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Clinical Sonography & Telecytology
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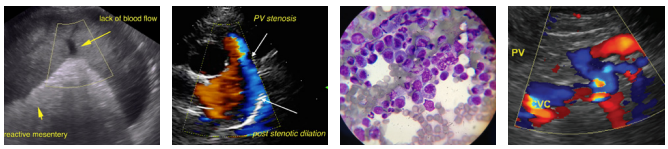

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1-800-838-4268 info@sonopath.com

PATIENT
Cocoa Chivily

SPECIES
Canine

BREED
Cockapoo

SEX
Neutered Male

AGE
15 Years

WEIGHT
20 Pounds

INTERPRETED BY
Eric Lindquist, DMV DABVP, Cert. IVUSS

IMAGING PERFORMED BY
Shari Reffi, CVT

HOSPITAL NAME
Marsh AH

REFERRING VET
Dr. Milwicki

INVOICE
25455

DATE
9/16/21

PRESENTING CLINICAL SIGNS

Presented for lethargy, collapsed, temp=105
Abnormal PE/Chem/CBC/UA Results: Pending today. 8/26/21- TP 4.7, Alb 2.2, BUN 38, BUN/creat ratio 48, Calcium 8.7, Amylase 2185, Presc PSL 262, wbc 15.7, PLT 559, Neuts 11461, mono 942, U/A-dark yellow, USG 1.058, trace protein

ULTRASONOGRAPHIC EXAMINATION OF THE HEARET & ABDOMEN

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	5.0		1.18	1.23	33	64	NM
CANINE CARDIAC PARAMETERS	**HR** (BPM)	**AV VMAX** (m/s)	**PV MAX** (m/s)	**BODY WEIGHT** (kg)	**LA** 2D short axis Base view (cm)	**LVIDd** Avg; 2D and m-mode short axis (cm)	**LVIDs** Avg; 2D and m-mode short axis (cm)
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6				
PATIENT	148	1.0			3.26	2.6	

Cardiac Presentation

The echocardiogram in this patient demonstrated normal **left atrial** size based on 3 separate methods of LA evaluation. Persistent insufficiency in both the **mitral** and **tricuspid** valves. The **left ventricle** presented thicknesses with linear contour and was not dilated nor restricted. The **myocardium** presented normal echogenicity without subjective evidence of significant fibrotic or ischemic disease. **Contractility** of the ventricular walls was adequate and in normal range for this patient evidenced by the fractional shortening measurement and subjective evaluation of the different regions of the myocardium. The **left ventricular outflow** tract demonstrated normal laminar flow and subjective structural integrity. The **right atrium** and auricle revealed normal size, structure and content. No evidence of masses was noted. The **right ventricle** was of normal size (1/3 diameter of LV), chordae structure, myocardial echogenicity and thickness. Minor pulmonic insufficiency noted, not clinically significant. No visible **pericardial** or free pleura fluid was noted. The cranial **mediastinum and pericardial and extra-cardiac regions** were free of masses in the visible window.

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 residual prostate measured 7.0 mm.

The **kidneys** presented similar changes as on the prior sonogram. with mild chronic increased cortical echogenicity, expected for this age patient, measuring 4.9 cm on the left. The right kidney measured 4.57 cm. Mild pyelectasia noted in the left kidney.

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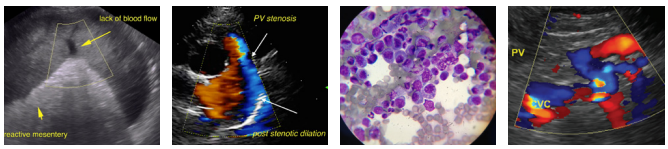

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Adrenal Glands

Both **adrenal glands** were visualized and recognized as having normal shape, size, position and echogenicity for this breed. The phrenic vasculature, glandular echogenicity and detail were unremarkable. Capsule, cortex, and medullary definition were normal for this age patient. The right adrenal gland measured 2.08 cm x 1.12 cm at the cranial pole and 0.84 cm at the caudal pole.

