



PATIENT PRESENTING CLINICAL SIGNS

Patient: Pugzee Brown
Species: Canine
Breed: Pug
Sex: Neutered male
Age: 13 years
Weight: 22.9 lbs

History: Patient is a chronic heart disease patient on Vetmedin, enalapril and lasix. Patient is PU/PD, not eating and lethargic.
Abnormal PE/Chem/CBC/UA Results: Rads: abd: enlarged, liver, 2 small bladder stones, thorax: enlarged heart, no evidence of fluid in chest or mass in chest CBC: WNL CHEM: SDMA 15, BUN 42, ALKP 686, Chol 449, Lipase 3000 TT4: 0.9 U/A: SG 1.032, Protein 500, NSEPI < 1/HPF, nhcst suspect, presence, no bacteria seen, WBC 2/HPF, RBC 2/HPF

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 residual prostate measured 0.4 cm.

The **kidneys** revealed largely normal size and structure, corticomedullary definition and ratio (cortex 1/3 of medulla) were essentially maintained with some 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 this age patient. Medullary structure differed distinctly from that of the cortex. The left kidney measured 4.0 cm. The right kidney revealed slight pyelectasia.

INTERPRETED BY

Eric Lindquist, DMV
DABVP, Cert. IVUSS

Adrenal Glands

The right **adrenal gland** was uniform and measured 0.8 cm. The left adrenal gland was mildly enlarged and measured 0.8 cm with areas of remodeling and mineralization.

IMAGING PERFORMED BY

Dr. Griffin

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.

HOSPITAL NAME

Northside

REFERRING VET

Dr. Griffin

Liver

The left cranial **liver** revealed a cystic and echogenic nodule or abscess in the left cranial liver adjacent to the diaphragm and measured 2.5 cm. The remainder of the liver was slightly swollen with mildly increased portal markings. Slight heterogenous changes were noted. The gallbladder presented acceptably thin walls with primarily anechoic content. The cystic and common bile ducts were normal.

INVOICE

91823

Gastrointestinal

DATE

9/14/21

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



PATIENT

Pugzee Brown

demonstrated normal luminal chyme and stool consistency respectively. No obstructive or overt infiltrative disease was noted. No associated abnormal lymphatic activity was noted.

SPECIES

Canine

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.

BREED

Pug

SEX

Neutered male

ULTRASONOGRAPHIC FINDINGS

Left cranial cystic nodule or abscess.

Mild bilateral adrenal enlargement, potential Cushing's/PDH.

AGE

13 years

Age related abdominal changes elsewhere.

WEIGHT

22.9 lbs

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Ultrasound-guided FNA is warranted of the liver nodule with drainage and culture as well as cytology would all be indicated.

INTERPRETED BY

Eric Lindquist, DMV
DABVP, Cert. IVUSS

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.

Dr. Griffin

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.

HOSPITAL NAME

Northside

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.

REFERRING VET

Dr. Griffin

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.

INVOICE

91823

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.

DATE

9/14/21



PATIENT

Pugzee Brown

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.

SPECIES

Canine

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.

BREED

Pug

3) **LDDST** (0.01 D-Sodium phosphate mg/kg IV) (Better screening test but plagued with false +) 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).

SEX

Neutered male

OR

AGE

13 years

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).

WEIGHT

22.9 lbs

5) If **diabetic** then run both LDDST & ACTH stim.

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.

INTERPRETED BY

Eric Lindquist, DMV
DABVP, Cert. IVUSS

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.

Suggested reading:

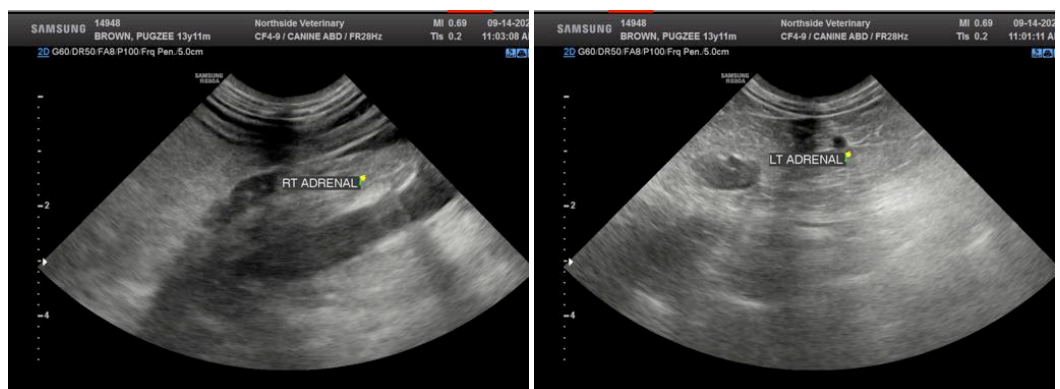
IMAGING PERFORMED BY

Dr. Griffin

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.

HOSPITAL NAME

Northside



REFERRING VET

Dr. Griffin

INVOICE

91823

DATE

9/14/21



PATIENT

Pugzee Brown

SPECIES

Canine

BREED

Pug

SEX

Neutered male

AGE

13 years

WEIGHT

22.9 lbs

INTERPRETED BY

Eric Lindquist, DMV
DABVP, Cert. IVUSS

IMAGING PERFORMED BY

Dr. Griffin

HOSPITAL NAME

Northside

REFERRING VET

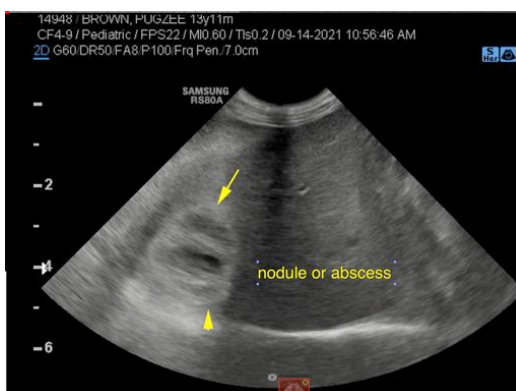
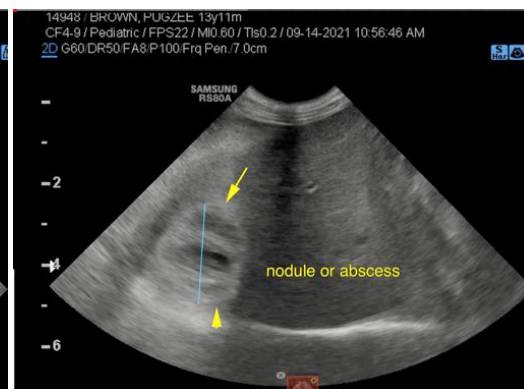
Dr. Griffin

INVOICE

91823

DATE

9/14/21





PATIENT

Pugzee Brown

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

Canine

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

Pug

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

SEX

Neutered male

AGE

13 years

WEIGHT

22.9 lbs

INTERPRETED BY

Eric Lindquist, DMV
DABVP, Cert. IVUSS

**IMAGING
PERFORMED BY**

Dr. Griffin

HOSPITAL NAME

Northside

REFERRING VET

Dr. Griffin

INVOICE

91823

DATE

9/14/21