



**PATIENT PRESENTING CLINICAL SIGNS**

Noche Alvarez History: Moderate elevation of liver enzymes on pre dental blood work. Body score 5/5

**SPECIES** Abnormal PE/Chem/CBC/UA Results: Moderate elevation of liver enzymes and mild elevation of bile acids pre-prandial 24 (range 14). Post prandial 52 (range 29).

Canine

**ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**

**BREED** *Urinary System*

Pug

The urinary bladder, trigone, cystourethral junction, and visible pelvic urethra to a depth of 3.0 cm exhibited normal thickness and tone. Anechoic urine was present in the lumen with no uroliths or sediment. The ureteral papillae were normal. The ureters were not visible which is normal. No evidence of inflammatory or neoplastic changes were noted.

**SEX**

Neutered Male

The residual prostate was symmetrically normal in size with uniform parenchyma and slight coarse echotexture measuring 0.81 cm in width.

**AGE**

8 Years

Normal size and margination were present in the kidneys. A normal 1:3 cortex / medulla ratio and normal corticomedullary definition were maintained. The echogenicity of the cortex was similar to or slightly less than normal liver parenchyma while the medulla echogenicity was hypoechoic to the cortex with no evidence of pelvic dilation. The left kidney measured 3.9 cm in length. The right kidney measured 4.4 cm in length.

**WEIGHT**

12 kg

**Adrenal Glands**

The left adrenal gland was uniform in size and contour with a uniformly hypoechoic parenchyma. The left adrenal gland measured 0.45 cm width at the caudal pole and 0.32 cm width at the cranial pole.

The right adrenal gland was uniform in size and contour with a uniformly hypoechoic parenchyma. The right adrenal gland measured 0.33 cm width at the caudal pole and 0.41 cm width at the cranial pole.

**INTERPRETED BY**

R. McKenzie Daniel,  
DVM, DABVP  
(Canine and Feline)

**Spleen**

The spleen exhibited a finely textured and homogenous parenchyma which was hyperechoic to the liver and renal cortical parenchyma. The capsule was smooth and regular without apparent expansion. The splenic vasculature at the hilus was normal in volume with no evidence of congestion or thrombosis. Acute to chronic inflammatory, neoplastic, or benign parenchyma changes were not noted.

**IMAGING PERFORMED BY**

Dr. Belan

**HOSPITAL NAME**

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Clinic

**Liver**

The liver exhibited mild to possible moderate enlargement with primarily maintained symmetrical capsule contour with minor areas of capsule asymmetry. Diffuse nonhomogeneous to mixed echogenic hepatic parenchyma with moderate coarse echotexture and parenchymal remodeling noted. Multiple variably sized to variably echogenic yet subjectively nondisruptive intraparenchymal nodules were present, an example of intraparenchymal liver nodule measured 1.8 cm.

**REFERRING VET**

Dr. Gadzhev

**INVOICE**

14552

**Gastrointestinal**

The gallbladder was non-distended in size with thin walls and primarily anechoic luminal content. The cystic and common bile ducts were normal.

**DATE**

4/1/22

The stomach presented intact wall layering with a normal wall layer ratio. The lumen of the stomach was empty with no signs of ileus, obstruction or foreign material.



**PATIENT**

Noche Alvarez

The small intestine presented intact wall layering with 1:3 muscularis/mucosa ratio. The lumen of the small intestine was empty with no signs of ileus, obstruction or foreign material.

Normal visible colon wall layers were present with apparent formed feces in lumen.

**SPECIES**

***Pancreas***

Canine

The pancreas was normal in size and contour with isoechoic to heterogeneous parenchyma compared to adjacent omentum. No signs of active inflammation or neoplasia.

**BREED**

***Free Abdomen***

Pug

No overt lymphadenopathy or peritoneal effusion was present.

**SEX**

Neutered Male

**ULTRASONOGRAPHIC FINDINGS**

- Heterogeneous nodular to irregular liver
- Mild heterogeneous pancreas

**AGE**

8 Years

**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

The hepatic parenchymal changes are nonspecific with considerations, including vacuolar hepatopathy, inflammatory/immune mediated disease, with generalized parenchymal remodeling, areas of nodular hyperplasia, extramedullary hematopoiesis, fibrosis with potential for infiltrative neoplasia (although thought less likely), or other hepatopathy. Correlation with pending hepatic cytology is recommended. Core or surgical biopsy of the liver may be required for a definitive diagnosis. Even though bile acids are mildly elevated, hepatic functionality is likely adequate, assuming normal albumin, glucose, BUN and cholesterol levels. If clinical signs suggestive of hepatic dysfunction are noted, some or all of the following protocol could be considered empirically.

**WEIGHT**

12 kg

**Hepatic Support for Bile Acid Elevation +/- Hepatic Encephalopathy**

**Royal Canin Hepatic Support diet or Hills L/D, Metronidazole** (7.5 mg/kg PO bid) over the next 14 days, **Lactulose** (Oral: 3.1-3.7 g/5 ml lactulose in a syrup base) long term to target 2-3 soft stools/day, with a **high-quality protein supplement** of minor amount of **yogurt** or **cheddar cheese**. Monitor bile acids, with attention paid to dropping albumin, BUN or cholesterol. SAME and nutraceuticals as needed. **Ursodiol** (10-15 mg/kg p.o. q24h) can be considered as hepatoprotectant and to enhance bile flow. **Zinc** serum level keep between 200—500 ug/dl. If deficient then Tx zinc acetate 1-3 mg/kg/day. Gastrointestinal protectants are recommended if the patient is anorexic.

