



PATIENT

Grace Zeng

SPECIES

Canine

BREED

Siberian Husky

SEX

Intact Female

AGE

11 Years

WEIGHT

58.2 Pounds

INTERPRETED BY

Eric Lindquist, DMV,
DABVP (Canine &
Feline), Cert. IVUSS

IMAGING PERFORMED BY

Dr. Varujan Belekdanian
/ Dr. Ohad Barnea

HOSPITAL NAME

Overpeck Creek AH

REFERRING VET

Dr. Varujan
Belekdanian

INVOICE

36734

DATE

4/23/26

PRESENTING CLINICAL SIGNS

History: Grace is a 11-year-old FI Siberian Husky who presented for a 105.7 and 105.5 fever. Patient has incontinence and constantly dribbles on herself with some hematuria. Patient has not eaten since 4/21/2026. Patient was hospitalized for the same incidence one other time about 2 months ago, which might have been pyelonephritis due to a severe urinary tract infection. She is currently hospitalized. Lepto testing is pending (ultrasound was done by both Dr. Belekdanian and Dr. Barnea, hence the extra images). A quick cardiac scan was done in order to rule out hemangiosarcoma of the right auricle.

Abnormal PE/Chem/CBC/UA Results: Recent labwork abnormalities showing a HCT of 33.5%, slight neutrophilia at 12,000, thrombocytopenia at 128k, and both ALT and ALP being mildly elevated (138 and 489, respectively).

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

Polyploid changes were noted at the cystourethral junction, measuring approximately 1.0 cm. The remainder of the **bladder** wall was unremarkable. Polyploid changes in the cystourethral junction were visible in multiple angles, appeared to enter into the pelvic urethra. Cystoscopy strongly recommended in this patient. The bladder polyploid changes measured 2.4 cm x 1.7 cm.

The **kidneys** revealed largely normal size and structure, corticomedullary definition and ratio (cortex 1/3 of medulla) were essentially maintained with some mild 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, and no evidence of pelvic dilation was present. The left kidney measured 7.4 cm. The right kidney measured 7.7 cm.

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 left adrenal gland measured 0.7 cm.

Spleen

The **spleen** was largely smooth with subtle heterogeneous parenchymal changes while maintaining normal echogenic relationship to the liver and kidney. These changes are mild and consistent with normal age-related alteration. The capsule was smooth without noticeable impingement from within the spleen or from pathology in the adjacent abdomen. The splenic vasculature demonstrated normal volume without signs of congestion or significant contraction. No evidence of active acute or chronic inflammatory, neoplastic, or infarctual changes were noted.

Liver



PATIENT

Grace Zeng

SPECIES

Canine

BREED

Siberian Husky

SEX

Intact Female

AGE

11 Years

WEIGHT

58.2 Pounds

INTERPRETED BY

Eric Lindquist, DMV,
DABVP (Canine &
Feline), Cert. IVUSS

IMAGING PERFORMED BY

Dr. Varujan Belekdanian
/ Dr. Ohad Barnea

HOSPITAL NAME

Overpeck Creek AH

REFERRING VET

Dr. Varujan Belekdanian

INVOICE

36734

DATE

4/23/26

The **liver** revealed slight increased portal markings, coarse architecture, and mild uniform enlargement. Minor coalesced **gallbladder** sludge was noted, not pathological.

Gastrointestinal

There was some residual chyme and gas noted in the **stomach**, yet not pathological. This is consistent with end post prandial presentation. 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. 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. 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.

Other

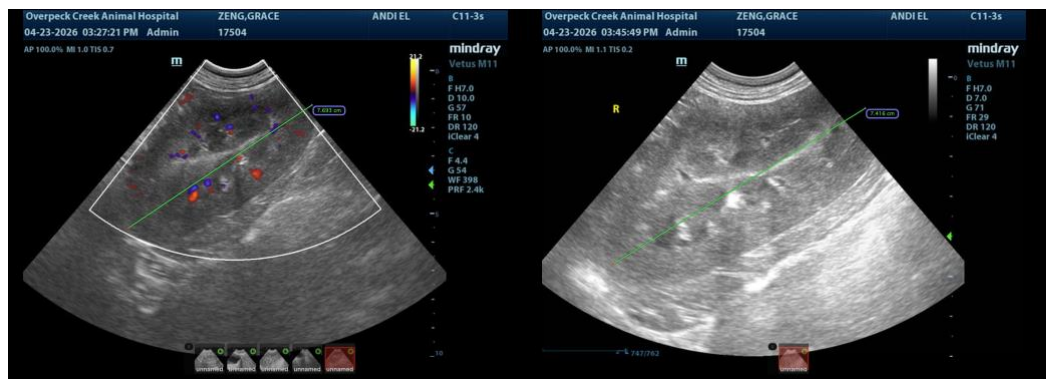
Cardiac presentation presented normal volumes and contractility. No evidence of masses or pericardial fusion were noted. Normal structure and functions were noted.

