



PATIENT

Mr. Piggy McCormack

PRESENTING CLINICAL SIGNS

History of weight loss and small bowel diarrhea, as well as increased ALT, AST, and low cholesterol. Abnormal PE/Chem/CBC/UA Results: ALT 906, AST 188, cholesterol 48.

SPECIES

Canine

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

BREED

Chihuahua

The **urinary bladder** is not fully distended, but its contents are anechoic. The wall is mildly irregular, which may be due to the bladder not being well distended. No abnormalities are noted with the trigone or proximal urethra, and there is no evidence of sediment, cystoliths, polyps or a mass.

Kidneys

SEX

Neutered Male

The **left kidney** measures 3.36 cm. The capsule is smooth. Its overall architecture, including the definition of the cortico-medullary junction, is preserved. There are no signs of nephroliths or pyelectasia. Blood flow is within normal limits. The surrounding mesentery is not hyperechoic.

AGE

12 Years

The **right kidney** measures 3.59 cm. Its overall architecture, including the definition of the cortico-medullary junction, is preserved. There are no signs of nephroliths or pyelectasia. Blood flow is within normal limits. The surrounding mesentery is not hyperechoic.

Aortic bifurcation/trifurcation No abnormalities observed.

WEIGHT

5.59 Pounds

Adrenal Glands

The **left adrenal gland** measures 0.37 cm at the cranial pole, 0.35 cm at the caudal pole and 1.40 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.

INTERPRETED BY

Lisa Carioto, DVM,
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The **right adrenal gland** measures 0.57 cm at the cranial pole, 0.36 cm at the caudal pole and 1.33 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.

IMAGING PERFORMED BY

Kelly Vazquez

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.

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Liver

There are no obvious signs of hepatomegaly and its borders are smooth and sharp. The liver's echotexture is homogeneous and it is within normal limits in echogenicity. Focal lesions are not observed. Perivascular cuffing of multiple larger blood vessels are noted, which may be associated with fat, mineralization, fibrosis and/or inflammation.

REFERRING VET

Dr. Stefanie Long

The gallbladder (GB) is mildly dilated (consistent with a fasted individual). There is no evidence of echogenic material within the GB or edema surrounding it. The GB wall is within normal limits in thickness and echogenicity. The cystic and common bile ducts cannot be followed due to the gas in the surrounding GI tract, however, there are no obvious signs of an obstruction.

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Gastrointestinal

A moderate to large amount of 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, however, the muscularis is more prominent to thickened (i.e. it is equal to the mucosa).

Duodenum: Fogging and diffuse stippling of the mucosa are noted.

Jejunum: Fogging, diffuse stippling and striations of the mucosa of multiple segments of the jejunum are observed.

The small intestinal wall thickness, including the duodenum, is within normal limits. There are no obvious signs of an obstruction.

Transverse colon: A large amount of ingesta and gas are present.

A large amount of gas is present in the descending colon

A few of the segments of colon are thickened (0.26 cm). Mural detail is conserved, however, the muscularis is more prominent in the thickened segments. A large amount of gas and soft stool are present in the colon.

Pancreas

The **left limb** is mildly enlarged and hypoechoic, with very mildly irregular contours. The surrounding omentum fat is mildly to moderately hyperechoic. Overt signs of neoplasia are not noted.

A proper evaluation of the **right limb** is not possible due to the large amount of gas in the surrounding gastrointestinal tract.

Other

Lymph nodes No abnormalities are observed, however, subtle abnormalities may have been overlooked due to the large amount of gas in the surrounding gastrointestinal tract.

Abdominal effusion is not visualized.

Heart

Thickening and irregularity of both leaflets of the mitral valve, consistent with myxomatous degeneration of the mitral valve.

ULTRASONOGRAPHIC FINDINGS

- **Gastrointestinal (GI) tract:** Delayed peristalsis based on amount of ingesta in GI tract despite period fasted. The abnormalities are most consistent with inflammation, (e.g. chronic enteropathy, which includes multiple causes of diarrhea, i.e., steroid responsive, food responsive, antibiotic responsive, fibre responsive, etc.). However, the striations are highly suggestive, but not pathognomonic, of lymphangiectasia or a protein losing enteropathy. Obvious signs of neoplasia are not appreciated. The mildly thickened colon is likely due to chronic diarrhea and secondary inflammation.

- **Pancreas:** A mild, smoldering pancreatitis cannot be excluded.

Liver: Perivascular cuffing, which is most often associated with deposition of fat, and not clinically significant. However, inflammation, with or without mineralization and fibrosis may occasionally be present. Individuals with chronic GI disease or inflammation may develop



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elevated ALT enzyme activity. Obvious hepatic diseases are not evident, however, underlying hepatitis (immune-mediated vs. secondary) cannot be excluded despite the absence of sonographic signs.

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- **Urinary bladder:** The mildly irregular wall of the urinary bladder wall is likely due to its underfilled nature, however, a urinalysis is required to exclude subclinical bacteriuria with certainty.

