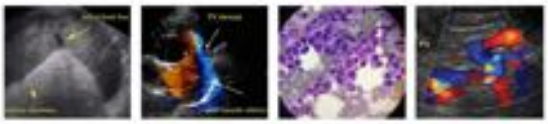

PATIENT

Perdita Kernitzi

SPECIES

Canine

BREED

Chihuahua

SEX

Spayed female

AGE

16 years

WEIGHT

4.3 lbs

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Loetitia Saint-Jacques, RVT

HOSPITAL NAME

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PRESENTING CLINICAL SIGNS

History: No sedation and a bit squirmy. History: off and on diarrhea, vomiting and anorexia for many years per owner, new client, was seen on 7-15-22 for HE. We are running repeat lab work and UA today while patient is here Physical exam findings: NSF Abnormal previous BW values: HCT 54%, BUN 56, Cr 1.9, low globulin and TP. Suspect some sort of protein losing enteropathy or nephropathy. Reason for Ultrasound: repeat HE, underweight, PLE or PLN?
Abnormal PE/Chem/CBC/UA Results: Abnormal from today: AST 97 (H), BUN 49 (H), Cr (1.7), BUN/Cr 29 (H), PSL 202 (H), CPK 1327 (H), increased platelets, T4 normal, UA trace proteinuria. negative fecal and negative accuplex.

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder is partially filled, but its contents are anechoic. The wall is very mildly irregular in certain regions. The latter may be due to the bladder not being well distended. No abnormalities are present with the trigone or proximal urethra. A trivial amount of free floating sediment is present, however, there is no evidence of cystoliths, polyps or a mass.

Kidneys

The **left** kidney measures 2.44 cm. The capsule is smooth. Its overall architecture, including the definition of the cortico-medullary junction, is preserved. Occasional mineralizations of the diverticulae and pelvis are present, without evidence of nephroliths. Pyelectasia is present 0.24 cm in the transverse view. The surrounding mesentery is not hyperechoic.

The **right** kidney measures 2.83 cm. The capsule is smooth. Its overall architecture, including the definition of the cortico-medullary junction, is preserved. Occasional mineralizations of the diverticulae and pelvis are present. There are no signs of nephroliths or pyelectasia. The surrounding mesentery is not hyperechoic.

Aortic bifurcation/trifurcation No abnormalities observed.

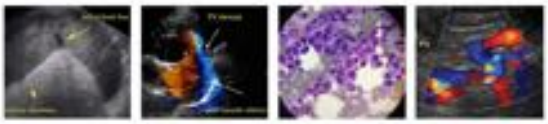
Adrenal Glands

The **left** adrenal gland measures 0.25 cm at the cranial pole, 0.25 cm at the caudal pole. Corticomedullary definition is preserved, and no major 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 approximately 0.27 cm at the cranial pole, 0.32 cm at the caudal pole. It is 1.00 cm in length. 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 appears "generous" in width for a dog of Perdita's stature. It has a miliary to mottled echotexture. Ill-defined heterogeneous "patches" are observed (e.g., 0.57 cm in diameter x 1.32 cm in



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length), in addition to the diffusely mottled echotexture. The capsule is smooth, yet rounded. Mild perivascular cuffing, consistent with myelolipomas is observed; these are not considered clinically significant. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified. The tail of the spleen is rounded and heterogeneous, with a mottled echotexture, in addition to hypoechoic nodules (0.40 cm in diameter). The diameter of the tail is approximately 1.5 cm.

Liver

There are no obvious signs of hepatomegaly and its borders are smooth and sharp, to mildly rounded. No abnormalities are observed with the liver's echogenicity. A diffuse, mildly coarse or granular echotexture is observed. However, the intercostal view of the right liver shows a heterogeneous, mottled parenchyma. A few hypoechoic nodules are observed scattered throughout the parenchyma. A hypoechoic nodule (1.04 cm in diameter x 1.29 cm in length). A second, well-circumscribed, hypoechoic nodule (0.32 cm in diameter x 0.48 cm in length) is present in the right liver, observed intercostally. No abnormalities are observed with the hepatic vessels visualized.