ULTRASONOGRAPHIC FINDINGS

- Cystourethral junction/bladder lesion/mass- strong concern for carcinoma
- Enlarged liver with coarse architecture and increased portal markings
- Coalesced gallbladder sludge, not pathological
- Age-related renal and splenic changes
- Partially full stomach

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Cytospin of a free catch urine sample, or better yet, endoscopy is indicated. No evidence of reproductive pathology.





PATIENT

Grace Zeng

SPECIES

Canine

BREED

Siberian Husky

SEX

Intact Female

AGE

11 Years

WEIGHT

58.2 Pounds

INTERPRETED BY

Eric Lindquist, DMV,
DABVP (Canine & Feline), Cert. IVUSS

IMAGING PERFORMED BY

Dr. Varujan Belekhdanian
/ Dr. Ohad Barnea

HOSPITAL NAME

Overpeck Creek AH

REFERRING VET

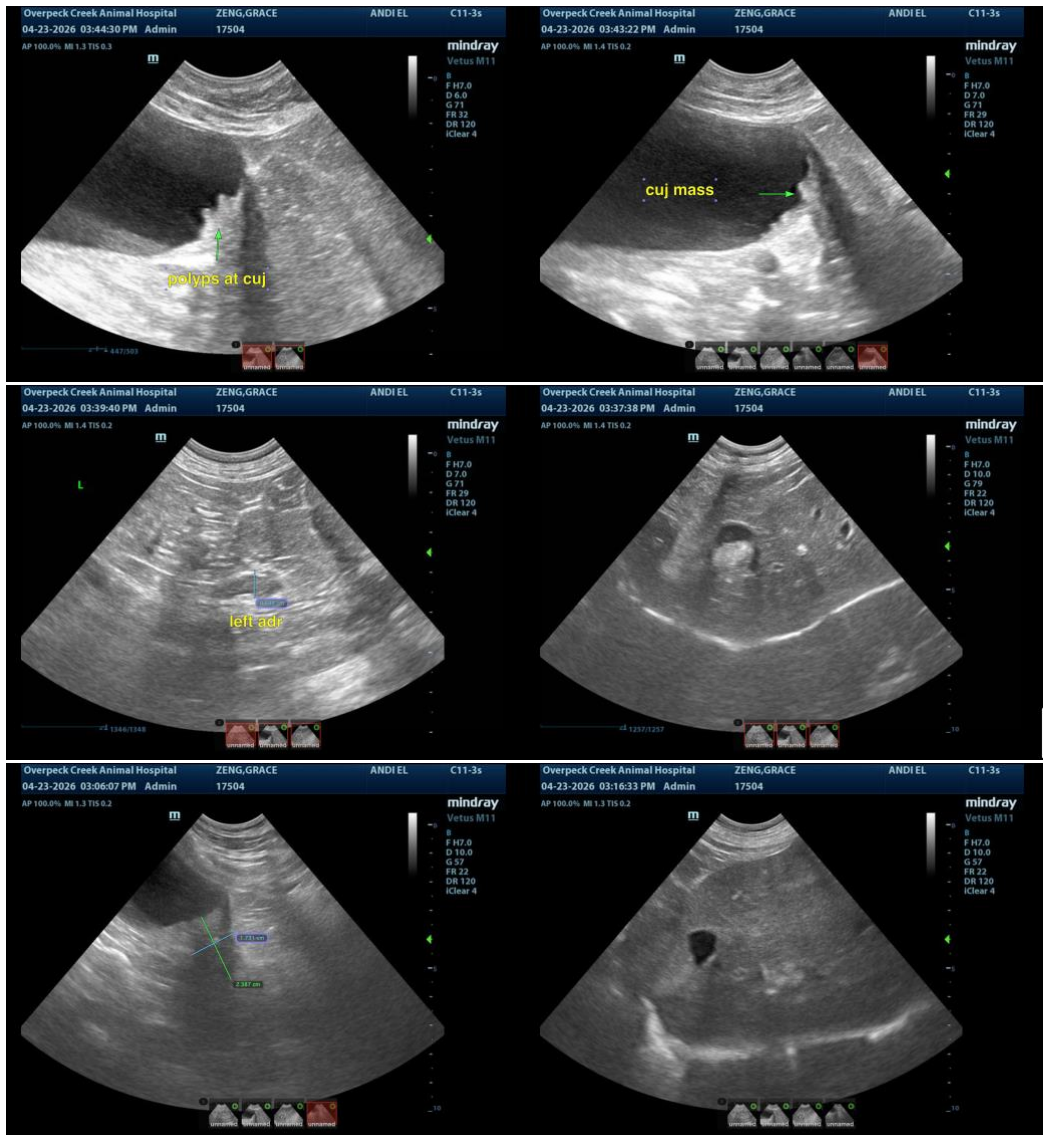
Dr. Varujan Belekhdanian

INVOICE

36734

DATE

4/23/26



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

FEVER OF UNKNOWN ORIGIN



PATIENT

Grace Zeng

SPECIES

Canine

BREED

Siberian Husky

SEX

Intact Female

AGE

11 Years

WEIGHT

58.2 Pounds

INTERPRETED BY

Eric Lindquist, DMV,
DABVP (Canine &
Feline), Cert. IVUSS

**IMAGING
PERFORMED BY**

Dr. Varujan Belekdanian
/ Dr. Ohad Barnea

HOSPITAL NAME

Overpeck Creek AH

REFERRING VET

Dr. Varujan
Belekdanian

INVOICE

36734

DATE

4/23/26

DESCRIPTION Fever of unknown origin (FUO) is any fever greater than a few days duration in which the cause is not obvious on initial history and physical examination. Important etiologies are infectious disease, immune-mediated diseases, and neoplasia. The common causes of FUO were summarized concisely in a presentation at the American College of Veterinary Internal Medicine 2004 Forum as follows:

Final Diagnosis	Bennett (Dogs & Cats)	Dunn and Dunn (Dogs Only)	Lunn (Dogs & 1 cat)	Total	Percent
Infection	21	16	10	47	28
Immune	18	22	6	46	27
Bone Marrow Disease	4	22	2	28	16
Neoplasia (outside marrow)	0	10	2	12	7
Miscellaneous	2	12	2	16	9
No Diagnosis	0	19	2	21	12
TOTALS	45	101	24	170	99

The types of infection diagnosed in this case series were varied, ranging from discospondylitis (8 cases), blastomycosis (6 cases), and bacterial endocarditis (4 cases), to leishmaniasis (1 case), prostatitis (1 case), and Ehrlichia canis infection (1 case); a multitude of other infectious causes also fell within the spectrum. Of the cases where immune-mediated disease was found, 44% had immune-mediated polyarthritis. Bone marrow diseases included myeloproliferative disease, myelodysplasia (8 cases), lymphocytic leukemia (8 cases), myeloma (3 cases), chronic granulocytic leukemia (3 cases), lymphoblastic leukemia, and malignant histiocytosis. The types of neoplasia