Acute Monocytic Leukemia in a Dog

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Introduction

Leukemia is a progressive malignant disease of bone marrow, characterized by unregulated clonal proliferation of hematopoietic stem cells (1, 5). Excessive proliferation of cells with defective maturation and function leads to reduction of normal hematopoiesis and invasion of tissue including liver, spleen, kidney and bone marrow (1, 3). Different types of leukemia are recognized according to the cell lineage involved. The most common type types of leukemia are lymphoid, myeloid and erythroid (1, 5). Acute monocytic leukemia is an extremely rare disease in dogs. The clinical report of leukemia is variable including anemia, vomiting and diarrhea (1). Presenting signs results either from the effects of the expanding neoplastic cells population within infiltrated organs or from tumor related complication and paraneoplastic syndrome (2). The objective of this study is to appreciate to clinical signs, clinical pathology and postmortem change.

Materials and Methods

A five year old male Labrador Retriever dog was presented to Small Animal Teaching Hospital, Chulalongkorn University, with a history of anorexia, vomiting and lateral recumbency about one week. Initial physical examination revealed pale to icteric mucous membrane and no evidence of lymphadenopathy. Complete blood count, reticulocyte count and routine blood chemistry panels were performed. And then the dog died and was necropsied. Further more investigation of disease and the cause of death were performed.

Result and Discussion

Clinical pathology finding showed severe non regenerative with normocytic normochromic anemia (total RBC 1.88x10^6 cells/μl, Hct 14%, reticulocyte count 0.1%), leucopenia (total WBC 6370 cells/μl) and concurrent severe thrombocytopenia (platelet 12,100
cell/µl). The blood chemistry showed azotemia (BUN 82 mg%, Creatinine 2.5 mg%), raised of liver enzyme (ALT 535 IU and ALP 2450 IU) and hypoglycemia (glucose 20 mg%). The major of leukocytes isolated from heparinized blood by centrifugation were monocytes and atypical monoblasts. Cellular morphology were pleomorphic mononuclear cells and contained intracytoplasmic vacuoles. The nuclei were large with multiple prominent nucleoli (4). The morphologic impression, strongly suggested that the neoplastic were of monocyte-monoblast origin. Cytochemical stains for non-specific esterase for the monocytic series revealed that the blast cell were strong positive, confirming the monocytic lineage of these cells. Sudan black B was mild positive indicating myeloid progenitor cells (3, 4). Macroscopic finding showed moderate icterus, enlarged spleen with pale and mottled. The liver was moderate enlarged with tan and mottled. The lung were diffusely firm. Histopathologically, there were diffusely infiltrated with pleomorphic neoplastic cells of spleen, liver and kidney. Section of the bone marrow demonstrated strong hypercellularity with the presence of neoplastic cells. Although, the term leukemia implies an increased leukocytes count with many neoplastic cells in the circulation (2, 4). In this case, the total leukocytes count was low, and only a few leukemic cells are present in blood that demonstrated a subleukemic leukemia (2). The dog died from anemia accompanied with multisystemic failure due to expanding neoplastic cells within infiltrative major functional organs (1). However the clinical findings on physical examination of the dog will not specifically suggest a diagnosis of leukemia. Invariably a series of laboratory-based investigation are required to reach a definitive diagnosis of leukemia and to assess the presence and severity of disease-related complication (1).

Fig. 1. The morphological of leukemic cells were pleomorphic mononuclear cells and contained intracytoplasmic vacuoles, nuclei were large with multiple prominent nucleoli. (Giemsa, 100x)

Figs. 2-5. Histopathology showed diffusely infiltrated with a pleomorphic neoplastic cells of bone marrow, kidney, spleen and liver.v (HE, 20x)

References