

Extradural Spinal Angiolipoma Associated with Bone Lysis in a Dog

An extradural spinal tumor was diagnosed in a 12-year-old Labrador retriever that was presented with a one-week history of paraparesis. Myelography indicated a deviation of the spinal cord to the right side at the level of the second lumbar (L₂) vertebra. The difference in length measuring the left and right sides of the L₂ vertebra suggested a fracture of the vertebral body. Severe bone remodeling and an extradural mass were seen on computed tomography (CT). Clinical, radiographical, and histological findings are described and considered homologous to extradural angiolipomas described in the human literature. J Am Anim Hosp Assoc 1998;34:373-6.

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Case Report

A 12-year-old, spayed female Labrador retriever was presented with a complaint of pelvic limb weakness. Shoulder and neck pain were noticed by the owner two weeks prior and were related to potential trauma from jumping out of the car. The shoulder and neck pain resolved after one week, at which time paraparesis was observed beginning with knuckling over on the pelvic limbs. For two weeks prior to admission, the dog had been treated with aspirin, which did not seem to have improved the clinical signs. During the three days prior to admission, increased weakness was noticed.

On physical examination, the dog was paraparetic and exhibited pain in the upper lumbar region. The dog also had crepitus in both stifles, pain on extension of the hip joints, and multiple subcutaneous lipomas of various sizes. Neurological examination revealed normal cranial nerve function and normal proprioception and spinal reflexes in the thoracic limbs. Evaluation of the pelvic limbs indicated bilaterally decreased proprioception which was more severe on the right side. Bilaterally decreased patellar reflexes and normal flexor reflexes resulted in the authors' assessment of lower motor neuron disease between the third lumbar (L₃) and the sixth lumbar (L₆) vertebrae. However, the history of neck pain suggested the possibility of a multifocal spinal cord lesion. In addition, the dog had orthopedic disease in both stifles and hips.

The thoracic radiographs were free of pulmonary metastases or thoracic lymphadenopathy. Therefore, the dog was hospitalized for further work-up. Results of a complete blood count (CBC) were within normal limits. Serum biochemical analysis indicated a slight hyperglobulinemia (globulin, 5.1 g/dl; reference range, 1.9 to 4.3 g/dl). Spinal radiographs taken under general anesthesia indicated decreased bone density of the vertebral bodies and articular processes of the second lumbar (L₂) to the fourth lumbar (L₄) vertebra. Extensive spondylosis was seen throughout the entire thoracic and lumbar region, resulting in fusion extending from the 13th thoracic (T₁₃) to the fifth lumbar (L₅) vertebra [Figure 1]. A lumbar puncture for cerebrospinal fluid (CSF) and myelography was unsuccessful. Cerebrospinal fluid, obtained at the level of the atlantooccipital joint, was colorless and clear with one nucleated and one red blood cell per μ l and had 32 mg/dl of total protein and normal cytology. Myelography

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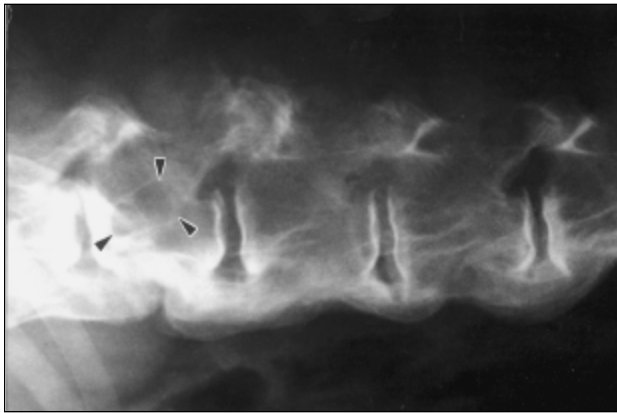


Figure 1—Lateral lumbar radiograph (cranial is to the left) of the 12-year-old Labrador retriever presented with a one-week history of paraparesis. The bone density in the area of the second (L_2), third (L_3), and fifth (L_5) lumbar vertebrae is decreased. Note the presence of extensive spondylosis and osseous proliferation with osteolysis involving the articular facets at the first lumbar (L_1)- L_2 and L_2 - L_3 vertebrae. A radiolucent area is present at the level of the vertebral body of the L_2 vertebra (arrowheads).



Figure 2—Myelogram (ventrodorsal radiographic view [cranial is to the top]) of the 12-year-old Labrador retriever presented with a one-week history of paraparesis. The length of the second lumbar (L_2) vertebra is shorter on the right side (collapse of the vertebral body), and the spinal cord is deviated toward the midline.

