



**PATIENT**

Buddy Nunemaker

**SPECIES**

Canine

**BREED**

Shih Tzu

**SEX**

Neutered Male

**AGE**

9 Years

**WEIGHT**

7.8 kg

**INTERPRETED BY**

Kathleen Sennello DVM,  
MS, Diplomate ACVIM  
(Small Animal Internal  
Medicine)

**IMAGING PERFORMED BY**

Dr. Hayley Gaynor

**HOSPITAL NAME**

Lambertville VC

**REFERRING VET**

Dr. Nicole DeGrande

**INVOICE**

46096

**DATE**

3/22/23

**PRESENTING CLINICAL SIGNS**

Buddy has an approximately 6 month history of elevated liver enzymes. He has been on several antibiotics and prednisone with worsening values. He has been largely asymptomatic throughout the time.

Abnormal PE/Chem/CBC/UA Results: Chem/CBC on 3/17/23 showed elevated liver values, bilirubin Biopsy on 2/8/23 attached.

**ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**

**Urinary System**

The urinary bladder is moderately distended with anechoic urine. The Bladder wall, trigone, ureteral papillae and visible urethra (to a depth of 2cm) appear normal with no evidence of wall thickening, mucosal irregularities, masses or cystic calculi.

The visualized areas of prostate and surrounding tissue appear normal. Unfortunately, the prostate is not fully visualized likely due to its intrapelvic location. Correlate with rectal exam findings.

The left kidney has a normal shape and size (4.36 cm). Overall echogenicity is normal with adequate corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of focal perinephric inflammation or effusion. There is no evidence of pyelectasia, nephroliths, infarcts or hydroureter. Renal vasculature is normal.

The right kidney has a normal shape and size (4.44 cm). Overall echogenicity is normal with adequate corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of focal perinephric inflammation or effusion. There is no evidence of pyelectasia, nephroliths, infarcts or hydroureter. Renal vasculature is normal.

**Adrenal Glands**

The region of left adrenal (Cranial to left renal artery) is unremarkable but the adrenal is not distinctly visualized. No evidence of a mass effect is visualized.

The right adrenal gland is normal in size measuring 0.41 cm at the caudal pole. It is observed in its normal position between the cranial aspect of the right kidney and the caudal vena cava. It is normal in appearance (uniformly hypoechoic) and shape with no evidence of a mass effect.

**Spleen**

The spleen is subjectively normal in size, echotexture is homogenous, and the splenic capsule is smooth with no irregularities. The blood flow through the hilus and splenic parenchyma appears normal. No focal parenchymal abnormalities are visualized.

**Liver**

The liver is large and irregular with normal echogenicity. The parenchyma is heterogenous in echotexture with subtle, indistinct focal mottling. The visible portions of the vasculature and biliary tract appear normal. There are diffuse variably sized hypoechoic nodules throughout the parenchyma varying in size from roughly 0.25-1.0 cm.

The gallbladder lumen is moderately distended. The wall of the gall bladder is prominent/mildly thickened at 0.33 cm. Luminal contents are mild and primarily anechoic. The cystic and common bile ducts are normal/not visible.



**PATIENT**

**Gastrointestinal**

Buddy Nunemaker

The stomach contains minimal luminal contents. It measures at a normal thickness of <0.7cm with some variability due to the presence of rugal folds. The distinction of the gastric wall layers is adequate and there is no impression of reduced peristaltic activity. No masses or focal lesions were observed.

**SPECIES**

Canine

The visualized areas of duodenum, jejunum and ileum have a relatively uniform diameter with minimal fluid distension. Wall thickness is normal. Bowel loops follow a curvilinear path with distinct wall layering maintaining the typical 1:3 muscularis:mucosa layer ratio. Jejunum wall measures 0.45 cm.

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Visualized peristalsis appears appropriate. There were no focal lesions consistent with obstruction or a mass effect observed.

**SEX**

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The ileocecal junction was visualized and exhibited normal intact wall layering and is subjectively of normal thickness. Sections of colon are visualized with formed fecal material and gas shadowing distally. There is no observed focal or generalized colon wall thickening or loss of layering.

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**Pancreas**

The pancreas is normal and isoechoic to surrounding mesentery. There is no evidence of nodules or cystic lesions. There is no evidence of regional mesenteric inflammation or fluid.

**WEIGHT**

7.8 kg

**Free Abdomen**

Evaluation of the peritoneal cavity did not reveal any evidence of effusion, or subjective lymphadenomegaly. The Medial iliac nodes appear normal and there was no evidence of a caudal aortic thrombus at the bifurcation. The omentum is of normal uniform echogenicity.

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**ULTRASONOGRAPHIC FINDINGS**

- Large, heterogeneous liver with diffuse hypoechoic nodules – The diffuse hepatic changes are non-specific and could be consistent with vacuolar hepatopathy, nodular hyperplasia, inflammatory/immune-mediated disease, fibrosis, extramedullary hematopoiesis, toxic hepatopathy (e.g., copper), infiltrative neoplasia (less likely) or other hepatopathy. The nodules observed trend toward a more benign process but underlying neoplasia cannot be ruled out.

