

Mya's Mystery Malaise

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**Introduction:**

Lymphoma is the most common feline cancer, and gastrointestinal lymphoma is the most common malignant neoplasm in both cats and dogs. <sup>(1,7)</sup> Previously, feline lymphoma was most commonly diagnosed in association with retroviral infection with the feline leukemia virus. <sup>(1,7)</sup> However, with the development of a feline leukemia vaccine and with decreasing incidence of feline leukemia virus infection, this does not reflect the current situation, and many cats with lymphoma are not infected with these viruses. <sup>(7)</sup> Lymphoma in cats can vary significantly in presentation and response to treatment with this variation in response related to grade of the tumor. <sup>(7)</sup>

**History and Presentation:**

Mya is an approximately 8-year-old female spayed domestic shorthair cat who was presented to the MSU-CVM Community Veterinary Service on August 20<sup>th</sup>, 2019, for an 8-day history of vomiting multiple times per day. Her owner reported she had been seen retching and salivating prior to vomiting. The vomitus contained both liquid and food contents. Mya had also been reported to be having a decreased appetite for approximately one week. She was reported to be urinating and defecating normally and her activity level was reportedly normal. She is an indoor-only cat. A physical exam performed on August 20<sup>th</sup> was within normal limits. She weighed 5.13 kilograms. A complete blood count and blood chemistry panel performed at this time found no significant findings. Mya was discharged on Purina Pro Plan FortiFlora with a recommendation to bring her back for abdominal radiographs and ultrasound if the vomiting continued.

Mya presented again to MSU-CVM Community Veterinary Service on August 26<sup>th</sup>, 2019. At this time, she was still anorexic and vomiting. Mya's owner reported that she was still

urinating normally but had not defecated since August 23<sup>rd</sup>, 2019. She weighed 4.94 kilograms. On physical exam Mya was depressed. She was determined to be approximately 5-7% dehydrated with an increased capillary refill time of about 3 seconds and had pale, tacky mucous membranes. Her temperature was 102.3 degrees Fahrenheit, her heart rate was 180 beats per minute with strong, synchronous pulses, and her respiratory rate was 84 breaths per minute. Her heart and lungs auscultated normally with no murmurs, arrhythmias, crackles, or wheezes heard. No peripheral lymphadenopathy was noted. On abdominal palpation, a firm mass was noted in the cranial abdomen. The remainder of Mya's physical exam was within normal limits.

### **Diagnostics:**

Due to Mya's two-week history of vomiting and anorexia, diagnostics including abdominal radiographs, abdominal ultrasound, a complete blood count, a blood chemistry profile, and a total T4 were performed. The complete blood count showed a mildly elevated MCHC of 35.6 g/dL (24.0-34.0 g/dL), decreased platelet count of 156 K/ $\mu$ L (200-700 K/ $\mu$ L) and a stress leukogram consisting of a lymphopenia. The platelet count was determined to be normal on manual count. The chemistry profile showed no significant findings. Mya's total T4 was low at 1.80  $\mu$ g/dL (2.00-5.00  $\mu$ g/dL). Abdominal radiographs revealed a smoothly marginated, ovoid, approximately 59 x 45.5 x 47.3 millimeters soft tissue opaque mass within the right middle abdomen. The mass was observed to be causing mid, caudal, and ventral displacement of the small intestine. Multiple loops of small intestine were greater than 12 millimeters in diameter. The kidneys were bilaterally small and undulating in margination. The possible organs of origin for the mass were determined to be lymph node, small intestine, and pancreas with neoplasia or granuloma considered likely etiologies. The changes to the intestines were considered likely due to neoplasia or inflammatory bowel disease. The changes to the kidneys were consistent with

