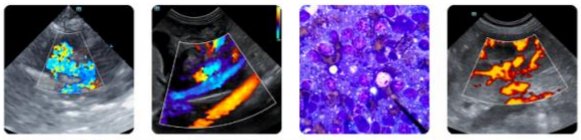


DATE

12/04/25

PATIENT

Bear Zelenka

SPECIES

Canine

BREED

Miniature Schnauzer

SEX

Intact Male

AGE

09/15/2013

WEIGHT

14.6 pounds

INTERPRETED BY

Eric Lindquist, DMV, DABVP(CFM), Cert. IVUSS

HOSPITAL NAME

Fullerton Animal Hospital

REFERRING VET

Dr. Greenfield

INVOICE

12579

PRESENTING CLINICAL SIGNS

Patient History: Inappetence for 1 month. Previous history of CKD. Physical exam unremarkable, but kidney disease is advancing.

Current Medications: SQ fluids 200 ml, Ondansetron 6mg BID, Naraquin
Labwork Results: Labwork attached, reported as: Creatinine 4.4 from 1.6, BUN 129, Phos 11.4, ALP >2000
Date of Previous IntraPet Ultrasound: 10/5/23 and 12/28/23. See attached.
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 **bladder** in this patient was mildly thickened with slight echogenic mural changes. No calculi or masses were noted. Slight micropolypoid changes were noted. This is a frequent finding in older animals and may be linked to a history of chronic urinary tract infection or active urinary tract infection. Urinalysis would be recommended with culture if any evidence of inflammatory sediment is present. The region of the trigone and visible pelvic urethra were normal.

The **testicles** were imaged and found to be uniform with no overt pathology.

The **prostate** was uniformly enlarged with minor lobar swelling appeared to impinge upon the urethra and mildly deviate the descending colon. The prostatic tissue was hyperechoic containing focal areas of decreased echogenicity. These changes are suggestive of either chronic inflammatory episodes, benign cystic pathology or both. Underlying neoplasia cannot be completely ruled-out but is lower on the differential list. This presentation is most consistent with benign prostatic hyperplasia with possible active prostatitis. Neutering or off-label Finasteride (Propecia) (0.1-0.5 mg/kg Sid) treatment is indicated +/- FNA or prostatic wash cytology and culture. The prostate measured 3.58 cm.

The **kidneys** revealed largely normal size and structure, corticomedullary definition and ratio (cortex 1/3 of medulla) were essentially maintained with some moderate age-related loss of curvilinear patterns regarding the capsule and C/M junction. The cortices presented largely uniform texture with some increased echogenicity expected for his age patient. Medullary structure differed distinctly from that of the cortex. Slight pyelectasia was noted in the left kidney measuring 0.56 cm. Blood flow to the kidneys appeared adequate. Anechoic cysts were visualized in the caudal pole of the right kidney. The left kidney measured 5.26 cm in length. The right kidney measured 5.26 cm in length.

Adrenal Glands

Both **adrenal glands** were visualized and recognized as having largely normal shape, size, position and acceptable echogenicity for this age group and breed. The adrenals were swollen in contour. These changes are likely age related but should be monitored by sonogram should the patient be suspected of having adrenal disease. Slight areas of mineralization were noted. The left adrenal gland measured 1.9 cm x 0.70 cm width at the caudal pole and 0.73 cm width at the cranial pole. The right adrenal gland measured 2.4 cm x 1.01 cm width at the cranial pole and 0.79 cm width at the caudal pole.

Spleen

The **spleen** was normal size and relatively normal contour with multifocal hyperechoic areas of mineralization. This is a benign change; however, can be related to Cushing's disease or other endocrinopathies.

Liver

The **liver** presented swollen, heterogenous and hyperechoic nodular changes measuring up to 3.36 cm with no significant disruption of architecture. The right cranial liver revealed a 4.56 cm x 3.0 cm parenchymal and cystic mass impinging upon the diaphragm. This may be completely benign such as hepatoma or hyperplasia.

The gallbladder was overdistended with dependent sand and suspended striating bile consistent with emerging mucocele.

