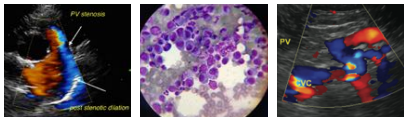
IMAGING PERFORMED BY

IntraPet.com



SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

DATE

3/13/23

PATIENT

Tootsie Stallings

SPECIES

Canine

BREED

Staffordshire Bull Terrier

SEX

Spayed female

AGE

10/30/11

WEIGHT

69 lbs

INTERPRETED BY

Eric Lindquist, DMV DABVP, Cert. IVUSS

HOSPITAL NAME

Warm and Fuzzy

REFERRING VET

Dr. Ullman

INVOICE

43261

PRESENTING CLINICAL SIGNS

Has been extremely thirsty all the time, will howl for more water or sometimes won't drink all day. Can't hold her urine very well, has a lot of accidents. Sometimes urine is very dark like almost black. Will vomit every time she eats and drinks, that has been going on for about a week. Decreased eating.
Current Medications: None.
Lab Results: Urinalysis- 4+ epithelial cells, Raft of epithelial cells present
Date of Previous IntraPet Ultrasound: No previous.
Sedation: Not required to complete full diagnostic ultrasound.
Stat Report: Not requested.
Imaging Performed By: Rachel Brilhart, RDMS.

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The **urinary bladder**, trigone, and pelvic urethra presented normal thicknesses and normal tone. The ureters were not visible which is normal. No uroliths or sediment were visualized and anechoic urine was present. No evidence of inflammatory or neoplastic changes was noted. Ureteral papillae were normal.

The **kidneys** revealed normal size and structure, corticomedullary definition and ratio for this age. The cortices presented largely uniform texture with normal echogenic relationship to liver and spleen. Medullary structure differed distinctly from the cortex and no evidence of pelvic dilation was present. The capsules were acceptably uniform without significant irregularities. The right kidney measured 5.9 cm. Blood flow to the kidneys appeared adequate on color flow assessment.

Adrenal Glands

The left **adrenal gland** revealed a slightly hyperechoic nodule at the cranial pole measuring 0.8 x 0.65 cm. The left adrenal caudal pole measured 0.53 cm and 3.07 cm in length.

Spleen

The **spleen** revealed a hypoechoic nodule in the mid body measuring 0.95 cm. This should be monitored or FNA would be appropriate. The remainder of the spleen is unremarkable.

Liver

The **liver** images from right and left intercostal as well as subcostal views revealed subjectively normal liver size, contour, and structure. Some age-related parenchymal remodeling was noted but likely not clinically significant at this time. Vascular and biliary tracts were of normal volume and no evidence of congestion was noted. The gallbladder presented some dependent debris with essentially normal contour. The cystic and common bile ducts were normal. No overt evidence of active inflammatory, infiltrative or regenerative pathology was noted but should be paired with current or past LE elevations regarding any clinical significance to this presentation. The hepatic lymph nodes were unremarkable.

Gastrointestinal

A minor amount of non-shadowing, non-obstructive ingesta was noted in the stomach. Transit of chyme into the small intestine was normal. Curvilinear patterns were maintained throughout the GI tract. No evidence of pathology. Small and large intestine demonstrated normal luminal chyme and stool consistency respectively. No obstructive or overt infiltrative disease was noted. The mesenteric lymph node was reactive and measured 1.65 x 0.65 cm.

Pancreas

The base and limbs of the **pancreas** were observed to be largely isoechoic to surrounding omental fat. Pancreatic duct and capsular contour were acceptably normal and parenchyma respected normal curvilinear patterns. No overt evidence of active inflammatory or neoplastic disease was noted.

Heart

Rapid view of the heart revealed no evidence of pathology. Contractility and volumes were normal. Pericardial space, right auricle and pleural space were unremarkable.

ULTRASONOGRAPHIC FINDINGS

Left adrenal nodule, subjectively benign.
Normal bladder and urethra.
Splenic nodule, unremarkable.
Age related liver.