Spleen

The **spleen** was mildly enlarged, uniform, measuring 1.6 cm.

Liver

The left medial **liver** revealed a hypoechoic, irregular nodule, strong concern for metastatic disease. Minor gallbladder debris noted.

Gastrointestinal

The **stomach** was unremarkable. Minor variable intestinal thickening noted in the midst of adhesions with regional mesenteric lymphadenopathy at 2.5 cm x 1.4 cm. Partial obstructive pattern also appeared present. A particular area of intestinal thickening appeared strictured, creating an intestinal mass effect measuring approximately 3.0 cm.

Pancreas

An ill-defined cranial abdominal mass was noted in the region of the pancreas with hyperechoic mixed echogenic changes, more aggressive than the prior sonogram. Regional lymphadenopathy and variable intestinal thickening noted. Fluid-filled cavity also noted, suggestive for abscessation.

ULTRASONOGRAPHIC FINDINGS

- Stable Stage B1 valvular disease
- Mitral, tricuspid and pulmonic insufficiency, compensated
- Cranial abdominal mass in the region of the pancreas
- Variable intestinal thickening and regional lymphadenopathy
- Liver nodule – suspect metastatic disease or possible hepatic abscessation
- Age related renal changes with pyelectasia
- Minor urinary debris
- Reactive spleen

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

No cardiac treatment recommended. Given the fever, endocarditis could not be entirely ruled out.

There are multiple issues in this patient. The region of the pancreas revealed abscessation and variable adhesions associated with intestinal thickening, all of which meets neoplastic criteria. There is a mild potential for non-neoplastic complicated inflammatory bowel. However, exploratory surgery would be necessary to liberate adhesions and obtain biopsies. Ultrasound guided FNA of the liver pathology and possibly the pancreatic pathology with drainage +/- the intestinal pathology all possible in this patient. Clean resection of the pathology is unlikely. There is a strong concern for underlying neoplasia involving the intestine +/- pancreas +/- liver. Possibility for penetrating small foreign body and chronic granulomatous disease given the prior history. Ultrasound guided sampling with stabilization or direct exploratory surgery indicated in this case. Prognosis is extremely guarded.

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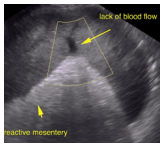

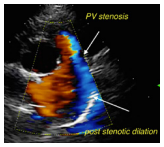

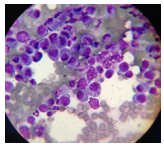
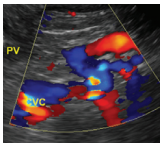

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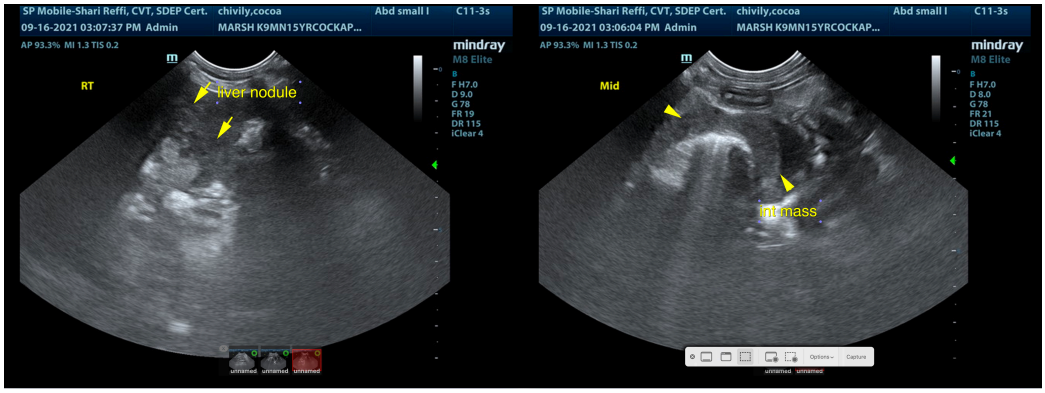

