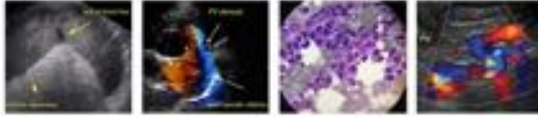

PATIENT

Daisy Giustino

SPECIES

Canine

BREED

Sheltie

SEX

Female

AGE

11 years

WEIGHT

21 Pounds

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Loetitia Saint-Jacques, RVT

HOSPITAL NAME

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REFERRING VET

Dr. Greg H

INVOICE

31740

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PRESENTING CLINICAL SIGNS

History: Check anorexia and lethargy. Patient has had near compete anorexia for 4 days and has no interest in drinking water. Trembling and lethargic during this span. No S/V/D. Hx chronic cough for the last 2-3 yrs that has not increased in frequency or severity. No historical problems/current medications reported. Some travel and not up to date on HWT/HWP. Owner is unsure if she is up to date on vaccines. Regular vet records not available at this time 1) Hematochezia and anorexia with abnormal cPL, likely pancreatitis - r/o: GIFB, parasite, open
Abnormal PE/Chem/CBC/UA Results: CBC/chem: Glob=5.4 (H), moderate monocytosis, and suspected bands, otherwise unremarkable. 4Dx test: Negative. cPL: Abnormal.

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The **urinary bladder** is well distended. The wall is smooth and regular. No abnormalities are present with the trigone or proximal urethra. A small amount of free floating sediment is present, however, there is no evidence of cystoliths, polyps or a mass.

Uterine body. The lumen is filled with hypoechoic fluid with flocculent (echogenic) material. The interior wall of the uterus is mildly hyperechoic, suggestive of inflammation.

Uterine horns. Both the **left** and **right** uterine horns are severely dilated; left measuring up to 5.0 cm in diameter), with a thickened wall (2.2 mm) and severely echogenic fluid (pus) within the lumen. Right (5.6 cm) with a 2.3 mm wall.

Ovaries

Left ovary is heterogeneous with anechoic cyst-like structures. The ovary measures 1.26 cm in diameter x 2.56 cm in length.

Right ovary 1.60 cm in diameter x 3.00 cm in length. Two larger cyst-like structures are observed, compared to the more heterogeneous left ovary.

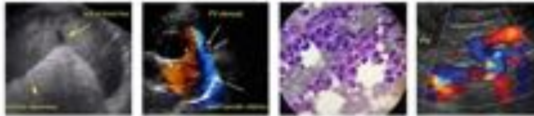
Kidneys

The **left kidney** measures 5.32 cm. The capsule is smooth. The cortex is very mildly hyperechoic and 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. An encapsulated, anechoic structure, measuring 0.49 cm x 0.43 cm is noted within the cortex at the anti-mesenteric border. It is most consistent with a benign cyst. Blood flow is within normal limits.

The **right kidney** measures 5.33 cm. The capsule is smooth. The cortex is very mildly hyperechoic and 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 encapsulated, anechoic structure, measuring 0.50 cm is noted within the cortex. It is most consistent with a benign cyst. A nephrolith measuring 0.45 cm is observed. Blood flow is within normal limits.

Aortic bifurcation/trifurcation No abnormalities observed.

Adrenal Glands



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The **left** adrenal gland measures 0.53 cm at the cranial pole, 0.45 cm at the caudal pole. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

The **right** adrenal gland measures 0.68 cm in diameter. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

Spleen

The spleen is within normal limits in size, architecture, echotexture, and echogenicity. The capsule is smooth. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

Liver

There are no obvious signs of hepatomegaly and its borders are smooth and sharp. A diffuse, mildly coarse or granular echotexture is observed. It is within normal limits in echogenicity. An anechoic structure measuring 1.62 cm in diameter x 1.79 cm in length is noted. This structure is actually part of a larger anechoic structure with a mildly irregular capsule, measuring approximately 2.97 cm in diameter x 2.04 cm in length, which is consistent with a benign cyst.

