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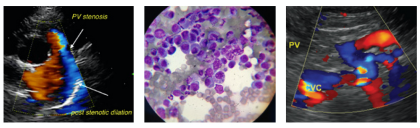

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Clinical Sonography & Telecytology
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PATIENT

Hocus Marshall

SPECIES

Feline

BREED

DSH

SEX

Spayed Female

AGE

11 Months

WEIGHT

11.3 Pounds

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Sarah Pender, CVT

HOSPITAL NAME

SVS Imaging QC

REFERRING VET

Dr. Abby Bowers

INVOICE

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PRESENTING CLINICAL SIGNS

Breathing fast, some coughing, O has just noticed over the last few days.
Abnormal PE/Chem/CBC/UA Results: Overweight, Muffled heart sounds ventrally, fast RR but not open mouth breathing. Radiographs showed a large amount of effusion in the chest, cannot visualize cardiac silhouette or exact margins of diaphragm. Abdomen does not show signs of free fluid, but the serosal detail of the small intestines is decreased. The stomach and liver do appear to be in their normal location, so my suspicion for diaphragmatic hernia is low. FeLv/FIV/HW negative, CBC: PLT low 65, rest of CBC wnl. SDMA 18, ALKP 112, rest of chem WNL

ULTRASONOGRAPHIC EXAMINATION OF THE HEART & ABDOMEN

FELINE CARDIAC PARAMETERS	**BODY WEIGHT** (kg)	**HR** (BPM)	**IVSd** (cm)	**LVIDd** (cm)	**LVWd** (cm)	**FS** (%)	**EF** (%)
NORMAL PARAMETER	------	150-240	0.3-0.6	1.0-2.1	0.25-0.6	35-67	80-100
PATIENT		222	Free hand 0.58	Free hand 0.98	Free hand 0.59	See image, below 65	See image, below 94
FELINE CARDIAC PARAMETERS	**LA/AO** (Boon)	**LA/AO HEART BASE** (Sisson)	**LA** 2D 4-chamber long axis AS to FW (Sisson) (cm)		**LVOT VEL.** (m/s)	**RVOT VEL.** (m/s)	**IVRT** (m/)
NORMAL PARAMETER	<1.5	0.88-1.79	0.7-1.7		<1.6	<1.3	40-60
PATIENT	1:1 (eyeballed)				Not available (angle of interrogation)	Not available (angle of interrogation)	NM

Adapted from June Boon,Veterinary Echocardiography,1998
Sisson D et al. JVIM 1991; 5: 232, Jacobs et al. Am J Vet Res 1985; 46:1705

Cardiac Presentation

The left atrium appears normal to the eye, i.e., the left atrium and aorta are equal in size. A mild amount of pleural effusion and scant amount of pericardial effusion are present. Fibrin, atelectatic and consolidated lung lobes are observed. There is no obvious lymphadenomegaly of the sternal lymph nodes or nodules along the pleura. Pulmonary edema is not visualized. A mass is not observed cranial or caudal to the heart. A moderate amount of tricuspid regurgitation (based on color flow Doppler) is present, with a velocity slightly less than 3.0 m/sec. No obvious abnormalities are noted with the tricuspid valve, but subtle abnormalities may be missed as Hocus was moving quite a bit. The aortic, pulmonic and mitral valves appear normal. No abnormalities are observed with the right auricle. Trivial aortic insufficiency is observed. Pseudohypertrophy of the left ventricle is noted, which is attributed to hypovolemia. Measurements of the left ventricle were performed “free hand” in longitudinal view in diastole intraventricular septum is 0.58 cm. The intraventricular lumen of the left ventricle is 0.98 cm. The left ventricular free wall in diastole measures 0.59 cm. Subjectively, the right atrium is mildly enlarged as it is the same size as the left atrium. An obvious arrhythmia was not noted during the echocardiogram. Obvious tricuspid valve dysplasia is not observed. However, a reevaluation of the tricuspid valve is warranted once Hocus is no longer dyspneic.

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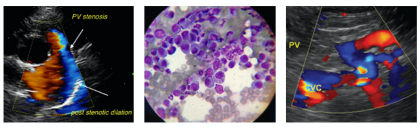

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Urinary System

The urinary bladder is well filled. The wall is smooth and regular. There is no evidence of cystoliths, polyps or a mass. A large amount of free floating sediment, most likely composed of mucus, crystals, and exfoliated cells, is observed. Obvious signs of cystitis are not appreciated. No abnormalities noted with the iliac trifurcation.

