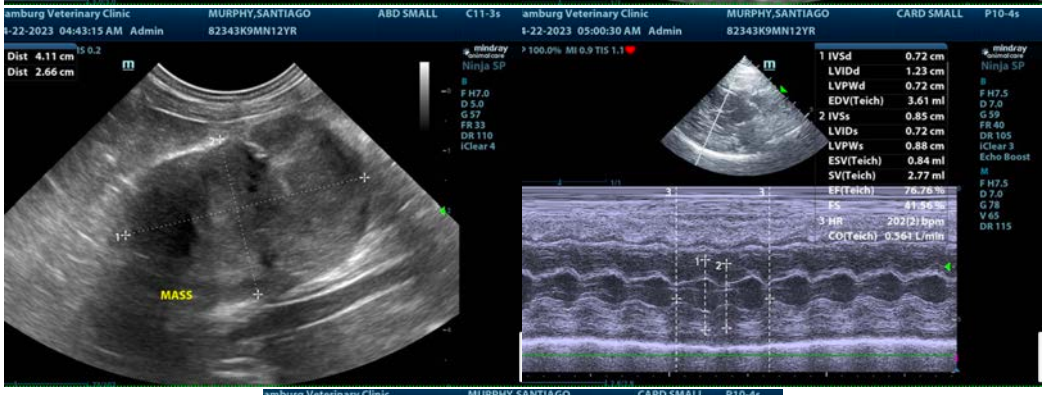

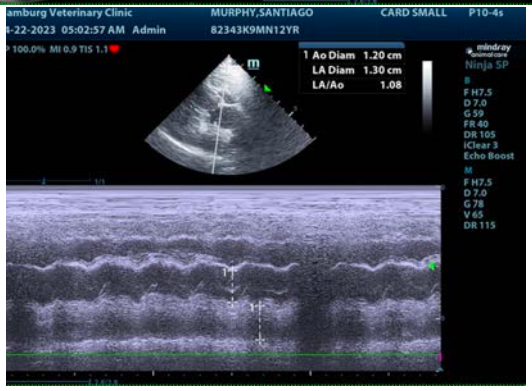

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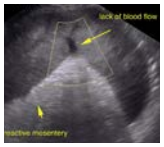
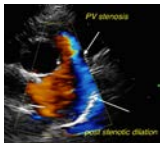
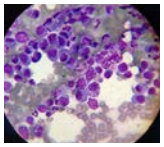
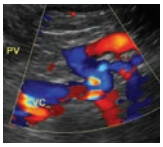

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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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