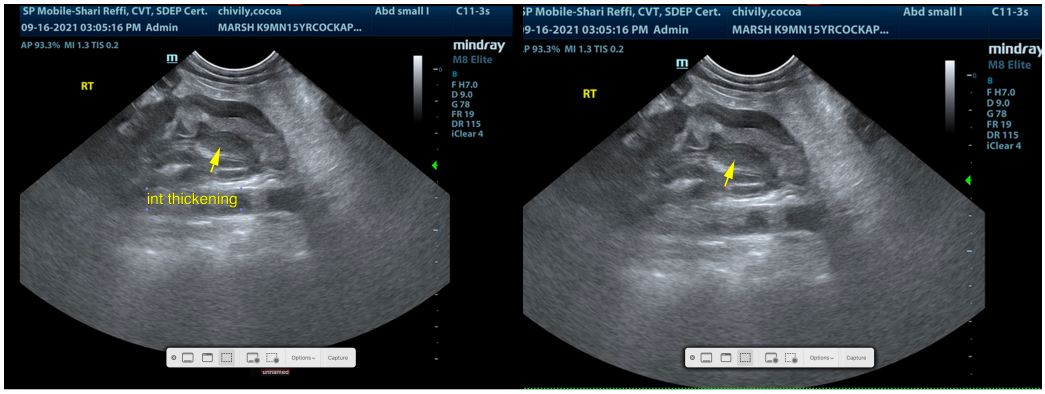

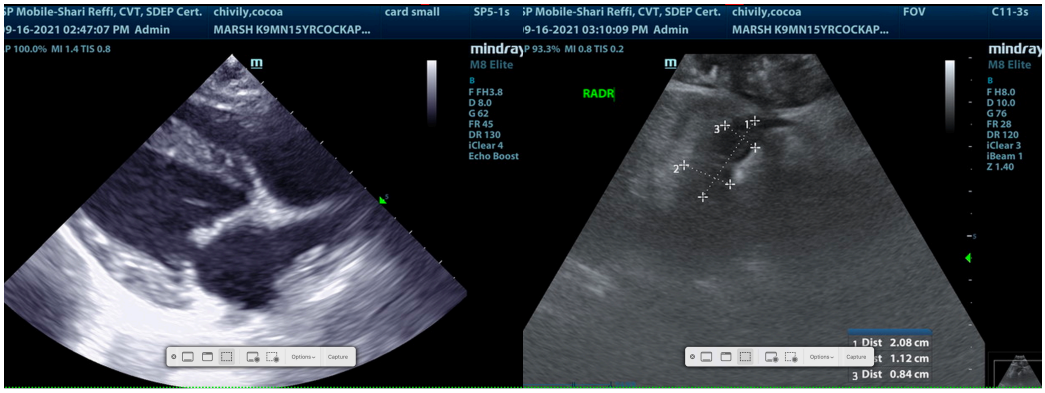

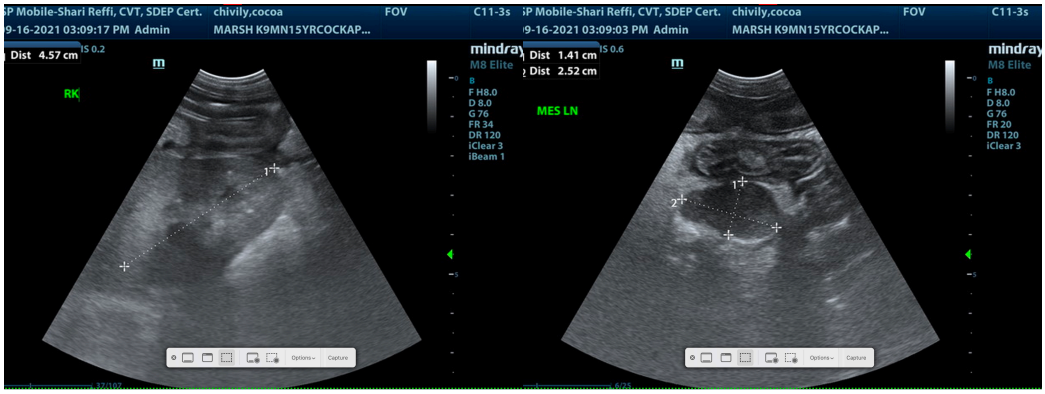

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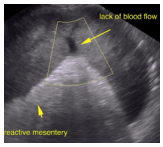

