

Weakness & Anorexia in a Reclusive Cat

A 12-year-old, neutered male domestic shorthair cat was presented for weakness, anorexia, and hiding.



Physical Examination. The cat was quiet but alert and responsive. Although the cat's body condition score was 5/9, medical records indicated a 2-pound weight loss since his prior office visit 6 months ago. Heart rate was 200 beats per minute with a normal sinus rhythm and grade 1/6 sys-

tolic murmur; respiration was 56 breaths per minute. Mucous membranes were pale.

On the basis of skin turgor, the cat was estimated to be 7% dehydrated. Multiple abdominal masses were palpated but did not elicit pain. Two of the masses were judged to be bilaterally enlarged, irregular kidneys; a third mass, located ventral to the kidneys, was similarly irregular and also firm.

Initial Diagnostics. Packed cell volume and total solids measured 18% and 8 g/dL, respectively. A CBC, serum biochemical profile, and urinalysis (Table) were performed.

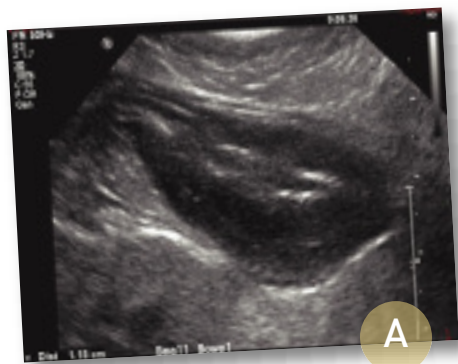
The CBC confirmed anemia but also detected neutropenia, thrombocytopenia, and relative eosinophilia. A reticulocyte count indicated non-regenerative anemia. The serum biochemical profile indicated azotemia. Urinalysis was unremarkable except for occult hematuria; it could

History. The owner reported that approximately 2 weeks earlier, the cat began sitting under the dining room table where heating pipes produced a warm spot. At first, this behavior was intermittent, but by the time of presentation, the cat was reluctant to move from the spot at all. His appetite had declined to the point of complete anorexia 2 days previously. The cat resides exclusively indoors with a female littermate that is clinically healthy.



ASK YOURSELF...

- What are the differential diagnoses in this case?
- In addition to a CBC, what other test may be helpful in assessing the cytopenias detected in this cat?
- What are the potential causes of this cat's azotemia?
- What is this cat's prognosis?



A



B



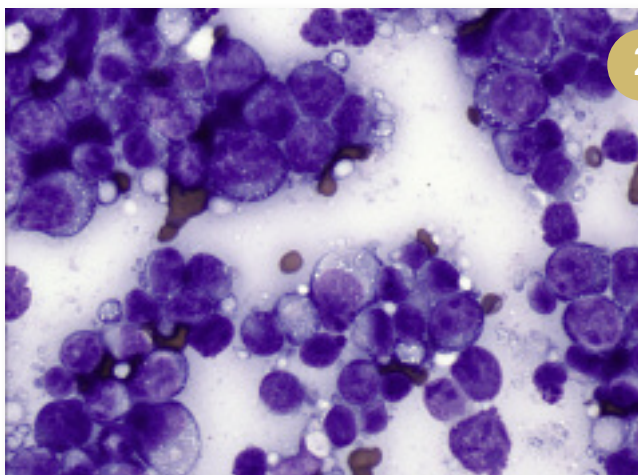
C

1 Ultrasound images of jejunum (A), left kidney (B), and right kidney (C)

▶ Table. Abnormal Laboratory Results

Test	Variable	Result	Reference Range
Complete blood count	Red blood cells (10 ⁶ /mcL)	4.2	6.8–10
	Hemoglobin (g/dL)	6	10.5–14.9
	Hematocrit (%)	18	31–46
	White blood cells (10 ³ /mcL)	1.93	4.5–15.7
	Neutrophils (10 ³ /mcL)	0.8	2.1–10.1
	Platelets (10 ³ /mcL)	126	183–643
Serum biochemical profile	Glucose (mg/dL)	165	70–120
	Blood urea nitrogen (mg/dL)	88	15–33
	Creatinine (mg/dL)	3.5	0.9–2.1
	Phosphorous (mg/dL)	8.6	6–8.4
Urinalysis (cystocentesis)	Turbidity	Cloudy	Clear
	Specific gravity	1.018	
	Heme proteins	3 +	Negative
	Red blood cells (hpf)	30–50	

hpf = high-power field



2

Fine-needle aspirate cytology of the kidney
Courtesy Dr. Perry Bain

not be determined if this was an artifact of cystocentesis or an indication of renal pathology. Urine specific gravity was 1.018, indicating that renal dysfunction was most likely a contributing factor to the azotemia. Nevertheless, dehydration and gastrointestinal bleeding could not be excluded.

Additional Diagnostics. Thoracic radiographs were within normal limits. Abdominal ultrasound revealed a small jejunal mass characterized by wall thickening and loss of layers (Figure 1A).