BREED
Chihuahua

- **Heart:** Myxomatous degeneration of the mitral valve.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The following are suggested/recommended

- SEX**
Neutered Male
- Inquiries regarding exposure to tick or other vector-borne diseases, in addition to medications and natural supplements, raw-meat diets (bacterial hepatopathies), as well as travel history. Exclude possibility of leptospirosis
- AGE**
12 Years
- Deworm, fenbendazole, even if he receives monthly heartworm prevention.
 - A low fat diet is recommended in case of lymphangiectasia. If little to no response, a hydrolyzed low fat diet (Purina HA) is suggested.
 - psyllium (soluble fibre) may be required
 - Diet trial (veterinary prescription brand hypoallergenic, ideally,
 - TLI, serum cobalamin, folate, +/- spec cPL, to exclude malabsorptive and maldigestive diseases, including exocrine pancreatic insufficiency, depending on response to the above suggestions. Note, false negative TLI results possible if pancreatitis present
 - +/- Supplementation with cobalamin
- WEIGHT**
5.59 Pounds
- Administration of a paste containing montmorillonite clay, with or without a synbiotic (product that contains both a pre and probiotic)
 - *Hypoadrenocorticism cannot be excluded despite the adrenal glands within the normal reference range, therefore, a baseline cortisol is recommended, particularly prior to general anesthesia
 - +/- Fine needle aspirate of the liver prior to endoscopy and biopsies of the GI tract if ALT still elevated.
 - Endoscopy and biopsies of the upper and lower GI tract diet, if no response to deworming and diet trials.
 - Urinalysis, +/- culture and sensitivity
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- IMAGING PERFORMED BY**
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The *heart disease* is an incidental finding and very common in dogs of Mr. Piggy's age, particularly for the Chihuahua breed. An echocardiogram would be required to classify Mr. Piggy's heart disease further. This is not urgent, nor is it a necessity. However, it should be considered if fluid therapy or steroids are administered in the future.

