Acute Lymphoid Leukaemia in a Labrador Dog: A Case Report

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INTRODUCTION

Lymphoid leukaemia is malignant neoplasm of the lymphocytes originating primarily from the bone marrow. It includes both acute and chronic lymphoblastic leukaemia which is uncommon therefore can be difficult to diagnose. Acute lymphoblastic leukaemia arises from the malignant transformation of lymphoid progenitors in bone marrow, which results in myelophthisis and subsequent invasion of peripheral tissues. Clinical signs are typically acute in onset, caused by the infiltrative and functional effects of the expanding burden of malignant cells, and are most commonly a consequence of disrupted hematopoiesis (Bennett *et al.*, 2017). This case report describes diagnosis and prognosis of acute lymphoid leukaemia (ALL) in a dog.

DIAGNOSIS AND TREATMENT

A five and half year old Labrador dog was presented to the Small Animal Clinics of Teaching Veterinary Hospital of Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, with the history of lethargy, inappetance, fever and polyuria for last 10 days. Physical examination revealed depression, pale mucus membrane, normal rectal temperature, respiration and heart rate with and normal superficial lymph nodes. A solid mass was felt on abdominal palpation. Hematology revealed anemia (Haemoglobin, 7 gm/dL), low platelet count and leukemoid response (Fig. 1) with a large number of bizzare lymphocytes (total leucocyte count (TLC), 1,45,000/µL, DLC; neutrophils 02%, lymphocytes 98%) confirming the diagnosis of acute lymphocytic leukemia. Blood biochemistry showed elevated alkaline phosphatase (ALP, 525 U/L) and globulin (4.7 g/dL). Lateral Thoracic radiography showed mild to moderate miliary interstitial pattern in lung. Heterogenous echotexture of spleen with a nodule protruding from its parenchyma was seen in abdominal ultrasonography (Figs. 2 & 3). Dog was treated with Vincristine (0.5 mg/m^3) IV once, Prednisolone @ 2 mg/kg, BD IM, Cefotaxime @

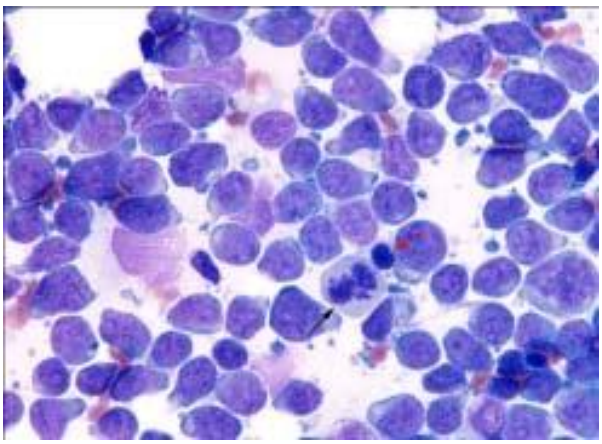

Fig. 1: Blood smear showing leukemoid response with a large number of bizzare lymphocytes

Fig. 2: Ultrasonogram showing a nodule protruding from splenic parenchyma

Fig. 3: Ultrasonogram showing heterogenous echotexture of spleen

25 mg/kg, BD IM, Enrofloxacin@ 5mg/kg, BD IM and Metronidazole @ 10mg/kg, BD IV, B Complex @ 2ml, OD IM. However, the dog succumbed to the disease within 1 week.

The ALL is a dangerous and rapidly progressive cancer that most often affects young and middle age dogs. Most animals with leukaemia present with vague, non-specific clinical signs (eg, lethargy, weakness, inappetence and weight loss). These are attributable to the consequences of the disease process viz., cytopenia, and metabolic or paraneoplastic complications (Dobson *et al*., 2006). In ALL, the early blast cells proliferate in the bone marrow at the expense of normal haematopoiesis, resulting in varying degrees of anaemia, thrombocytopenia and neutropenia and blast cells also spill over into the blood and infiltrate in the peripheral organs, especially the liver and spleen (Chowdary *et al*., 2015). Similar findings were also seen in the present case.

Routine haematological assessment of a patient usually provides the first indication of leukaemia. The most common and striking hematologic abnormality is leukocytosis that is usually due to the presence of neoplastic lymphocytes (pleiomorphic lymphocytes with heterogeneous chromatin pattern and prominent nucleoli) in the circulation (Couto, 2003).

Treatment of ALL is often unrewarding, and remission can be difficult to achieve. A combination of vincristine and prednisone is the foundation of induction therapy for ALL and was the most successful protocol in an earlier study of dogs with ALL (Couto, 2003). This combination uses vincristine administered at 0.5 to 0.7 mg/m^3 IV once weekly with prednisolone given concurrently at 40 to 50 mg/m^3 PO once daily for 1 week and then slowly tapered until remission occurs along with supportive therapy such as administration of broad-spectrum antibiotics to prevent sepsis, intravenous fluids to correct dehydration and nutritional support. In present case, death of dog might have resulted from failure to induce remission, organ failure from neoplastic infiltration, or sepsis associated with preexisting and/or chemotherapy-induced cytopenias.

Thus, it can be concluded that the prognosis of ALL is grave due to very rapid course of disease with an abnormal increase of immature lymphocytes hindering the production of other blood cells, posing an immediate threat to the patient's life.

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