

**PATIENT**

Einstein Knapp

**PRESENTING CLINICAL SIGNS**

chronic cough- mild hepatomegaly- chronic elevated ALP- chronic vs recurrent diarrhea-  
Abnormal PE/Chem/CBC/UA Results: ALP 667 on 8/18/21 ALP 729 on 6/30/21

**SPECIES**

Canine

**ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**

**BREED**

Bichon X

**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, or masses. There is a small line of dependent, mineralized, small stones varying in size from 2.0-0.5 mm.

**SEX**

Neutered Male

The prostate is normal in size (0.8 cm) and shape for this neutered male dog. The parenchyma is homogenous and the external margins are smooth. The prostatic urethra appears normal with no evidence of irregularity, invasion, mass effect or calculi.

**AGE**

13.5 Years

The left kidney has a normal shape and size (5.48 cm). Overall echogenicity is slightly hyperechoic with poor corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of perinephric inflammation or effusion. Non-obstructive nephroliths were present measuring 0.4 and 0.37 cm, and numerous small cortical cysts. There is no evidence of pyelectasia, infarcts or hydroureter. Renal vasculature is normal.

**WEIGHT**

29.7 Pounds

The right kidney has a normal shape and size (5.36 cm). Overall echogenicity is slightly hyperechoic with poor corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of perinephric inflammation or effusion. Non-obstructive nephroliths were present measuring 0.4 and 0.37 cm, and numerous small cortical cysts. There is no evidence of pyelectasia, infarcts or hydroureter. Renal vasculature is normal.

**INTERPRETED BY**

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

**Adrenal Glands**

The left adrenal gland is normal in size measuring 0.9 cm at the cranial pole, 0.49 cm at the caudal pole, and 2.1 cm in length. It is observed in its normal position cranial to the left renal artery. It is somewhat abnormal in appearance in that the cranial pole is larger than the caudal pole, but it is of uniform echogenicity. There is no evidence of a discreet mass effect.

**IMAGING PERFORMED BY**

Loetitia Saint-Jacques, RVT

The right adrenal gland is normal in size measuring 0.53 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.

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**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.

**REFERRING VET**

Dr. Rachel Kuester

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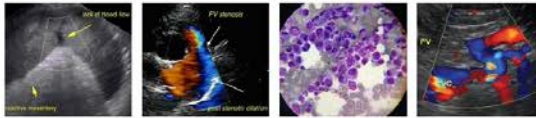
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**Liver**

The liver is subjectively large in size, and normal in echogenicity with smooth peripheral margins. The parenchyma is heterogenous in echotexture with subtle, indistinct focal mottling. The visible portions of the vasculature and biliary tract appear normal. There is a small hypoechoic nodule measuring 0.88 cm in the parenchyma.

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Einstein Knapp The gallbladder lumen is moderately distended. The wall of the gall bladder is not thickened and has a smooth mucosal surface. Luminal contents are primarily anechoic. The cystic and common bile ducts are normal/not visible.

**SPECIES**

Canine

**Gastrointestinal**

**BREED**

Bichon X

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.

**SEX**

Neutered Male

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. Duodenum wall measures 0.42 cm. Jejunum wall measures 0.32 cm. Visualized peristalsis appears appropriate. There were no focal lesions consistent with obstruction or a mass effect observed.

**AGE**

13.5 Years

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.

**WEIGHT**

29.7 Pounds

**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.

**Free Abdomen**

**INTERPRETED BY**

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

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.

**IMAGING PERFORMED BY**

Loetitia Saint-Jacques, RVT

**ULTRASONOGRAPHIC FINDINGS**

- Large, heterogeneous liver with a small hypoechoic nodule – 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.
- Prominent cranial pole of left adrenal gland – This could be an incidental benign finding, or could be consistent with a left adrenal nodule.
- Decreased corticomedullary distinction in both kidneys with non-obstructive nephroliths and small cortical cysts – Mild loss of corticomedullary distinction in both kidneys could be consistent with chronic degenerative disease or interstitial nephrosis.
- Very small bladder calculi

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**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

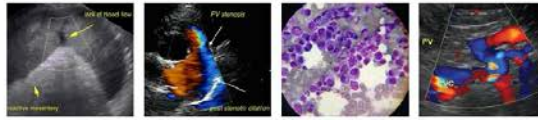
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The liver is large and heterogeneous. This is most likely consistent with a vacuolar hepatopathy based on the ALP elevation. This combined with the prominent left adrenal gland increases suspicion for an endocrinopathy. It is unclear how significant the left adrenal enlargement is. If signs of Cushing's are present, I would proceed with testing for Cushing's disease, but consider monitoring the left adrenal gland periodically with ultrasound to look for signs of change/growth, which could be most consistent

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with an adrenal tumor, and in that event, removal would be recommended. Recommend blood pressure evaluation and 3-view thoracic radiographs. If signs of Cushing's are not present, I would consider a liver function test and fine needle aspirate of the liver to confirm this is a benign process. I suspect the chronic diarrhea is independent of the liver changes.

