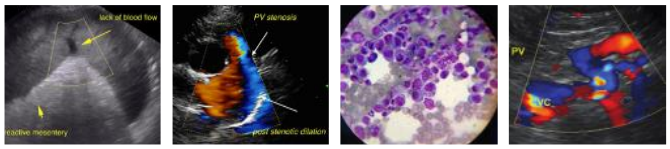
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Gracie Miranda

SPECIES
Canine

BREED
Corgi Mix

SEX
Spayed Female

AGE
14 Years

WEIGHT
18.6 Pounds

INTERPRETED BY
Eric Lindquist, DMV DABVP, Cert. IVUSS

IMAGING PERFORMED BY
Jack Reese

HOSPITAL NAME
Willow Run VC

REFERRING VET
Molly Arnold, DVM

INVOICE
17977

DATE
10/31/22

PRESENTING CLINICAL SIGNS

History: 3-day history of lethargy, anorexia, and weakness. P was normal Friday afternoon per O. Into Saturday morning, they started to notice weakness in the rear limbs, decreased appetite, and lethargy. O noted diarrhea Sunday afternoon and Monday morning. Otherwise, no other GI symptoms present.

Abnormal PE/Chem/CBC/UA Results: PE - moderate thoracolumbar pain and significant pain with cranial abdominal palpation. Dry MM. No neurologic deficits. Weakness is suspected secondary to fever. Temp - 105.8 CBC - Mild anemia 34%, Mild leukopenia at 5,000 Chemistry - BUN 35, ALT 362 (199 in 2020), ALP 1,057 (207 in 2020), Amylase >2500, Lipase 5633. 4DX - Negative

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 were noted. Ureteral papillae were normal. The pelvic urethra was imaged 3.0 cm beyond the cystourethral junction.

The **kidneys** revealed largely normal size and structure, corticomedullary definition and ratio (cortex 1/3 of medulla) were essentially maintained with some minor 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 and no evidence of pelvic dilation was present. Slight mineralizations were noted. The right kidney measured 5.0 cm. The left kidney measured 5.0 cm.

Adrenal Glands

The caudal pole of the **left adrenal gland** was slightly swollen, measuring 0.67 cm at the caudal pole and 0.35 cm at the cranial pole.

The **right adrenal gland** was slightly enlarged, measuring 1.3 cm at the cranial pole and 0.61 cm at the caudal pole.

Spleen

The **spleen** presented relatively normal size and contour with minor multifocal hyperechoic nodular changes, most consistent with fatty deposits or lipogranulomas. These are not typically pathological. No suspicion of significant. Capsular and parenchymal integrity was normal otherwise.

Liver

The **liver** revealed macronodular changes. Slight irregular contour and increased portal markings were noted. The gallbladder and common bile duct were unremarkable.

Gastrointestinal

The **pyloric** wall was mildly thickened in this patient. The colonic wall was slightly thickened and empty in this patient.

Pancreas

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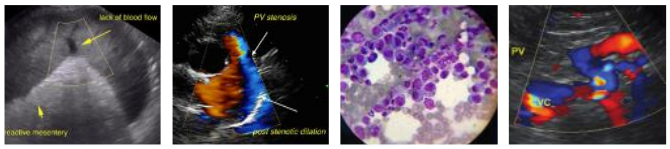