The left kidney measures 3.65 cm; mildly decreased (3.80-4.40 cm). The capsule is smooth. The definition of the cortico-medullary junction is considered decreased for a cat of Hocus' age. There are no signs of nephroliths or pyelectasia. The surrounding mesentery is not hyperechoic.

The right kidney measures 3.40 cm. A full longitudinal view of the right kidney is not possible. Findings are similar to the left kidney.

Adrenal Glands

The left adrenal gland measures 0.37 cm. No abnormalities are noted with the gland's shape, overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

The right adrenal gland measures 0.41 cm. Findings are similar to the left adrenal gland.

Spleen

The spleen is decreased in diameter at 5.4 mm; hypovolemia is suspected.

Liver

Subjectively, the liver is mildly hypoechoic, but it is homogeneous. The walls of the portal veins are hyperechoic and more prominent than usual. Venous congestion of the hepatic veins is present. An obvious portosystemic shunt is not visualized.

A trivial amount of echogenic material is visualized within the gallbladder, which is considered clinically insignificant. The biliary system is otherwise within normal limits.

Gastrointestinal

The stomach is filled with gas and food; subtle details may therefore be missed. However, no obvious abnormalities are observed.

Pancreas

No overt abnormalities are observed with the left limb of the pancreas. The surrounding mesentery is hyperechoic, however, it does not appear to be in attributed to the pancreas. There are no obvious signs of acute or primary pancreatitis.

The right limb of the pancreas is not visualized.

Other

A hypoechoic lymph node is present within the mesentery, measuring 6.3 mm x 11.9 mm. The intestines in the region of this lymph node are within normal reference range in terms of thickness, yet mild mucosal fogging is present and the surrounding mesentery is mildly to moderately hyperechoic.

Multiple lymph nodes are enlarged, with some having irregular contours. The lymph nodes affected are concentrated at the mesenteric root, as well as throughout the mesentery, which is moderately to markedly hyperechoic. The chain of mesenteric lymph nodes are more "plump" and hypoechoic than usual.

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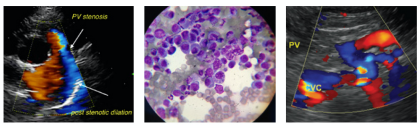

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Abdominal effusion is not visualized.

There are no signs of a diaphragmatic hernia.

ULTRASONOGRAPHIC FINDINGS

- Hocus appears hypovolemic based on the size of the lumen of the left ventricle and the spleen.
- Tricuspid regurgitation is present. There are no obvious abnormalities to suggest dysplasia of the tricuspid valve, however, a re-evaluation is suggested once Hocus' respiration is stable.
- An obvious primary cardiac abnormality is not identified to explain her clinical signs.
- As mentioned above, the pleural effusion, scant pericardial effusion, atelectatic lung lobes, and fibrin appear to be non-cardiac in nature. The main differential diagnosis is lymphoma, however, idiopathic chylothorax must be considered. Feline infectious peritonitis cannot be excluded.
- The lymphadenomegaly observed throughout Hocus' mesentery may be due to lymphoma, yet reactive hyperplasia is another possibility.
- The hepatic changes, including the mild and diffuse hypoechogenicity, may be due to lymphoma, but may also occur secondary to congestion.
- A few of the bowel loops have very mild fogging of the mucosa. The latter is a non-specific change, which may be associated with inflammation. Therefore, inflammatory bowel disease cannot be excluded. The changes may also occur secondary to congestion of the gastrointestinal tract.
- The absence of a well-defined corticomedullary junction one would normally expect for a cat of Hocus' age may be normal for Hocus, however, one must consider glomerulonephritis, interstitial nephritis, or pyelonephritis as possible differential diagnoses. Lymphoma, leptospirosis, and FIP must also be considered. Leptospirosis is considered much less likely if Hocus and her littermate do not go outdoors and if they do not live with a dog.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Butorphanol is recommended to help decrease respiratory effort and distress. This may be given as a CRI or subcutaneously every 4 hours. Buprenorphine is not suggested, as it can cause respiratory depression.

Ideally, thoracocentesis should be performed, and cytology of the fluid should be evaluated to rule out chylothorax, lymphoma, FIP. Fluid should be set aside for a possible culture and sensitivity depending on the cytology results.

A fundic exam is recommended.

A blood smear is recommended to evaluate the platelets and rule out platelet clumping.

