

Leukemic Lymphomatosis

Rare disease in horse

Robert Loften, '43

THE faculty and students at Stange Memorial Clinic of Iowa State College were interested in a very unusual case that was brought to their attention on July 7, 1942. The patient was a thirteen-year-old brown mare that had shown general depression and impaired appetite for two weeks. Small subcutaneous swellings had developed during this time. The animal had been fed oats and red clover hay, and had access to bluegrass pasture.

The general condition of the patient on the date of presentation was fair, the body temperature was 103.4°F., the pulse was 84 and the respiration 30. The swellings were located in the subcutis of the cervical, sternal and costal areas, and proved to be firm, non-fluctuating and non-sensitive on palpation. These enlargements were not situated in the areas of the chief lymph nodes with the exception of one of the inferior cervical group. The growths ranged in size from one in the poll region measuring 3 cm. x 2 cm. x 2 cm. to one 20 cm. in length filling an intercostal space. Muscular twitching immediately posterior to the elbows and buckling of the rear fetlock joints gave evidence of general weakness. The cardiac impulse was visible and auscultation revealed abnormally loud heart sounds. The conjunctiva was congested and the animal was greatly depressed.

A blood sample was obtained from the jugular vein and cell counts were made, including a differential count for leucocytes. The results of these examinations

are listed in the chart below and are contrasted with the numbers and percentages of cells found in normal equine blood.

	Patient's Blood cu. mm.	Normal Blood cu. mm.
Erythrocytes	7,675,000	6,940,000
Leucocytes	115,000	10,300
Differential Count on Leucocytes		
	Patient's Blood Percentage	Normal Blood Percentage
1. Lymphocytes	95	38
2. Neutrophiles		
(a) Stabs	2.6	2.6
(b) Segmenters	2.22	51.4
Total	4.82	54.0
3. Basophiles	0.18	Up to 1.0
4. Eosinophiles	0.00	Up to 4.0
5. Monocytes	0.00	Up to 4.0

Many of the lymphocytes were extremely immature indicating very rapid development.

A biopsy was performed on a small growth in the subcutis of the poll region. The cells of this tissue were immature—the nuclei being large, vesicular, and containing many mitotic figures. The tumor apparently began development in a lymph nodule and increased in size infiltrating adjacent adipose tissue. A diagnosis of lymphocytoma was made.

Patient Weakens

The patient gradually became more depressed, weakened progressively, and lost condition rapidly until death on July 11, four days after entrance into the clinic. During this period no medicinal therapy was administered. A record of the body temperature, pulse and respiratory rates

of the mare during her time in the clinic is given below.

	Respiration per min.	Pulse per min.	Body temp.
July 7,A.M.	30	84	103.4° F.
July 8,A.M.	42	72	104.2° F.
July 9,A.M.	48	78	104.2° F.
July 10,A.M.	52	84	103.8° F.
July 11,A.M.	Dead

A necropsy was performed shortly after the death of the patient. Approximately fifteen subcutaneous lymphocytomas were observed whose range in size has already been given. One inferior cervical lymph node was hyperplastic, measuring 16 cm. x 8 cm. x 6 cm. This fact was of especial significance since no other important external node was involved. Four tumors were located in the pyloric portion of the gastric wall. These growths measured 6 x 4 x 3 cm., 5 x 3 x 3 cm., 4 x 3 x 2 cm., and 3 x 2 x 2 cm.

Abdominal Organs

The most outstanding lesion of the abdominal organs was an extreme splenomegaly, the spleen being at least twice its normal size. The characteristic shape was altered, but no tumors were present. Focal subcapsular hemorrhages spotted the organ but blood did not ooze from cut surfaces since the enlargement was due to hyperplasia of the parenchyma. One of the splenic nodes was hyperplastic, the only internal node to be so involved. The liver was rough, nodulated, friable and had a mottled, yellowish color both externally and internally. The incised surface closely resembled the surface of a grated nutmeg in color. Sections were made of this organ and microscopic examination revealed an extensive infiltration of the hepatic tissue with immature lymphocytes. Figure 1 illustrates the characteristic appearance of the liver. The kidneys showed fatty degeneration, being friable and very yellow. Adhesions were present on the hepatic and splenic capsules due to an active chronic peritonitis.

