Globule Leukocyte Neoplasm in a Cat
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Globule leukocytes (GL) are commonly found in the mucosa of the intestinal, respiratory and urinary tracts of many animal species as well as human and birds [1, 5, 9, 10]. The GL is morphologically characterized by large eosinophilic cytoplasmic globules and a lymphocyte-like nucleus under hematoxylin and eosin (HE) stain. The origin of the GL has been suggested as mast cell [1, 8, 11], plasma cell [12], lymphocyte [2, 6, 7, 9], or a unique mesenchymal cell population [9]. Despite those vigorous attentions, its origin and biologic functions have not been determined. Neoplastic proliferation of GL is a rare entity, and only two cases have been reported in cats among all animal species [3, 4]. In the present communication, we report another feline case with a severe gastrointestinal involvement.

A 4-year-old male domestic short hair cat was presented to the hospital with a history of anorexia, intermittent vomiting and diarrhea for the past 2 weeks. Physical examination revealed emaciation (body weight 3.2 kg), dehydration, splenomegaly, thickening of intestinal loop, and an abdominal mass (3 to 4 cm in diameter). The body temperature (38.2°C) was normal. Survey radiography and ultrasonography confirmed the abdominal mass and thickening of intestinal loop. Hematologic findings included leukocytosis characterized by mature neutrophilia and monocytes with decreased lymphocyte and eosinophil counts. Clinicopathologic data are shown in Table 1. The cat was feline leukemia virus (FeLV) negative (Leukassay F, Pitman-Moore, NJ, USA). Test for feline immunodeficiency virus (FIV) antibody was not done.

Fine needle aspiration of the enlarged spleen showed abundant mononuclear cells with basophilic globules of variable size (0.7 to 1.5 μm in diameter) in the cytoplasm when stained with Wright-Giemsa (Fig. 1). The condition deteriorated despite supportive therapy consisting of fluid and antibiotics, and the cat died 5 days following the biopsy.

Necropsy revealed marked splenomegaly (11×3×1.5 cm), thickened colic wall, and constricted proximal colon by the enlarged right colic lymph node (3×2×2 cm). Histologically, the spleen had multiple necrotic foci surrounded by fibroblasts and collagen fibers. The white pulp showed depletion of lymphocytes and hyalinization of reticular fibers (Fig. 2). Proliferation of mononuclear cells with cytoplasmic globules was seen in the red pulp and around the central arteriole of the white pulp (Figs. 2 and 3). Neoplastic proliferation of the globule cells with

Table 1. Clinicopathologic findings of the patient at admission

<table>
<thead>
<tr>
<th>RBC: 6.19×10^6/μl</th>
<th>TPP: 7.2 g/dl</th>
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<tbody>
<tr>
<td>PCV: 38%</td>
<td>Alb: 2.1 g/dl</td>
</tr>
<tr>
<td>WBC: 35300/μl</td>
<td>Glu: 82 mg/dl</td>
</tr>
<tr>
<td>seg: 31977/μl</td>
<td>ALT: 343 IU/L</td>
</tr>
<tr>
<td>lym: 355/μl</td>
<td>ALP: 9 IU/L</td>
</tr>
<tr>
<td>mon: 2487/μl</td>
<td>BUN: 58 mg/dl</td>
</tr>
<tr>
<td>eos: 178/μl</td>
<td></td>
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<tr>
<td>Plat: 40×10^4/μl</td>
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</table>

Fig. 1. Fine needle aspiration of the enlarged spleen. Neoplastic cells have eccentric round or oval nuclei. Cytoplasmic globules were basophilic and had an approximate diameter of 1 μm. Wright-Giemsa stain. ×1000.
Fig. 2. Extensive proliferation of the neoplastic cells are seen in red pulp. White pulps show depletion of lymphocytes and severe hyalinization of reticular fibers. Spleen. HE stain. ×26.

Fig. 3. Higher magnification of Fig. 2. Proliferation of mononuclear cells with cytoplasmic globules is seen in the splenic red pulp. HE. stain. ×260.

Fig. 4. The abundant neoplastic cells with blonish black globules are seen in the splenic red pulp stained with PTAH. ×660.

extensive coagulation necrosis was noted in the right colic lymph node. Infiltration of the same cells was seen in the Glisson’s capsule of the liver, lymph nodules of colon, lamina propria of the gastric mucosa, bone marrow, and pulmonary interstitium. Erosion of the colon mucosa was observed at the site of thickening.

The cytoplasmic globules of the neoplastic cells in various tissues of involvement stained eosinophilic with HE stain, while they appeared basophilic with Wright-Giemsa. They were brownish black with phosphotungstic acid hematoxylin (PTAH) stain (Fig. 4). But they failed to show metachromasia with toluidine blue at pH 4.1, and were negative for periodic acid-Schiff reaction (PAS). The cells were negative for feline immunoglobulins by direct immunofluorescence in formalin-fixed paraffin section. These staining and morphologic characteristics suggested that the neoplastic cells found in this fatal case were GL as described previously [3, 4].

Although the primary focus of the neoplastic proliferation of GL was not determined in this case, the spleen or right colic lymph node seems to be the primary organ of involvement as judged by its extensive enlargement and necrosis. At the same time, it was suggested that extensive invasion of the alimentary system with the neoplasia leading to the constriction of the colon was responsible for death of the patient. In the previous two cases of GL neoplasm [3, 4], reported clinical signs consisted of vomiting and diarrhea as in the present case. However, the primary lesion in the previous cases was intestinal mucosa, and no neoplastic lesion was reported in the spleen or lymph node. The involvement of the abdominal organs with this rare type of tumor suggests that GL tumor must be considered in differential diagnoses of the abdominal mass in the cat.

REFERENCES

猫のGlobule leukocyte腫瘍の1例(短報)：高橋和男13・今野明弘・石田卓夫・鷲巣月美・友田 勇(日本獣医畜産大学獣医臨床病理学教室, 13高橋動物病院)—重篤な消化器症状と、脾臓および右結腸リンパ節の腫大がみられた猫において、脾臓の針吸引生検標本中に、ライトグリッサ染色で好塩基性に染まる滴状顆粒を有する単核球が豊富に認められた。剖検後の病理組織学的検索では、これらの細胞は腫瘍性に増殖しており、細胞内顆粒は、ヘマトキシリン・エオジン染色で好酸性、過ヨウ素酸シップ反応陰性、免疫グロブリン陰性、トルイジン青染色で異染性を示さず、またリンキングステン酸・ヘマトキシリン染色で黒褐色の染色性を示したことから、Globule leukocyte由来の腫瘍と診断された。