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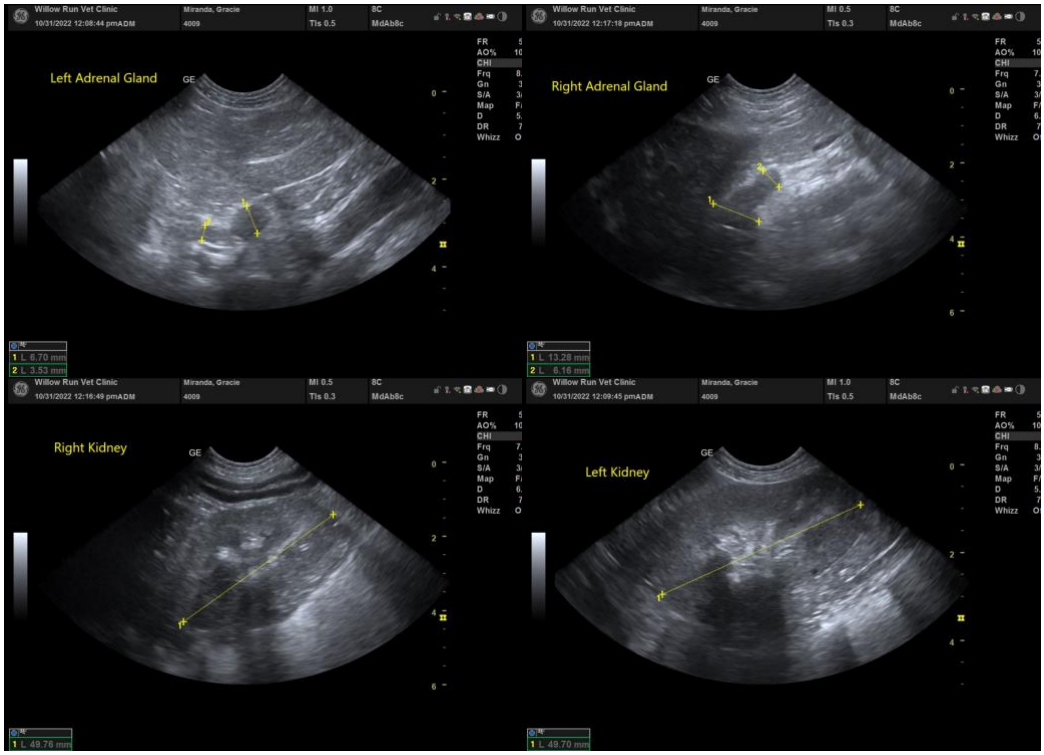
Minor heterogenous parenchymal changes were noted in the right limb and base of the **pancreas**, consistent with pancreatic remodeling and likely chronic active pancreatitis. The pancreatic lymph nodes were slightly enlarged, reactive and slightly cystic.

ULTRASONOGRAPHIC FINDINGS

- Gastritis/chronic active pancreatitis presentation
- Slightly enlarged, reactive and slightly cystic pancreatic lymph nodes
- Age-related renal changes with mineralization
- Slightly swollen caudal pole of the left adrenal gland
- Enlarged right adrenal gland
- Multifocal hyperechoic nodular changes in the spleen
- Macronodular changes, slight irregular contour and increased portal markings in the liver

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

No evidence of foreign body or neoplasia. GI protectant protocol is warranted. Deep subxiphoid palpation is recommended to assess for discomfort. Canned B.I.D. diet is indicated. Orthopedic comorbidities should be considered as well. The exact cause of the fever is unclear- viral or other systemic infection could be considered. The gastrointestinal and pancreatic presentation may be a secondary issue. If the patient appears cushingoid, and urine specific gravity is <1.020, eventual work up for pituitary dependent hyperadrenocorticism is indicated.



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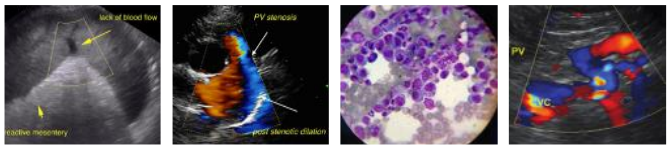

