

# Feline Enlarged Kidney

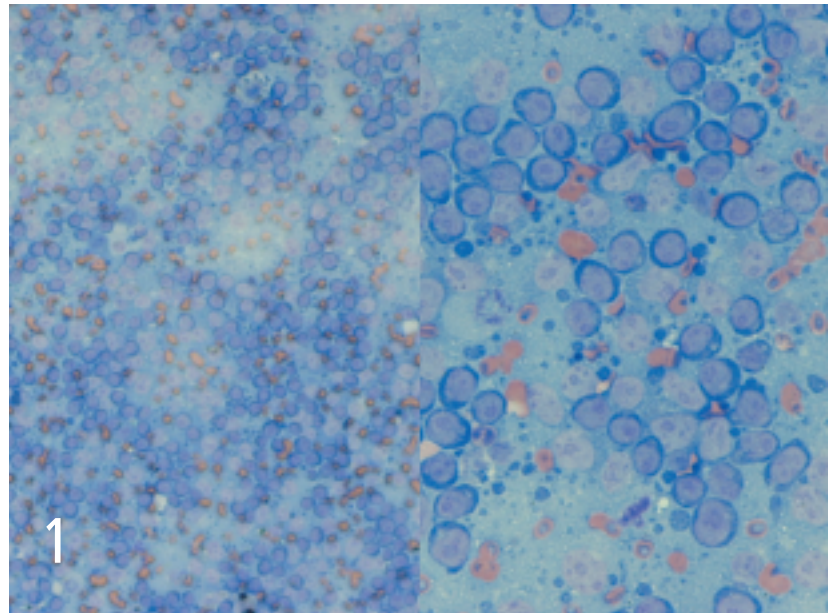
Kimberly J. Caruso, DVM, Diplomate ACVP (Clinical Pathology), California Veterinary Specialists, San Marcos, California

An 8-year-old, spayed female domestic shorthair is presented with a history of weight loss, lethargy, and anorexia. The cat was adopted from an animal shelter 1 year ago.

**History.** The medical history is unknown, but the cat has been previously healthy. The patient is primarily an indoor cat but occasionally goes outdoors, especially in the spring and summer. Vaccinations are up to date, including a vaccination for FVRCP and rabies before adoption.

**Physical Examination.** The cat is approximately 7% to 8% dehydrated, mildly depressed, and has a thin body condition and a temperature of 104°F. The right kidney is moderately enlarged, slightly irregular, and nonpainful on palpation.

**Laboratory Analysis.** Hemogram, urinalysis, and an ultrasound-guided fine-needle aspiration biopsy of the right kidney are done initially. A mild nonregenerative anemia (PCV 27%) is the notable finding on the hemogram. Hematuria and a 2+ proteinuria with a specific gravity of 1.012 are noted on urinalysis. You consult the veterinary clinical pathologist working at the specialty hospital near your clinic, and together the two of you review the cytologic smear from the aspirate of the right kidney (**Figure 1**).



Original magnification: 500× (left), 1000× (right)

## ASK YOURSELF...

- Is the sample cellular?
- Are the cells compatible with the anticipated renal cells?
- Describe the cellular characteristics of the predominant cell type. These findings are most consistent with what cell type?

continues

## CASE STUDY OF THE MONTH . DIAGNOSIS

### Diagnosis: Renal failure secondary to lymphoma

#### Discussion

Fine-needle aspiration biopsy is a rewarding diagnostic approach for renomegaly and is recommended in cases of abnormal kidney size and/or shape. The procedure is easily performed in cats because their kidneys are often easily palpable and immobilized and ultrasonography is readily available. A 22-gauge needle used with a nonaspiration technique works best in obtaining an intact, adequately cellular specimen while minimizing hemodilution. Renal aspirates are best at detecting underlying inflammation, infection, neoplasia, or cysts. Possible differentials for cats with unilateral renomegaly include lymphoma, FIP, pyelonephritis, hydronephrosis, and renal carcinoma. The first two differentials will be discussed further because of their prevalence in cats.

