

**DATE PRESENTING CLINICAL SIGNS**

12/3/21

History: 11/20/21: O dropped off urine sample for UA for having urinary accidents in the house and drinking more than normal. Urine hyposthenuric; no evidence of infection. Recommended bloodwork.

**PATIENT**

Mack Ruppensberger

11/29/21: Bloodwork unremarkable. Recommended dropping of first morning urine sample. 12/1/21: First morning urine isosthenuric (USG 1.012); inactive sediment. No further urinary accidents, but still PU/PD according to O.

**SPECIES**

Canine

Lab Results: 11/20/21: UA (free catch): USG 1.007, pH 5.0, inactive sediment. 11/29/21: CBC: wnl, Chemistry: wnl, T4: wnl, UA (not received). 12/1/21: UA (free catch): USG 1.012, pH 5.0, inactive sediment. Date of Previous IntraPet Ultrasound: No previous IntraPet scans. Sedation: Trazadone, Dexdomitor, Torb.

**BREED**

Mastiff X

Stat Report: Not requested.

**SEX**

Neutered Male

**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.

**AGE**

4/11/05

The visualized areas of prostate and surrounding tissue appear normal. Unfortunately, the prostate is not fully visualized likely due to its intrapelvic location. Correlate with rectal exam findings.

**WEIGHT**

87 Pounds

The left kidney has a normal shape and size (7.38 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 (6.93 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**

Andi Parkinson RDMS

**Adrenal Glands**

The left adrenal gland is normal in size measuring 0.54 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.

**HOSPITAL NAME**

Timonium AH

The right adrenal gland is normal in size measuring 0.63 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.

**REFERRING VET**

Dr Falkowski

**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.

**INVOICE**

33252

**Liver**

The liver is subjectively normal in size, and 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 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.

### ***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 (between 0.2-0.47cm.) 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, 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.

## **ULTRASONOGRAPHIC FINDINGS**

- 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. If liver values are normal, this likely represents age related change.

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

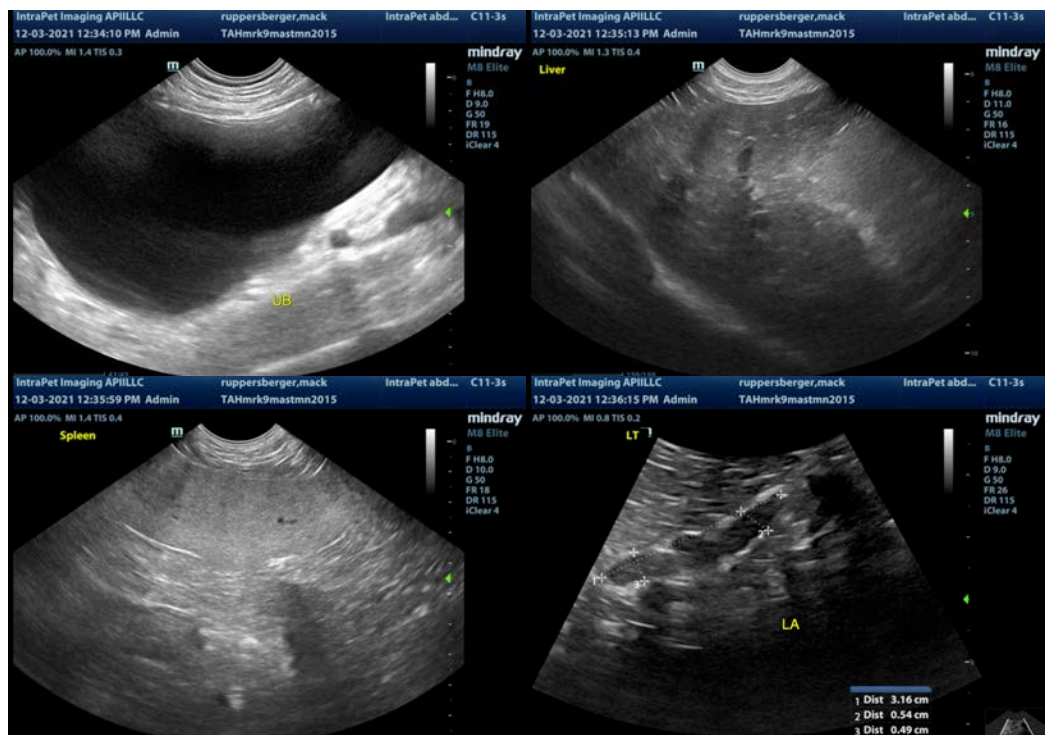
An obvious cause for the increased thirst and urination reported is not identified. Additionally, your baseline blood work is reported as normal, providing no clues. Recommend urinalysis and culture. In this cases, I typically methodically go through a list of possible differentials, excluding the easy/common diagnoses first and moving on to more challenging possibilities. Below is the list I consider:

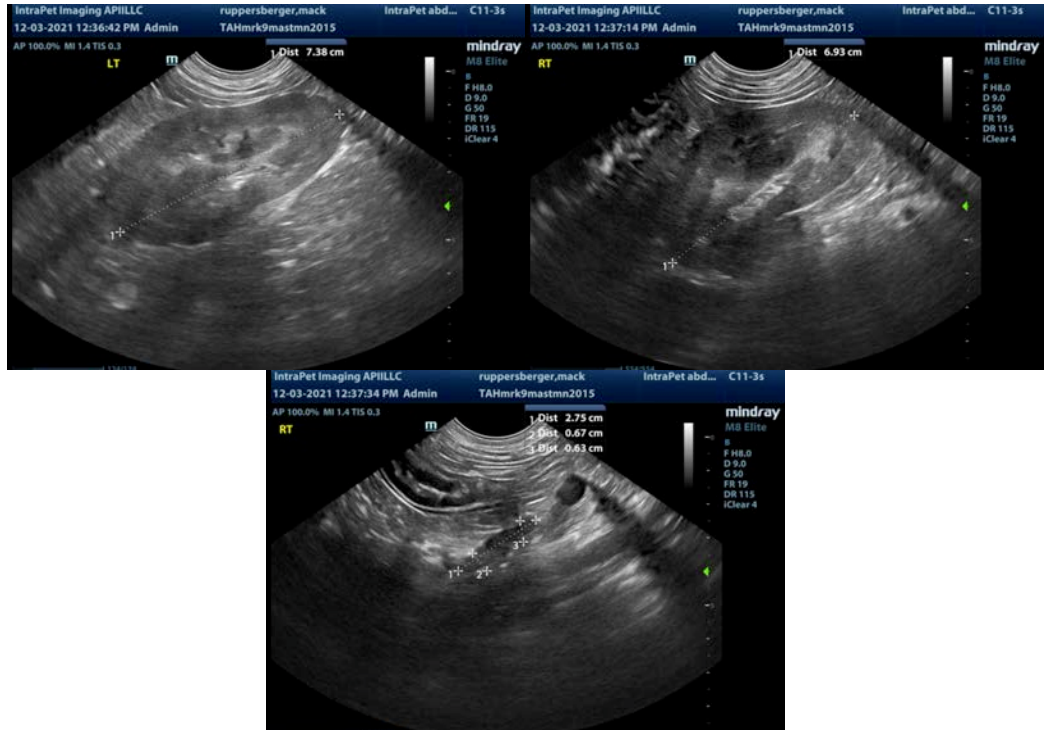
PU/PD list: Some of these can be ruled out immediately, as you work your way down the list these differentials are much more rare and difficult to diagnose.

- (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.





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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