Gastrointestinal

Examination of the **gastrointestinal tract** revealed a stomach and intestine free of stasis, of normal wall thickness, acceptable curvilinear mural detail, and peristaltic activity. Small and large intestine demonstrated normal luminal chyme and stool consistency respectively. No obstructive or overt infiltrative disease was noted. No associated abnormal lymphatic activity was noted.

Pancreas

The base and limbs of the **pancreas** were observed to be largely isoechoic to surrounding omental fat. Some parenchymal remodeling, however, with mild deviation from curvilinear normalcy was observed. Pancreatic duct and capsular irregularities were present consistent with age related changes. If pain upon imaging (+ Murphy sign) was present or if the patient is focally painful in subxiphoid palpation then low-grade smoldering chronic pancreatitis should be suspected.

ULTRASONOGRAPHIC FINDINGS

- BPH prostate.
- Bladder wall thickening.
- Mild to moderate degenerative renal changes.
- Heterogenous liver with masses- potentially benign, hepatomas, low-grade carcinoma possible.
- Immature gallbladder mucocele.
- Bilateral adrenal hypertrophy.
- Mineralized spleen- likely owing to endocrinopathy.
- Age-related pancreatic changes.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The hepatic presentation is fairly similar to prior sonogram with a new development of the isoechoic mass. Ultrasound guided FNA of the right cranial mass from an SDEP 12 position would be ideal. Gallbladder motility study is indicated. The kidneys do not subjectively appear end stage. A 72-hour IV fluid protocol, blood pressure, urine culture and sensitivity, IV antibiotics are all indicated. Given the 2:5 white cells and the presence of isosthenuria, imbedded infection/pyelonephritis is likely playing a role in this patient. Reassessment of the clinical status regarding the azotemia/renal failure would be indicated. Eventual work up for PDH/Cushing's would be appropriate if not already performed.

Internal medicine consult can be utilized through Sonopath.com. You can select the internal medicine drop down at http://spa.sonopath.com/.

One of the world's top internists & SonoPath associate Dr. Remo Lobetti BVSc, MMedVet, PhD, DECVIM can evaluate your case through SonoPath. https://sonopath.com/resources/sonopath-services/internal-medicine-teleconsultation-services

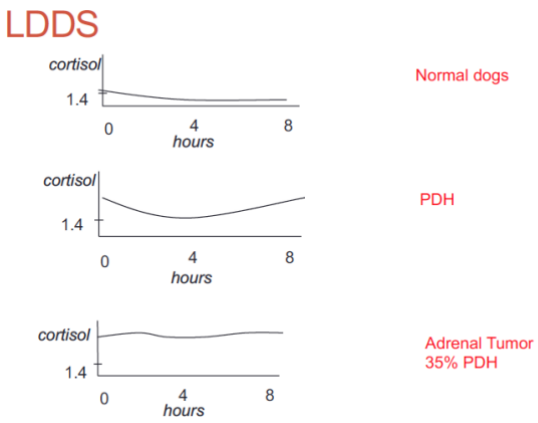
Efficient & Accurate Cushing's Work up-Lindquist

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.

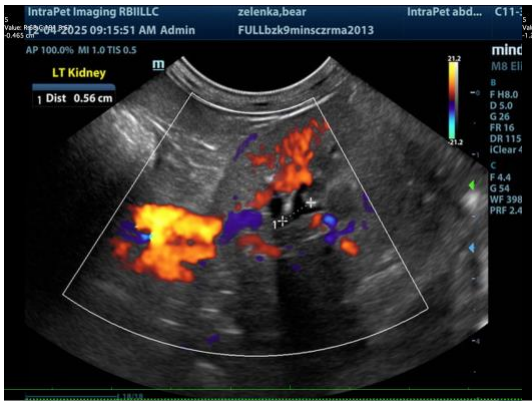


Courtesy: Rebecca Berg DACVIM, DECVIM

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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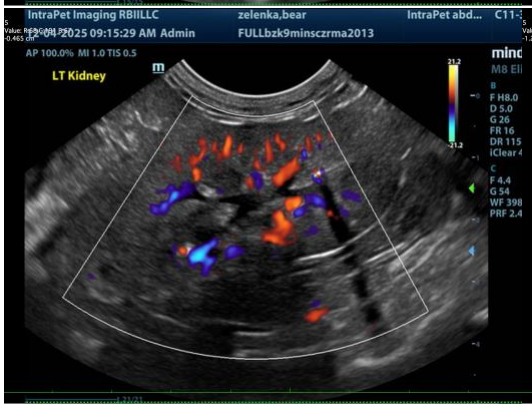
FULLbzk9minsczrma2013
AP 100.0% MI 1.0 TIS 0.5
LT Kidney
1 Dist 0.56 cm


