

**DATE PRESENTING CLINICAL SIGNS**

3/8/22

Excessive PU/PD for couple of months- fairly acute onset about 1 year ago. Frequent urination with accidents in the house- usually where he lays would have a puddle. Over past few months has also been drinking A LOT of water- seems always thirsty. PE unremarkable.

PATIENT

Teddy Yantz

Current Medications: Was on Proin early on but didn't resolve the issue. 2 courses of Baytril back in the summer/fall- maybe helped calm the symptoms but never resolved. Clavamox 375mg BID for 14 days 2/7/22- maybe very slight improvement in symptoms but not resolved.

SPECIES

Canine

Lab Results: 6/2021: CBC/Chem WNL except for mild hypernatremia. UA WNL except USG 1.012, pH 9.0. 7/2021 repeat UA: USG 1.026, pH 6.0, all else WNL. 10/2021 UA: USG 1.010, pH 9.0, all else WNL. Chem 10 WNL. 1/2022 CBC/Chem WNL. UA: USG 1.005, 2+ blood (likely secondary to cysto), pH 8.5, culture negative. 2/2022 UCCR WNL (25); multiple checks of USG at different times of the day- range between 1.020 and 1.005. usually more concentrated in AM.

BREED

Labrador X

Radiographs: WNL.

Date of Previous IntraPet Ultrasound: No previous.

SEX

Sedation: Not required to complete full diagnostic ultrasound.

Stat Report: Not requested.

Neutered Male

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**AGE**

3/22/14

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.

WEIGHT

56 Pounds

The prostate is normal to borderline enlarged in size (1.7 cm in the sagittal view, 1.4 cm x 3.0 cm in the cross sectional view) and normal 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.

INTERPRETED BY

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

The left kidney has a normal shape and size (7.13 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.

IMAGING PERFORMED BY

Rachel Brillhart RDMS

The right kidney has a normal shape and size (6.15 cm) with pinpoint non-obstructive nephroliths. 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

Greenbrier Vet Clinic

Adrenal Glands

The left adrenal gland is normal in size measuring 0.75 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. Streett

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

35963

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. While no discreet

mass effects or nodules are visualized, there is an isoechoic bulge towards the cranial third of the spleen measuring approximately 2.23 cm.

Liver

The liver is 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. No focal nodules or cystic lesions are observed.

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 uniform diameter with minimal fluid distension. Wall appears subjectively, mildly increased. Bowel loops follow a typical curvilinear path with distinct wall layering. Jejunum wall measured 0.38 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 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

Evaluation of the peritoneal cavity did not reveal any evidence of effusion. There are occasional prominent mesenteric lymph nodes visualized measuring 0.45 cm, and the omentum is of normal echogenicity.

Other

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

PRIMARY FINDINGS

- Borderline enlarged prostate – The prostate appears prominent in size, but is relatively normal in shape and appearance. Correlate with age of neutering. If neutered after puberty, this is likely within normal limits. If neutered early, then correlate with digital rectal exam and possibly a fine needle aspirate.
- Isoechoic “bulge” in the spleen – The significance of this ill-defined area is unclear. Consider cytology or continued monitoring.
- Mildly 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.
- Prominent small intestine – The mild small intestinal wall changes may be a normal variant in this

patient or could be consistent with an inflammatory process (e.g., inflammatory bowel disease).

SECONDARY FINDINGS

- Mild gallbladder debris – The significance of the aggregated gallbladder sludge is unclear. This could represent an early mucocele, cholestasis, or may be secondary to fasting.
- Mildly prominent mesenteric lymph nodes – likely an insignificant finding.