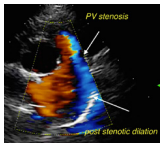

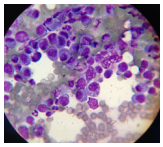
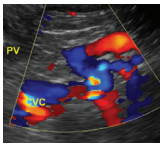

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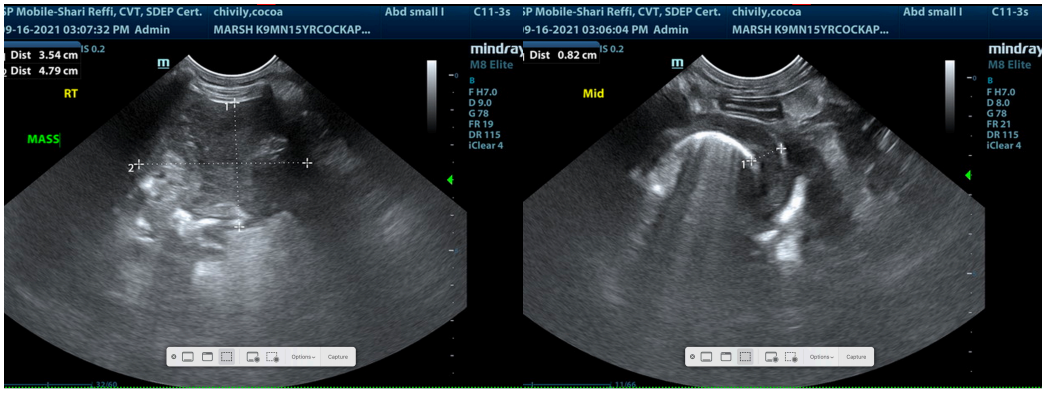

