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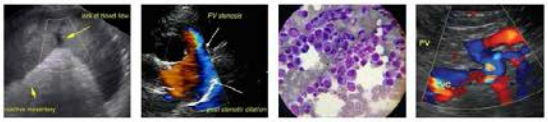


IMAGING PERFORMED BY
pawsonography@gmail.com 530-786-8340

**PATIENT**

Peppi Hoshi

**SPECIES**

Canine

**BREED**

Terrier X

**SEX**

Neutered Male

**AGE**

12 Years 7 Months

**WEIGHT**

25 Pounds

**INTERPRETED BY**

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

**IMAGING BY**

Loetitia Saint-Jacques, LVT

**HOSPITAL NAME**

Donner Truckee VH

**REFERRING VET**

Dr. Greg H

**INVOICE**

38356

**DATE**

6/3/22

## PRESENTING CLINICAL SIGNS

6/1/2022 history- p presented with 4 day hx inappetence, some lethargy. depressed, dehydrated on presentation. p has PCV of 20%, saline autoagglutination positive. Differential Diagnosis* r/o causes for IMHA such as neoplasia vs. other Findings: Six radiographs of the thorax and abdomen are submitted for evaluation. The thorax is within normal limits without evidence of cardiac or pulmonary pathology identified. The liver, spleen, both kidneys, and the bladder are visible and appear normal. A prostatic shadow is also identified on the right lateral but does not appear to be overly enlarged. The stomach and small bowel are empty. The colon contains only loosely formed fecal material. Abdominal serosal detail is considered good. Degenerative spinal changes are evident including narrowing of the disc space at T11 – T 12 and L3 – L4. The coxofemoral joints are not well seen, but no abnormalities are suspected. Assessment: The thorax and abdomen are within normal limits MEDS: Rx Prednisone at immune suppressive dose to be continued until otherwise instructed. Rx Omeprazole x 1 mo. Rx Doxycycline x 2 wks. Provided written rx for Clopidogrel 37.5 mg PO SID x 2 mo
Abnormal PE/Chem/CBC/UA Results: Reason for Visit: Client Communication on 6/2/2022 CBC with reticulocyte count: Hct=20% (L), Hgb=6.3 (L), MCV=83 (H), nRBC=4/100 WBC (H), mild neutrophilia with bands, moderate monocytosis, moderate anisocytosis, slight polychromasia, moderate rouleaux, and retic=81,600 (H). Path review: Pending. Tick PCR: Pending. 6/3/2022 PCV 24%

## ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

### *Urinary System*

The urinary bladder is well distended with anechoic contents. The wall is smooth and regular. No abnormalities are noted with the trigone or proximal urethra, and there is no evidence of sediment, cystoliths, polyps or a mass. A small amount of anechoic effusion is visualized ventral to the urinary bladder.

**Prostate**

The prostate is homogenous and measures 1.25 cm, which is within normal limits for a neutered male.

**Kidneys**

The **left** kidney measures 4.30 cm. The capsule is smooth. The cortex is very mildly hyperechoic, i.e. it is hyperechoic to the spleen. A very mild loss of the normal definition of the cortico-medullary junction is present. Mineralizations of the diverticulae and pelvis are present, without evidence of nephroliths or pyelectasia. An accumulation of intrapelvic fat is noted. The surrounding mesentery is not hyperechoic.

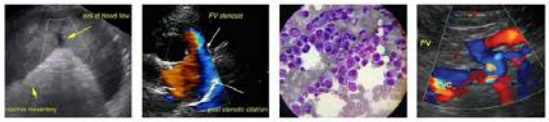
The **right** kidney measures 4.02 cm. Findings are similar to the left kidney other than the presence of mild pyelectasia (2.28 cm) in the right (noted in the longitudinal view).

**Aortic bifurcation/trifurcation**

No abnormalities observed.

