A 5-year-old 0.83-kg (1.83-lb) sexually intact female guinea pig was evaluated by a veterinary practitioner because of a 3- to 4-week history of gait abnormalities. At that time, a mass involving the proximal portion of the right tibia was detected; with time, the mass continued to enlarge and the guinea pig was euthanized 6 months later. Notice the multilobular 4 X 4.5 X 4.5-cm mass in association with the right tibia, stifte joint, and femur.

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Formulate differential diagnoses from the history, clinical findings, and Figure 1—then turn the page →
Histopathologic Findings

Specimens from the right hind limb, spleen, kidneys, pancreas, liver, lungs, and heart were routinely fixed in neutral-buffered 10% formalin and stained with H&E stain. Histologic examination of sections of the right hind limb revealed a multilobular, highly cellular, poorly demarcated, and partially encapsulated infiltrative neoplasm. The polygonal to round tumor cells were organized in short bundles and localized sheets between irregular trabeculae of basophilic homogeneous matrix (mineralized osteoid; Figure 2). The cells had undefined cell borders, a moderate amount of clear eosinophilic cytoplasm, and round to oval vesicular nuclei with 1 to 3 nucleoli. Anisocytosis and anisokaryosis were moderate. There was < 1 mitotic figure/400X hpf. There were scattered osteoclasts along the trabeculae. Multiple metastatic foci identified in the sections of kidney, spleen, and pancreas had neoplastic cells with similar morphological features. Moderate hyperemia was present in the lungs, heart, and liver. In addition, the liver had multifocal areas of steatosis and extramedullary hematopoiesis and mild proliferation of biliary ducts.

Morphologic Diagnosis and Case Summary

Morphologic diagnosis and case summary: productive osteoblastic osteosarcoma with metastases in a guinea pig.

Comments

Osteosarcoma is the most common primary neoplasm of bone in dogs and cats, accounting for > 80% of malignant bone tumors in dogs and approximately 70% in cats. In general, osteosarcoma is a rapidly progressive tumor with early metastasis to the lungs, which results in early death. Comparable data are not available for other domestic animals because primary bone neoplasm is uncommon in these species.

Spontaneous tumors in pet guinea pigs have been reported, and their rarity has been emphasized. The mean life span of companion guinea pigs is approximately 5 to 7 years. Neoplasms in guinea pigs < 1 year of age are considered highly rare, but at 3 years of age, tumor frequency reaches 15% in this species. The most common neoplasms are follicular skin tumors (especially trichoepithelioma), mammary gland adenocarcinomas, lipomas, fibrosarcomas, and lymphomas. Tumor frequency in guinea pigs may be higher, considering that owners do not always pursue a final diagnosis.

Osteosarcoma appears to be extremely rare in guinea pigs, with only 6 cases reported to our knowledge. Among those 6 osteosarcomas, 2 originated in lumbar vertebrae, 1 originated in the left femur, 1 originated in the left tibia, and 1 originated in an extraskeletal location; the site of origin was not reported for the remaining guinea pig. In 4 of the 6 affected guinea pigs, metastases to the lungs, liver, spleen, kidneys, subcutaneous tissues, stomach, pancreas, heart, testes, seminal vesicles, peritoneal and pleural cavities, and mesentery were described. In 4 of the 6 cases, the age at onset of osteosarcoma was ≤ 2 years. It is interesting that in the guinea pig of the present report, there was a lack of pulmonary metastases, which frequently develop in dogs and humans with osteosarcoma and were detected in 3 of the 6 guinea pigs with osteosarcoma in the previous case reports.

The most effective treatment of choice for appendicular osteosarcoma is limb amputation, but this is not always possible because of owner resistance to such a procedure. However, removal of the primary osteosarcoma could enhance the progression of pulmonary metastases as suggested by findings in mice with experimentally induced osteosarcomas and in a guinea pig with spontaneous tibial osteosarcoma. For the guinea pig with spontaneous osteosarcoma, thoracic radiographic findings were unremarkable, and the affected hind limb was amputated. One month later, the guinea pig died of pulmonary metastasis. In the case described in the present report, surgery was not possible and the guinea pig was euthanized 7 months after the onset of gait abnormalities. Over the 6-month interval between the initial examination and the recheck examination, radiography revealed that the size of the metastatic foci (detected as areas of mineral opacity in the hypochondriac and sublumbar regions) in the spleen, pancreas, and right kidney did not appear to change, suggesting...
that the presence of the primary osteosarcoma may keep
the process of metastasis dormant. As highlighted by
the present case report, practitioners should be aware of
the potential development and clinical course of osteo-
sarcomas in guinea pigs.

References