Evaluation of the albumin/globulin ratio on the serum biochemical profile may help decrease one's suspicion of FIP.

Depending on the cytology results of the fluid, fine needle aspirates of the liver and lymph nodes may be necessary, providing the platelet count is above 50 x 10^9/L.

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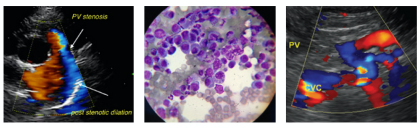

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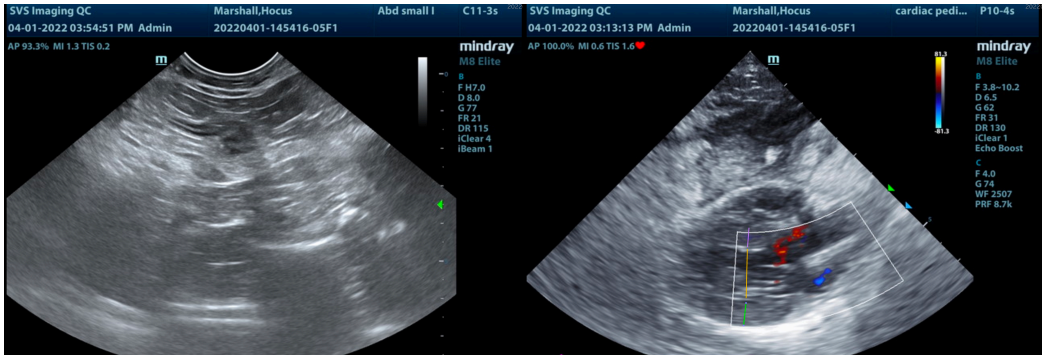
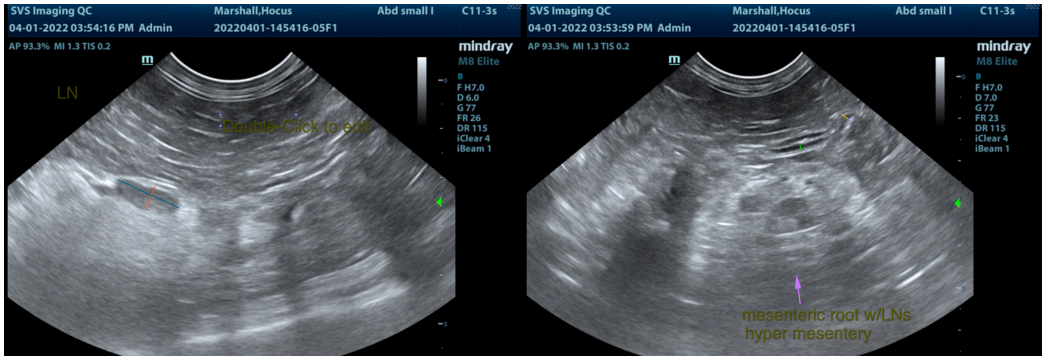
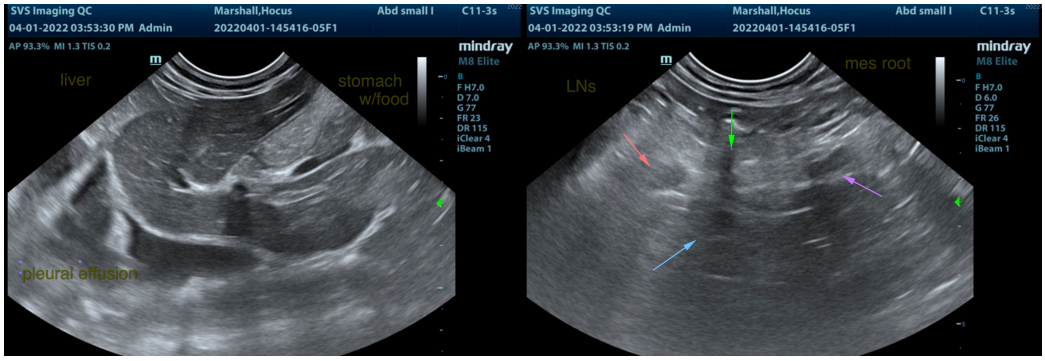
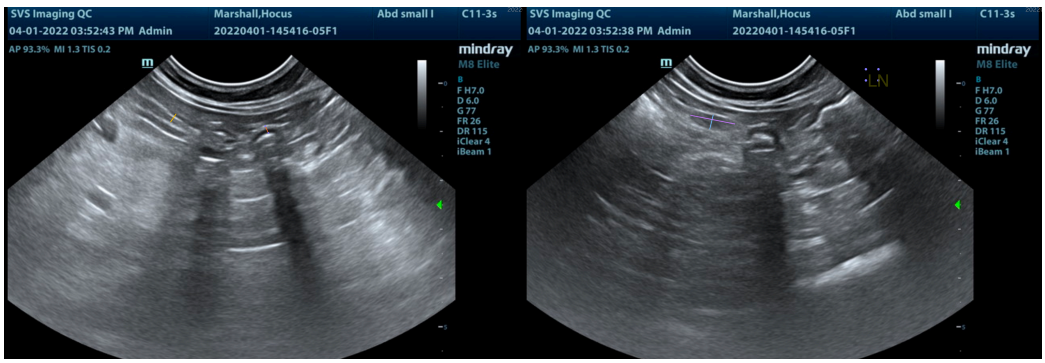
Please refer to the email sent the evening of April 1st for further details.









