What Is Your Diagnosis?

Figure 1—Lateral (A) and ventrodorsal (B) radiographic views of the lumbar vertebral column in a 4-year-old neutered male Treeing Walker Coonhound that was evaluated because of chronic signs of back pain of 4 months’ duration and progressing paraparesis.

History

A 4-year-old neutered male Treeing Walker Coonhound was evaluated because of a 4-month history of chronic signs of back pain and progressing paraparesis. On initial evaluation, the dog was weak in the pelvic limbs and swayed to the left side. Severe muscle atrophy of the pelvic limbs was evident. Signs of pain were elicited on palpation of the caudal lumbar region. Conscious proprioception was fully present in the left pelvic limb but was slightly decreased in the right pelvic limb. The pelvic limbs had hypertonic reflexes, and the dog dribbled urine both while lying down and standing. The tail was notably flaccid, and the dog lacked anal tone during palpation per rectum.

A CBC revealed leukocytosis, but results were otherwise unremarkable, as were results of serum biochemical analysis and urinalysis. A CSF sample was obtained, and cytologic evaluation indicated that the sample was clotted and contained abundant RBCs and associated leukocytes. No infectious organisms or malignant cells were observed. Radiographs of the lumbar vertebral column were obtained (Figure 1).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page →

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Diagnostic Imaging Findings and Interpretation

The body of L5 (arrow) has a moderate to marked increase in opacity, compared with the adjacent vertebral bodies; this radiographic finding is consistent with vertebral body sclerosis (Figure 2). Differential diagnoses for total vertebral sclerosis in humans include metastatic osteoblastic carcinoma, malignant lymphoma, and hematoma.1,2 In dogs, focal sclerosis of the vertebral body may be secondary to previous trauma, a metabolic disorder, or neoplasia such as lymphoma, fibrosarcoma, or osteosarcoma.

Neurologic signs in this dog, however, could not be attributed to the radiographic findings alone. Therefore, T2-weighted short-tau inversion recovery MRI images (in which fluid was hyperintense, soft tissue was hypointense, and the signal from fat had been suppressed) of the lumbar vertebral column were obtained (Figure 3) to evaluate the spinal canal for evidence of stenosis or compression. A right-sided extradural mass causing marked spinal cord compression at L4-5 was evident. On the sagittal sequence, hyperintensity, indicating edema, was seen within the L5 body. In the transverse sequence, a hypointense lesion was seen displacing the spinal cord to the left. On MRI images of the abdomen, a mass was seen on the caudal pole of the left kidney (Figure 4). Abdominal ultrasonography was also performed, and large hepatic masses, a single left renal mass, and enlarged mesenteric lymph nodes were also identified.

Treatment and Outcome

Given the likelihood of a metastatic neoplastic process, the progression of neurologic signs, and the poor prognosis, the owner elected to have the dog euthanized. On necropsy, a mass extending into the lumbar vertebral canal, multiple liver masses, a mass in the caudal pole of the left kidney, and enlarged mesenteric lymph nodes were confirmed. Histologically, sections of spinal cord were characterized by an infiltration of highly pleomorphic neoplastic polygonal to spindloid cells that surrounded the dorsal and ventral nerve roots and multifocally extended through the dura mater into the subdural space from L2 to L5. Neoplastic cells focally infiltrated the white matter of the spinal cord at the level of L4. Multifocally, sections of liver, kidney, and mesenteric lymph nodes were infiltrated by similar neoplastic round cells that obliterated the normal tissue parenchyma. The body of L5 was characterized by osteosclerosis and marked medullary fibrosis. Focally, individual pleomorphic round cells were seen within the bone marrow beneath the surface of the vertebral canal of L5. The round cell origin of the neoplastic cells was confirmed with immunohistochemical labeling for CD18 in sections of spinal cord and liver; a diagnosis of disseminated histiocytic sarcoma was made on the basis of these staining results and the histologic cellular features.
The compressive effect of an extradural mass within the spinal canal, as noted on the MRI, was considered to be the cause of the neurologic signs observed in the dog of the present report. Magnetic resonance imaging also revealed a renal mass, which further supported the likelihood of a neoplastic process and prompted further diagnostic testing. Taken together, findings on radiography, MRI, and ultrasonography including MRI signal characteristics and multiple lesions were more indicative of neoplasia, as opposed to an inflammatory process, as the cause of clinical signs. Imaging findings, however, were not specific for the type of neoplasia.

