Case 15

TITLE: Silicate-associated osteoporosis in a Quarter horse

ABSTRACT BODY:
Narrative: Clinical history: 12-year-old palomino Quarter Horse found dead.
Gross findings: Complete fractures of 1st-18th right ribs, 1st-7th, 11th, 13th, 14th, and 16th left ribs; C1, C6, T12, and T13 vertebrae; both scapulae; left ischial tuberosity; and left mandible, with extensive surrounding soft tissue hemorrhages. The left 8th-10th and 12th ribs had well-demarcated, rough-surfaced bone calluses consistent with chronic healing fractures. The tracheobronchial lymph node was enlarged and nearly completely replaced by mineralized material. There were multiple, firm, off-white, gritty nodules throughout the pulmonary parenchyma.
Microscopic description: Rib. The periosteum is expanded by dense fibrous connective tissue. Underlying bone consists of irregular woven trabeculae. Multifocally, there are extensive areas of loss and decreased trabecular density, fragmentation, and haphazardly arranged bone spicules. Trabeculae have scalloped resorption surfaces lined by numerous osteoclasts within Howship's lacunae. Remaining trabeculae are lined by plump osteoblasts, with numerous basophilic reversal lines creating a mosaic remodeling pattern. Intertrabecular spaces are multifocally expanded by fibrous connective tissue. Fracture is surrounded by abundant fibrosis, neovascularization, cartilage, and woven bone.
Morphologic diagnosis: Rib. Transverse complete fracture with associated callus formation. Multifocal osteolysis with numerous osteoclasts, bone remodeling, and medullary/periosteal fibrosis.
Condition: Silicate-associated osteoporosis (SAO).
Comments: Silicosis is a chronic respiratory disease caused by inhalation of crystalline silica particles that induce granulomatous inflammation in the lungs and regional lymph nodes. In horses, chronic silica exposure has also been associated with SAO, a rare syndrome characterized by severe bone remodeling and pathologic fractures, although its etiopathogenesis remains unknown. SAO has been reported primarily in horses from silica-rich regions of California. This horse lived in a coastal city in Southern California, where prolonged environmental exposure was likely. This case highlights the importance of obtaining a geographic history to identify chronic silica exposure and considering SAO as a differential diagnosis in horses with multiple pathologic fractures. Gross and microscopic lesions, including granulomatous pneumonia with intralesional birefringent crystals and similar lymph node lesions, supported diagnosis of SAO.

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AWARDS:

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