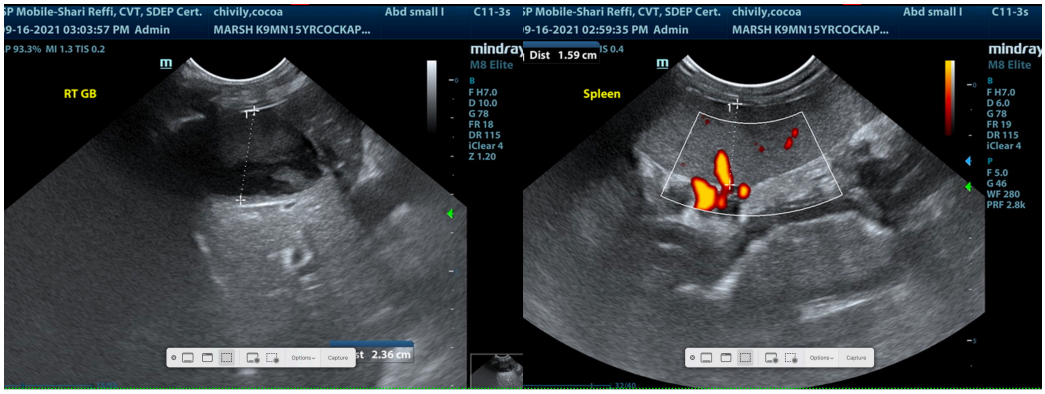

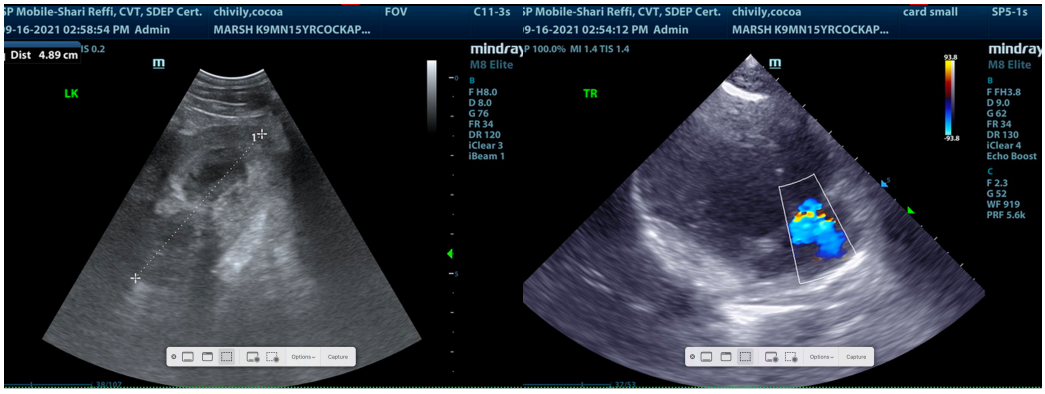

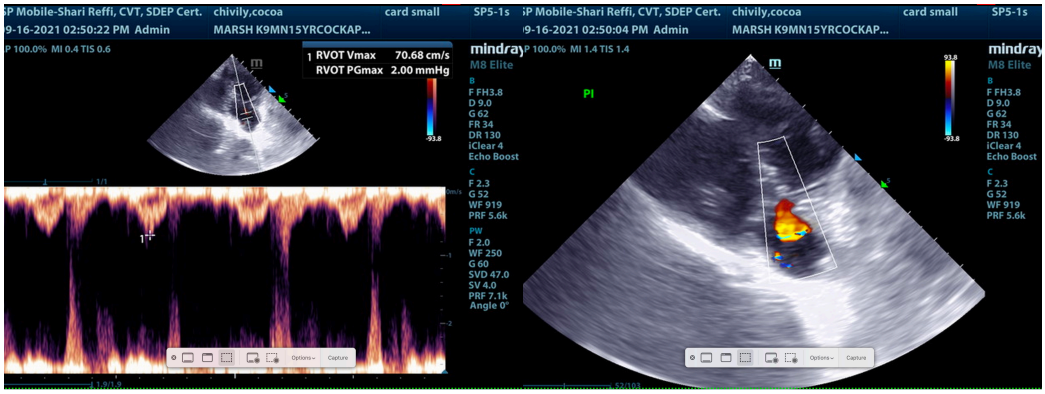

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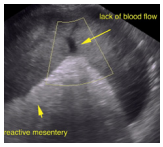

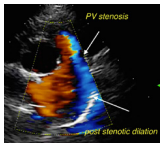

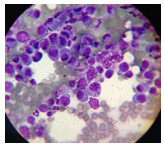
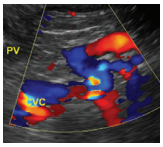

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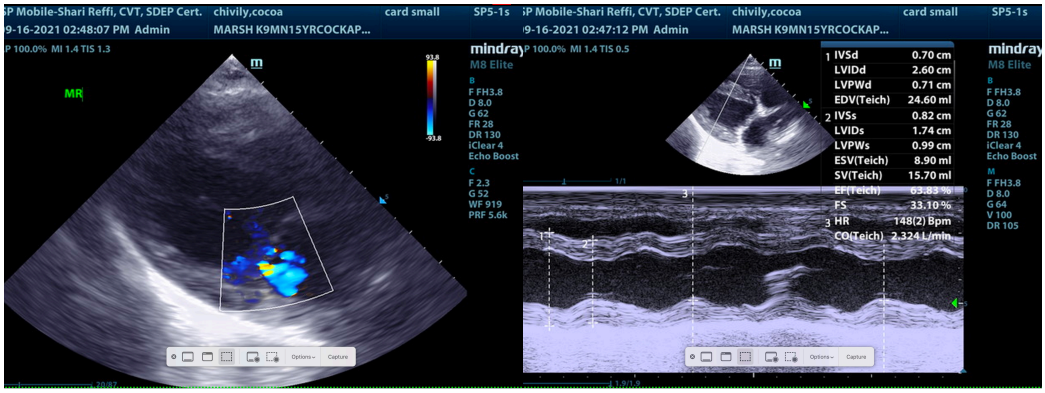

