



**PATIENT**

Carver Martino

**SPECIES**

Canine

**BREED**

Beagle

**SEX**

Neutered Male

**AGE**

13.5 Years

**WEIGHT**

27 Pounds

**INTERPRETED BY**

Beth Johnson, DVM  
DACVIM

**IMAGING PERFORMED BY**

Dr. Tamara Mengine

**HOSPITAL NAME**

Stoney Creek VH

**REFERRING VET**

Dr. Tamara Mengine

**INVOICE**

35658

**DATE**

2/15/22

**PRESENTING CLINICAL SIGNS**

Hypoalbuminemia first noted 6 months ago (2.1, TP 5.4). No proteinuria. Recheck bloodwork 6 months later, Alb still 2.1, TP 5.0 and SDMA 20, else unremarkable. Mild weight loss (1.5 pounds in 8 months), no clinical signs of illness except a chronic cough for several years.

**ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**

**Urinary System**

The urinary bladder is moderately distended with anechoic contents. No masses, inflammatory changes, echogenic sediment or cystoliths are observed. The urinary bladder, trigone and visible pelvic urethra are normal in thickness with a smooth mucosal surface.

Prostate (neutered) is normal in size, echotexture and echogenicity for a neutered male.

The right kidney is normal in size (4.8 cm) and shape with smooth peripheral margination. A normal 1:3 cortex to medulla ratio is maintained. The medulla and cortices are uniform in texture with some mild increased echogenicity and mild loss of corticomedullary distinction. There is no evidence of pyelectasia, mineral or infarcts observed.

The left kidney is normal in size (4.65 cm) and shape with smooth peripheral margination. A normal 1:3 cortex to medulla ratio is maintained. The medulla and cortices are uniform in texture with some mild increased echogenicity and mild loss of corticomedullary distinction. There is no evidence of pyelectasia, mineral or infarcts observed.

**Adrenal Glands**

The right adrenal gland is normal in size (0.54 cm at the cranial pole and 0.58 cm at the caudal pole), shape and contour. Corticomedullary structure is unremarkable. Visible surrounding vasculature appears normal.

The left adrenal gland is normal in size (0.64 cm at the cranial pole and 0.92 cm at the caudal pole), shape and contour. Corticomedullary structure is unremarkable. Visible surrounding vasculature appears normal.

**Spleen**

The spleen is subjectively normal in size with a normal smooth capsular contour. Parenchyma is appropriately finely textured and homogenous with normal echogenicity relative to surrounding tissue (hyperechoic to liver). No focal nodules or masses are observed. Splenic vasculature appears normal.

**Liver**

The liver is subjectively subjectively mildly small in size with normal smooth curvilinear peripheral contour. Parenchyma is appropriately hypoechoic to the spleen in echogenicity and appropriately mildly coarse and homogenous in echotexture. No focal lesions are observed. Visible vasculature and biliary tree appear normal without distension or congestion.

The gallbladder is non-distended in size. The wall is smooth without visible thickening. Luminal contents are primarily anechoic. There is no evidence of cystic or common bile duct dilation.

**Gastrointestinal**

The stomach wall is normal in thickness (canine < 0.5 cm and feline < 0.4 cm) and layering. The lumen of the stomach is empty with no evidence of obstruction, foreign material or infiltrative disease. Pyloric outflow tract appears patent.



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The visible small intestines are overall normal in wall thickness and layering, except for the duodenum, which is mildly thick, measuring 0.54 cm thick with normal layering maintained. Small intestinal motility appears adequate (1-3 contractions per min). The duodenum has a corrugated appearance characterized by an undulating wall appreciated due to visualization of an undulating mucosa/lumen interface and undulating submucosa. The lumen of the small intestine is empty with no evidence of obstruction, foreign material or infiltrative disease.

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The visible colon is normal in wall thickness (< 0.2 cm) and layering. Contents are consistent with normal formed feces and gas.

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***Pancreas***

The pancreatic parenchyma is appropriately isoechoic to surrounding tissue. Visible capsule is smooth and normal in contour. There is no visible pancreatic duct dilation. There is no evidence of active peripancreatic inflammation.

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***Free Abdomen***

There is no evidence of peritoneal effusion. There is no apparent lymphadenopathy.

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**ULTRASONOGRAPHIC FINDINGS**

- Mildly thick duodenum with corrugation – Corrugation is an abnormal but non-specific finding that can be caused by a variety of underlying etiologies including pancreatitis, intestinal lymphangiectasia, non-specific enteritis or peritonitis, and even infiltrative neoplasia/lymphoma. Given the concurrent thickness with normal layering, etc., infiltrative inflammatory bowel disease +/- lymphangiectasia is considered the top differential.
- Subjectively mild microhepatica – Top differential is normal patient variant. Chronic hepatitis +/- a vascular anomaly (which is not appreciated in these images) are possible, though considered less likely given the lack of clinical signs and/or laboratory changes previously in this patient.
- Age related kidney change – This finding is expected/consistent with age-related mild degenerative disease and should be interpreted clinically in combination with laboratory changes.