A well-circumscribed, hyperechoic nodule measuring 1.10 cm in diameter x 1.14 cm in length is noted. It is suggestive of nodular regeneration or a lipoma. It has a small hypoechoic centre when imaged from a different plane, however, it is not consistent with a true "target" lesion. A few, 1-2 mm, hyperechoic nodules are noted throughout the parenchyma, which are attributed to fat, fibrous tissue, and/or mineralization. There are no obvious signs of neoplasia.

Perivascular cuffing is observed, which are most likely due to myelolipomas, which are not considered clinically significant. No major abnormalities are observed with the larger hepatic vessels.

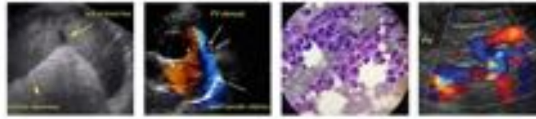
The **gallbladder** (GB) is severely distended with a large amount of free floating, gravity-dependent and inspissated echogenic material (sludge). The sludge is adhered to the intramural wall circumferentially. The GB wall is mildly thickened and mildly hyperechoic. Sludge is present within the cystic duct, which is mildly dilated (0.4 cm). The common bile duct is also dilated at 0.46 cm. It measures 0.36 cm as it enters the duodenum (i.e., mildly dilated). Neither duct is tortuous. The parenchyma surrounding the GB is not overtly hyperechoic and there are no signs of an obstruction. Intra-hepatic bile ducts are not distended.

Gastrointestinal

Gas 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.

The small intestinal wall thickness, including the duodenum, is within normal limits and the definition of the wall layers is preserved. Abnormally dilated loops of bowel are not observed.

The colonic wall is not thickened and mural detail is considered normal. Gas and formed stools are present within the colon.



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Pancreas

The pancreas has a mildly coarse echotexture, which is considered secondary to age related changes, however, previous episodes of pancreatitis cannot be excluded. There are no signs of neoplasia.

Other

Lymph nodes No obvious abnormalities are observed, however, the uterine horns are so enlarged that subtle abnormalities may be overlooked.

Abdominal effusion is not visualized.

Heart

A brief video clip of the heart was submitted. Pericardial and pleural effusion are not identified. A mass is not observed on evaluation of the cardiac chambers.

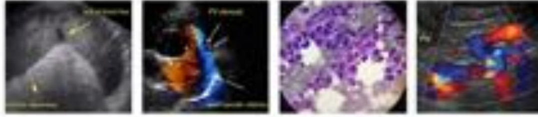
Myxomatous degeneration of the mitral (moderate) and tricuspid (mild) valves is present, with prolapse of the mitral valve. Mild left atrial and left ventricular enlargement are suspected, however, measurements not performed. No obvious abnormalities with contractility

ULTRASONOGRAPHIC FINDINGS

- **Reproductive system**: Pyometra
- **Liver**: Reactive hepatopathy suspected, in addition to a benign cyst and occasional hyper and hypoechoic nodules. The latter may be due to nodular regeneration or a lipoma, as well as nodular hyperplasia. There are no obvious signs of neoplasia.
- **Gallbladder**: Gallbladder sludge. A mucocoele is not present, however, Shetland sheepdogs are predisposed to the development of mucocoeles. 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 may be required. Ursodeoxycholic acid should be considered in a month or so, i.e. once Daisy has fully recovered from her current illness.
- **Kidneys**: Age related changes, with benign cysts and a nephrolith (right kidney).
- **Pancreas**: Although there are no overt signs of active pancreatitis, the severe intra-abdominal inflammation and the stress of undergoing surgery and anesthesia may cause pancreatitis post-operatively, particularly with an abnormal SNAP cPL. Maintenance of arterial blood pressure will be important, without creating volume overload.
- **Heart**: Myxomatous degeneration of the mitral (moderate) and tricuspid (mild) valves with mild left atrial and ventricular enlargement (measurements not performed).

