

B Cell Lymphoma with Mott Cell Differentiation in a Dog

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ABSTRACT

Background: B cell lymphoma with Mott cell differentiation is rarely reported in dogs. This neoplasms has been diagnosed in the gastrointestinal tract and therefore is considered the differential diagnosis of obstruction by foreign body, enteritis and other intestinal neoplasms. The objective of the present study was to describe macroscopic, microscopic and immunohistochemical findings of a B cell lymphoma with Mott cell differentiation in the gastrointestinal tract of a dog.

Case: A 7-year-old male German Shepherd dog was referred to necropsy with a mass 12 cm in diameter in the ileum-cecocolic junction, compromising mesenteric lymph nodes. Cytology showed two types of lymphoid cells. Approximately 80-90% of cells were round, with large cytoplasm containing numerous basophilic inclusion corpuscles, round nuclei, condensed chromatin, inconspicuous nucleoli, moderate anisokaryosis and marked anisocytosis. The other cells were round, with scarce basophilic cytoplasm, round nuclei, condensed chromatin and inconspicuous nucleoli. Mild anisokaryosis and anisocytosis and mitotic figures were sometimes identified. Histology revealed the predominance of round cells, with large cytoplasm containing numerous eosinophilic corpuscles (Russel bodies). Neoplastic cells were PAS and PTAH-positive, and toluidine blue-negative. Immunohistochemistry revealed positive immunoreactivity to antibodies against the CD-79 α antigen, though no immunolabeling was observed to anti-CD3 and anti-lysozyme antibodies, which defined the diagnosis of canine B cell lymphoma with Mott cell differentiation.

Discussion: B cell lymphoma in the gastrointestinal tract of dogs with Mott cell differentiation is a rare neoplasia that affects mainly the small intestine and the stomach. Cytological examination is a useful tool in the diagnosis of B cell lymphoma. In the disease, the punction of the neoplastic mass or of compromised lymph nodes reveals numerous neoplastic cells with large, slightly basophilic cytoplasm containing multiple inclusions of different sizes, indicative of Russell bodies. The histological examination of the neoplasm analyzed in this report underlines the similarities with gastrointestinal B cell lymphoma with Mott cell differentiation and confirms the heterogeneous cellular character of the tumor, with the predominance of lymphocytes with scarce homogeneous basophilic cytoplasm, round nucleus, condensed chromatin and high mitotic index. The cytoplasm inclusions present in Mott cells were PAS-positive, similarly to previous reports and PTAH-positive, which is common in this cell type. The intense and diffuse immunoreactivity of neoplastic cells to the anti-CD79 α antibody demonstrates the predominance of B lymphocytes, which agrees with most previous reports. Although immunohistochemistry reveals the origin of this lymphoma, the differential diagnosis between B cell neoplasias like multiple myeloma and extracellular plasmocytoma is essential. B cell lymphoma with Mott cell differentiation in the gastrointestinal tract of dogs is rare, but it should be investigated in the differential diagnosis of proliferative or obstructive lesions in the small intestine. In the present report, histology indicated the diagnosis of round cell neoplasia, with the predominance of Mott cells, containing a large amount of Russell bodies that were intensely stained with PAS and PTAH. Immunohistochemistry revealed the strain of these lymphocytes, confirming the diagnosis.

Keywords: intestinal lymphoma, Russell bodies, canine immunohistochemistry.

INTRUDUCTION

Lymphoma is the most frequently diagnosed tumor affecting the hematopoietic system in adult dogs, with variable prevalence for different breeds [3,10]. In this neoplasia, genes for B cell phenotypes are usually expressed, though B cell lymphomas with Mott cell differentiation are rare [4-6,9,10].

B cell lymphoma with Mott cell differentiation is cytologically similar to multiple myeloma and extramedullary plasmocytoma. Macroscopic similarities with other gastrointestinal tumors, foreign body, lymphangiectasia, lymphocytic-plasmocytic enteritis, systemic mycosis and gastroduodenal ulcer have also been reported [3].

