Diagnostic Exercise

From The Davis-Thompson Foundation*

Case # **246**; Month: **October**; Year:**2024**

Answer sheet

Title: Cecal T-cell lymphoma in a horse with lymph node, hepatic and renal metastases

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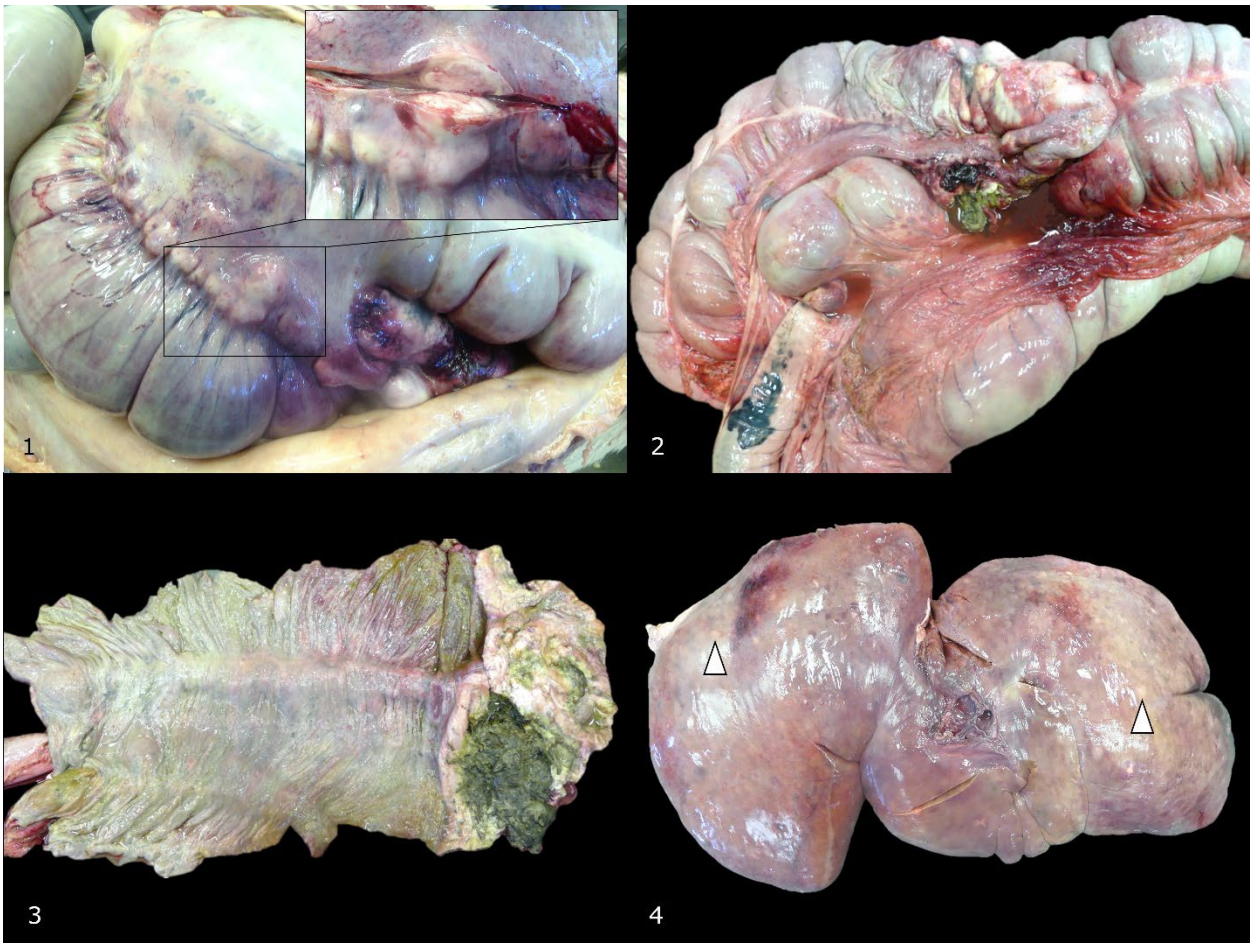
History: A 17-year-old castrated, paint horse was presented to the Cornell University Hospital for Animals with history of fever, progressive weight loss and subcutaneous edema on sheath and abdomen. A blood work showed mild neutropenia, hypoalbuminemia and elevated liver enzymes. Due to the worsening of the general condition the owners elected euthanasia, and the body was submitted to the Cornell Animal Health Diagnostic Center for necropsy.