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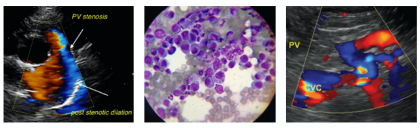

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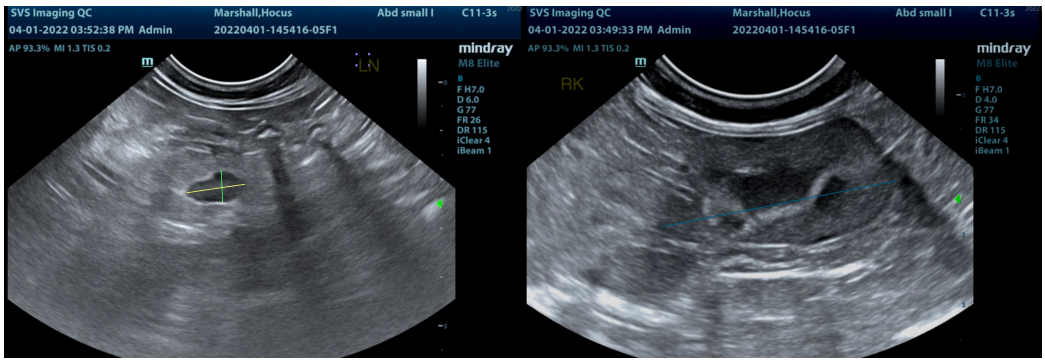