The **gallbladder** (GB) wall is within normal limits in thickness and echogenicity. There is no evidence of echogenic material within the GB or edema surrounding it. An echogenic structure, 0.68 cm in diameter x 0.60 cm in length, is visualized within the GB, which may be a polyp or mass. This is confirmed in images later in the exam, however, the structure appears more consistent with a polyp, adenoma, or possibly a lipoma. The latter is not vascularized when evaluated with colour Doppler. The cystic and common bile ducts could not be followed due to gas in the surrounding gastrointestinal tract, however, obvious signs of an obstruction are not observed.

Gastrointestinal

Gas is present within the stomach. The gastric wall is within normal limits in thickness and the wall layers are well defined. No obvious abnormalities are noted with the pyloric duodenal junction. Peristalsis appears to be within normal limits.

Duodenum: Echogenic and granular ingesta, and fluid, are present within the lumen.

Jejunum: Wall thickness is within normal limits and the definition of the wall layers is preserved, however, occasional stippling of the mucosa is observed, and the submucosa appears more prominent than usual. Striations may also be present in a few segments of jejunum. A "to and fro motion" of the ingesta and fluid within the loops of bowel is noted.

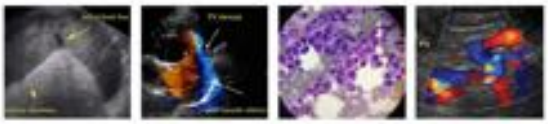
No obvious abnormalities are noted with the ileo-cecal-colic junction.

Abnormally dilated loops of bowel are not observed, i.e., signs of obstructive disease are not evident.

Certain regions of the colonic wall are thickened (0.36 cm), however, mural detail is conserved. A large amount of gas and soft fecal matter are present in the colon.

Pancreas

The **right limb** is mildly to moderately enlarged and has a coarse, heterogeneous echotexture. Its contours are slightly irregular. Hypoechoic nodules of variable size and pinpoint to punctate hyperechoic foci are scattered throughout the parenchyma. The former abnormalities are suggestive of active pancreatitis, while the latter are most likely due to age-related changes, such as nodular



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hyperplasia and fibrosis, respectively. Fibrosis may occur secondary to age, previous episodes of pancreatitis, mineralization, as well as amyloid deposition. It is difficult to evaluate the omentum in the surrounding area due to the large amount of gas and echogenic ingesta in the gastrointestinal tract. Overt signs of neoplasia are not noted.

The very small portion of the **left limb** visualized is mildly hypoechoic, and the surrounding mesentery is mildly hyperechoic.

Other

Lymph nodes No abnormalities are observed

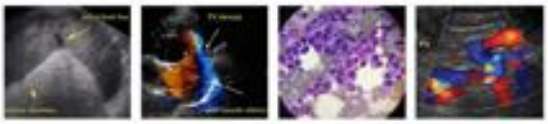
Abdominal effusion is not visualized.

Heart

The left ventricle and left atrium and mitral valve are visualized. Contractility appears within normal limits. Thickening and a regular valve leaflets are consistent with myxomatous degeneration of the mitral valve and prolapse is present. There is no evidence of pericardial or pleural effusion, nor pulmonary edema.