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Exploratory laparotomy to perform an emergency ovariohysterectomy



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A suggested anesthesia protocol is the following based on the mild left atrial and left ventricular enlargement noted on the brief echocardiogram

- Premedication with an opioid, such as hydromorphone, butorphanol, or methadone, +/- *low dose* of midazolam. Avoid dexmedetomidine (label indications).
- Avoid acepromazine, atropine and glycopyrrolate. The latter two drugs should only be considered if a patient becomes bradycardic during the procedure.
- Preoxygenation for 10-15 minutes (minimum 5 minutes).
- Induction with alfaxalone, or propofol, if alfaxalone is not available. Avoid ketamine, if possible.
- Monitor arterial blood pressure during the procedure. The mean blood pressure should be between 90 - 100 mm Hg. If the patient's blood pressure is decreased, dobutamine is suggested, i.e. fluid boluses should *not* be administered to avoid volume overload and congestive heart failure.
- The intravenous fluid rate should be approximately ¼ of the DAILY maintenance requirements, or 1.75-2 ml/kg/hour to avoid fluid overload.
- Local anesthesia is *strongly* recommended to decrease MAC and the amount of isofluorane necessary, as the latter tends to cause hypotension, particularly in cardiac patients. For example, a lidocaine "splash" of the abdominal incisions, as well as injections of the ovarian pedicles.

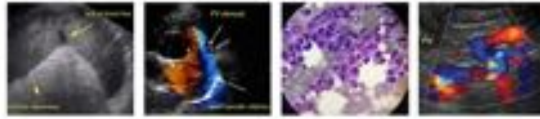
- Monitoring of the resting (sleeping) respiratory rate (RRR) is recommended once a day. The RRR should NOT EXCEED 30 breaths per minute (bpm). If the respiratory rate is greater than 30 bpm, *or* if there is a gradual increase (over a day or two) toward 30 bpm, the patient should be evaluated immediately for congestive heart failure and the appropriate treatment initiated.

- If necessary, weigh Daisy pre and post operatively. If a large weight gain has occurred (despite removal of uterus), furosemide may be administered at 1-1.5 mg/kg IV once.

Analgesia – IV, ideally a CRI of an opioid (e.g. fentanyl), and CRI of lidocaine and ketamine (careful of heart rate)

gabapentin

In the future: The use of ursodeoxycholic acid (Ursodiol) may be considered, however, it should not be started concurrently with the other medications. Furthermore, it should be administered judiciously, at a very low dose, and slowly up-titrate to decrease the risk of GB rupture. For example, 3 mg/kg PO once a day for 5-7 days, then 5 mg/kg PO once a day for 5-7 days, then 7.5 mg/kg PO once a day for 5-7 days, then 10 mg/kg PO once a day for 5-7 days. She may not be able to tolerate the 15 mg/kg/day dose. Also, the dose should be divided BID and given with a meal to decrease the risk of nausea, cramps, vomiting and diarrhea.



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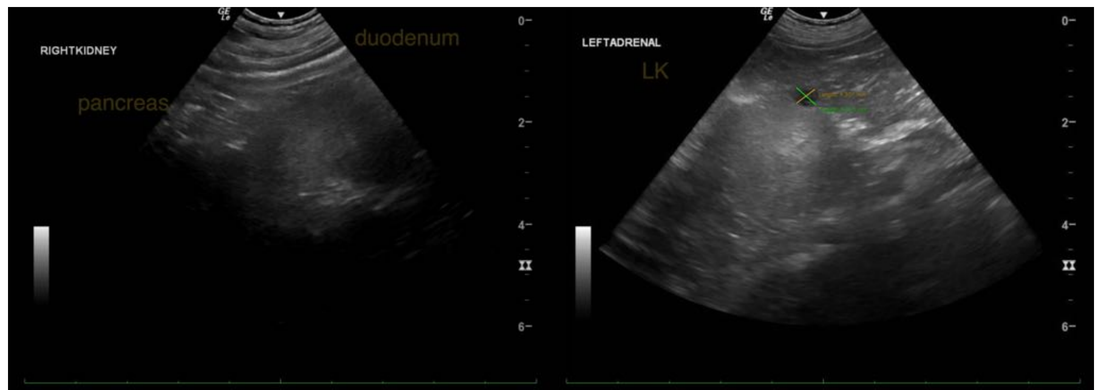

