



The University of Georgia

Department of Pathology
Athens, Georgia 30602-7388

College of Veterinary Medicine

Telephone: (706) 542-5837
FAX: (706) 542-5828

Case Number: UGA 11212

Presenters: Lisa S. Kelly, Melinda S. Camus

E-mail: lskelly@uga.edu

Signalment: 5 year old, female spayed, Golden Retriever dog

Clinical History: The dog presented to the UGA Emergency and Critical Care Service for a one-week history of lethargy, progressive inappetence, polydipsia, and vomiting. Physical examination revealed hyperthermia (103.6 °F; 39.8°C) and an approximately 20 cm mid-abdominal mass that caused apparent discomfort upon palpation, with no other abnormalities found. Abdominal radiographs and ultrasonography confirmed a large, mid-abdominal mass that was suspected to be a markedly enlarged lymph node, multiple enlarged lymph nodes near the aorta and intestines, and a moderate diffuse hepatomegaly. Thoracic radiographs demonstrated a widened mediastinum, which was suspected to be an enlarged lymph node based on ultrasonography.

Brief Clinicopathologic Findings:

	<u>Result</u>	<u>Units</u>	<u>Ref. Interval</u>
<u>Truncated CBC:</u>			
HCT	36.6	%	36.6- 59.6
WBC	12.8	x 10 ³ /μL	5.5-13.9
Platelets	92	x 10 ³ /μL	235-694
MPV	22.7	fl	6.1-10.1

Serum Chemistry (abnormals only):

Urea Nitrogen	6.2	mg/dL	8.5-28.5
Alk Phos	186	U/L	10-119
Total bilirubin	0.30	mg/dL	0-0.25

Urinalysis:

USG = 1.010 Trace protein on dipstick; UP:UC =0.14 (Ref. Interval = <0.5)

Specimen for Evaluation: Peripheral blood smear



The University of Georgia

Department of Pathology
Athens, Georgia 30602-7388

College of Veterinary Medicine

Telephone: (706) 542-5837
FAX: (706) 542-5828

Case Number: UGA 11212

Presenters: Lisa S. Kelly, Melinda S. Camus

E-mail: lskelly@uga.edu

Signalment: 5 year old, female spayed, Golden Retriever dog

Blood Smear Evaluation: The red cell density and morphology are unremarkable. The leukocytes are comprised of approximately 41% segmented neutrophils, 21% monocytes, 15% mast cells, 13% basophils, and 1% eosinophils. The mast cells are pleomorphic with granulation ranging from poorly to moderately granulated, and they exhibit moderate anisocytosis and anisokaryosis. There are multiple platelet clumps present at the feathered edge, and the platelet mass appears mildly decreased. There are occasional shift platelets.

Interpretation: Mastocytemia with pleomorphic mast cells and basophilia- most consistent with mast cell neoplasia. Moderate monocytosis consistent with chronic inflammation. Mild thrombocytopenia with increased MPV consistent with destruction or consumption of platelets and active thrombopoiesis.

Additional testing: The mid-abdominal mass was diagnosed as a lymph node with metastatic mast cell tumor (MCT) by fine needle aspiration.

Comments: Circulating mast cells are not pathognomonic for disseminated MCT. In fact, the vast majority of dogs with mastocytemia do not have mast cell neoplasia. Mastocytemia is most commonly seen with inflammatory diseases, especially of the GI, respiratory, and reproductive tract, but may also be seen with regenerative anemia, non-MCT neoplasia, or trauma. When mast cells are circulating as part of an acute inflammatory response, there is often a concurrent inflammatory leukogram consisting of neutrophilia or neutropenia, often with toxic change and/or a left shift. Inflammatory mast cells are well-differentiated and are not expected to show pleomorphism and variable granularity, although they can degranulate upon specimen retrieval. Neoplastic mast cells may be either well- or poorly-differentiated. Due to the lack of specificity and prognostic power, evaluation for the presence of mastocytemia via buffy coat analysis is no longer considered essential in staging MCTs.

Mast cell neoplasia may be associated with a paraneoplastic basophilia, regardless of the presence of mastocytemia. Basophilia may also occur with allergic or parasitic responses, or with other neoplasms such as lymphomatoid granulomatosis. Although basophils are often listed as part of a 5-part leukocyte differential, they typically account for <0.5% of circulating leukocytes in dogs, and are rarely reported from 100-cell count differentials. Basophils in dogs can only be appreciated on a manual differential, as they are not recognized by automated analyzers, where they may be counted as either large unstained cells (large, peroxidase negative cells), neutrophils, or lymphocytes, depending on the analyzer.

This case was unusual for the absence of any cutaneous masses, indicating a primary visceral MCT. Primary visceral MCT originates most commonly in the GI tract, liver or spleen, but the definitive origin was not identified in this patient. Visceral MCT is frequently associated with mastocytemia, and carries a very poor to grave prognosis.

References:

1. Lilliehöök I, Tvedten HW. Errors in basophil enumeration with 3 veterinary hematology systems and observations on occurrence of basophils in dogs. *Vet Clin Pathol*. 2011. Dec;40(4):450-8
2. McManus PM Frequency and severity of mastocytemia in dogs with and without mast cell tumors: 120 cases (1995-1997). *JAVMA*. 1999. 215(3):355-7.
3. Weiss DJ and KJ Wardrop (eds.). 2010. *Schalm's Veterinary Hematology*. Blackwell Publishing. 6th edition. pp. 290-297; 483-490.