ULTRASONOGRAPHIC FINDINGS

- **Gastrointestinal (GI) tract:** Inflammatory changes of the small intestines are present, which are consistent with acute hemorrhagic diarrhea syndrome (AHDS), previously known as hemorrhagic gastroenteritis (HGE). An underlying chronic enteropathy (i.e., inflammatory bowel disease, dysbiosis, food or fat intolerance, inadequate amounts of dietary fibre, etc.), cannot be excluded.
- **Liver:** A reactive hepatopathy may be present, however, neoplasia cannot be excluded as the cause of the mottled, heterogeneous echotexture of the right liver. Although less likely, extramedullary hematopoiesis could cause the mottled appearance, particularly if the liver is responding to the anemia. The hypoechoic nodules are attributed to nodular hyperplasia.
- **Gallbladder:** High index of suspicion of a polyp, adenoma, or possibly a lipoma. Obvious signs of neoplasia are not evident, however, a re-evaluation to monitor the evolution of the structure is recommended.
- **Spleen**: Splenitis and reactive hyperplasia are possible causes for the spleen's appearance. Extramedullary hematopoiesis, nodular and lymphoid hyperplasia could also explain the ill-defined heterogeneous "patches". However, neoplasia (lymphoma or other round cell tumour) cannot be excluded with certainty, and a fine needle aspirate would be required to achieve a definitive diagnosis. A mass effect with a similar mottle appearance is noted at the tail. Extramedullary hematopoiesis, nodular and lymphoid hyperplasia remain possible differential diagnoses, however, neoplasia must also be considered.
- **Pancreas**: Signs consistent with mild pancreatitis, age-related changes and fibrosis due to possible previous episodes of pancreatitis are observed.



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- **Adrenal glands**: Hypoadrenocorticism should be tested for. Although they are not flattened or severely decreased in size, they may be at the low end of the normal reference range for a dog suffering from stress and illness, particularly since Perdita has always suffered from intermittent GI signs.
- **Heart**: Myxomatous degeneration of the mitral valve

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

High index of suspicion of acute hemorrhagic diarrhea syndrome (AHDS), however, hypoadrenocorticism may mimic AHDS.

A baseline (random) cortisol to exclude hypoadrenocorticism, including "relative" hypoadrenocorticism.

Ideally, fine needle aspirates of the spleen and liver to exclude neoplasia, pending coagulation profile results.

vitamin K (0.5 mg/kg SQ q8-12h for 1-3 doses) suggested, even if PT/PTT within normal limits.

Evaluate dietary history, including raw meat diet, for example, *E. coli*, *Clostridium* spp., *Campylobacter* spp., *Salmonella*, etc.

+/- Serum cobalamin, folate to exclude dysbiosis

Supplementation with cobalamin

A clay based paste, containing montmorillonite and a synbiotic, may be administered during episodes of acute diarrhea.

Diet trial to rule out food intolerance or inflammatory bowel disease, ideally with a hydrolyzed hypoallergenic diet. A low fat diet is suggested due to pancreatic changes, e.g. Purina HA.

*Supplement diet with psyllium (soluble fibre), particularly if hydrolyzed hypoallergenic diet is fed. Many dogs with AHDS respond to diets high in soluble fibre.

Small, frequent meals

A sonographic re-evaluation of the gallbladder structure to monitor its evolution.

Findings of the heart are an incidental finding and do not affect Perdita's prognosis, however the presence of heart disease may affect fluid rates when administering intravenous fluids and possible use of steroids in the future. An echocardiogram would be required to further classify the severity of Perdita's heart disease.

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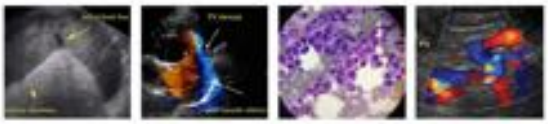

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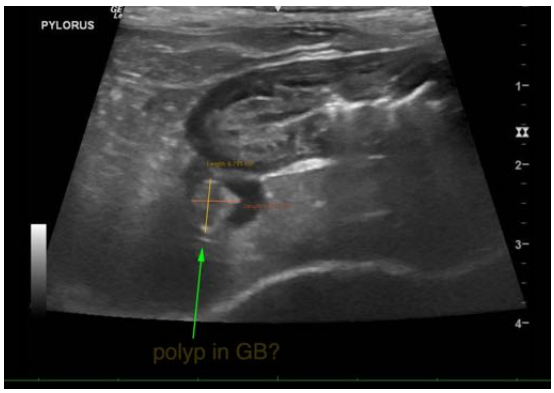