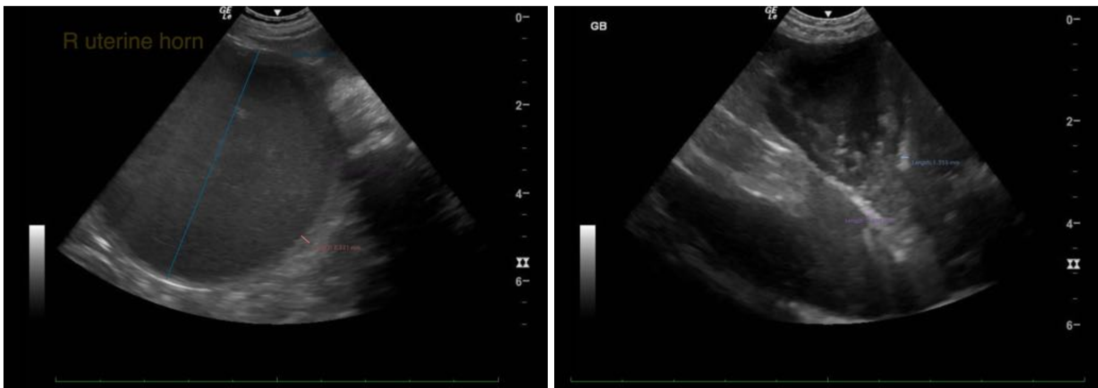

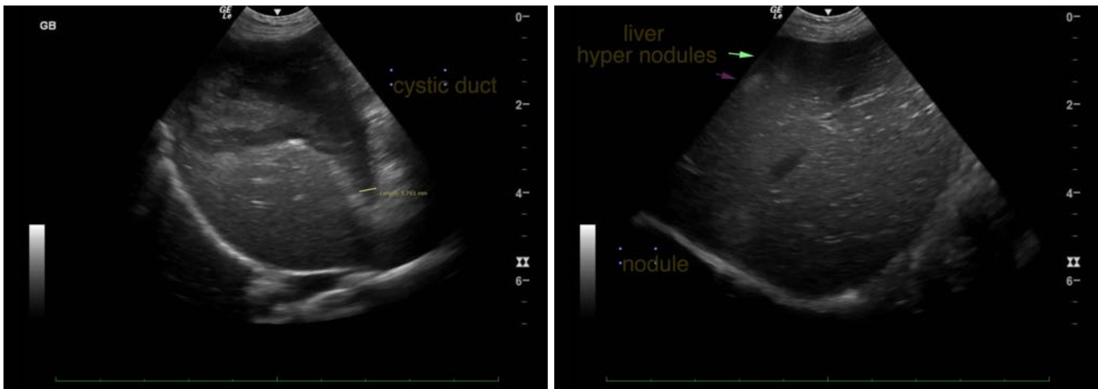

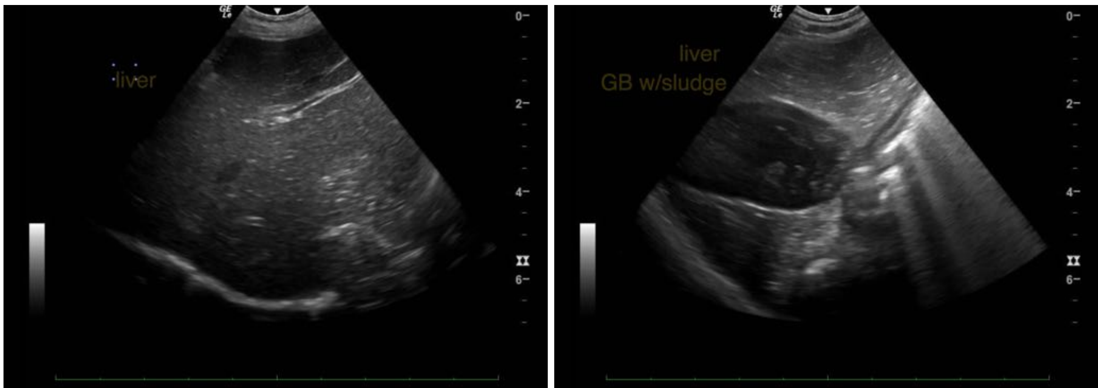

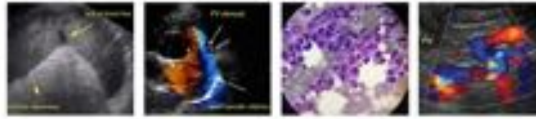

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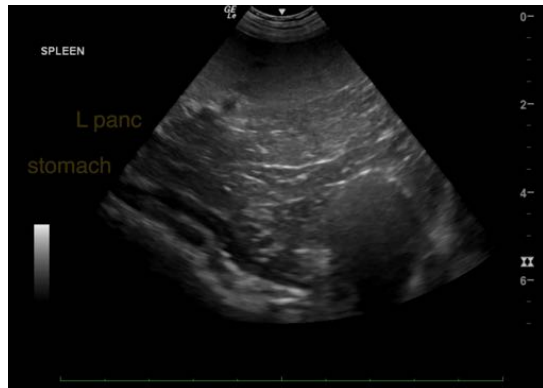