**SPECIES**

Canine

If liver function is normal, then primary intestinal disease is the most likely cause for the diarrhea. Consider primary GI causes such as GI parasitism, dietary indiscretion, mild pancreatitis, bacterial dysbiosis, food allergy, IBD, and less likely intestinal neoplasia.

**BREED**

Bichon X

In older patients with more chronic symptoms, I would most strongly consider food allergy, IBD, and intestinal neoplasia.

**SEX**

Neutered Male

- Recommend diet trial with a novel protein/hydrolyzed prescription diet
- Recommend GI panel for evaluation of B12 levels etc. (start empirical B12 while waiting for results)
- If symptoms are progressing consider obtaining GI biopsies

**AGE**

13.5 Years

These are general recommendations I give in cases of an ALP elevation with no focal liver lesions:

**WEIGHT**

29.7 Pounds

- Induction phenomena is the most common cause of an elevated 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.

**INTERPRETED BY**

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

- 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.

**IMAGING PERFORMED BY**

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- Consider long term use of denamarin, and monitoring for the signs of Cushing's developing.

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- A primary vacuolar hepatopathy can be breed related and is seen in Scottish Terriers, Schnauzers, Cocker spaniels etc.

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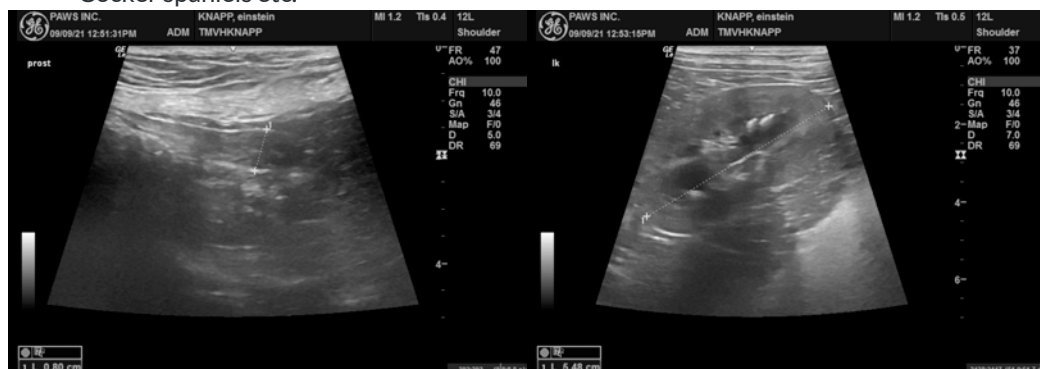
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**SPECIES**

Canine

**BREED**

Bichon X

**SEX**

Neutered Male

**AGE**

13.5 Years

**WEIGHT**

29.7 Pounds

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**IMAGING PERFORMED BY**

Loetitia Saint-Jacques, RVT

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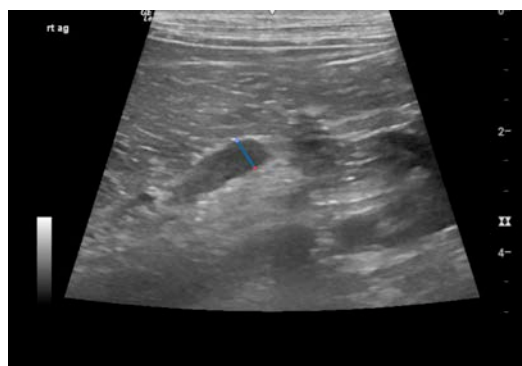
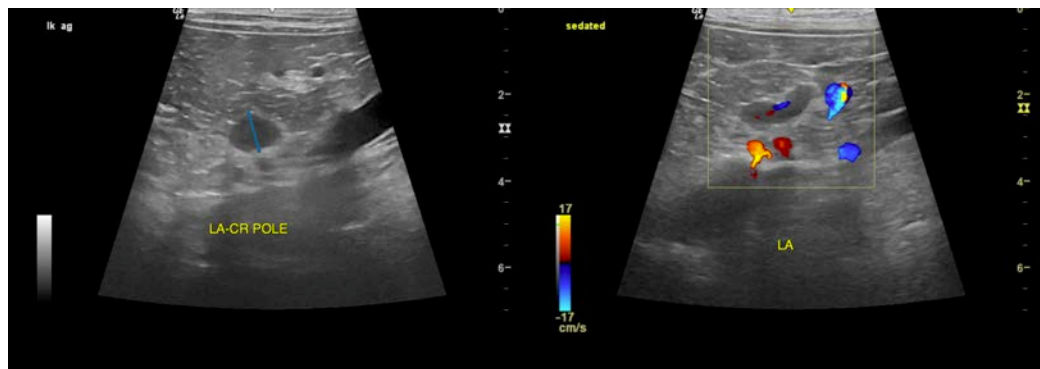
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

**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.

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

**BREED**

Bichon X

kathleen.sennello@sonopath.com

**SEX**

Neutered Male

**AGE**

13.5 Years

**WEIGHT**

29.7 Pounds

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MS, Diplomate ACVIM  
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**IMAGING PERFORMED BY**

Loetitia Saint-Jacques, RVT

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