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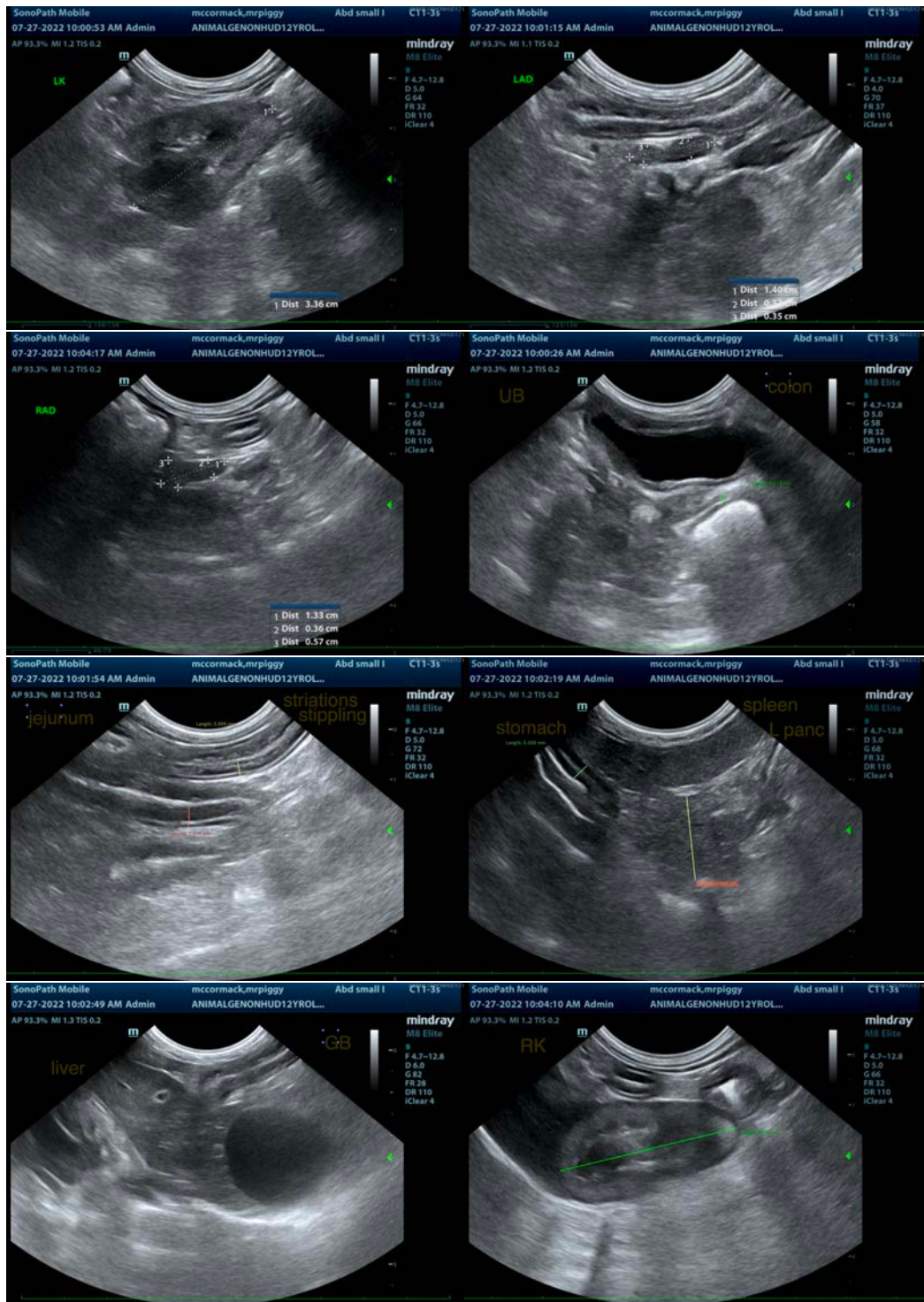
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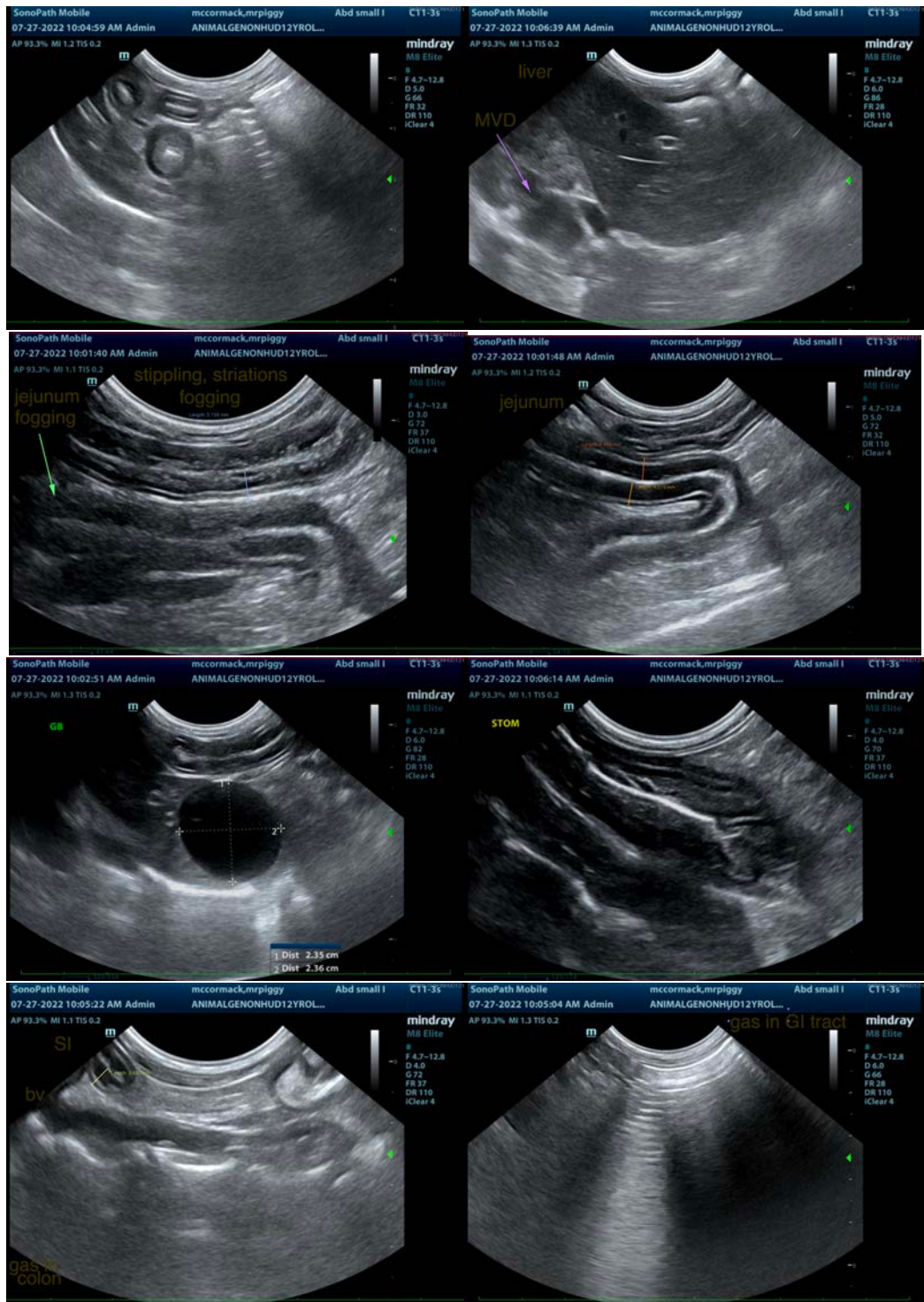
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

SPECIES

Canine

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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