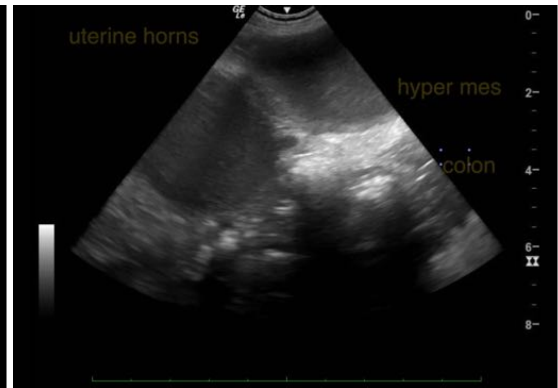

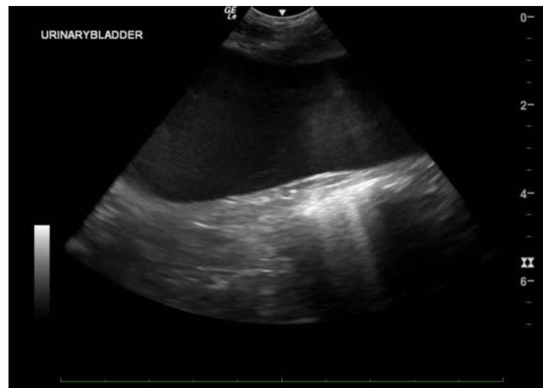

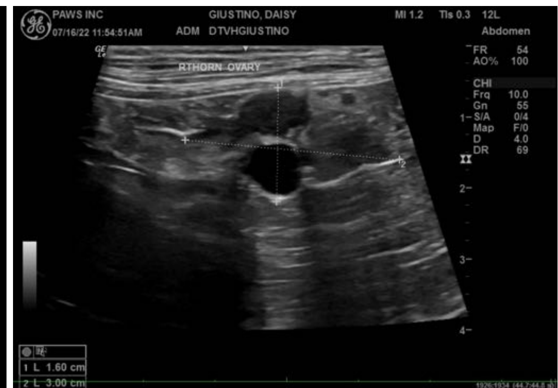

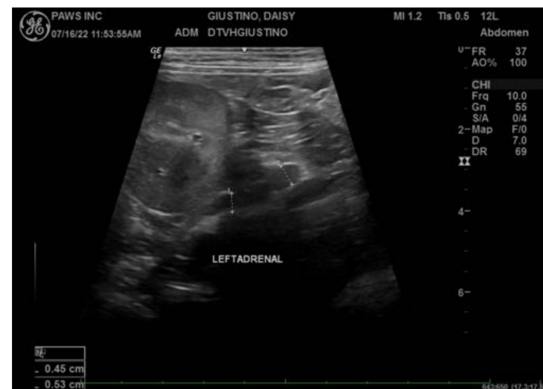

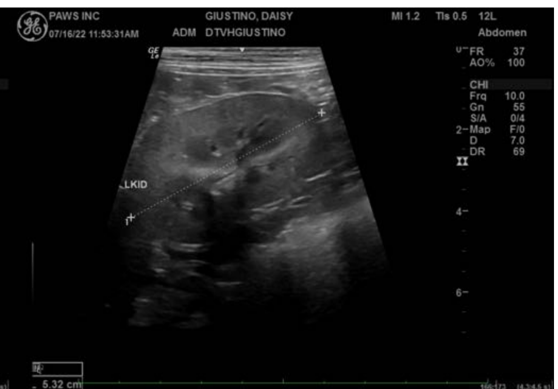

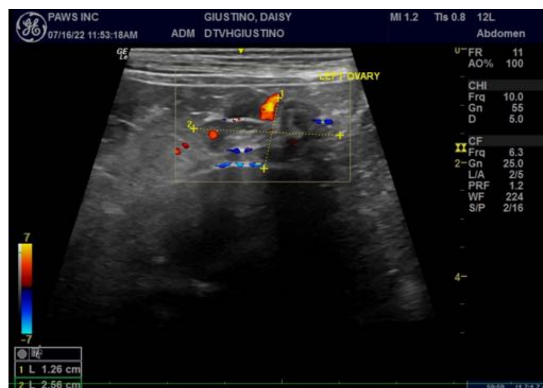