Necropsy findings: Examined is an adult castrated paint horse, in reduced body condition (Henneke body condition score of 4 out of 9) with mild autolysis. Upon opening of the abdominal cavity is enlargement of cecal and colonic lymph nodes (Fig. 1), which on section are diffusely white and bulge. The apex of the cecum is markedly expanded by an irregular, approximately 25 x 15 cm, white mass (Fig. 2) which is ulcerated (Fig. 2-3). The mass on the cecum apex is attached to the diaphragmatic flexure of the colon (not shown). The ileal serosa has a locally-extensive, irregular, well-demarcated, slightly raised black area (Fig. 2). The liver is diffusely enlarged, pale brown to tan, and contains dozens of nodular, 3-4 cm, poorly demarcated, white nodules (Fig. 4). On section these nodules bulge and are diffusely tan to white. The hepatic parenchyma is diffusely friable. The renal cortex has dozens of pinpoint, tan to white, foci surrounded by a red halo that slightly bulge on section. A longitudinal section of the left femur reveals partial replacement of the bone marrow by adipose tissue.



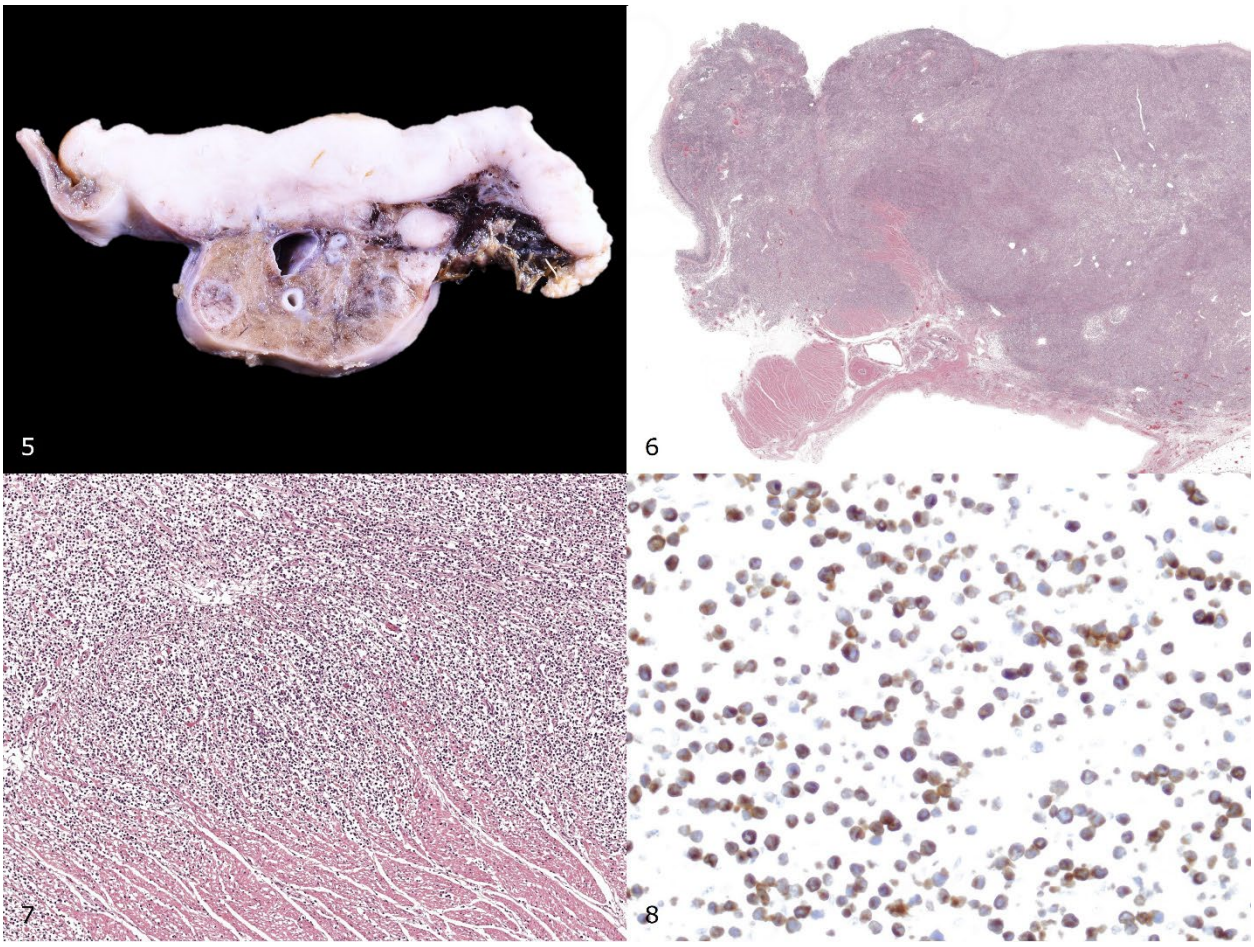
Figures 1-4: Cecal T-cell lymphoma in a horse with metastases. 1) Cecal lymph nodes are enlarged and, on section, are diffusely white and bulge. 2) The apex of the cecum is effaced by an irregular, white mass. 3) The cecal mass is replaced by an irregular, approximately 25 x 15 cm, white, ulcerated mass. 4) The liver is enlarged, pale brown to tan, and has dozens of nodular, 3-4 cm, poorly demarcated, intraparenchymal white nodules (arrowheads).