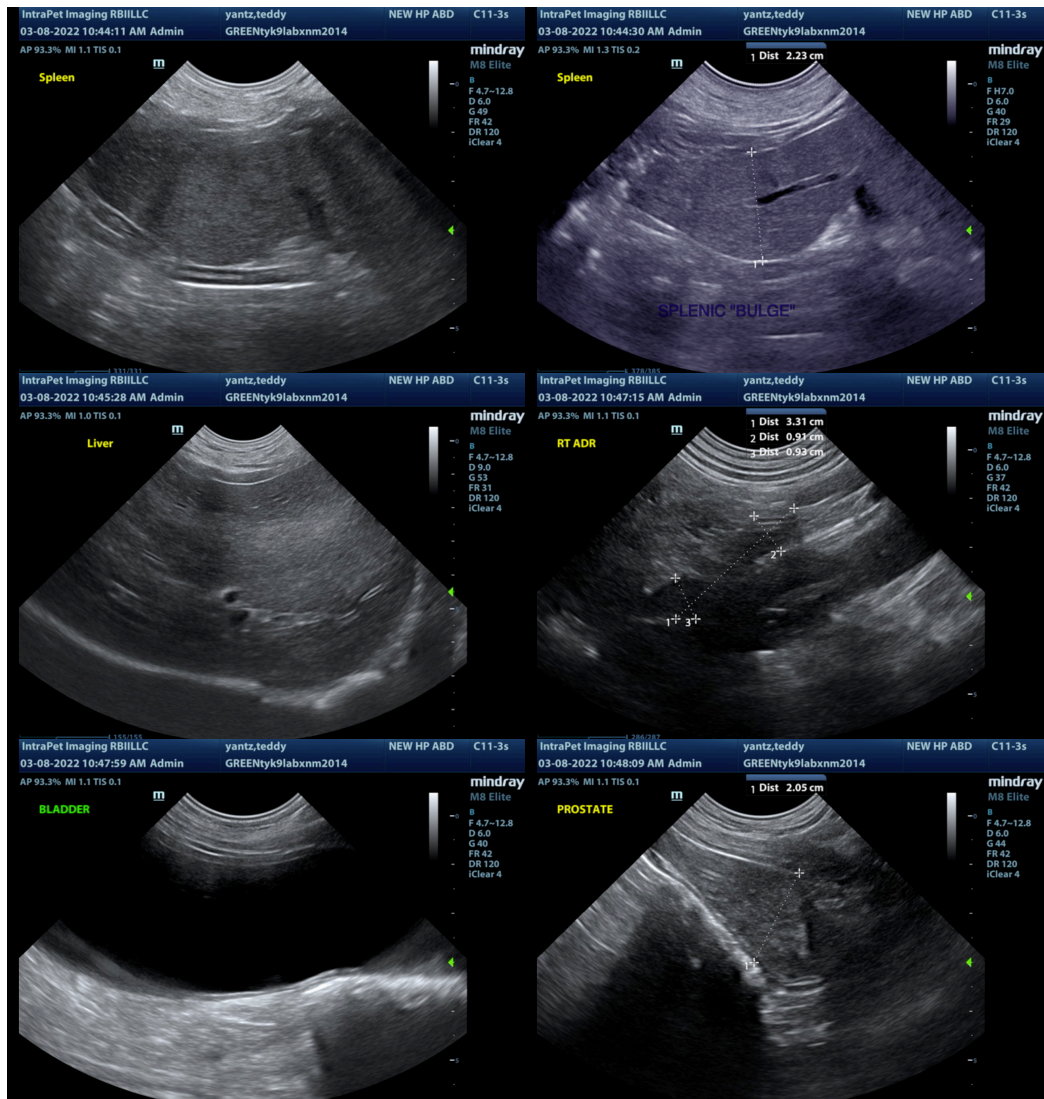
INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