#### Lymphoma

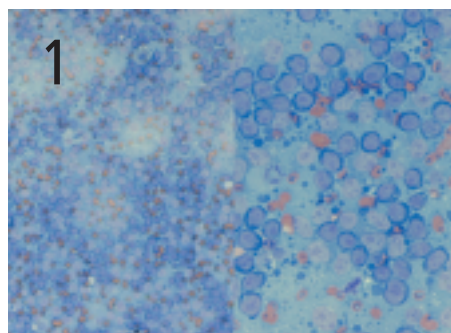
Lymphoid neoplasia arising outside the bone marrow in lymph nodes or solid visceral organs is known as lymphoma. This form of cancer is one of the most common hematopoietic neoplasms of cats. Renal lymphoma is one of the extranodal classifications of lymphoma in cats aside from the alimentary, mediastinal, cutaneous, and multicentric forms. The clinical expression of lymphoma is determined on the basis of the location of the lymphoid neoplasia. Hence, renomegaly and clinical signs consistent with renal failure—such as lethargy, inappetence, and vomiting—are observed in cats with renal lymphoma. Laboratory evidence of azotemia and isosthenuria confirms renal failure as the disease process. Lymphoma is readily diagnosed via fine-needle aspiration cytology, as in the case here (Figures 1 and 2).

#### Feline Infectious Peritonitis

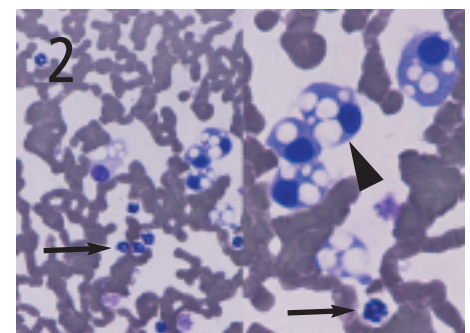
As in lymphoma, clinical signs depend on the extent of the lesions (granulomas represent the dry form of disease) and the presence or absence of body cavity effusions (effusions indicate the wet form of disease). Renomegaly with

#### DID YOU ANSWER...

- The cytologic specimen is cellular.
- No epithelial cells indicative of kidney cells are observed. There is a monomorphic population of large, discrete cells with a round-to-slightly oval nucleus, a stippled-to-smooth chromatin containing a prominent nucleolus and surrounded by a small amount of basophilic cytoplasm. The cytoplasm occasionally contains a small, paranuclear clear zone. Lymphoblasts can be differentiated from small mature lymphocytes by comparing their size with that of the neutrophil (Figure 1,) and the scattered reddish-brown erythrocytes. Lymphoblasts are slightly larger than a neutrophil and have visible nucleoli, whereas lymphocytes are smaller than neutrophils and have dense chromatin and absent nucleoli.
- A healthy kidney is shown in Figure 2. In this kidney, renal tubular epithelial cells (arrowhead) are large (compare with neutrophils [arrows]), oval cells comprising a round nucleus with dense chromatin. The chromatin contains an indistinct nucleolus surrounded by abundant basophilic cytoplasm that often contains few-to-several punctuate clear vacuoles compatible with lipid droplets. The latter is a common, normal finding in renal tubular cells in cats.



Fine-needle aspiration (left, 500× original magnification; right, 1000× original magnification)



Normal renal tubular epithelial cells (left, 500× original magnification; right, 1000× original magnification)

or without renal failure can be one of the manifestations of the dry form and is attributed to multiple granuloma formations. Other nonspecific signs include fever, weight loss, and depression. Cytologic evaluation of a fine-needle aspiration sample shows a mild pyogranulomatous response and may identify a mixed inflammatory cell population comprising neutrophils, macrophages, and lesser numbers of lymphocytes (pyogranulomatous) (Figure 2, right-hand panel).

Chronic pyelonephritis and systemic fungal disease are other differentials causing a pyogranulomatous response in the kidney; when present, the inflammatory response is often more pro-

nounced than that associated with FIP.

Other laboratory tests supportive of a diagnosis of FIP include marked hyperglobulinemia, renal proteinuria/azotemia, elevated liver enzymes, nonregenerative anemia, polyclonal gammopathy, and positive serology/PCR. With the latter tests, specificity is not sufficient or uncertain. Biopsy and tissue analysis with PCR, immunofluorescent antibody, and immunohistochemistry can provide a definitive diagnosis. Although pyogranulomatous inflammation in the kidney is not specific for FIP, this finding from fine-needle aspiration combined with other supportive tests can be highly suggestive of FIP in a cat with compatible clinical signs. ■