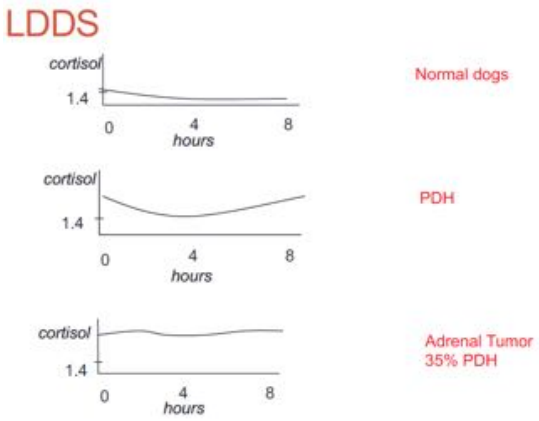
INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

There was no evidence of significant disease in this patient. However, the splenic nodule should be monitored carefully for any growth or an FNA could be utilized. The cause of urinary issues is not evident unless the left adrenal nodule may represent emerging functional adenoma or adenocarcinoma. If the urine specific gravity is persistently less than 1.020 then monitoring for Cushing's would be appropriate if the patient appears Cushingoid. Recheck sonogram is recommended in 4 weeks of the left adrenal and splenic nodules. There is a minor potential for round cell neoplasia or hemangiosarcoma.

Efficient & Accurate Cushing's Work up-Lindquist
Notes regarding Cushing's Clinical Presentations:
Nearly all Cushing's dogs have SAP elevations and true PU/PD (USG < 1.025) and most are polyphagic. Cushing's dogs are > 6 years and usually > 9 years old, usually have poor skin coats, body scores > 3/5, and are usually sedentary animals.
Its important to remember that Cushing's dogs usually look and play the part and other diseases cause false + stress related cortisol spikes. On rare occasion a Cushing's dog will not follow the rules but this is truly an exception.
Potential Cushing's patient workups can be costly and frustrating if not definitive and, in my experience, the non-definitive patient usually has something else going on that may be contributing to some of the clinical signs a Cushing's dog will have, especially SAP elevations or PU/PD. Based on this prelude of information I came up with the following algorithm in the spirit of diagnostic efficiency.
The following suggested protocol is based on current available literature on Cushing's disease and extensive clinical-sonographic experience evaluation + Cushing's and False + LDDST & ACTH stim. cases in order to maximize the efficiency of a Cushing's workup in practice.

Screen first, workup second
1) **UA:** Repeatable (2-3 urine samples) Urine specific gravity & urine cortisol/creatinine ratio (UCCR): If ***repeatable USG< 10.20 and + UCCR*** move to next step 2.
Note: UA is inexpensive and easy to obtain and if UA criteria is not met for Cushing's then resources can be spent into other more pertinent diagnostics or left on hold until the UA criteria is met in emerging Cushing's cases.
2) **Sonogram:** Does the patient **have concurrent disease** clinically or sonographically as non-Cushing's illness will influence the potential false + LDDST or even ACTH stim. The sonogram gives a global perspective of the internal health of the patient to be considered in the Cushing's workup as an assessment of concurrent disease. Is there a concurrent neoplastic process, UTI pancreatitis, mucocele….? Are the adrenals enlarged

(Cushing's-PDH, stress, age related or breed variant), or atrophied (Iatrogenic Cushing's or adrenal burnout), have asymmetric enlargement (Adrenal tumor, hyperplasia, adenoma, age related variant), or is there vascular invasion (Invasive pheo with false + UA criteria or adenocarcinoma or phrenic thrombosis)? The sonogram answers these questions proactively.
Address & treat concurrent disease first before performing Cushing's testing or testing will be artificially altered increasing false negatives and positives.
3) **LDDST** (0.01 D-Sodium phosphate mg/kg IV ***with precise dosing****)*** (Better screening test but plagued with false + but considered more specific than ACTH stim) Use if there is potential early Cushing's or if adrenal asymmetry present on sonogram suspecting tumor. Use LDDST in cats at a higher dose (0.1 mg/kg IV). **Interpetation LDDST:** Look at 8-hour post first: If > 1.4 = Cushing's. Then look at 4-hour: if > 1.4 or > 50% baseline = Cushing's. 4-hour do then 8-hour spike most consistent with PDH. Flat line high constant curve without dip more consistent with tumor but can be PDH. See attached graph.