### *Adrenal Glands*

The **left** adrenal gland measures 0.78 cm at the cranial pole, 0.67 cm at the caudal pole. The cranial pole is mildly enlarged and mildly "plump". It has a hyperechoic area within the center of





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the pole, which may be due to fat, mineralization, ischemia and/or fibrosis. A hyperechoic area is also noted in the caudal pole. There are no signs of neoplasia. No abnormalities are noted with the gland's overall architecture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

The **right** adrenal gland measures 0.74 cm at the cranial pole, 0.54 cm at the caudal pole. The cranial pole is round and nodular, however, there are no abnormalities with the echogenicity or echotexture. A mass is not visualized. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

### *Spleen*

Subjectively, mild splenomegaly is present. It is within normal limits in architecture, echotexture, and echogenicity. The capsule is curvilinear and smooth. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified. The mesentery surrounding the spleen is mildly hyperechoic, which is attributed to the presence of the ascites.

### *Liver*

Mild hepatomegaly with "swelling" and rounded borders are suspected. The liver has a diffuse, mildly coarse or granular echotexture. It is difficult to assess the echogenicity due to the surrounding ascites. A mildly hypoechoic nodule measuring 1.22 cm in diameter is noted subcapsularly. It does not disrupt the integrity of the capsule. Subjectively, the hepatic veins are slightly dilated, or congested. The portal vein is not overtly dilated.

The gallbladder is moderately distended with echogenic material (sludge) within the lumen. The sludge is hyperechoic, free floating and gravity dependent. A large portion of the bile is inspissated and remains immobile. The wall of the gallbladder is mildly thickened and hyperechoic in certain areas, and measures up to 2.25 mm. However, a circumferential hypoechoic "halo effect" surrounding the gall bladder is observed This is suggestive of edema and/or free fluid. The portions of the cystic and/or common bile ducts observed are not dilated or tortuous, i.e. there are no signs of an obstruction or a rupture of the gallbladder.

### *Gastrointestinal*

Ingesta is present within the lumen of the stomach. The gastric wall is within normal limits in thickness and the wall layers are well defined. No obvious abnormalities are observed with its peristalsis.

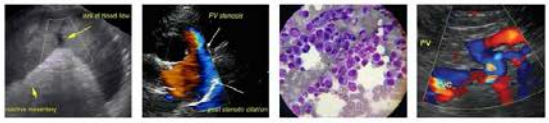
No abnormalities are noted with the small intestinal wall thickness, including the duodenum, or the definition of the wall layers. Ingesta is present within the loops of jejunum. Abnormally dilated loops of bowel are not observed.

Gas is present in the transverse colon.

The colonic wall is not thickened and mural detail is considered normal.

### *Pancreas*

The **right limb** is mildly enlarged and diffusely hypoechoic. It appears edematous with irregular contours. Pinpoint and small punctate, hyperechoic foci are noted in the parenchyma, which may be due to fibrosis secondary to age-related changes and possible previous episodes of pancreatitis, as well as amyloid deposition. The surrounding mesenteric fat is mildly to moderately hyperechoic, suggestive of saponification. It is difficult to determine if the changes in





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the mesentery are due to primary pancreatitis, secondary to ascites, or possibly a combination of both. Overt signs of neoplasia are not noted.

The **left limb** has a very mildly coarse echotexture, which is considered secondary to age related changes. The mesentery surrounding the left limb is not overtly hyperechoic.

**Other**
**Lymph nodes**
No obvious abnormalities are observed

**Abdominal effusion**
A small to moderate amount of ascites is observed throughout the abdomen.
Anechoic effusion is visualized in the region of the spleen and ventral to the urinary bladder. A moderate amount is also noted between the liver lobes and between the liver and the diaphragm, cranial to the right kidney and in between a few loops of bowel.

**Heart**
A brief video clip of the heart was submitted. Pleural effusion is not identified, however, a scant amount of pericardial effusion is suspected at the apex of the left ventricle (4 chamber, apical view). An obvious mass is not observed on evaluation of the cardiac chambers.

Moderate myxomatous degeneration of the septal leaflet mitral valve is present.

No obvious abnormalities with contractility (measurements not performed).

The right atrium appears mildly dilated

No obvious signs of pulmonary edema are noted.

## ULTRASONOGRAPHIC FINDINGS

• **Pancreas**: Primary pancreatitis is suspected, however, the ascites may be contributing to the severity of the hyperechoic mesentery.

