



PATIENT

Dozer Hill

SPECIES

Canine

BREED

Mixed

SEX

Neutered

AGE

11 Years 10 Months

WEIGHT

83 Pounds

PRESENTING CLINICAL SIGNS

PAWS Request Form: Chief Concern / Provisional Diagnosis: Persistent PU/PD Relevant Medical History and Physical Exam findings: **Dozer** presented in September 2021 as a second opinion for persistent increased urination and thirst (large volumes). Mildly reduced energy and occasional loss of appetite, but otherwise unremarkable. His previous blood work showed no abnormalities. On examination, **Dozer** was found to be BAR, seen to consume large quantities of water during exam and required a break to urinate a large volume. A Large panel was performed (CBC/Chem/T4/UA/Culture/fecal) and showed beta hemolytic strep urinary tract infection which was highly susceptible to antibiotics and elevations in SDMA. Concerning for pyelonephritis and long term undiagnosed urinary tract infection. **Dozer** was treated for 4 weeks with clavamox due to concern for pyelonephritis. He has since had two negative urine culture results and continues to have PU/PD. It is improved from before antibiotic treatment (no longer unable to hold his bladder). Looking for other underlying causes to explain PU/PD and with relatively unremarkable blood work. Highly interested in urinary tract and prostate Recent Diagnostics: Relevant Laboratory Results / Abnormalities: Mountain View Animal Hospital and Holistic Pet Care Ultrasound Submission Form Client: Lauren Hill Patient: **Dozer** Sex: Neutered Male Date: 12/16/2021 DOB: 2/13/2010 Species: Canine Phone: (773) 744-0176 Age: 11 Yrs. 10 Mos. Breed: Mixed 8/14/2021: CBC/Chem/UA/Urine Culture/T4 SDMA 17 USG 1.012 Betahemolytic streptococcus cultured > 100,000 CFU per ml 9/16/2021: UA & Culture USG 1.012 Culture negative 11/15/2021: UA & Culture with Chem SDMA 15 USG 1.018 Culture negative Current medications (include full name, dosage and frequency): probiotics once daily Relevant Radiograph Findings(email radiographs if available): none

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 prostate is normal in size (0.98 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.

The left kidney has a normal shape and size (6.84 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.

The right kidney has a normal shape and size (6.63 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.

Adrenal Glands

The left adrenal gland is normal in size measuring 0.95 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.

The right adrenal gland is normal in size measuring 0.98 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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IMAGING PERFORMED BY

Loetitia Saint-Jacques, RVT

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Dr. Sarah Kalivoda

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PATIENT

Dozer Hill **Spleen**

SPECIES

Canine

The spleen is subjectively normal in size. The spleen echotexture is heterogenous and mildly mottled, the splenic capsule is smooth with no irregularities. The blood flow through the hilus and splenic parenchyma appears normal. There is an ill-defined, hypoechoic nodule visualized within the parenchyma, measuring 0.81 cm.

BREED

Mixed

Liver

The liver is subjectively normal in size and hypoechoic 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. No focal nodules or cystic lesions are observed.

SEX

Neutered

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.

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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.

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83 Pounds

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 measured 0.53 cm. Jejunum wall measured 0.41 cm. Visualized peristalsis appears appropriate. There is a 2.38 cm x 2.65 cm circular structure visualized in the right cranial quadrant of the abdomen in the area of the pancreas. This has apparent gas within the lumen, and a wall thickness of 1.1 cm. This structure most closely resembles bowel, but a pancreatic lesion cannot be excluded as a possibility.

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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. In the right cranial quadrant of the abdomen, there is a circular structure visualized with apparent intraluminal gas. This appears most consistent with a bowel lesion, but I cannot rule out the possibility of an abscess in the area of the pancreas. This seems unlikely, as there is no surrounding inflammation, and the pancreas appears normal.

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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 generally of normal uniform echogenicity.

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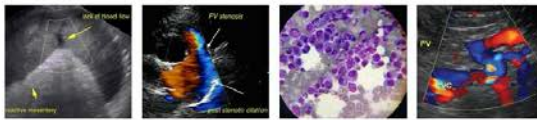
Other

A brief view of the heart was submitted. No significant pericardial effusion was seen.