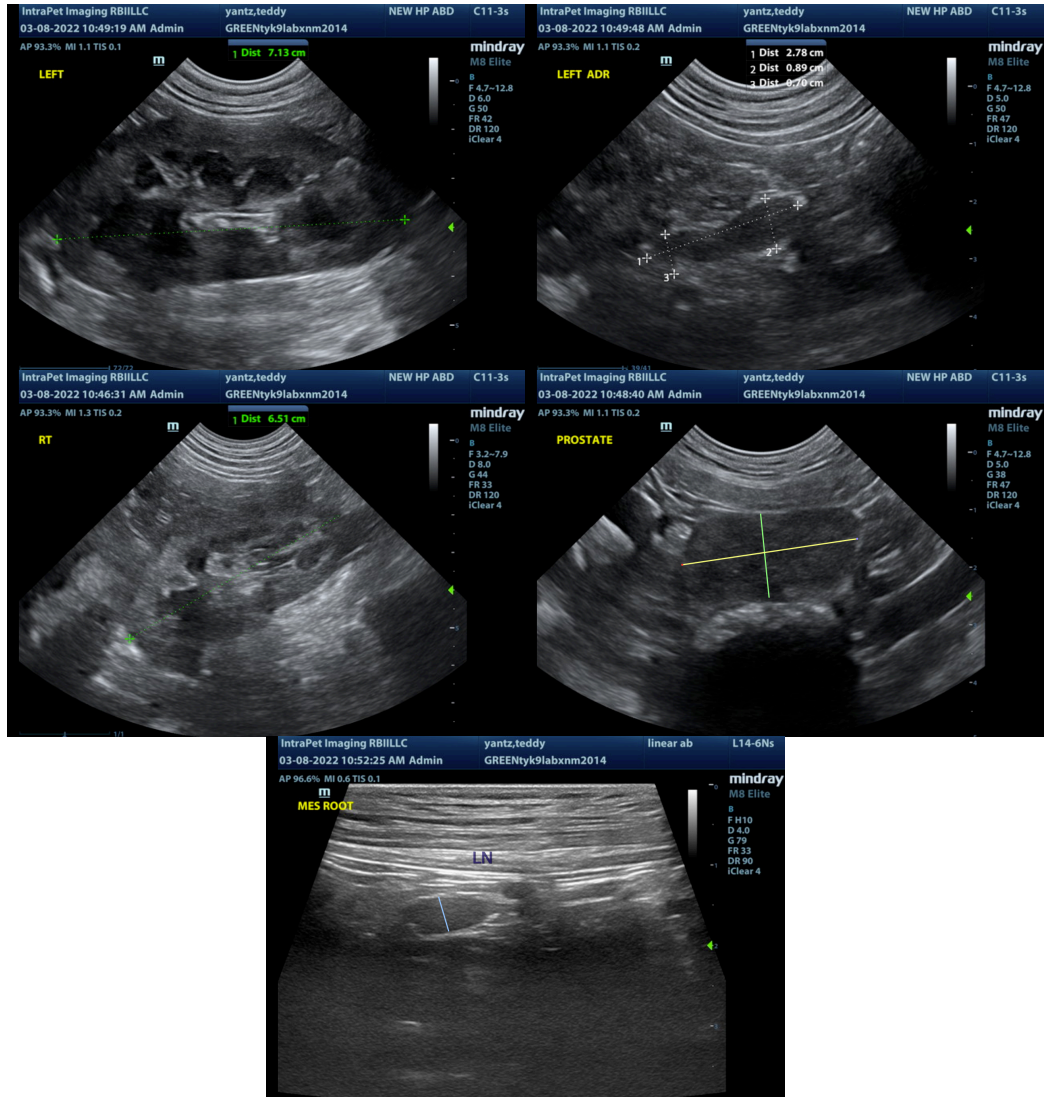
An obvious lesion responsible for the reported increase in thirst and urination was not visualized. Some issues such as early renal disease, Cushing's disease, behavioral issues, neurologic disease, dietary issues, electrolyte disturbances etc.. are not able to be diagnosed with ultrasound alone. These 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. Unfortunately, as you work your way down the list the differentials become harder to definitively diagnose. This is the differential list I start with:

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

**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.

Many of these differentials can be ruled out based on your routine bloodwork and today's imaging, Make sure to confirm that you have a normal calcium level and chest radiographs. Options moving forward would include a possible fine needle aspirate of the spleen, testing for Cushing's disease (this would be an atypical case, but possible), possible fine needle aspirate of the prostate or continued monitoring if this is unlikely to be a factor, thorough evaluation of treats and diet changes, quantitate water intake, etc. Acquired diabetes insipidus is a very rare diagnosis, and should only be arrived with a thorough evaluation.





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.

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