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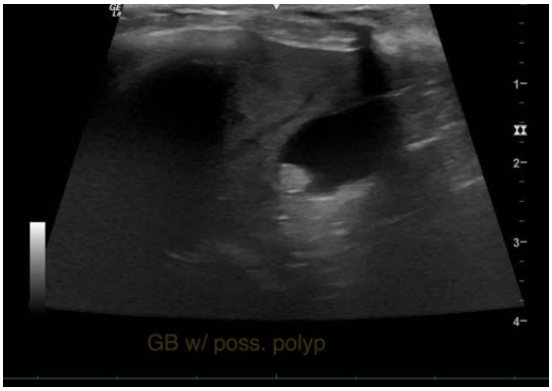

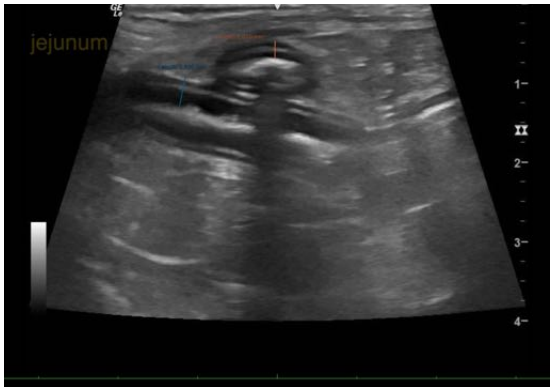

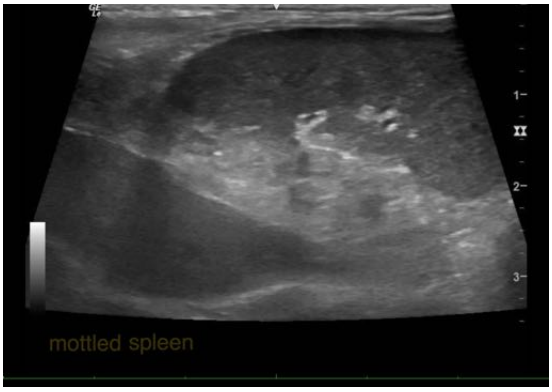

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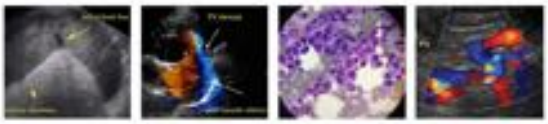

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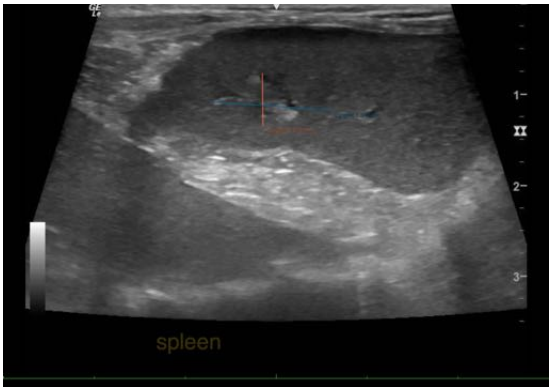

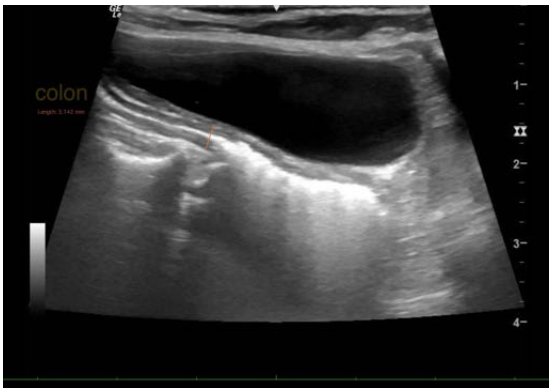

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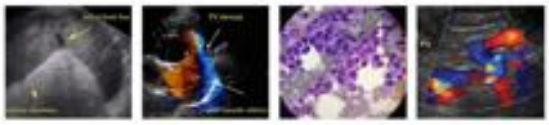

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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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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