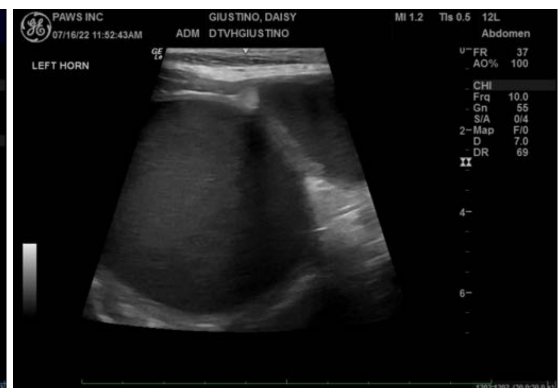

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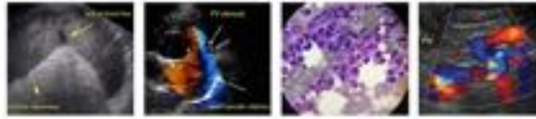

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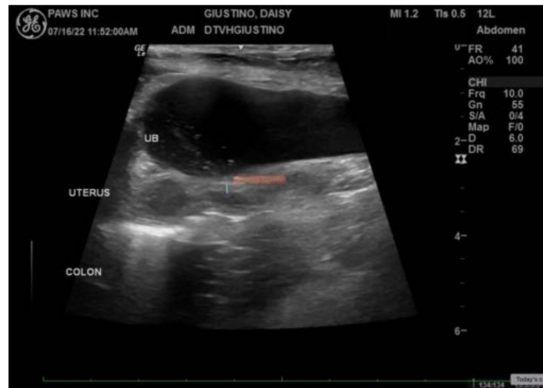