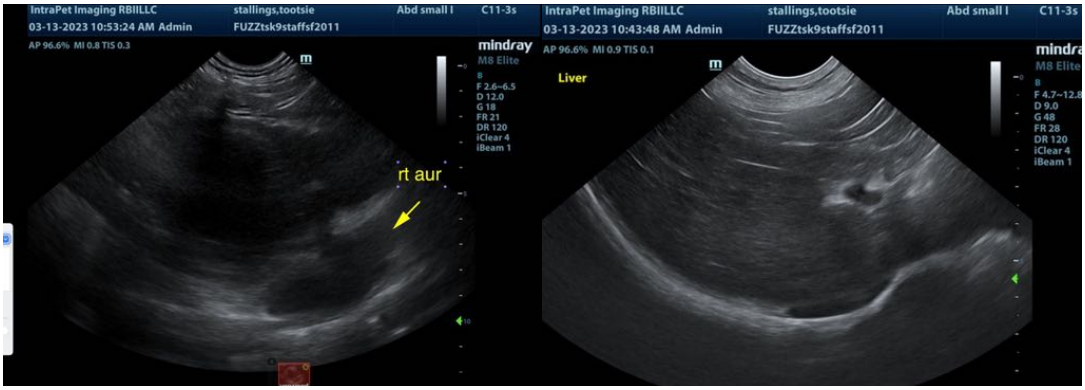


Courtesy: Rebecca Berg DACVIM, DECVIM

4) **ACTH stim**. (Better confirming test but can have false +) Use if the patient "looks" Cushingoid or if bilateral adrenal enlargement is present, or high normal width on sonogram, or if iatrogenic Cushing's suspected (Cortisone Tx in past). ACTH stim is better for diagnosis of Addisons, Iatragenic Cushing's, and Cushing's therapy monitoring but problematic with initial Cushing's diagnosis. First dx LDDST is suggested.
5) If **diabetic** then run both LDDST & ACTH stim but stabilize as much as possible first.
5) Run a **serial blood pressure** in a BP friendly non "white coat effect" atmosphere. Run at least 3 at different times over a few hours or when eating as the patient tends to be calm when eating or give Torbutrol when entering the facility. Cushing's hypertension is usually 150-180 systolic range while pheochromocytoma range is more often > 180 systolic.
6) **Perform CT** of the pituitary to identify macro adenoma expansion if any lethargy or dullness or other central clinical CNS signs are minimally present. CT for adrenal may be more through for adrenalectomy surgical planning if ultrasound views of the CVC were problematic.
7) **Adrenectomy** for adrenal mass is prescribed then it is essential to stabilize the patient first regarding secondary disease such as organ dysfunction, hypertension, diabetes mellitus, hypernatremia, thromboembolic risk urinary and other infection in order to minimize potential for operative and postoperative complications as they are common in adrenalectomy. Trilostane stabilization therapy for Cushing's would be the first approach then address surgery and hypertension should be managed ideally < 160 systolic with ace inhibitors, phenoxybenzamine, or amlodipine.

Suggested reading:

