



College of Veterinary Medicine
Department of Pathology

Case number: C18-025212

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Signalment: 6 year old, male neutered domestic short hair cat

Clinical history: The patient presented to the oncology service for evaluation of unknown circulating cells (others). He had a history of vomiting multiple times per day for 2-3 months prior. On examination by the referring veterinarian, blood work revealed neutropenia and circulating “unknown cells”. An abdominal ultrasound revealed a duodenal mass (this mass was not sampled).

Physical exam findings: The cat was quiet, alert and responsive. He was overweight and appeared painful during abdominal palpation. The rest of the findings were within normal limits.

Selected laboratory findings:

Analyte	Patient Results	Reference Intervals
RBC x10 ⁶ /uL	4.56	7.60-10.90
Hgb g/dl	7.1	11.3-16.2
HCT %	21.1	33.6-49.0
MCV fl	46.2	39.0-52.0
MCHC g/dl	33.5	32.0-35.0
Platelets x 10 ³ /uL	51	206-465
Segmented Neutrophils x 10 ³ /uL	0.710	1.850-9.990
Band Neutrophils x10 ³ /uL	0.284	0.000-0.300
Lymphocytes x10 ³ /uL	4.544	0.800-6.400
Monocytes x 10 ³ /uL	0.426	0.000-0.550
Eosinophils x10 ³ /uL	0.000	0.000-1.500
Basophils x 10 ³ /uL	0.000	0.000-0.100
Others x 10 ³ /uL	1.136	0.000-0.000
Nucleated RBC /100 WBC	4	0-5
Absolute reticulocytes x 10 ³ /uL	4.3	6.0-52.9

A blood smear is provided for your evaluation.



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Blood smear evaluation: The cells counted as “others” include variably granulated mast cells, with the majority of cells being poorly granulated. Lymphocytes are variable in size but predominantly intermediate and occasionally display a faint nucleolar ring. No platelet clumps are observed and all other findings are confirmed.

Diagnosis: Mastocytemia, most consistent with neoplasia

Discussion:

The incidental identification of mast cells in peripheral circulation is rare. Mastocytemia carries different clinical significance in dogs and cats. In dogs, mast cells in circulation are most commonly associated with inflammation, other neoplasia, regenerative anemia, or trauma.^{1,2} The majority of cats with mastocytemia have concurrent visceral or cutaneous mast cell neoplasia.¹ However, cats with mastocytemia have also been found to have other forms of neoplasia such as lymphoma and hemangiosarcoma, and potentially even chronic kidney disease with no confirmed neoplasia (not definitively ruled out either).¹ Mastocytemia and/or bone marrow involvement has been reported to occur in roughly 50% of feline splenic mast cell tumors, with involvement of blood and bone marrow considered much less common with intestinal mast cell neoplasia.³ It has been shown that cats with mastocytemia and confirmed mast cell tumors typically have more mast cells per blood smear (up to 100+), whereas cats without a confirmed mast cell tumor generally have only 1-2 per smear.¹ Buffy coat preparation has been recommended for all cases of suspected or known mast cell neoplasia in cats as it is more sensitive at identifying their presence than direct smear evaluation.³ Clinical signs of cats with mastocytemia include anorexia, splenomegaly, vomiting, diarrhea, weight loss, and lethargy.¹ Because these are very nonspecific signs, fine-needle aspirates of spleen and liver may be useful to rule out occult mast cell neoplasia. With treatment for visceral mast cell neoplasia (splenectomy and chemotherapy), mastocytemia usually does not resolve completely but may decline; buffy coat smears may be used as a way to monitor disease progression.⁴ This cat did have an intestinal tumor but further work-up was not pursued by the owners so it is unknown if this was a primary intestinal mast cell tumor causing mastocytemia. Interestingly, both humans and rarely cats have been diagnosed with concurrent occult mast cell neoplasia and hematologic neoplasia such as lymphoma.¹ Unfortunately the significance of the intermediate-sized lymphocytes in this patient’s blood smear is uncertain due to lack of additional diagnostic testing, but lymphoma (in the blood, bone marrow, and/or intestine) cannot be ruled out as a cause for this patient’s mastocytemia.

References:

1 Piviani M, Walton RM, Patel RT. Significance of mastocytemia in cats. *Veterinary Clinical Pathology*. 2013; Vol 42 (1): 4-9.

2 Harvey, John W. “Mastocytemia.” *Veterinary Hematology: A Diagnostic and Color Atlas*. Saunders, 2012.

3 London, Cheryl. “Mast Cell Cancer.” *Schalm’s Veterinary Hematology*. 6th. Blackwell, 2010.

4 Skeldon NC, et al. Mastocytosis in cats: prevalence, detection and quantification methods, haematological associations and potential implications in 30 cats with mast cell tumours. *Journal of Feline Medicine and Surgery*. 2010.12 (12): 960-6.