Histologic description:
Cecum, apex: The mucosa, submucosa, and muscularis are diffusely effaced and replaced by a transmural, poorly demarcated, unencapsulated, diffuse, densely cellular, infiltrative neoplasm (Fig. 5-6). The neoplasm is composed of lymphocytes arranged in sheets and supported by a minimal preexistent fibrovascular stroma (Fig. 7). Neoplastic cells are round, small (1.5 times the size of red blood cells), have distinct cell borders, and a scant pale basophilic cytoplasm. Nuclei are rounded, centrally located, and contain coarsely to finely stippled chromatin, and inconspicuous nucleoli. Anisocytosis and anisokaryosis are mild to moderate. Two mitoses are counted in 2.37mm^2 (ten 400× fields).

Histologic examination of the cecal and colonic lymph nodes, liver and kidney reveals infiltration of these organs by the same neoplastic lymphocytes. The bone marrow is within normal limits.

Immunohistochemistry:

Immunohistochemistry for cluster of differentiation-3 (CD3) (T-cells) and paired box protein 5 gene (*Pax5*) (B-cells) reveals that the neoplasm is composed of T-cells and no B-cells are identified (Fig. 8).



Figures 5-8. Cecal T-cell lymphoma in a horse with lymph node, hepatic and renal metastases. 5) Section of the cecum after formalin-fixation showing severe thickening of the wall and white nodules in the adjacent cecal lymph node. 6) The cecal wall is transmurally effaced by neoplastic lymphocytes. 7) Neoplastic lymphocytes are arranged in sheets that completely efface the mucosa and submucosa and infiltrate the muscularis. 8) Cluster of differentiation-3 (CD3) immunohistochemistry shows diffuse immunolabeling of neoplastic lymphocytes.

Morphologic diagnoses:
Cecum, apex: T-cell lymphoma
Cecal and colonic lymph nodes: Metastatic T-cell lymphoma
Liver: Metastatic T-cell lymphoma
Kidney:
1. Metastatic T-cell lymphoma
2. Severe, acute, focal-extensive, coagulative necrosis (acute infarct)

Ileum: Hemomelasma ilei (incidental)

Comments:

Equine intestinal tumors are rare in horses; among them, lymphoma is the most common intestinal neoplasm and often affects the small intestine (2, 9, 10). Lymphomas in the large intestine of horses usually arise from the colon (2) and cecal affectation is only reported secondary to lymphoma elsewhere in the intestine (3, 4). This horse had lymphoma exclusively in the cecum apex but not anywhere within the alimentary system.

Among horses, the most frequent lymphoma subtypes are T-cell rich, B-cell lymphoma (TCRBCL) (9), and enteropathy-associated T-cell lymphoma (EATL) types I or II (the latter renamed as monomorphic epitheliotropic intestinal T-cell lymphoma, MEITL). MEILT is primarily found in the small intestine (2, 6, 7, 8) unlike this case. Rarely, a paraneoplastic syndrome causing hypereosinophilia in horses with intestinal T-cell lymphoma has been documented (4, 5). Recently, equine herpesvirus type 5 (EHV-5) has been detected identified in a TCRBCL through *in situ* hybridization (1).

Regardless of the location, immunophenotype or histologic subtype, equine intestinal lymphoma commonly metastasizes to mesenteric lymph nodes (3, 6, 10). Distant metastases of intestinal lymphomas in horses are seldom reported, in part due to the diagnostic challenge of distinguishing metastatic disease from multicentric lymphoma in advanced stages. The subcutaneous edema noted on clinical examination may be due to a reduced albumin production in the liver due to metastatic disease and/or to protein loss through the intestine.

Lymphoma classification undergoes continual updates, leading to the renaming, convergence, or divergence of certain subtypes or entities. Extrapolation of the World Health Organization Classification from humans, with defined clinicopathologic features and prognosis, to non-human animals is not appropriate. Despite some lymphomas in humans may share histologic features with their animal counterparts, lymphomas exhibit different behaviors and prognoses depending on the species.

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