The objective of the present study was to describe macroscopic, microscopic and immunohistochemical findings of a B cell lymphoma with Mott cell differentiation in the gastrointestinal tract of a dog.

CASE

A 7-year-old male German Shepherd dog with a record of hematochezia was referred for necropsy. Samples of the neoplastic mass and of organs were fixed in formalin 10% for 48 h and then diaphonized, dehydrated and embedded in paraffin. After, 3- μ m sections were sliced in a microtome and stained by hematoxylin-eosin (HE), Periodic acid-Schiff (PAS), Phosphotungstic acid hematoxylin (PTAH) and toluidine blue (TB) methods and used in histological analyses.

Immunohistochemistry was carried out to determine the expression for T lymphocyte, B lymphocyte and macrophage/monocyte cell markers. Anti-CD3 monoclonal antibody (A0452, DakoCytomation)¹ diluted to 1:500 with antigen recovery by protease XIV (15 min, room temperature), anti-CD79 monoclonal antibody (HM57, DakoCytomation)¹ diluted to 1:100 with antigen recovery by Tris EDTA (pH 9.0, 20 min, 96°C), and anti-lysozyme polyclonal antibody (A0099, DakoCytomation)¹ diluted to 1:200 with antigen recovery by proteinase K (10 min, room temperature) were used. Tissue fragments were incubated with biotinylated secondary antibody (room temperature, 20 min) and with the streptavidin-HRP complex [LSAB™ kit, Dako]² (room temperature, 20 min). In addition, 3,3'-diaminobenzene (Dako) was used as chromogen. Samples were counterstained with Harris hematoxylin.

The main findings during necropsy were cachexia, dehydration and severe paleness of mucosae. Opening of the abdominal cavity revealed a whitish mass 12 cm in diameter, beginning in the ileum-cecocolic junction (Figure 1), involving the mesenteric lymph nodes, and causing lumen obstruction.



Figure 1. German Shepherd dog presenting B cell lymphoma with Mott cell differentiation located in the ileum-cecocolic junction.

An imprint of the abdominal neoplastic mass was obtained during necropsy and stained using the Romanowsky stain. Cytological inspection showed two types of lymphoid cells (Figure 2A). Approximately 80-90% of cells were round, with large cytoplasm containing numerous basophilic inclusion corpuscles, round nuclei, condensed chromatin, inconspicuous nucleoli, moderate anisokaryosis and marked anisocytosis. The other cells were round, with scarce basophilic cytoplasm, round nuclei, condensed chromatin and inconspicuous nucleoli. Mild anisokaryosis and anisocytosis and mitotic figures were sometimes identified.

Histological analysis revealed two kinds of neoplastic lymphoid cells arranged in a shroud pattern, supported by discrete preexisting fibrovascular stroma infiltrated in the mucosa, submucosa, lamina propria, Peyer patches, and muscle layer. Round cells with large, well-defined cytoplasm containing numerous eosinophilic corpuscles of different sizes (Russell bodies), round and peripheral nuclei with condensed chromatin identified as Mott cells (Figure 2B) were observed. Moderate anisokaryosis and marked anisocytosis were detected. The second cell type accounted for approximately 30-40% of the mass and was composed by round cells with scarce, slightly basophilic cytoplasm, round nuclei, roughly granulous chromatin and inconspicuous nucleoli.

Mild anisokaryosis and anisocytosis were observed. Occasional mitotic figures were observed between the two cell types. The large intestine presented only congestion, and no change was observed in the other organs. Russell bodies were revealed by the PAS staining method (intense pink, Figure 2C) and PTAH (blue-violet), but not in the TB method.

Diffuse but marked positive immunoreaction of membrane to anti-CD79 antibody (Figure 2D), and discrete and individual immunoreaction of typical lymphocytes by anti-CD3 antibody were observed in the two cell populations. Cells were not immunoreactive to the anti-lysozyme antibody.