chronic renal disease with renal infarct. Incidental findings were hemoclips from previous ovariohysterectomy and decreased space between the cardiac silhouette and diaphragm, which was considered likely due to sedative medication administration. Abdominal ultrasound revealed a moderate amount of hyperechoic material freely suspended within the gallbladder. The jejunal and right colic lymph nodes were enlarged (measuring up to 3.96 x 3.21 x 4.74 centimeters) and irregularly shaped and margined, and heterogenous in echotexture and echogenicity, and were hypoechoic. The larger lymph nodes contained hyperechoic areas. The mesentery surrounding the lymph nodes was hyperechoic and heterogenous. The muscularis layer of the small intestine was determined to be diffusely thickened with a focal region of jejunum containing severely thickened wall measuring up to 0.49 centimeters. The kidneys were observed to have changes consistent with chronic renal disease. Left-sided nephrolithiasis was noted. The changes to the lymph nodes and small intestine were most consistent with neoplasia, such as lymphoma, and infectious or inflammatory etiologies were considered less likely, but not ruled out. Ultrasound-guided fine needle aspirates of the largest jejunal lymph node and the largest right colic lymph node were performed using 22-gauge, 1.5-inch needles and five slides were submitted for cytologic evaluation.

Two of the slides were essentially non-diagnostic due to poor cellular preservation. One slide consisted of poorly preserved or degenerate neutrophils with lower numbers of small lymphocytes and macrophages. The neutrophils were rarely seen phagocytizing cocci. The remaining two preparations consisted of lymphoid tissue with a heterogenous population of lymphocytes with small mature lymphocytes predominating. Low numbers of neutrophils, macrophages, and plasma cells and moderately increased numbers of eosinophils were admixed with the lymphocytes. There was no overt evidence of neoplasia. The most likely diagnosis

based on the slide preparations was a septic suppurative inflammation with eosinophilic lymphadenitis. Differential diagnoses for the eosinophilic lymphadenitis included a neoplastic process, hypersensitivity reaction, or parasitism.

Mya's owner was informed of the results of the diagnostic tests performed, and the differentials considered most likely, including lymphoma and sepsis. Due to Mya's current condition and her prognosis, her owner elected for humane euthanasia.

### **Pathophysiology:**

Hematopoietic tumors comprise approximately one third of all feline tumors; lymphoma, which occurs in many species and at varying ages, is a malignant neoplasm of lymphocytes and is the most frequently diagnosed feline cancer, accounting for 90% of all hematopoietic tumors in cats. <sup>(7)</sup> There are two basic types of feline lymphoma recognized: retrovirus-associated and nonviral in origin. <sup>(2)</sup> Much of the information regarding feline lymphoma reflects disease incidence before development of a feline leukemia virus (FeLV) vaccine and may not reflect the current situation. <sup>(7)</sup> Prior to control of FeLV in the 1980s, FeLV accounted for as many as 70% of the cases of feline lymphoma. <sup>(2)</sup> Nonviral associated lymphomas constitute the largest group of lymphocytic cancers observed in cats at the present time. <sup>(2)</sup>

There are several anatomic forms of lymphoma in cats, and these differ in reported incidence with gastrointestinal lymphoma regarded by several authors as the most common site, although leukemic, mediastinal, and multicentric have all also been reported to be most common. <sup>(7)</sup> However, in cats, many classification schemes inadequately reflect the complexity and heterogeneity of cases, and some classifications of gastrointestinal lymphoma include hepatic or splenic involvement whereas others consider this pattern to be multicentric. <sup>(7)</sup> Feline gastrointestinal lymphoma can be either B-cell or T-cell origin with the literature contradictory

on which type predominates. However, to date, there are insufficient data to correlate tumor phenotype with clinical significance and outcome. <sup>(1,5)</sup> There are different grades of gastrointestinal lymphoma, commonly referred to as low-grade (lymphocytic or small cell), high grade (lymphoblastic, immunoblastic, or large cell), and intermediate grade with high grade being more aggressive. <sup>(7)</sup>

Several segments of the gastrointestinal tract are often simultaneously involved, including the liver. <sup>(7)</sup> The gross appearance of feline gastrointestinal lymphoma varies with the specific anatomic location. <sup>(7)</sup> There can be a focal mass or diffuse infiltration. <sup>(7)</sup> When a focal alimentary tract mass is present, there is usually transmural thickening, with or without mucosal ulceration. <sup>(7)</sup> Mesenteric lymphadenopathy is usually overt grossly or on ultrasonographic examination whereas hepatic involvement can be variable in appearance with some cases appearing grossly normal. <sup>(7)</sup>