• **Liver**: Hepatomegaly is suspected secondary to immune-mediated hemolytic anemia (IMHA). There are no obvious signs of neoplasia. The hypoechoic nodule may be due to nodular hyperplasia or regeneration. A fine needle aspirate would be required to confirm this suspicion.

• **Gallbladder**: The appearance of Peppi's gallbladder is not consistent with a "classical" mucocoele. However, a mucocoele in its early development cannot be excluded, nor can cholecystitis. There are no obvious signs of a rupture. Gallbladder sludge is often clinically insignificant, however, gastroesophageal reflux disease (GERD), can occur in some patients. Obtaining a history regarding signs of GERD from the client is suggested. Treatment with an anti-acid, proton pump inhibitor or ursodeoxycholic acid may be required.

• **Spleen**: Splenomegaly with preservation of the normal architecture. The most likely cause is extramedullary hematopoiesis due to IMHA. Other differential diagnoses include, splenitis due to antigenic stimulation and secondary inflammation, hypersplenism and reactive hyperplasia.

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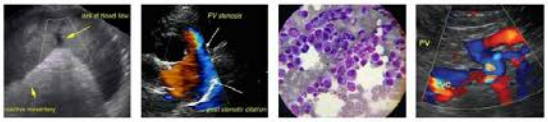

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Neoplasia, such as lymphoma, or other round cell tumour, is considered highly unlikely based on its appearance, but could only be excluded with certainty by performing an aspirate.

• **Adrenal glands**: Bilateral adrenomegaly with possible nodules; most likely an incidental finding. Adrenal hyperplasia secondary to chronic illness, which is a form of stress. Benign adenomas are suspected, myelolipomas, and nodular hyperplasia, as well as age-related fibrosis may also explain the hyperechoic region at the cranial pole of the left gland. Hyperplasia due to pituitary dependent hyperadrenocorticism, that is not yet clinical (and may never become clinical) is also possible.

• **Kidneys**: Pyelectasia of the right kidney is very mild and may be physiological. It may be due to polydipsia and polyuria, as well as intravenous fluids. Pyelonephritis is another differential diagnosis. Other changes are consistent with age-related degeneration.

• **Ascites**: The ascites may be due to vasculitis secondary to IMHA and/or pancreatitis. Subjectively, Peppi's right atrium is not large enough to cause ascites.

• **Heart**: The right atrium is subjectively enlarged, albeit very mildly. This can occur in patients with anemia. The presence of pericardial effusion is not conclusive, and if present, it is an extremely small amount that may occur with vasculitis secondary to IMHA, pancreatitis, as well as infectious diseases. Moderate myxomatous degeneration of the mitral valve.

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Fine needle aspirates are not considered necessary at this time based on the findings of today's ultrasound. However, one could pursue them at a later date if there is difficulty obtaining remission.

Urine culture and sensitivity to exclude pyelonephritis as it can be difficult to exclude this disease based on ultrasound.

Arterial blood pressure.

If possible, an echocardiogram is suggested to obtain baseline cardiac measurements an ensure that the administration of prednisone does not cause Peppi's heart disease to decompensate. Another option is to administer dexamethasone (less mineralocorticoid effect).

A second immunosuppressive drug is strongly recommended in an attempt to decrease the dose of steroids as much and as quickly as possible.

Tests for vector borne diseases are pending.

*Leptospira* spp. tests suggested (PCR on serum and urine prior to administration of antibiotics)
Obtain a history regarding signs of GERD, i.e. treatment with an anti-acid, proton pump inhibitor or ursodeoxycholic acid may be required.

Ursodeoxycholic acid for the gallbladder is not recommended at this time (not for at least 2 weeks-one month), while stabilizing his IMHA.