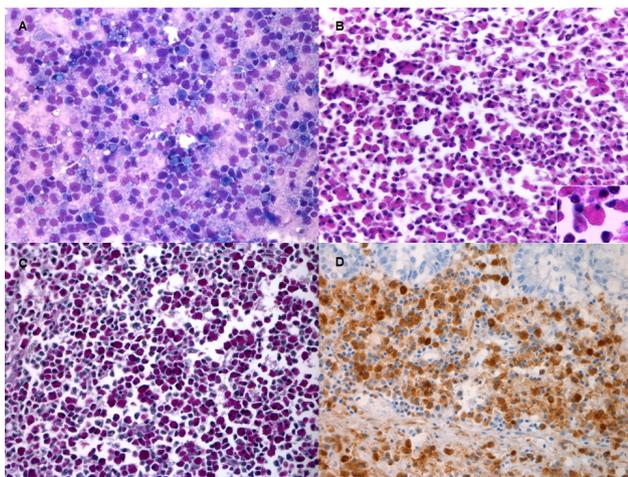


Figure 2. A- Imprint of the neoplasm shows the predominance of Mott cells containing numerous Russell bodies, in addition to some lymphocytes. The inset shows a neoplastic Mott cell [Romanowsky stain, Obj.40]. B- Neoplastic proliferation of B cells with numerous Mott cells arranged as a shroud and supported by a discrete fibrovascular stroma. The inset shows a neoplastic Mott cell [HE, Obj.40]. C- Russel bodies [PAS, Obj.40]. D- Diffuse, intense anti-CD79 α immunoreaction of cytoplasmic neoplastic cells [HE, Obj.40].

DISCUSSION

B cell lymphoma in the gastrointestinal tract of dogs with Mott cell differentiation is a rare neoplasia that affects mainly the small intestine and the stomach [7,10]. Primary neoplasms of the stomach may metastasize to the duodenum, spleen, liver, lungs and several lymph nodes [4]. When it occurs in the intestine, metastasis to the liver [10] and infiltration of neoplastic cells into mesenteric lymph nodes have been reported [7,10]. Here, only lymph nodes were affected.

The punctation of the neoplastic mass or of compromised lymph nodes reveals numerous neoplastic cells with large, slightly basophilic cytoplasm

containing multiple inclusions of different sizes, indicative of Russell bodies. In the present case report, cytological examination revealed the heterogeneous aspect of the neoplastic mass, with moderate amounts of atypical cells, similar to those described in the literature [7,10].

The histological examination of the neoplasm analyzed in this report underlines the similarities with gastrointestinal B cell lymphoma with Mott cell differentiation and confirm the heterogeneous cellular character of the tumor [7].

The cytoplasm inclusions present in Mott cells were PAS-positive, similarly to previous reports [4,7] and PTAH-positive, which is common in this cell type [1,8]. The intense and diffuse immunoreactivity of neoplastic cells to the anti-CD79 α antibody demonstrates the predominance of B lymphocytes, which agrees with most previous reports [5,7,9,10].

Although immunohistochemistry reveals the origin of this lymphoma, the differential diagnosis between B cell neoplasias like multiple myeloma and extracellular plasmocytoma is essential. In the present case, the fact that bone marrow was not affected rules out the suspicion of multiple myeloma. However, both lymphoma and extracellular plasmocytoma may be primary tumors in the gastrointestinal tract, differing in histological characters [6]. Additionally, reports of extracellular plasmocytoma with massive presence of Mott cells are rare.

B cell lymphoma with Mott cell differentiation it should be investigated in the differential diagnosis of proliferative or obstructive lesions in the small intestine. The Mott cells, containing a large amount of Russell bodies that were intensely stained with PAS and PTAH and immunohistochemistry revealed the strain of these lymphocytes, confirming the diagnosis.

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Declaration of interest. The authors report no conflicts of interest. The authors alone are responsible for the contents and writing of the paper.

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