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The mildly heterogeneous pancreas is nonspecific with considerations, including patient or early age-related variant and not suggestive of active pancreatitis. Potential for low grade to chronic pancreatitis could be considered if evidence of cranial abdominal or subxiphoid discomfort on palpation and/or elevated CPL.

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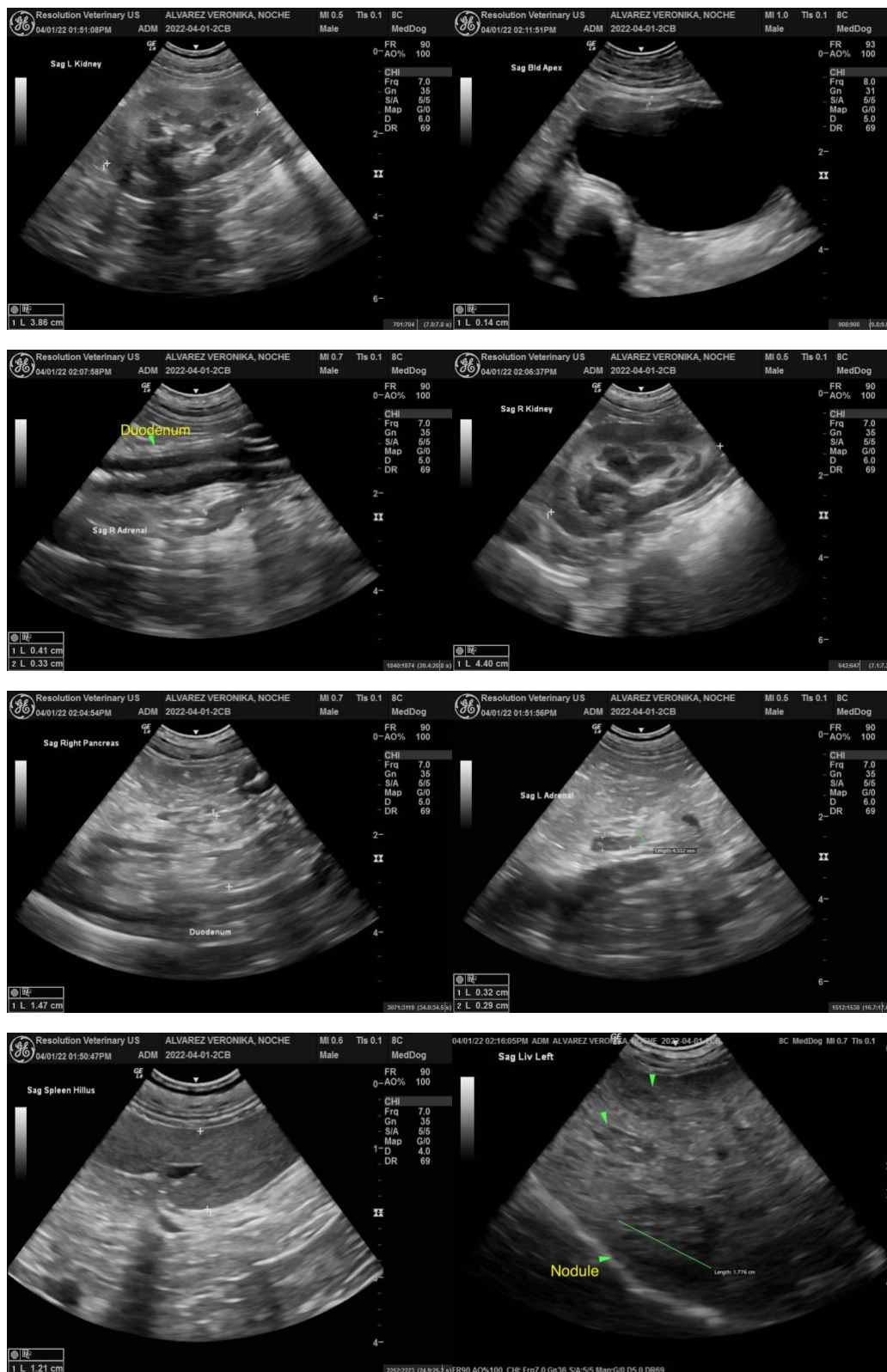
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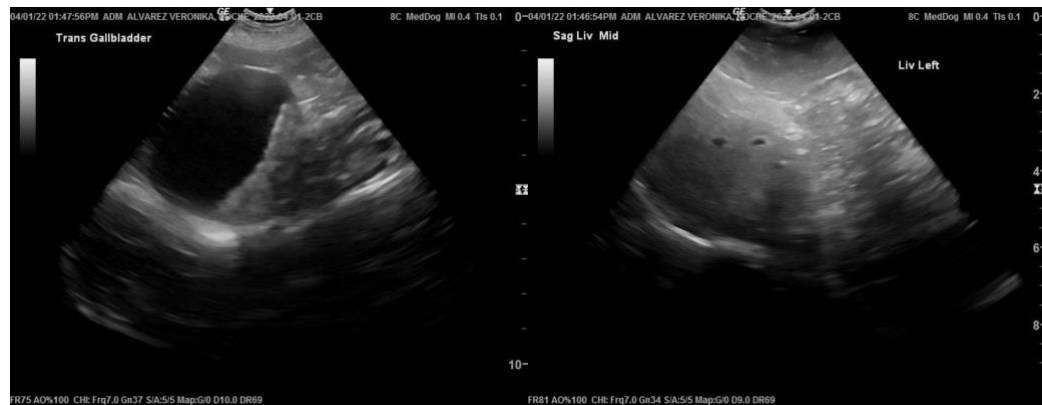
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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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