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**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

The top differential for this patient's low albumin (given the ultrasound findings) is considered protein losing enteropathy secondary to infiltrative/inflammatory bowel disease. Recommendations include a gastrointestinal malabsorption panel to include TLI, PLI, folate and cobalamin to Texas A&M GI laboratory for further assessment of digestion/absorption.

**REFERRING VET**

Dr. Tamara Mengine

Given the subjective microhepatica, bile acids are also warranted to more definitively assess liver function as a potential cause for hypoalbuminemia. In the meantime, empirical therapy with a low-fat diet is recommended. Ultimately, biopsies of the small bowel may be necessary to definitively diagnosis and therefore manage the underlying etiology. However, if biopsies are not an option, and hypoalbuminemia persists despite a diet change, empirical steroids may be considered.

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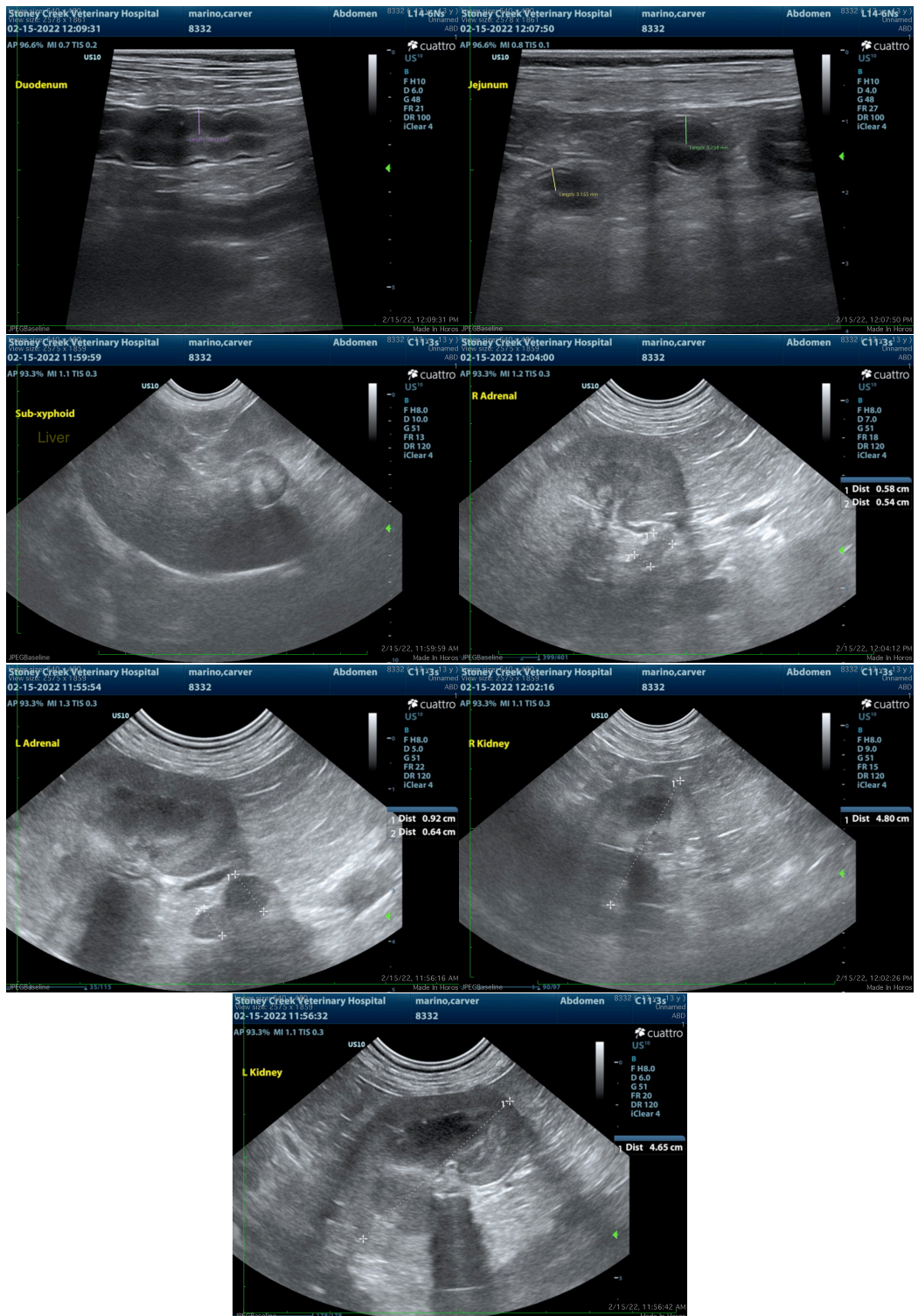
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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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.

**Beth Johnson, DVM, DACVIM**

Beth.Johnson@sonopath.com

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