Acute Leukemia in a New South Wales Koala
(Phascolarctos c. cinereus)

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SUMMARY

Acute leukemia has been noted as occurring in a male New South Wales koala, and this appears to be the second reported instance of leukemia on record in this species.

Leukemias of various types have frequently been reported in a wide variety of domestic and wild species. The authors are aware of only one previous report of leukemia in the species described in this paper (1).

This report deals with acute leukemia in a New South Wales koala (Phascolarctos c. cinereus). This specimen was received as a gift of Sir Edward Hallstrom, Director, Taronga Zoological Park Trust, Sydney, Australia, with permission of the Government of New South Wales on April 16, 1959.

History.—On September 15, 1960, this koala was reported as not appearing normal. The animal was lethargic, had been observed eating dirt, emitted cries as though in pain when urinating, or attempting to defecate; his appetite was apparently normal. The animal could not be readily restrained without provoking hostile behavior and stress, and a cursory examination was made with the following findings: mucous membranes were pale; animal felt cold; eyes and nostrils were clear of any exudation; heart sounds were normal with prominent arrhythmia; no evidence of pain on abdominal palpation; auscultation of lung fields revealed no abnormality. It was noted that the animal was thin, weighing 15.5 pounds. No treatment was given this date.

The next day, the animal appeared dehydrated and had passed no feces. A warm water enema was given. Blood smears were made and revealed 95 per cent immature leukocytes exhibiting prominent nucleoli and many mitotic figures. A tentative diagnosis of acute leukemia was made. A complete blood examination was made September 22, 1960, revealing: RBC = 3.1 million; WBC = 350,000; hemoglobin = 8 gm.; PCV = 31 mm.; blood urea nitrogen was 45 mg. per cent. The peripheral smear contained 98 per cent leukemic cells, which were 15–20 μ in diameter (Fig. 1). Nuclei of these cells were composed of amorphous basophilic chromatin and contained one to three nucleoli. Several mitotic figures were seen in each high dry field; the scant cytoplasm was lightly basophilic; platelets were greatly reduced in number; erythrocytes appeared normal, though there was little evidence of active erythropoiesis. The animal expired the same day.

Autopsy.—The abdominal cavity contained 30 cc. clear straw-colored fluid; liver and spleen were purple, thin strands of beige tissue defined the liver lobules and splenic follicles. Enlarged, firm, tan lymph nodes were found in the axillary, hilar, periaortie, inguinal, and mesenteric areas. Similarly appearing tan tissue was seen to invade the hilus of each kidney. Adrenal glands appeared normal. Bladder showed petechiae on its external surface. Stomach contained about 20 cc. digested blood; a 2.0 × 1.8 × 0.8 cm. raised mass of firm tan tissue was noted in the gastric antrum, and the mucosa at this point contained several punched out ulcers with fibrin and friable clots at their bases. The caecum contained several similar masses at its wall, but no mucosal ulcerations. No intestinal parasites were found. The frontal sinuses were filled with clear colorless fluid. Brain was unremarkable. The sternal bone marrow was tan and “dry.”

Histology.—Sections of tissue showed complete replacement of sternal marrow by leukemic cells.
Fig. 1.—Leukemic cells in the peripheral blood (×1200).
Fig. 2.—Leukemic infiltrates in kidney (×200).
Fig. 3.—Leukemic infiltrates in liver (×200).
Fig. 4.—Leukemic infiltrates in cerebellar meninges (×200).
of the type described in peripheral blood smears (Fig. 2). The lymph nodes showed a complete obliteration of normal architecture by leukemic cells (Fig. 3). The sinusoids in some nodes were prominently congested with red cells and macrophages with vacuolated cytoplasm. Lesions grossly described in stomach, kidneys, bladder, and caecum all proved to be leukemic infiltrations. Leukemic infiltrates were also found in pleura, pancreas, adrenals, portal areas of the liver, and splenic parenchyma. Scattered hemosiderin was noted in hepatic parenchymal cells. The cerebellar meninges contained leukemic infiltrate within the pia arachnoid (Fig. 4). Focal calcification of cerebellar cortex and unknown significance was also noted. Areas of encephalomalacia were seen within cerebellar white matter.

DISCUSSION

Spontaneous leukemia in animals is not a rare occurrence. In many respects this case resembles viral leukemia seen in laboratory animals with respect to tumor morphology, ecology, and cytology. Viral studies were not performed on this case. The leukemic cells seen in this case appeared to be of the lymphocytic series.

REFERENCES

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