

**DATE**

4/1/22

**PRESENTING CLINICAL SIGNS****PATIENT**

Luna Snyder

History: Potbelly, no obvious masses or FB appreciated however P tense and difficult to accurately palpate. Reviewed BW- moderately to markedly elevated ALP, mild hyperglobulinemia. Discussed UA and LDDST vs AUS to investigate for Cushing's vs breed related liver changes. Discussed cost differences and potential for still needing AUS after UA and LDDST. O elects to start with AUS.

**SPECIES**

Canine

Current Medications: None.

Lab Results: moderately to markedly elevated ALP, mild hyperglobulinemia.

Date of Previous IntraPet Ultrasound: No previous.

Sedation: Not required to complete full diagnostic ultrasound.

**BREED**

Scottie

Stat Report: Not requested.

Imaging Performed By: Stephanie Pearce RDCS, RVT.

**SEX**

Intact Female

**ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN****Urinary System**

The urinary bladder is moderately distended with anechoic urine. The bladder wall largely appears normal but there is a discreet, rounded mass effect towards the apex of the urinary bladder, measuring 1.68 cm x 1.12 cm. This lesion has adequate vascularity. The area of the trigone, ureteral papilla and proximal urethra appear normal with no evidence of mass effect or cystic calculi. These findings are most consistent with a focal bladder mass. Other differentials are possible.

**AGE**

2/11/14

**WEIGHT**

24.6 Pounds

The left kidney has a normal shape and size (5.26 cm). Overall echogenicity is normal with adequate corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of perinephric inflammation or effusion. There is no evidence of pyelectasia, nephroliths, infarcts or hydroureter. Renal vasculature is normal.

**INTERPRETED BY**

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

The right kidney has a normal shape and size (5.83 cm). Overall echogenicity is normal with adequate corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of perinephric inflammation or effusion. There is no evidence of pyelectasia, nephroliths, infarcts or hydroureter. Renal vasculature is normal.

**HOSPITAL NAME**

Festival VC

**Adrenal Glands**

The left adrenal gland is normal in size measuring 0.76 cm at the caudal pole. It is observed in its normal position cranial to the left renal artery. It is normal in appearance (uniformly hypoechoic) and shape with no evidence of a mass effect.

**REFERRING VET**

Dr. Harvey

The right adrenal gland is normal in size measuring 0.78 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.

**INVOICE**

14525

**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 subjectively large in size with smooth peripheral margins. The parenchyma is hyperechoic and homogenous in echotexture. While the liver itself has adequate vascularity and good portal markings in addition to a normal branching portal vein, the vena cava appears large and there appears to be a diversion

in connection with the aorta, most consistent with a caval aortic window. No focal hepatic nodules or masses are visualized.

The gall bladder lumen is moderately distended. The wall of the gall bladder is not thickened and has a smooth mucosal surface. There is a moderate amount of non-organized echogenic debris. The cystic and common bile ducts are normal/not visible.

### ***Gastrointestinal***

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.

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. The duodenum measured as normal (between 0.3-0.5cm in wall thickness) and the jejunum measured as normal (0.28 cm) Visualized peristalsis appears appropriate. There were no focal lesions consistent with obstruction or a mass effect observed.

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.

### ***Pancreas***

The (pancreas/region of 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.

### ***Free Abdomen***

No free fluid. A prominent mesenteric lymph node is visualized, measuring 0.45 cm. The omentum is of normal echogenicity.

### ***Other***

The left ovary is visualized and appears normal/mildly cystic. The right ovary is not visualized.

The uterus is visualized and appears within normal limits.

There is a 1.7 cm anechoic structure visualized medial to the spleen which is most consistent with an omental cyst.

## **ULTRASONOGRAPHIC FINDINGS**

### **Primary Findings**

- Focal mass effect within the urinary bladder. The findings are very concerning for a TCC, given the breed susceptibility to this condition. Other differentials are possible.
- Large hyperechoic liver. The diffuse hepatic changes are non-specific and can be seen with vacuolar hepatopathy, reactive change, nodular hyperplasia or, less likely, inflammatory/immune-mediated disease, infiltrative neoplasia, or other hepatopathy.
- Dilated vena cava with a connection to the aorta. The findings are most consistent with a caudal aortic window/vascular anomaly.

## **Secondary Findings**

- Moderate gallbladder debris. The significance of the aggregated gallbladder debris is unclear. This could represent an early mucocele, cholestasis, or may be secondary to fasting.
- Suspect omental cyst medial to the spleen. I recommend continued monitoring.
- Cystic left ovary. This is likely an incidental finding but should be monitored.
- Prominent mesenteric lymph node. The prominent abdominal lymph nodes are most consistent with reactive lymphadenitis or lymphoid hyperplasia. Neoplastic infiltration is considered less likely.

## **INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

The reason for this ultrasound was evaluation of the elevation in ALP. The liver is large and hyperechoic and has no focal lesions. Additionally, there is moderate gallbladder sludge but no evidence of serious biliary disease. Based on the appearance, this is most likely consistent with either a Scottie hepatopathy or possibly Cushing's disease. The adrenals are not overtly enlarged. Below are my recommendations for a patient with a chronic significant ALP elevation.

An elevation in ALP is a common finding. In general, however, causes of ALP elevation fall into three primary categories:

Induction phenomena, biliary diseases, and primary liver disorders.