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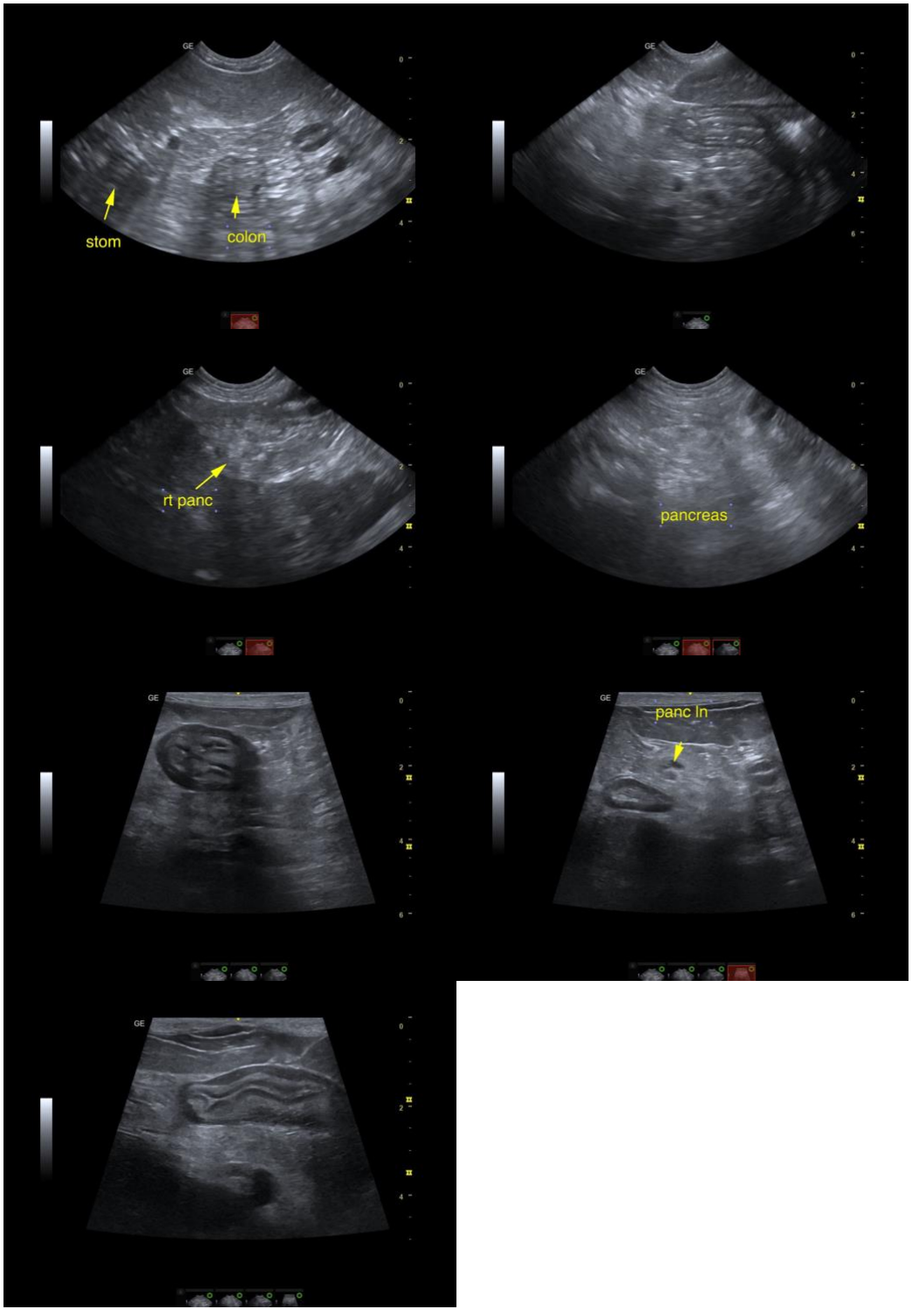
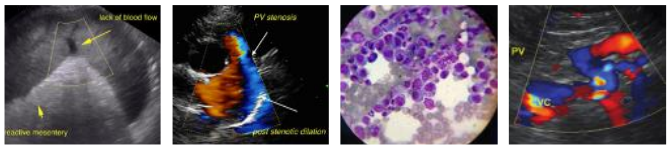


The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I



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can be of any further assistance please contact me.

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

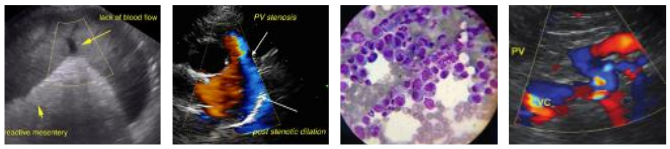
Fever of Unknown Origin

http://www.sonopath.com/FUO

Description: The definition of a fever of unknown origin (FUO) has not been clearly defined for animals. Currently, it is either understood to be a fever that does not resolve within the period one would expect for a "self-limiting infection" being treated with appropriate antimicrobial therapy, or that for which an underlying diagnosis has not been determined despite considerable diagnostic effort. The common causes of FUO were summarized concisely in a presentation at the American College of Veterinary Internal Medicine 2004 Forum. The presenters synthesized information from three veterinary papers on the subject, which suggested the following:

Final Diagnosis	Bennett (dogs & cats)	Dunn and Dunn (dogs only)	Lunn (dogs & one cat)	Total
Infection	21	16	10	47
Immune	18	22	6	46
Bone marrow disease	4	22	2	28
Neoplasia (outside marrow)	0	10	2	12
Miscellaneous	2	12	2	16
No diagnosis	0	19	2	21
TOTALS	45	101	24	170

The types of infection diagnosed in this case series were varied, ranging from discospondylitis (8 cases), blastomycosis (6), and bacterial endocarditis (4), to leishmaniasis (1), prostatitis (1), and *Ehrlichia canis* infection (1); a multitude of other infectious causes also fell within the spectrum. Of the cases in which immune-mediated disease was found, 44% had immune-mediated polyarthritis. Bone marrow diseases included myeloproliferative disease, myelodysplasia (8), lymphocytic