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There is a 2.38 cm x 2.65 cm circular structure visualized in the right cranial quadrant of the abdomen. This structure appears to have gas within the lumen, and a wall thickness of 1.1 cm. This most strongly



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Dozer Hill resembles bowel, but a longitudinal connection to other bowel is not visible. An alternative differential would be a cystic structure such as a pancreatic abscess, necrotic intraabdominal lipomas, etc.

SPECIES ULTRASONOGRAPHIC FINDINGS

Canine

- Mildly mottled spleen with small, hypoechoic nodule – There is a non-cavitated, hypoechoic splenic nodule visualized. Differentials include lymphoid hyperplasia, extramedullary hematopoiesis, infiltrative neoplasia, inflammation, other. Cytology or histopathology would be necessary to get a definitive diagnosis.

BREED

Mixed

- Hypoechoic, heterogeneous liver – 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.

SEX

Neutered

- Prominent, circular gas-filled structure in right cranial quadrant of the abdomen – Possible differentials include bowel loop, cystic structure (cyst, abscess), necrotic lipoma, other.

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The changes associated with the spleen and liver are relatively non-specific. Additionally, the adrenal glands are at the high end of normal size wise, and this could be significant. In this case there seem to be two different issues, which could be related or could be separate. First is the increased thirst and urination. I typically rely on a list of differentials and work my way through the list from most common to least common, and most likely given the clinical signs exhibited, etc. I will include this list at the end of the report in case it is at all helpful. In this situation, I would work my way down the following list as needed:

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- Start with current bloodwork to make sure nothing has changed since August
- Provided calcium is normal, etc., I would consider testing for Leptospirosis
- Current urinalysis and culture (I believe you have one)
- Consider liver function test
- If signs of Cushing's are present +/- ALP elevation, consider adrenal function testing

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The other observation was a round circular lesion in the right cranial quadrant of the abdomen. This has the characteristics of a thickened loop of bowel (gas within, etc.), but no sagittal view revealing anything but a circular structure was visualized, so alternatives such as a pancreatic abscess, cyst-like structure, etc. need to be considered. In the absence of specific symptoms such as vomiting, diarrhea, abdominal pain, surrounding inflammation, etc., options for further diagnostics would include:

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- Fine needle aspirate of the lesion with cytology +/- fluid analysis if there is fluid present
- Advanced imaging (contrast CT scan) of the area
- Continued workup for PU/PD and rescan this area thoroughly again in 3-4 weeks
- Consider fine needle aspirate of the splenic lesion.
- 3-view thoracic radiographs to look for possible concurrent intrathoracic disease

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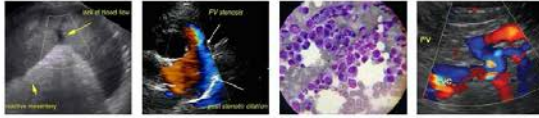
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An obvious lesion responsible for the reported increase in thirst and urination was not visualized. Some issues such as early renal disease, cushings disease, behavioral issues, neurologic disease, dietary issues, electrolyte disturbances etc.. are not able to be diagnosed with ultrasound alone. These can be challenging cases. The top 10 differentials can be ruled in/out with routine bloodwork, urinalysis and culture. Several more can be evaluated with a good history and imaging. Unfortunatel, as you work your

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PATIENT

Dozer Hill way down the list the differentials become harder to definitively diagnose. This is the differential list I start with:

SPECIES

Canine

- (1) Hyperadrenocorticism (may be a mixed primary PU and PD)
- (2) Hypoadrenocorticism (either Addison's or hypocortisolism)
- (3) Hypercalcemia
- (4) Diabetes Mellitus

BREED

Mixed

- (5) Liver Disease (hepatic encephalopathy may be a mixed primary PU and PD)
- (6) Pyelonephritis
- (7) Leptospirosis (can present without azotemia)
- (8) Chronic Renal Disease/Renal Failure (can present pre-azotemic, especially in dogs, but expect the BUN & creatinine not to be at the low end of the reference range)

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Neutered

- (9) Hyperthyroidism
- (10) Hypokalemia
- (11) Pyometra (including stump pyometra in spayed dogs)
- (12) Renal Tubular Diseases (glycosuria or Fanconi & Fanconi-like syndromes or RTA)
- (13) Chronic Partial Urinary Obstruction or Post-Obstructive Diuresis

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- (14) Iatrogenic Disease due to medications (diuretics, phenobarbital, KBr; diets either high in salt [such as S/D] or very low in protein (such as U/D))
- (15) Pheochromocytoma
- (16) Polycythemia