**IMAGING PERFORMED BY**

Dr. Hayley Gaynor

**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

**HOSPITAL NAME**

Lambertville VC

No unexpected lesions are visualized on today's exam. The liver is large and nodular, and the gallbladder wall is slightly thickened. These findings are consistent with a primary hepatopathy. You've done a nice job working up this case, obtaining biopsies for a more definitive diagnosis, which is most consistent with inflammatory liver disease and associated fibrosis and copper accumulation. The challenge is figuring out how best to treat this patient, and there is no recipe that will fit each individual.

**REFERRING VET**

Dr. Nicole DeGrande

If possible, this would be a great case for an internist to manage, or for you to work with an internist that can follow up on this patient with you, as treatment choices would depend greatly on response to therapy, etc. In general with this patient, I would consider lifelong Denamarin therapy and lifelong Ursodiol therapy for possible cholestasis (even though that is not reflected on the biopsies). Other options would include anti-fibrotics, immunosuppressants, copper chelators, etc., but these decisions would largely depend on how the patient is doing, the owner's desires, etc., and unfortunately falls beyond the scope of an ultrasonographic interpretation.

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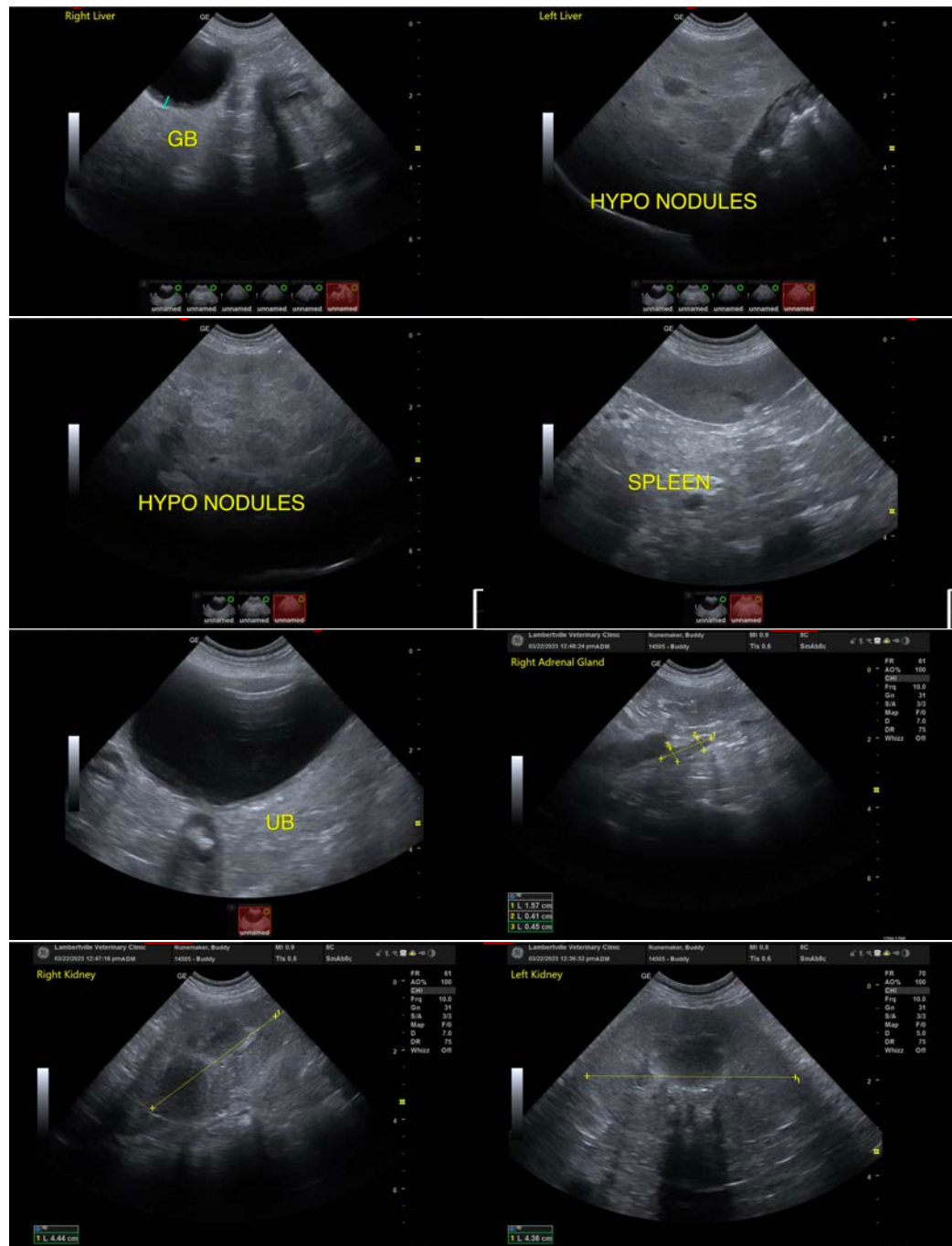
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Kathleen Sennello DVM,MS, Diplomate ACVIM (Small animal Internal Medicine)

kathleen.sennello@sonopath.com