Both kidneys were enlarged with irregular capsular margins and mild subcapsular edema (Figure 1B and 1C). Enlarged lymph nodes within the abdomen were not detected.

A fine-needle aspirate of the left kidney (Figure 2) revealed a pleomorphic population of medium to large lymphocytes, many of which possessed multiple nucleoli and cytoplasmic vacuolization. Lymphoglandular bodies (cytoplasmic fragments of lymphoid cells) were present in the background.

CONTINUES

DIAGNOSIS: HIGH-GRADE LYMPHOMA

The predominance of lymphoid cells within the kidney in the absence of other inflammatory cells is diagnostic of lymphoma. Ideally, the gastrointestinal mass would have been aspirated or biopsied.

In this case, the clinician was able to obtain renal aspirates while the cat was awake. The decision was made to forego further aspirates, treat for lymphoma, and monitor response to therapy.

Treatment. Intravenous fluids were administered as supportive care while results of the diagnostic studies were pending. Once lymphoma was confirmed, chemotherapy was initiated with L-asparaginase and prednisone. Treatment was continued with a CHOP-based chemotherapy protocol.



DID YOU ANSWER ...

- **The differentials for bilateral renomegaly** include polycystic kidneys, feline infectious peritonitis, hypereosinophilic syndrome, other neoplasias (such as renal cell carcinoma), and bilateral hydronephrosis secondary to partially obstructing ureteroliths.
 - **Polycystic kidneys** are not commonly recognized for the first time in a 12-year-old cat.
 - **Feline infectious peritonitis** is an important differential because the condition not only can cause renal enlargement but may also produce a pyogranulomatous mass effect at the ileocolic junction. The relative increase in globulins should heighten suspicion of this differential.
 - **Hypereosinophilic syndrome** should also be considered, particularly in light of this cat's relative eosinophilia. However, it should be noted that eosinophilia is a recognized paraneoplastic syndrome in lymphoma.
 - Because the tumors may be bilateral and metastatic to an intraabdominal lymph node (third mass), **renal carcinoma** should be considered but is a rare possibility.
- **A bone marrow aspirate is indicated** for peripheral cytopenias. The most common hematologic abnormality associated with lymphomatous infiltration of the bone marrow is thrombocytopenia.
 - Anemia associated with lymphoma is often nonregenerative. While anemia related to lymphoma may result from myelophthisis, it is most commonly due to anemia of inflammatory disease, particularly when the anemia is mild and occurs without other cytopenias.
 - Less commonly, immune-mediated destruction of red blood cells may occur as a paraneoplastic syndrome in cats with lymphoma. In these cases, the anemia is often severe and regenerative.
 - Additionally, nonregenerative anemia may result from chronic renal insufficiency due to reduced production of erythropoietin by the kidneys. However, in this case, gastrointestinal hemorrhage leading to anemia should be considered due to the mass involving the small intestines (although the red blood cell parameters did not support iron deficiency, and no disproportionate increase in blood urea nitrogen concentration was observed).

In this patient, the decreases in 3 cell lines observed on the CBC make bone marrow involvement probable. However, the anemia is likely multifactorial.

- **Azotemia in cats with renal lymphoma** may be due to prerenal (dehydration) or intrinsic renal causes. Significant renal failure is not seen in every cat with renal lymphoma. The relatively low level of azotemia in this cat and the rapid resolution with supportive care supports prerenal causes.
- **The prognosis for feline lymphoma is fair.** Response to chemotherapy is associated with lymphoma grade and the anatomic site of disease. Prognosis for renal lymphoma has not been associated with the presence of azotemia. High-grade lymphomas initially tend to respond quickly to chemotherapy, but median survival times are often less than 1 year. For low-grade lymphomas, characterized by more mature lymphocytes, median survival times have been reported to be approximately 18 months.

CHOP = cyclophosphamide, hydroxydaunorubicin (doxorubicin), vincristine (Oncovin; elanco.com), and prednisone

Due to reports of a high potential for relapse of renal lymphoma within the central nervous system, many oncologists use prednisone and another chemotherapy agent that crosses the blood–brain barrier. Historically, this agent has been cytarabine, but lomustine has recently been incorporated into feline lymphoma protocols.

Outcome. The cat responded well to early treatments and began eating and drinking within 72 hours. Hematocrit initially decreased to 14% after rehydration; however, it steadily increased to normal range within 2 months. In addition, the neutropenia and thrombocytopenia resolved in approximately 3 weeks. The small intestinal mass was no longer detectable within 1 month.

The shape and ultrasonographic architecture of kidneys in cats with renal lymphoma often do not return to normal, despite remission of the disease. This is presumed to be due to scarring. In this patient, the kidneys decreased in size but remained irregular in contour.

Fine-needle aspiration of the kidneys performed 3 months after initiation of chemotherapy revealed no evidence of neoplastic lymphocytes. This cat's lymphoma was particularly sensitive to therapy, and he remained in complete clinical remission at 1 year.

See Aids & Resources, back page, for references and suggested reading.

