What Is Your Diagnosis?

History

A 4-year-old spayed female Siamese cat was admitted to the Veterinary Teaching Hospital of the University of Bristol because of a 6-month history of swelling in the area of the left zygomatic arch and progressive left forelimb lameness of 1 month's duration. The cat was intermittently non-weight bearing lame on the left forelimb. The patient had access to both the indoors and outdoors and lived in a rural area. On physical examination, a hard mass on the zygomatic arch was detected that measured 15 x 10 mm; no signs of pain were associated with the mass. The left elbow joint area was swollen, and signs of pain were elicited on palpation. No abnormalities were found on CBC and serum biochemical analysis. Results of serologic tests for FIV and FeLV were negative. Radiographs of the left elbow joint were taken (Figure 1).

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

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Radiographic Findings and Interpretation

Mixed osteolytic and osteogenic bone lesions affect the distal aspect of the humerus and proximal aspect of the radius and ulna. The distal aspect of the humerus and the proximal aspect of the radius and ulna have several ill-defined areas of radiolucency (Figure 2). The bone appears mottled, with a coarse trabecular pattern. The cortices on the lateral and medial aspect of the distal portion of the humerus and on the lateral aspect of the proximal portion of the radius appear thin. Smooth periosteal new bone formation is observed on the lateral and medial aspects of the distal portion of the humerus; this is poorly mineralized and slightly irregular on the medial aspect. The articular surfaces are spared. The margins of the medial coronoid process are ill-defined and mildly rounded. Mild soft tissue swelling is present.

Further radiographs of the skeleton were taken to assess the facial swelling and to screen for concurrent bone lesions. Radiography revealed similar lesions affecting the left zygomatic arch (Figure 3), proximal aspects of the humeri, the left iliac shaft and wing, and the left side of the atlas. Findings on thoracic radiography, abdominal radiography, and abdominal ultrasonography were unremarkable. The detection of multifocal polyostotic aggressive bone lesions on radiographs supported possible neoplasia (lymphoma, myeloma, or other metastatic disease); a less likely differential diagnosis was fungal disease, although polyostotic spread of infection is uncommon in adults and fungal disease is rare in the United Kingdom.

Treatment and Outcome

Biopsy samples of the left zygomatic arch and proximal aspect of the left humerus were obtained. Histologic analysis revealed pyogranulomatous cellulitis as—
associated with new bone formation. Special stains failed to identify the presence of infectious organisms. Results of aerobic bacterial, anaerobic bacterial, and fungal cultures were negative. A biopsy sample was sent for PCR assay for *Mycobacterium* spp, and results were negative. Another biopsy sample was sent for *Mycobacterium* spp culture at the National Mycobacterium Reference Laboratory\(^a\) and results were positive for *Mycobacterium bovis*. Because of the zoonotic implications, euthanasia of the cat was elected.

**Comments**

In cats, tuberculosis is rare and is classically caused by *Mycobacterium microti* or *M. bovis*.\(^1,2\) Most reported cases of *M. bovis* infection involve infection of the liver, intestines, and associated lymph nodes and are believed to be due to the ingestion of milk from cows with tuberculosis.\(^1\) Skin lesions are also commonly reported.\(^3\) To histologically confirm mycobacterial involvement, aspirates or biopsy samples of affected tissue should be stained with Ziehl-Neelsen stain.

The cat of the present report had radiographic bone lesions consistent with previously described lesions in cases of confirmed tuberculosis.\(^4\) However, the usefulness of radiography depends on the extent of the infection. It can be useful in the appraisal of lung involvement, where the changes are variable and may include tracheobronchial lymphadenopathy, interstitial or miliary lung infiltration, localized lung consolidation, or pleural effusion. Abdominal radiography may reveal hepatomegaly or splenomegaly, abdominal masses, mineralized mesenteric lymph nodes, or ascites. Bone lesions tend to consist of areas of bony lysis and sclerosis, osteoarthritis, diskospondylitis, or periostitis.\(^5\) In the case described in the present report, the infection was found only in bone, mimicking a more frequently encountered polyostotic neoplastic disease. Swelling involving the skull has been reported previously in cats with tuberculosis.\(^5\) Studies in the United Kingdom have shown that tuberculosis in cats and dogs may be transmitted via direct penetration of the skin. Wild rodents may be infected with *M. microti*, and an even wider range of wild mammals can be infected with *M. bovis*, including species that cats prey on.\(^2\) In conclusion, the diagnosis of tuberculosis in cats is challenging and an extensive diagnostic imaging approach is preferable, considering that multiple sites could be affected at the same time.

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