IntraPet Imaging RBIILLC
zelenka,bear
IntraPet abd...
FULLbzk9minsczrma2013
AP 100.0% MI 1.4 TIS 0.3
Liver


IntraPet Imaging RBIILLC
zelenka,bear
IntraPet abd...
FULLbzk9minsczrma2013
AP 100.0% MI 1.4 TIS 0.3
Spleen


IntraPet Imaging RBIILLC
zelenka,bear
IntraPet abd...
FULLbzk9minsczrma2013
AP 100.0% MI 1.4 TIS 0.2
LT Kidney
1 Dist 5.26 cm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IntraPet Imaging RBIILLC
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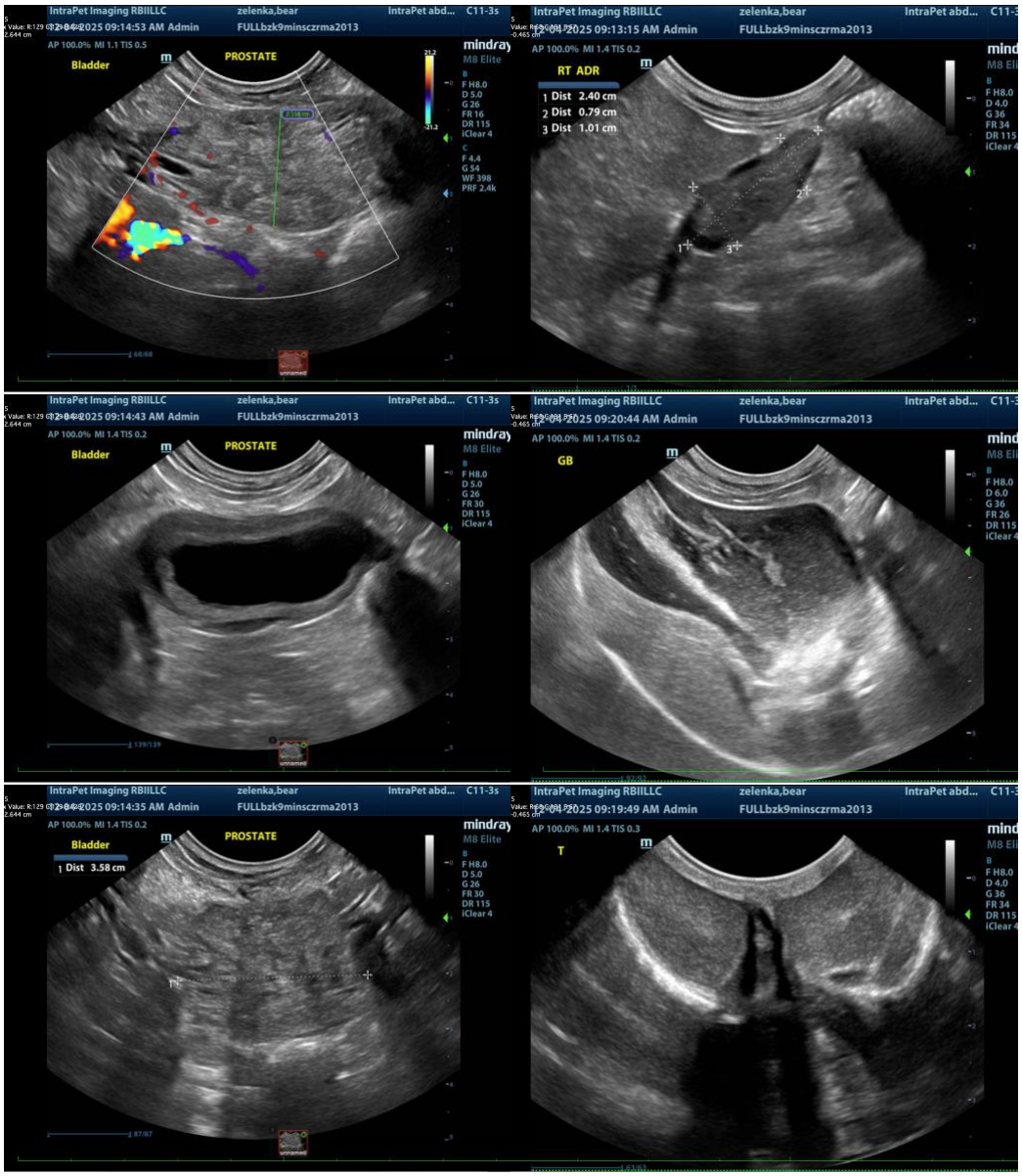
IntraPet abd...
FULLbzk9minsczrma2013
AP 100.0% MI 1.4 TIS 0.2
LT ADR
1 Dist 1.90 cm
2 Dist 0.70 cm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IntraPet abd... C11-3s