Clinical signs of gastrointestinal lymphoma can include weight loss, anorexia, vomiting, diarrhea, lethargy, polydipsia, and polyuria. <sup>(7)</sup> Physical exam findings may include poor body condition, thickened gastrointestinal loops, or a palpable abdominal mass. Presence of an abdominal mass is more suggestive of high-grade lymphoma. <sup>(7)</sup>

Common diagnostic test findings associated with gastrointestinal lymphoma in cats include thickened walls and loss of layering, which can be focal, multifocal, or diffuse on abdominal ultrasound. <sup>(3,7)</sup> Fine needle aspirates may be diagnostic for large-cell lymphoma but are less helpful for small cell. <sup>(3)</sup> Surgical or endoscopic biopsy may be helpful in diagnosing gastrointestinal lymphoma with endoscopic biopsy less likely to be diagnostic due to the inability to obtain full-thickness biopsies. <sup>(3)</sup> Surgical biopsy is associated with a low risk of post-

operative complications. <sup>(3)</sup> However, the potential complications are serious and can include dehiscence of the biopsy site, leading to sepsis. <sup>(3)</sup>

### **Treatment:**

Several treatment protocols for gastrointestinal lymphoma in cats have been developed. For low-grade gastrointestinal lymphoma, the treatment modality of choice seems to be prednisolone and chlorambucil. <sup>(3,7,8)</sup> Treatment of high-grade lymphoma is more difficult and involves other chemotherapeutics and strategies for management. The treatment of choice for high-grade lymphoma is multi-drug chemotherapy. Several drug combinations have been used with varying levels of success, including CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisolone) or COP (cyclophosphamide, vincristine, and prednisolone). <sup>(3,7)</sup> Other drugs have been used with varying success, including lomustine (CCNU), L-asparaginase (L-spar), and methotrexate. <sup>(3,6,7)</sup> Surgical removal of discrete tumors or masses has been studied as well with unclear results as to possible benefits. <sup>(3)</sup> Additionally, in a small study, abdominal irradiation was used as a rescue therapy for cats with gastrointestinal lymphoma with 10 out of 11 cats showing a response to the treatment. <sup>(4)</sup>

### **Case Outcome:**

Mya's body was submitted for necropsy. On gross exam there was a large mass in the mesentery of the jejunum, which was determined to be an enlarged lymph node measuring 4.5 x 5.5 x 3.5 centimeters and was firm, encapsulated, and lobulated with smooth surface and had multifocal to coalescing red foci on the dorsal aspect. On cut surface, this mass had a thick capsule surrounding a green, necrotic center. The ileum and jejunum were diffusely thickened. There were widely disseminated pinpoint red foci throughout the surface of both lungs. Both

kidneys were irregularly shaped with multifocal depressed areas that on cut surface were determined to be fibrosis.

On histopathologic evaluation, neoplastic lymphocytes were present in the small intestine, mesenteric lymph nodes, liver, and spleen. These cells were round with large nuclei and scant eosinophilic cytoplasm. The nuclei had coarsely stippled chromatin and 1-2 small nucleoli. The mitotic index was 2-3 per high powered field. The neoplastic cells stained diffusely positive for CD3, which is a T-cell marker, thus making Mya's diagnosis multifocal T-cell lymphoma.

Given Mya's clinical signs and the physical exam and diagnostic imaging findings of a large mass in her abdomen, Mya's lymphoma was advanced at the time of presentation, and her prognosis was poorer. In addition, the cytology preparations from the fine needle aspirates that were performed were likely from the necrotic center of the mass in the mesentery, and from normal lymphatic tissue, which led to not being able to definitively diagnose lymphoma at that time and led to the differential diagnosis of sepsis being considered.

### **Conclusion:**

Lymphoma is a malignant neoplasm that can have many different clinical presentations. It should be considered as a differential in a feline patient where vomiting, anorexia, and other gastrointestinal signs are occurring. Definitive diagnosis may be obtained with cytology by fine needle aspiration; however, this diagnostic test can be inconclusive and further diagnostics, such as biopsy, may be needed in these cases. Treatment varies depending on grade of disease, and management of low-grade disease can often be accomplished with oral chemotherapeutics, with survival times of greater than one year possible.



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