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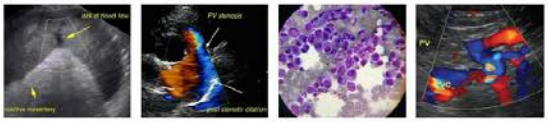

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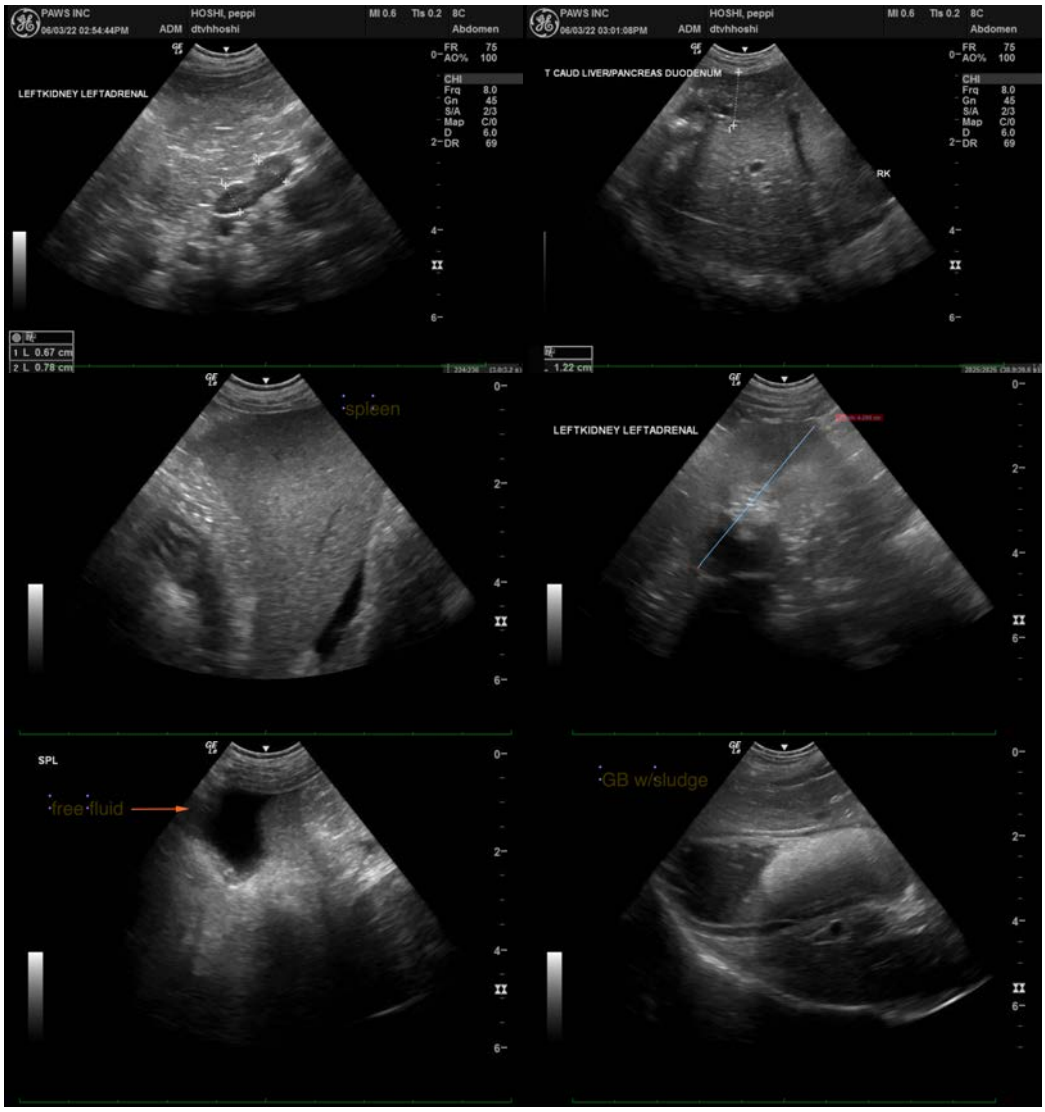
+/- Spec cPL, although will not change treatment plan

Analgesia (gabapentin, methadone) for treatment of pancreatitis.
Further diagnostics for HAC are not recommended if Peppi was not demonstrating clinical signs prior to his current signs of illness (false positives possible).