FULLbzk9minsczrma2013
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Bladder
PROSTATE
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M8 Elite
IntraPet Imaging RBIILLC
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IntraPet abd... C11-3s
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RT ADR
1 Dist 2.40 cm
2 Dist 0.79 cm
3 Dist 1.01 cm
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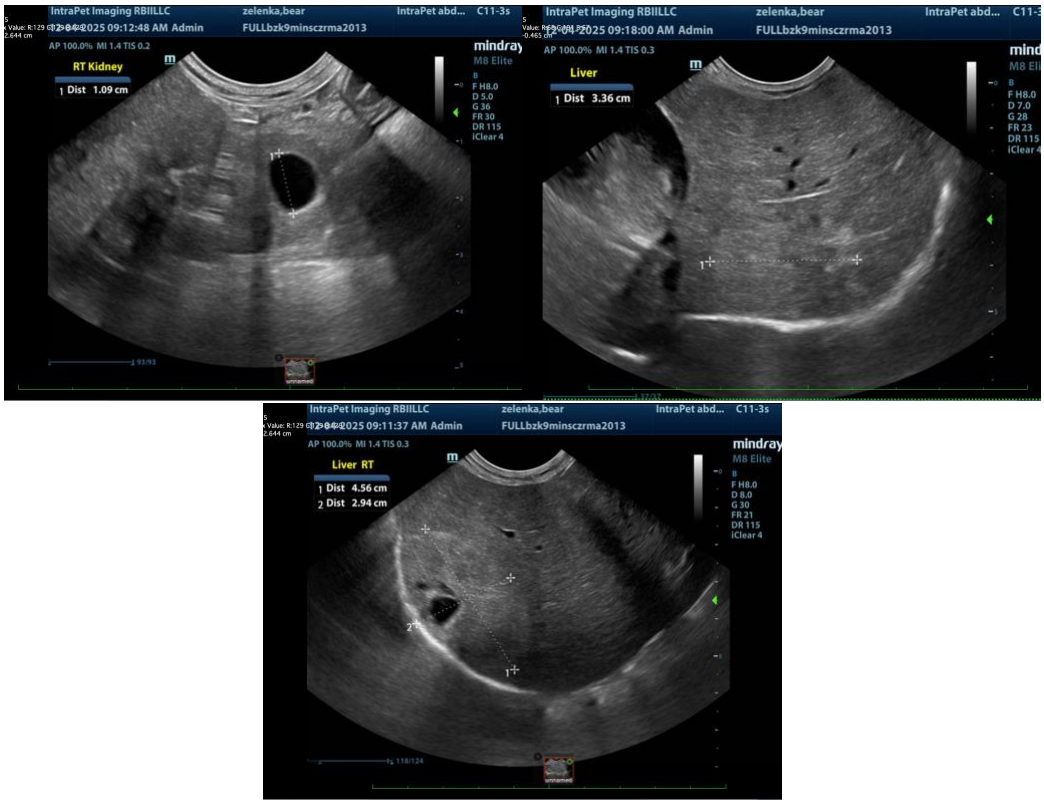

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Eric Lindquist, DMV, DABVP(CFM), Cert. IVUSS,

CEO, Owner, Founder -- SonoPath.com

info@SonoPath.com