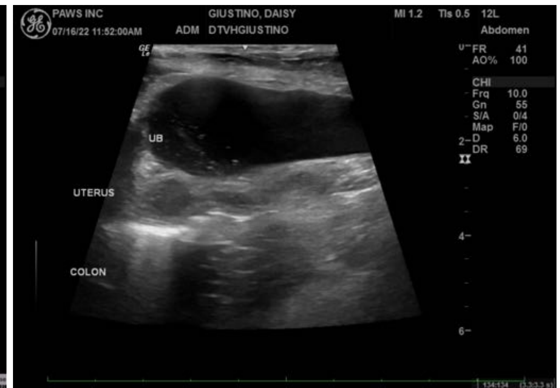

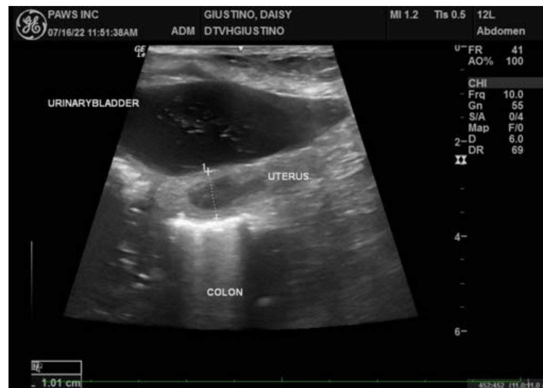

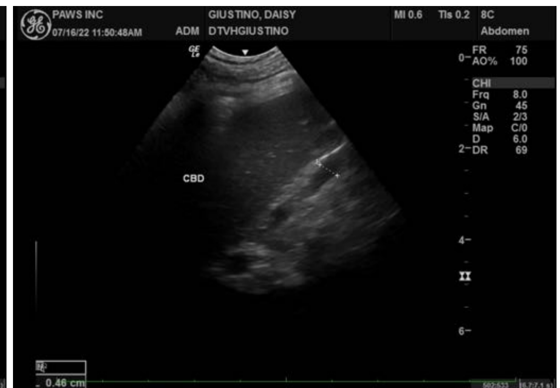

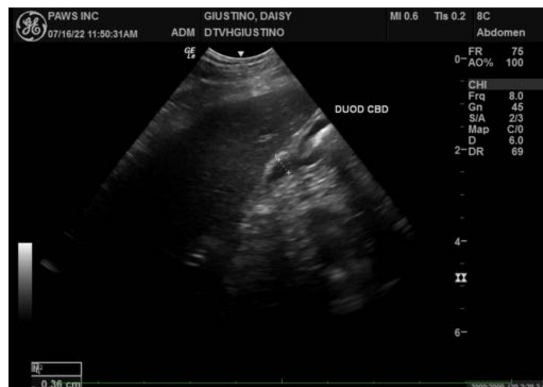

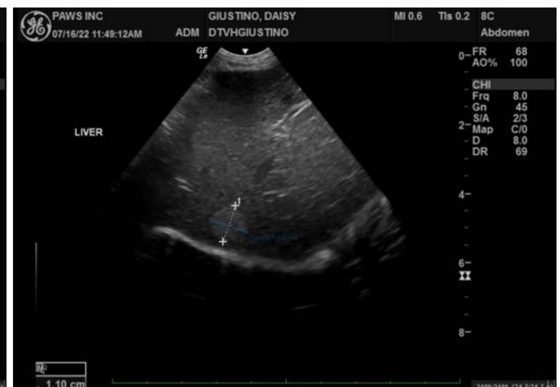

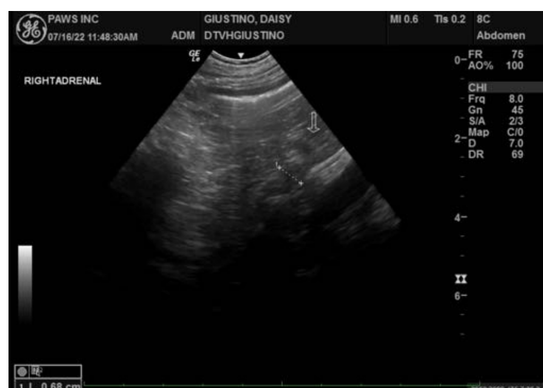

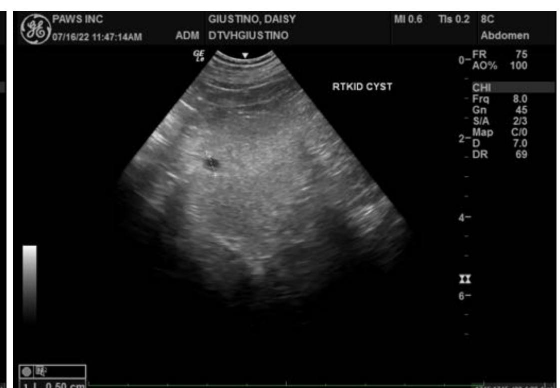