located outside the bone marrow included lymphoma (6 cases), metastatic disease (2 cases), and neoplasms of the lung, spleen, and stomach. Finally, miscellaneous diseases included hypertrophic osteodystrophy (6 cases), meningitis (3 cases), portosystemic shunt (3 cases), lymphadenitis (2 cases), panosteitis, and intervertebral disc disease. Overall, the most common causes across all cases were polyarthritis (44 cases), lymphoid neoplasia (15 cases), discospondylitis (8 cases), myelodysplasia (8 cases), hypertrophic osteodystrophy (6 cases), and blastomycosis (6 cases).

CLINICAL SIGNS Animals usually present with either persistent or waxing and waning fevers ranging from 103–106°F (39.5–41°C). Other clinical signs depend on the underlying cause of the fever. Careful and thorough physical examination is required to assess potential causes. History and physical examination represent the first, best, and least expensive opportunity to localize the disease process causing the fever.

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, obtaining 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 and retroviral testing 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, Rocky 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



PATIENT

Grace Zeng

SPECIES

Canine

BREED

Siberian Husky

SEX

Intact Female

AGE

11 Years

WEIGHT

58.2 Pounds

INTERPRETED BY

Eric Lindquist, DMV,
DABVP (Canine &
Feline), Cert. IVUSS

IMAGING PERFORMED BY

Dr. Varujan Belekdanian
/ Dr. Ohad Barnea

HOSPITAL NAME

Overpeck Creek AH

REFERRING VET

Dr. Varujan
Belekdanian

INVOICE

36734

DATE

4/23/26

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 Coombs 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.

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

1. Battersby IA, Murphy KF, et al. Retrospective study of fever in dogs: laboratory testing, diagnoses and influence of prior treatment. *J Small Anim Pract.* 2006; 47: 370-376.
2. Flood J. The diagnostic approach to fever of unknown origin in cats. *Compend Contin Educ Vet* 2009; 31 (1): 26-31.
3. Flood J. The diagnostic approach to fever of unknown origin in dogs. *Compend Contin Educ Vet* 2009; 31 (1): 14-21.
4. Lappin MR. The role of blood borne pathogens in feline fever of unknown origin. *Proceedings from the American College of Veterinary Internal Medicine, Denver, CO, June 15-18, 2011.*
5. Lunn KF. Fever of unknown origin: a systematic approach to diagnosis. *Compend Contin Educ Vet* 2001; 23 (11): 976-92.
6. Lunn KF. Fever of unknown origin: appropriate choice of diagnostic tests. *Proceedings from the American College of Veterinary Internal Medicine, Minneapolis, MN, June 9-12, 2004.*