Adenocarcinoma of the kidney with metastasis to the liver and vertebral body was a possibility; however, this tumor generally has a more lytic rather than sclerotic appearance when invading bone. Histiocytic sarcoma is a malignant proliferation of dendritic cells (interdigitating dendritic cells in lymphoid tissues and perivascular interstitial dendritic cells in other involved tissues are the most likely subtypes), which can be highly metastatic or multicentric (malignant histiocytosis). It is not possible to differentiate these 2 conditions; thus, the term disseminated histiocytic sarcoma is used to refer to either condition. Generally, the term malignant histiocytosis is reserved for breeds that are known to be predisposed to this disease, such as Bernese Mountain Dogs (primarily), Rottweilers, Flat-Coated Retrievers, and Golden Retrievers. The common sites of primary or metastatic lesions are the skin, spleen, liver, lung, regional lymph nodes, periartricular tissues, and bone marrow. Adenocarcinoma of the kidney with metastasis to the liver and vertebral body was a possibility; however, this tumor generally has a more lytic rather than sclerotic appearance when invading bone. Histiocytic sarcoma is a malignant proliferation of dendritic cells (interdigitating dendritic cells in lymphoid tissues and perivascular interstitial dendritic cells in other involved tissues are the most likely subtypes), which can be highly metastatic or multicentric (malignant histiocytosis). It is not possible to differentiate these 2 conditions; thus, the term disseminated histiocytic sarcoma is used to refer to either condition. Generally, the term malignant histiocytosis is reserved for breeds that are known to be predisposed to this disease, such as Bernese Mountain Dogs (primarily), Rottweilers, Flat-Coated Retrievers, and Golden Retrievers. The common sites of primary or metastatic lesions are the skin, spleen, liver, lung, regional lymph nodes, periartricular tissues, and bone marrow. Adenocarcinoma of the kidney with metastasis to the liver and vertebral body was a possibility; however, this tumor generally has a more lytic rather than sclerotic appearance when invading bone. Histiocytic sarcoma is a malignant proliferation of dendritic cells (interdigitating dendritic cells in lymphoid tissues and perivascular interstitial dendritic cells in other involved tissues are the most likely subtypes), which can be highly metastatic or multicentric (malignant histiocytosis). It is not possible to differentiate these 2 conditions; thus, the term disseminated histiocytic sarcoma is used to refer to either condition. Generally, the term malignant histiocytosis is reserved for breeds that are known to be predisposed to this disease, such as Bernese Mountain Dogs (primarily), Rottweilers, Flat-Coated Retrievers, and Golden Retrievers. The common sites of primary or metastatic lesions are the skin, spleen, liver, lung, regional lymph nodes, periartricular tissues, and bone marrow. Adenocarcinoma of the kidney with metastasis to the liver and vertebral body was a possibility; however, this tumor generally has a more lytic rather than sclerotic appearance when invading bone. Histiocytic sarcoma is a malignant proliferation of dendritic cells (interdigitating dendritic cells in lymphoid tissues and perivascular interstitial dendritic cells in other involved tissues are the most likely subtypes), which can be highly metastatic or multicentric (malignant histiocytosis). It is not possible to differentiate these 2 conditions; thus, the term disseminated histiocytic sarcoma is used to refer to either condition. Generally, the term malignant histiocytosis is reserved for breeds that are known to be predisposed to this disease, such as Bernese Mountain Dogs (primarily), Rottweilers, Flat-Coated Retrievers, and Golden Retrievers. The common sites of primary or metastatic lesions are the skin, spleen, liver, lung, regional lymph nodes, periartricular tissues, and bone marrow.

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