Behrend EN, Kooistra HS, Nelson R, et al. Diagnosis of Spontaneous Canine Hyperadrenocorticism: 2012 ACVIM Consensus Statement (Small Animal). J Vet Intern Med 2013;27:1292–1304 .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C11-3s
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AP 96.6% MI 0.8 TIS 0.3
mindray
M8 Elite
rt aur
IntraPet Imaging RBIILLC
stallings,tootsie
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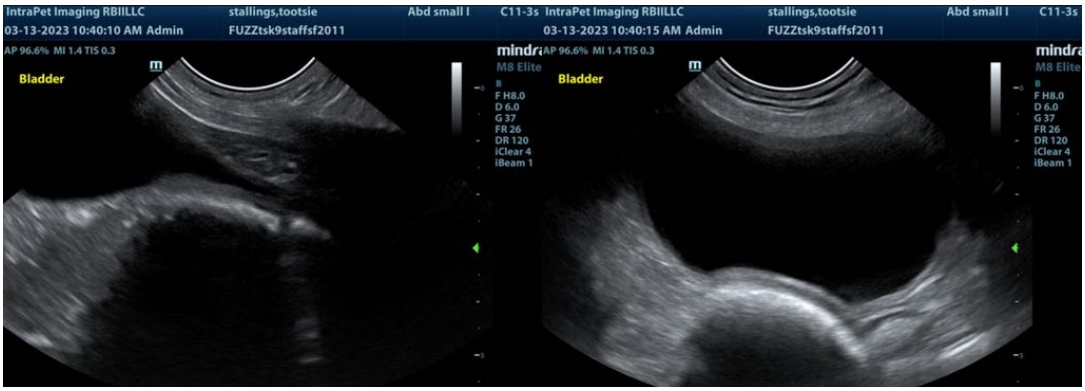
Liver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AP 96.6% MI 1.4 TIS 0.3
Bladder
IntraPet Imaging RBIILLC
stallings,tootsie
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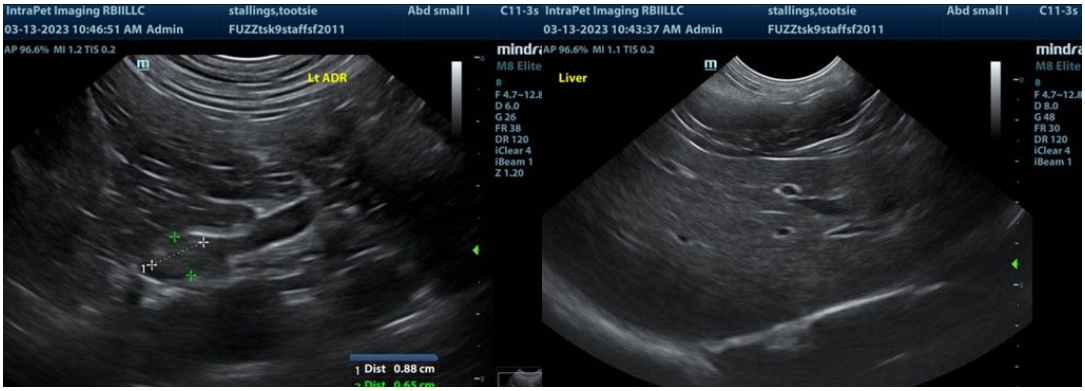
AP 96.6% MI 1.4 TIS 0.3
Bladder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Abd small I
C11-3s
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AP 96.6% MI 1.2 TIS 0.2
Lt ADR
1 Dist 0.88 cm
IntraPet Imaging RBIILLC
stallings,tootsie
Abd small I
C11-3s
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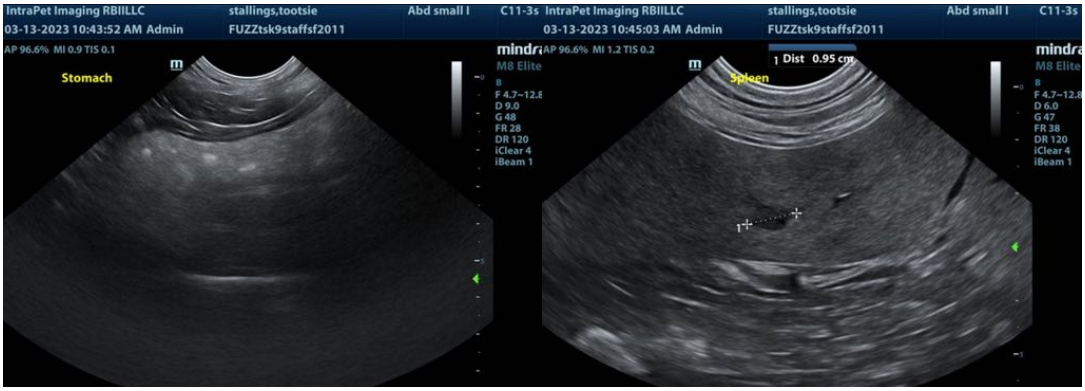
AP 96.6% MI 1.1 TIS 0.2
Liver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Stomach
IntraPet Imaging RBIILLC
stallings,tootsie
Abd small I
C11-3s
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FUZZtsk9staffsf2011
Spleen
1 Dist 0.95 cm