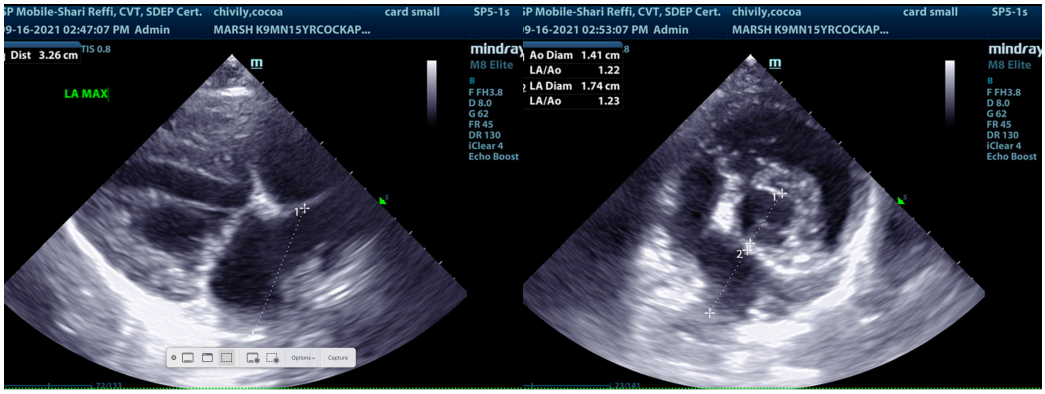

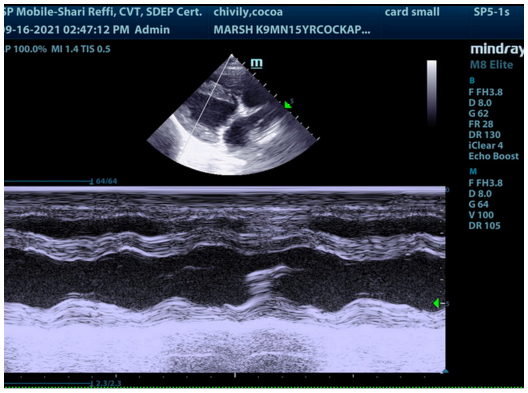

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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

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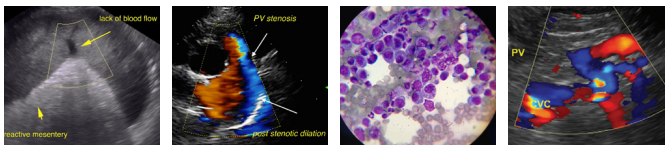

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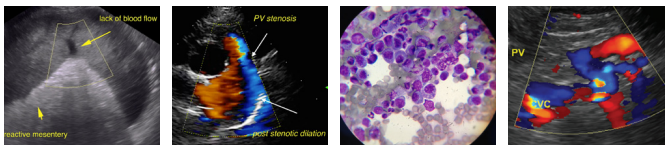
http://www.sonopath.com/FUO

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 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).



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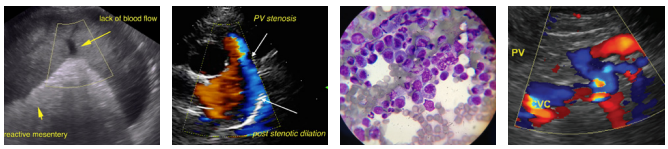
Clinical Signs: Animals usually present with either persistent or waxing and waning fevers ranging from 103ºF to 106ºF. Other clinical signs depend on the underlying cause of the fever. Careful and thorough physical examination is required to assess potential causes.

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.

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.



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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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