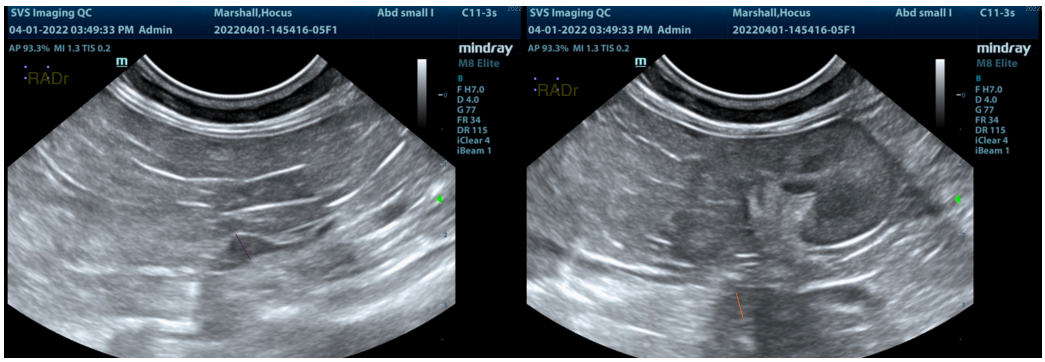

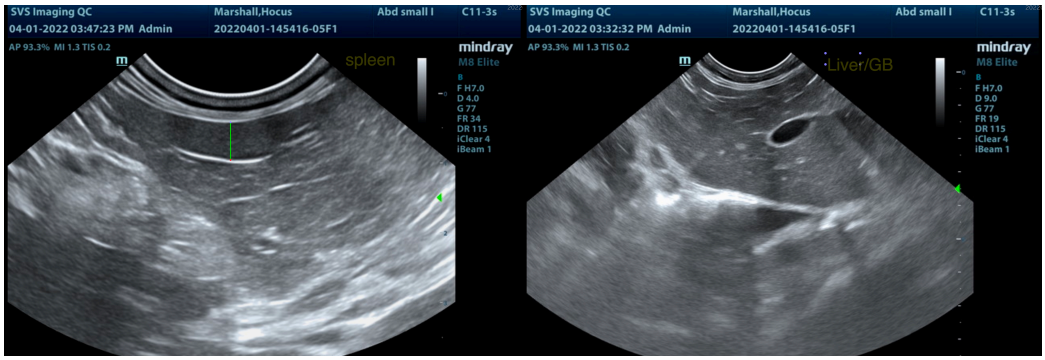

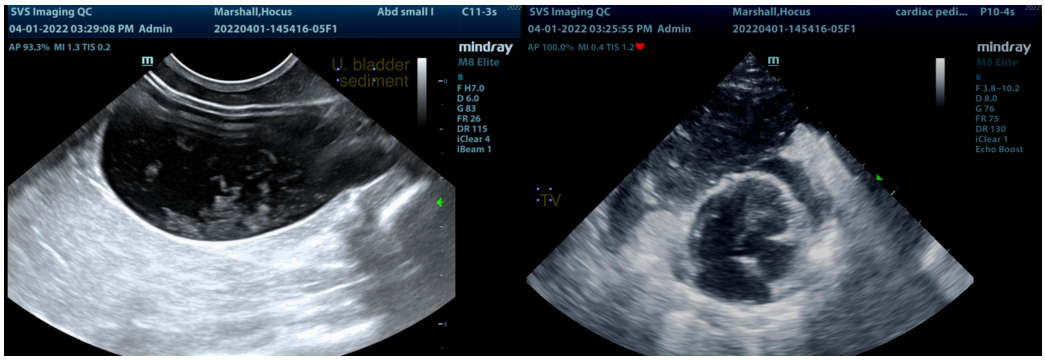

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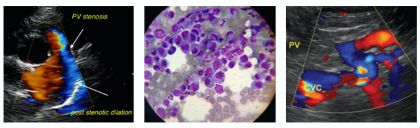

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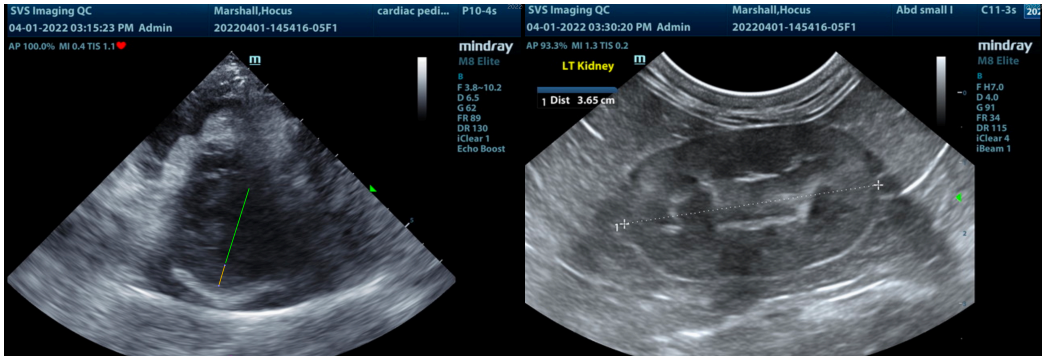

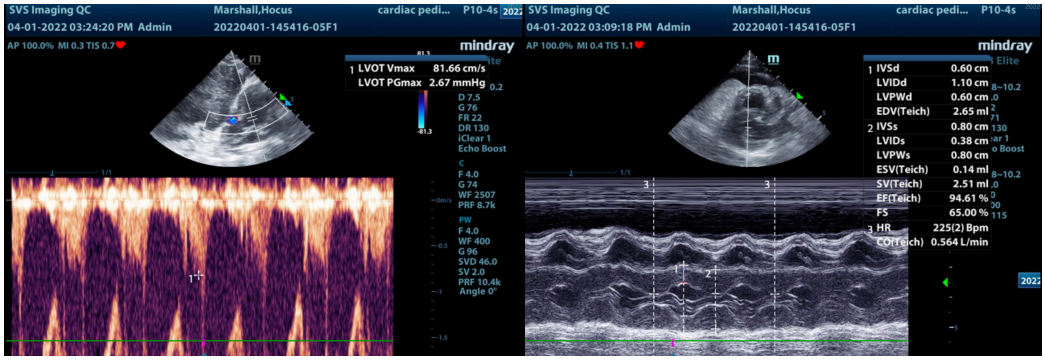

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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

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