Examination of the thoracic cavity revealed an active chronic pleuritis and chronic serofibrinous pericarditis. An epicarditis was noted, and the entire myocardium was degenerated as was mani-

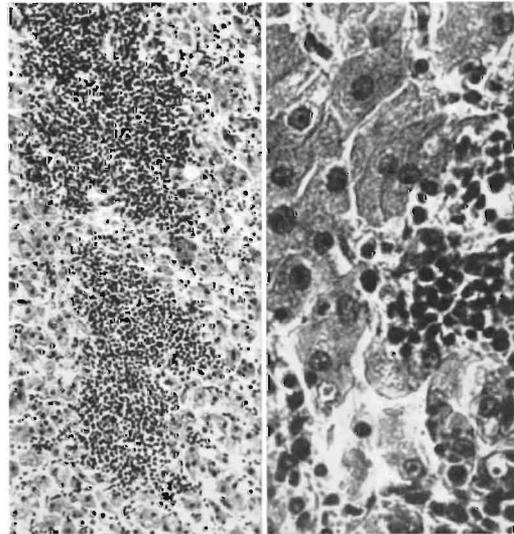


Fig. 1. Photomicrographs showing infiltration of liver by lymphocytes; X110 and X410.

festated by its brownish-grey color. The endocardium was rough and nodular. Most striking of the cardiac lesions was an infiltration of the atrial myocardium with neoplastic tissue. The walls of both atria were considerably thickened. Fingerlike projections of the tumorous mass extended into the myocardium of the ventricles. The mass also extended upward entirely enclosing the base of the aorta, increasing the thickness of its wall to 3 cm. Sections were also prepared of the heart and microscopic examination revealed the same type of infiltration found in the liver. Figure 2 illustrates this extension of the tumor.

Complications

Complicating the pathological picture was an extensive gangrenous pharyngitis and esophagitis. In addition there was a severe hemorrhagic tracheitis, and the antero-ventral portion of the diaphragmatic lobe of the right lung showed localized foreign-body pneumonia. There were also lesions of an intoxication, chief among which were hemorrhages in the subcutis and peritoneal adipose tissue. The lesions of the respiratory and upper digestive tracts were not believed to be directly

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related to the tumorous condition. The possibility of faulty drenching with some irritant "home remedy" must be considered although the history did not indicate that such was the case.

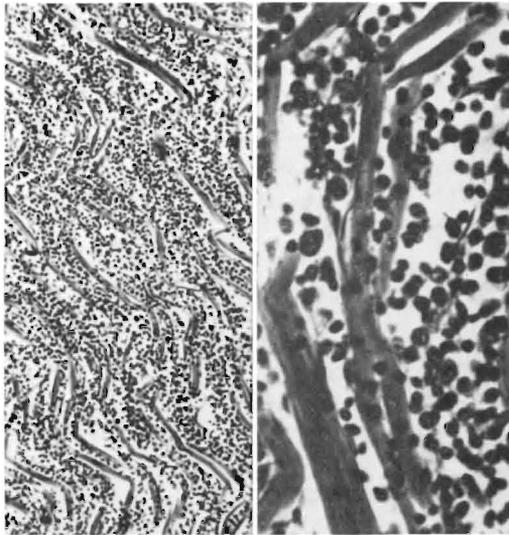


Fig. 2. Photomicrographs showing infiltration of lymphocytes into myocardium; X110 and X410.

This case presented symptoms and lesions of both leukemia and lymphocytomatosis. These conditions are rare in the equine. The blood picture was that of lymphatic leukemia but the nature of the lymphoid hyperplasia did not entirely warrant such a diagnosis since only two of the important nodes of the body were enlarged; yet the spleen and liver were heavily infiltrated with lymphocytes. The numerous tumors were suggestive of lymphocytomatosis. The lesions and symptoms of an intoxication may have arisen from the respiratory and upper digestive tract lesions, the general tumorous condition, or both. Careful consideration of all symptoms and lesions led to a diagnosis of leukemic lymphocytomatosis.

Photomicrographs by Department of Veterinary Pathology, Iowa State College.

Fall, 1942

SERUM BANKS

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serological tests. These are time-consuming procedures which in emergencies may be significant. The availability of donors is also an important factor to consider, especially in military practice. These difficulties can be removed by the use of plasma or serum. By adequate preparation they may be stored for long periods without deterioration and be ready for instant use. Preliminary typing and compatibility tests are unnecessary because isoagglutinations are partially suppressed by pooling and are further inhibited by the patient's blood.

This article in no way covers the field of serum used in blood-volume restoration. Its purpose is merely to throw a little light on the subject and explain the reason why veterinary students are so whole-heartedly backing the donation of blood at Iowa State College.

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