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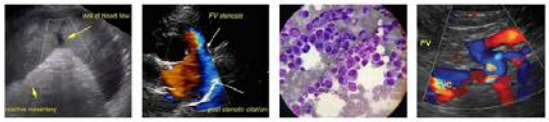

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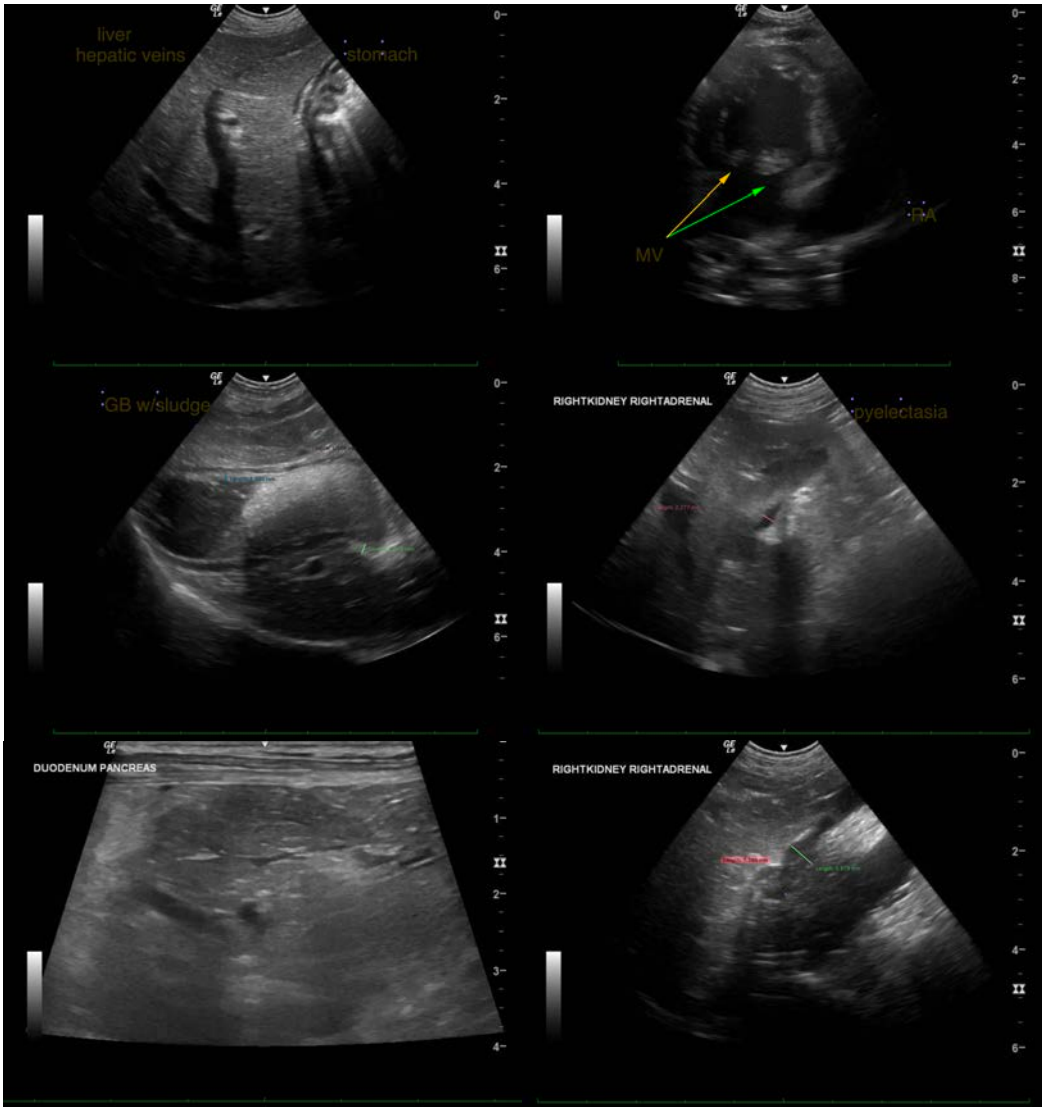


**The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

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.

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