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- (17) Hypertension Acromegaly (expect these patients to have diabetes)
- (18) Paraneoplastic Syndromes (particularly splenic hemangiosarcoma?)
- (19) Pericardial Effusion
- (20) Atypical Cushing's and SARDS Psychogenic Polydipsia (as in a true behavior disorder with a compulsive element)

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- (21) Primary Non-Medical Polydipsia (aka "I drink a lot because I like it or I engage in activities that promote it, but that doesn't mean I'm sick")
- (22) Psychogenic Polydipsia (as in a true behavior disorder with a compulsive element)
- (23) Acromegaly (expect these patients to have diabetes)
- (24) Primary Nephrogenic Diabetes Insipidus (Congenital Nephrogenic Diabetes Insipidus, other diseases that cause primary PU other than Congenital Diabetes Insipidus would be considered Acquired Nephrogenic Diabetes Insipidus)
- (25) Central Diabetes Insipidus

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**Keep in mind that diabetes insipidus is a VERY rare disorder and that water deprivation tests are rarely/if ever recommended-if possible consider referral to an internal medicine specialist if reaching that point.

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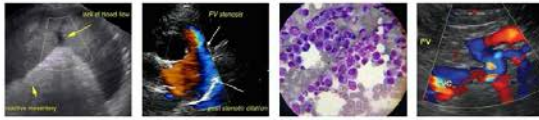
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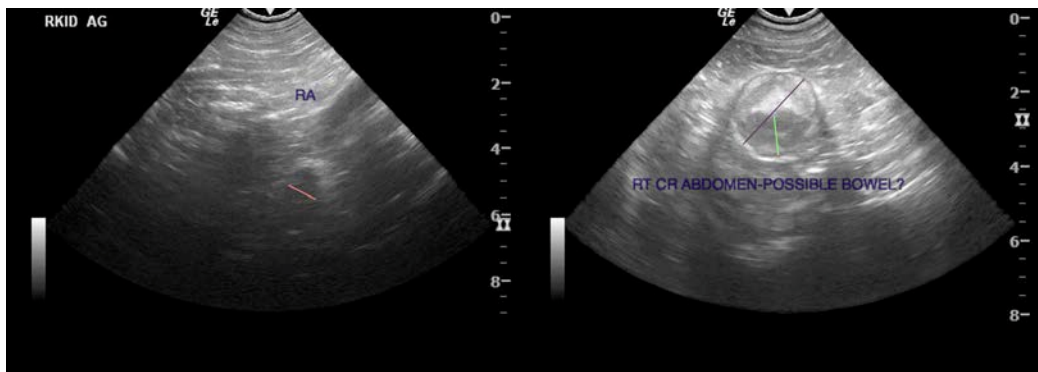
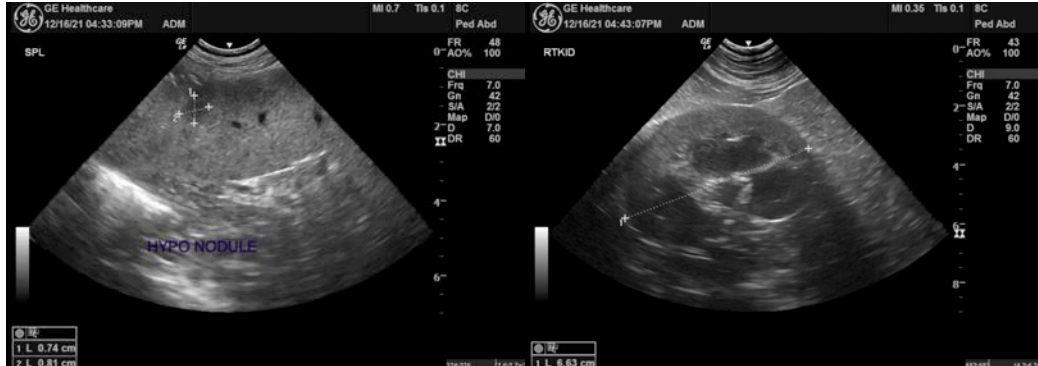
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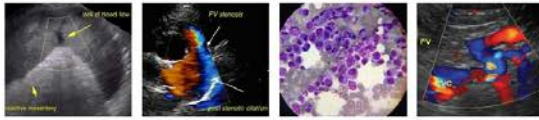
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

SPECIES

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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.

BREED

Mixed

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