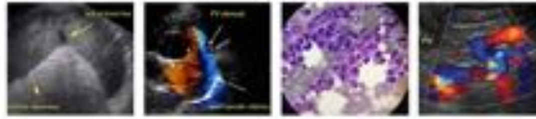

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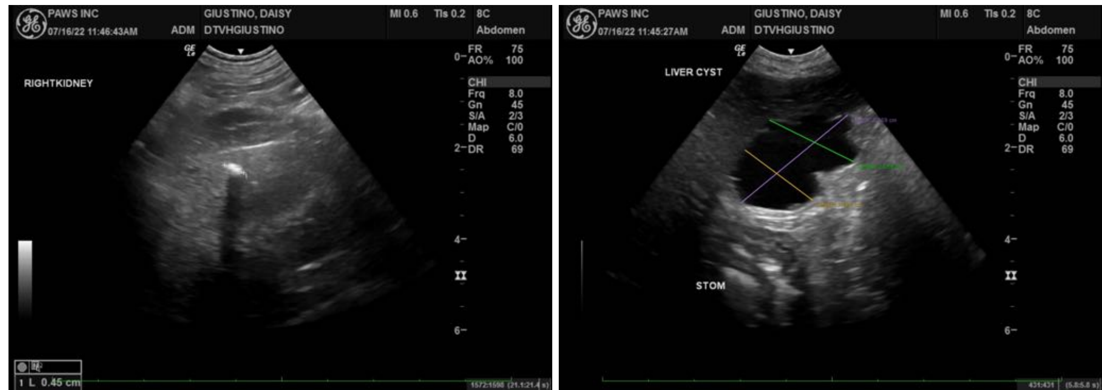

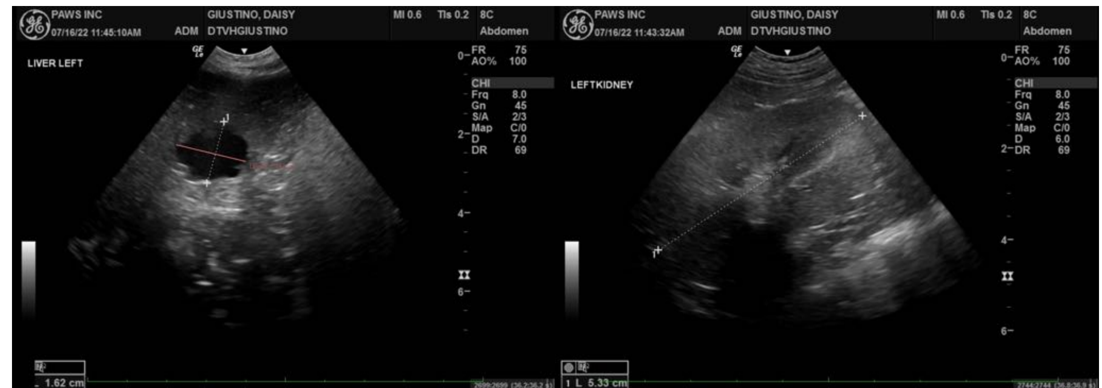

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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