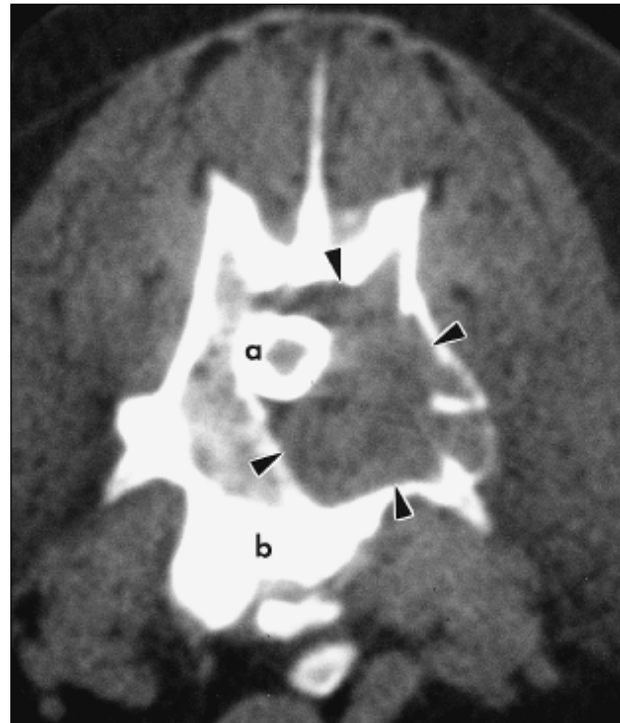


Figure 3—Computed tomography (transverse view) of the second lumbar (L_2) vertebra. Contrast material is surrounding the spinal cord (a), and severe spondylosis is present ventral to the vertebral body (b). Note the tumor (arrowheads) surrounding the spinal cord, resulting in loss of lamina and vertebral body.

was performed by cisternal injection of iopamidol (9 ml).^a On ventrodorsal radiographs, the myelogram indicated a deviation of the spinal cord to the right side over the middle of the L_2 vertebra. By measuring the length of the vertebral body of the L_2 vertebra, using the ventrodorsal view, a 2-mm difference between the left and the right side was detected and suggested a collapse of the vertebral body [Figure 2]. No other lesions of the spinal cord or vertebrae were evident. A computed tomography (CT) of the L_2 and L_3 vertebrae indicated a space-occupying mass in the extradural space of the vertebral canal without compression of the subarachnoid space. The mass extended ventral to the spinal cord and occupied the vertebral bodies of the L_2 and L_3 vertebrae. Severe bone remodeling was observed, and the lamina of the L_2 vertebra was perforated at various locations [Figure 3].

The tumor type could not be determined without a biopsy. The client requested conservative treatment; therefore, the dog was sent home on oral prednisolone (2 mg/kg body weight, decreased to 1 mg/kg body weight daily after one week) with a guarded-to-poor prognosis. The paraparesis improved while the dog was kept on prednisolone, and for the next 3.5 months, no pain or discomfort were noted by the owner. During the last two weeks, the dog progressively had difficulty getting up to a standing position;

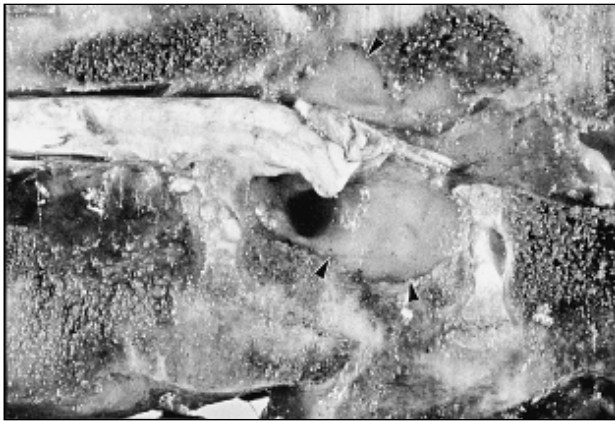


Figure 4—Longitudinal section of the lumbar vertebral column. Note the pale neoplasm (arrowheads) filling the lytic space within the body of the second lumbar (L_2) vertebra and extending into the extramedullary space.

but when assisted, the dog ambulated normally. After an acute recurrence of the paraparesis with progression of signs over two days, the dog was euthanized.

Upon gross necropsy, a white, gelatinous mass filled the extradural space surrounding most of the lumbar spinal cord; this mass mostly was prominent along the dorsal aspect of the vertebral canal. A similar-appearing mass was present within the vertebral bodies of the L_2 and L_3 vertebrae, resulting in bone lysis and expansion of the vertebral bodies laterally [Figure 4]. Along the ventral surfaces of the thoracic and lumbar vertebrae, extensive bony exostoses fused adjacent vertebrae (i.e., spondylosis).