IntraPet Imaging RBIILLC
stallings,tootsie
Abd small I
C11-3s
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Lt Kidney
IntraPet Imaging RBIILLC
stallings,tootsie
Abd small I
C11-3s
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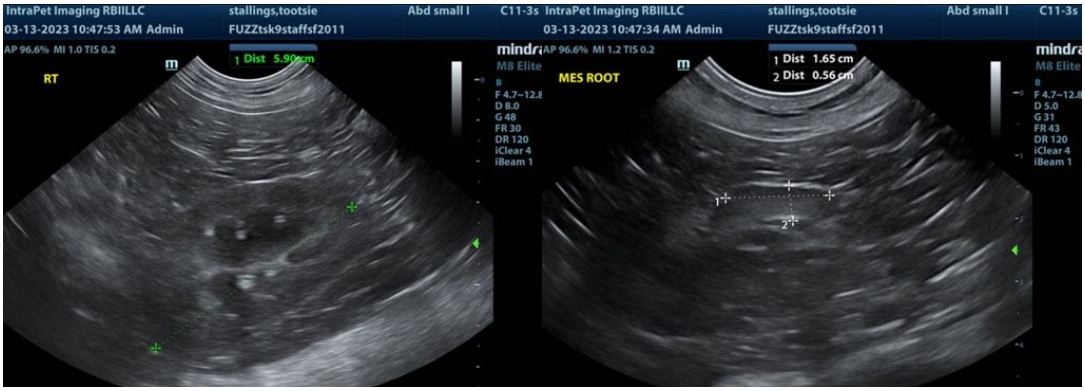
RTADR
1 Dist 2.68 cm
2 Dist 0.71 cm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RT
1 Dist 5.90 cm
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stallings,tootsie
Abd small I
C11-3s
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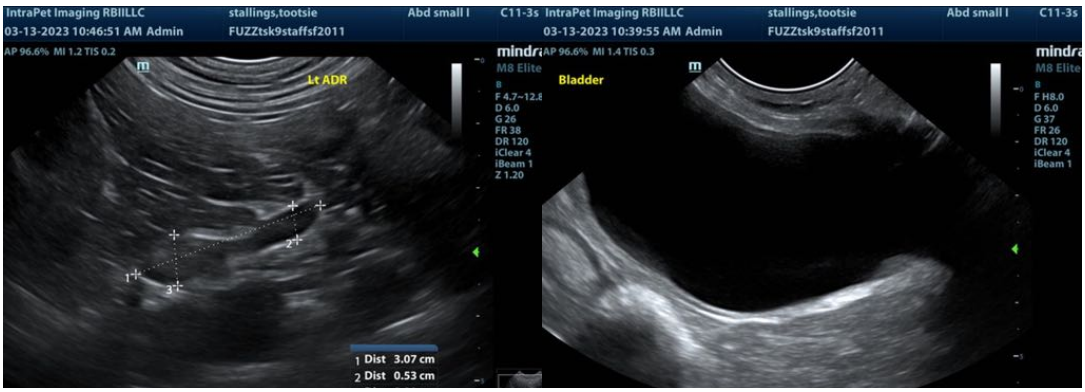
MES ROOT
1 Dist 1.65 cm
2 Dist 0.56 cm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C11-3s
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Lt ADR
1 Dist 3.07 cm
2 Dist 0.53 cm
IntraPet Imaging RBIILLC
stallings,tootsie
Abd small I
C11-3s
03-13-2023 10:39:55 AM Admin
FUZZtsk9staffsf2011
Bladder

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.

Eric Lindquist, DMV, DABVP, Cert. IVUSS, CEO of SonoPath.com
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