- Induction phenomena are the most common cause for an elevation in ALP. These are systemic illnesses that 'turn on' the liver enzyme. Causes of this include Cushing's disease, dental disease, arthritis, and numerous others. In many cases the exact cause is unclear but as long as ultrasound and bile acids tests are normal most patients do not have progressive changes in their liver. While liver biopsy is not routinely performed, vacuolar hepatopathy, is noted on most biopsies. This is often non-progressive but in rare cases can be more severe and lead to liver failure.
- If signs of Cushing's disease are present recommend endocrine function testing to evaluate for Cushing's disease.
- Consider fine needle aspirate to rule out round cell neoplasia if this is a concern.
- If a cause for the ALP elevation is not identified: I recommend recheck general blood work every 6 months, ultrasound once per year, and bile acids test every 1-2 years based on other results. If the ALP continues to climb a biopsy could be considered.
- Consider long term use of denamarin, and monitoring for the signs of Cushing's developing.
- A primary vacuolar hepatopathy can be breed related and is seen in Scottish Terriers, Schnauzers, Cocker spaniels etc.

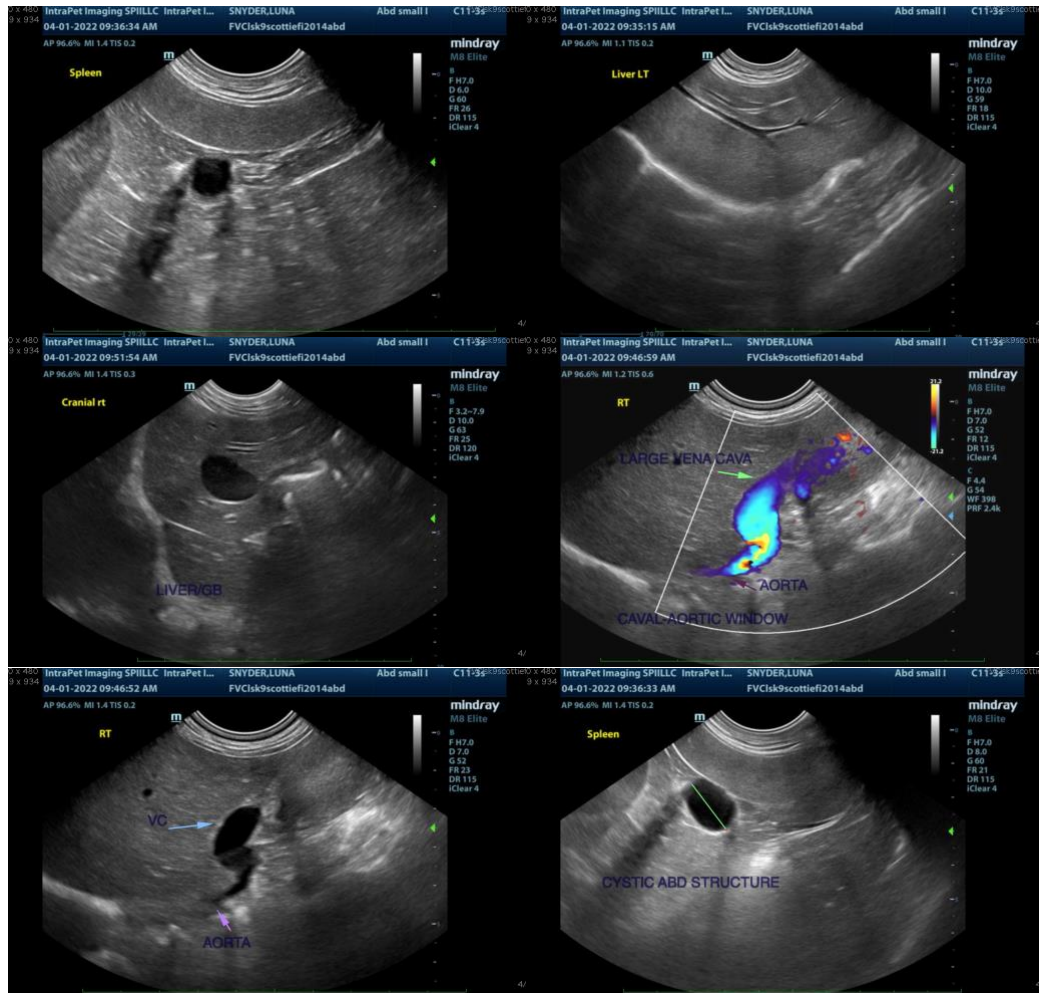
Additionally, there is what appears to be a vascular anomaly present. The vena cava appears dilated and shunts into the aorta at the level of the liver. The liver itself appears to have adequate blood supply and good portal markings. This is most consistent with a caval aortic window and is most likely an idiopathic vascular anomaly. Bile acid evaluation could be considered and if more information regarding this congenital anomaly is desired, then consider a contrast CT scan.

There is a small mass effect within the urinary bladder. I'm concerned that this is an early TCC lesion. Although the possibility of a polyp, etc. is possible. Given the breed predilection for this disease, suspicion is high. Options moving forward include a urine BRAF test. If this is positive, I would very strongly suspect this is a TCC. If this is negative, then it's an inconclusive test and additional testing (most likely a traumatic catheterization) would be recommended. This lesion is in a good location, relatively far away from the outflow tract and ureters. I recommend consultation with veterinary oncologist, as I believe this is caught early and could have a slow progression with intervention.

There are numerous other findings, which are likely incidental in this patient, including a suspected omental cyst, a cystic left ovary and a prominent mesenteric lymph node. If this patient has an abdominal surgery, I would recommend spaying to reduce the likelihood of complications associated with an intact uterus and continued monitoring of the left ovary is warranted.

Consider three view thoracic radiographs to rule out concurrent thoracic disease/involvement.





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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