The histopathologies of the extradural mass and the mass within the vertebral bodies were similar microscopically. The masses were composed of mature adipose tissue with scattered small vessels, consistent with lipomas [Figure 5]. Features (e.g., increased cellularity, multinucleated or giant nuclei, elevated mitotic index with atypical mitoses) suggestive of liposarcoma were not present. The bone adjacent to the lipomas within the vertebral bodies appeared normal, as did the bone marrow.

Discussion

Tumors of the spinal cord can be subdivided into extradural, intradural-extramedullary, and intramedullary locations.¹ Extradural neoplasms comprise approximately 50% of all spinal neoplasms. In dogs, the most frequently reported extradural tumors are primary malignant bone tumors (e.g., osteosarcoma, chondrosarcoma, fibrosarcoma, hemangioendothelioma, myeloma) and tumors metastatic to bone and soft tissue.^{2,3}

Extradural and intradural spinal lipomas have been described previously in veterinary medicine. Although by definition they are benign neoplasms of well-differentiated lipocytes, confinement within the spinal canal causes spinal cord compression leading to clini-

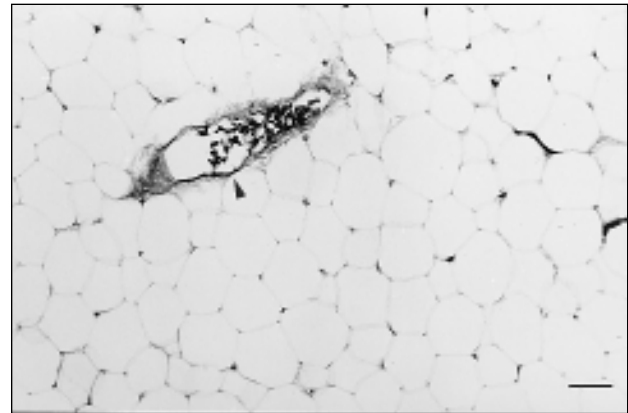


Figure 5—Photomicrograph of the neoplasm within the vertebral body of the second lumbar (L_2) vertebra. The neoplasm is composed entirely of adipocytes with scattered blood vessels (arrowhead) (Hematoxylin and eosin stain, 250X; bar=80 μ m).

cal signs such as paresis or paralysis. In human medicine, spinal lipomas account for approximately 1% of all spinal tumors. They have an increased incidence in children and often are associated with congenital vertebral abnormalities.⁴

Only in the last few years have angiolipomas been considered as different entities, distinguished from lipomas in humans.^{5,6} Angiolipomas differ from spinal lipomas because they appear mainly in adults, they are located almost exclusively in the epidural space, and they lack associated congenital malformations.⁵ They are subdivided into two types: noninfiltrating and infiltrating. The noninfiltrating angiolipoma is much more common and remains confined to the epidural space, usually in the dorsal area.⁷ The infiltrating angiolipoma invades the bony structures of the spine and usually is localized ventrally in the spinal canal.⁷ Signs of bone involvement caused by pressure erosion and by direct infiltration of the bone have been described.⁷ These signs include widening of the vertebral canal and intervertebral foramen with erosion, destruction, and deformity of the vertebral body.^{8,9} Histologically, angiolipomas consist of mature adipose tissue interspersed with small- and medium-caliber vessels. Osteoporotic changes of the vertebra at the level of the tumor may occur, resulting in a pathological fracture of the vertebral body.¹⁰ In human medicine, surgical treatment is recommended for infiltrating angiolipomas, because they grow very slowly and do not undergo malignant transformation.^{6,11,12}

In the authors' case, it is unclear whether the tumor actively eroded the vertebral body and therefore caused pressure atrophy and remodeling of the bone, or if the tumor originated in the vertebral body and invaded the spinal canal only secondarily. However, based on clinical, radiographic, and histological results, the authors believe that this presentation of a spinal lipoma is homologous to the extradural angiolipomas described in the human literature. Most

probably a fracture of the vertebral body or a partial vertebral collapse initiated the clinical signs. The severe spondylosis and fusion of the vertebrae may have prevented a more severe scenario.

Conclusion

Care must be taken when interpreting radiographic signs of spinal tumors. Epidural angioliipomas are rare tumors and histologically benign, but their myelographic and macroscopic appearance may suggest malignancy.⁹ Biopsy should be performed to obtain a definite diagnosis. Although bony lysis often is associated with malignancy, bone atrophy and remodeling due to chronic pressure can cause similar changes. Exploratory spinal surgery and biopsy should be considered as diagnostic and possibly therapeutic tools in cases with suspected spinal cord masses. In this case, surgery was not an option due to the client's wishes.

^a Isovue, iopamidol; E.R. Squibb and Sons, Inc., New Brunswick, NY

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