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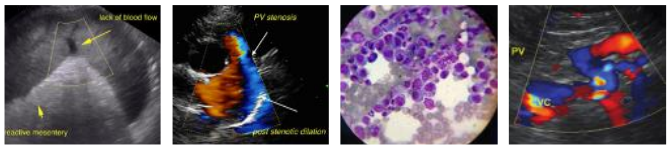
leukemia (8), myeloma (3), chronic granulocytic leukemia (3), lymphoblastic leukemia, and malignant histiocytosis. The types of neoplasia located outside the bone marrow included lymphoma (6), metastatic disease (2), and neoplasms of the lung, spleen, and stomach. Finally, miscellaneous diseases included hypertrophic osteodystrophy (6), meningitis (3), portosystemic shunt (3), lymphadenitis (2), panosteitis, and intervertebral disc disease. Overall, the most common causes across all cases were polyarthritis (44), lymphoid neoplasia (15), discospondylitis (8), myelodysplasia (8), hypertrophic osteodystrophy (6), and blastomycosis (6).

Clinical Signs: Animals usually present with either persistent or waxing and waning fevers ranging from 103ºF to 106ºF. Other clinical signs depend on the underlying cause of the fever. Careful and thorough physical examination is required to assess potential causes.

Diagnostics: FUO etiologies are partly related to geography, and thus locale or travel history should factor into a practitioner's diagnostic approach. A patient's lifestyle may also provide clues regarding exposure to certain etiologic agents. Therefore, conducting a thorough history can unveil important pieces of the diagnostic puzzle. Physical examination is especially important and should include an inspection of all accessible lymph nodes, palpation and movement of the joints, a fundic examination, a neurological evaluation, spinal and limb palpation and range of motion tests, and a rectal examination.

A minimum database should include a CBC reviewed by a clinical pathologist, as well as a biochemical profile and urinalysis. Retroviral testing should also be considered in cats. In areas where tick-borne disease is prevalent, in-house testing should be performed early. Advanced laboratory work can include: urine culture, blood culture, and infectious disease panels (PCR and/or serology). In dogs, one may screen for the following infectious agents: *Ehrlichia* spp., *Borrelia burgdorferi*, Rock Mountain Spotted Fever, *Bartonella* spp. (culture and PCR), and *Leptospira* spp. in cases of hepatic or renal involvement. In cats, one should evaluate for FeLV, FIV, feline infectious peritonitis (FIP) virus, toxoplasmosis, *Hemoplasma* spp. (*Mycoplasma*), and *Bartonella* spp. (culture and PCR). Testing for *Ehrlichia* spp., *Rickettsia* spp., and *Anaplasma phagocytophilum* can also be considered. A fungal assay is indicated if the patient lives in or has had exposure to a region with a higher incidence of fungal disease. Other infectious disease tests may be performed depending on the geographical location of the pet. Screening for *Brucella* should be done in breeding dogs. Immune-mediated disease screening can include a Coomb's test, a slide agglutination test (if the patient is anemic), and an antinuclear antibody (ANA) test. Immune disease is often a diagnosis of exclusion.

Imaging should include thoracic radiographs, abdominal ultrasound, and/or abdominal radiographs. Ultrasound can be very useful for assessing evidence of cholangiohepatitis, pyelonephritis, chronic urinary tract infection, abscess formation, peritonitis, and neoplasia; it also permits an examination of the intra-abdominal lymph nodes. An echocardiogram can offer assessment for vegetative endocarditis, whereas spinal radiographs offer assessment for discospondylitis. In cases where all other testing has proven negative and the patient has not responded to broad-spectrum antibiotics and supportive care, arthrocentesis should be considered to evaluate for septic joint disease, immune-mediated polyarthritis, and infectious disease. Finally, one can consider assessing the cerebrospinal fluid for meningoencephalitis, GME, and meningitis/arteritis. A bone marrow exam should be performed if blood dyscrasias are noted on the CBC.



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Treatment: Treatment of the fever depends entirely on the underlying cause. Ideally, a thorough diagnostic plan will yield a diagnosis that will guide the appropriate therapeutic course. However, if an exhaustive approach has not produced a definitive diagnosis and there is no response to broad-spectrum antibiotics, trial therapy with immunosuppressive agents such as prednisolone can be considered to treat presumed immune-mediated diseases. Given the potential for negative sequelae should an underlying infection be present, one must be certain that the investigation is thorough and monitor the patient's response carefully.

Conclusion: If a documented fever has not responded to antibiotics, antipyretics, or general nursing care, it is important to obtain a diagnosis to guide more specific treatment. A systematic physical examination and thorough history-taking will help inform further diagnostics in addition to what is revealed by the minimum database.

References:

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