JAVMA

What Is Your Diagnosis?

In collaboration with the American College of Veterinary Radiology

History

A 4-month-old 14.9-kg sexually intact male Chinese Shar-Pei was presented for right hind limb lameness. The dog had been vaccinated against canine distemper virus, hepatitis virus, *Leptospira*, parvovirus, parainfluenza virus, rabies virus, and *Bordetella* spp 16 days prior to presentation and became toe-touching lame in the right hind limb 14 days prior to presentation. This lameness progressed to non–weight-bearing lameness and did not improve with a course of carprofen (2.5 mg/kg, PO, q 12 h for 5 days) initiated 8 days prior to presentation. One day prior to presentation, serum biochemical analyses and a CBC revealed mild leukocytosis (19.9 X 10^3 cells/µL; reference range, 6.0 X 10^3 cells/µL to 17.0 X 10^3 cells/µL) characterized by granulocytosis (15.4 10^3 cells/µL; reference range, 3.5 X 10^3 cells/µL to 12.0 X 10^3 cells/µL).

On presentation, the dog was stable with a clinically normal pulse (140 beats/min; reference range, 60 to 160 beats/min) and respiratory rate (36 breaths/min; reference range, 15 to 60 breaths/min) but had a high rectal temperature (40 °C; reference range, 36.9 to 39.2 °C) and mild, diffuse superficial dermatitis. On orthopedic examination, the dog was severely toe-touching to non–weight-bearing lame on the right hind limb and had severe diffuse right hind limb muscle atrophy, signs of pain during range of motion of the right hip joint, and signs of pain on palpation of the right femur and pelvis and surrounding soft tissues. No other orthopedic abnormalities were identified. Lateral and ventrodorsal pelvic radiographic images were made **(Figure 1)**.

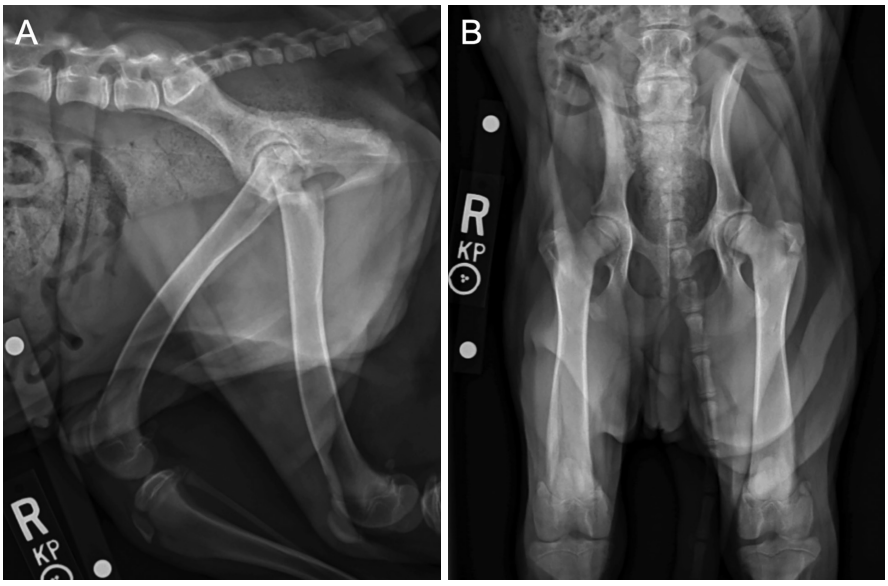

Figure 1—Right lateral (A) and ventrodorsal (B) radiographic images of a 4-month-old 14.9-kg sexually intact male Chinese Shar-Pei evaluated because of a 14-day history of toe-touching to non–weight-bearing lameness of the right hind limb.

Formulate differential diagnoses, then continue reading.

Diagnostic Imaging Findings and Interpretation

Pelvic radiography revealed a faint irregular periosteal reaction along the lateral cortical margin of the right ilium at the level of the sacrum and medullary sclerosis of the ilium adjacent to the sacroiliac joint, with associated lysis of the articular surfaces **(Figure 2)**. The right gluteal and thigh musculature was moderately decreased in mass, compared with the left. All other osseous structures were radiographically normal.

Pelvic CT (Revolution EVO 64-slice detector; GE Healthcare) revealed that the right sacroiliac joint articular margins were ill-defined and irregular, with moth-eaten lysis along the associated articular margins, step defects at the caudal and ventral margins of the sacroiliac joint, and joint space nar-

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Figure 2—Same ventrodorsal radiographic image as in Figure 1. There is right ilial periosteal proliferation (white-outlined arrow) and lysis centered on the right sacroiliac articulation (white arrow). There is also right thigh disuse muscle atrophy (arrowheads).

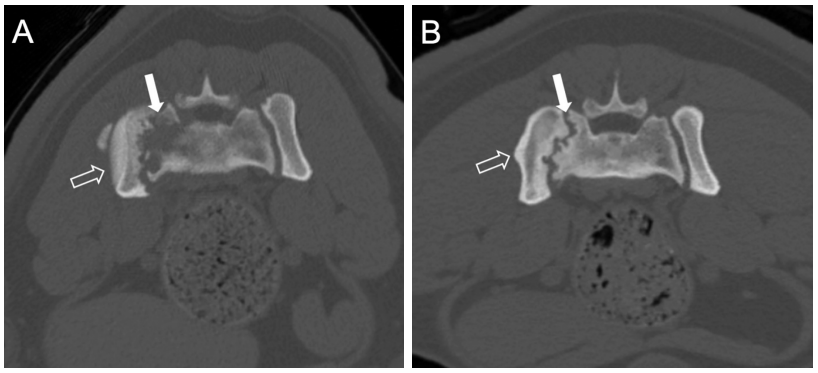

Figure 3—Transverse plane CT images of the sacroiliac joints of the dog described in Figure 1 when initially evaluated (A) and 9 weeks later (B). Lysis centered on the right sacroiliac joint (white arrows) with periosteal proliferation along the lateral cortical margin of the ilium (white-outlined arrows). There is subluxation of the right sacroiliac joint. The lytic region at presentation (A) is filled with new bone in the recheck CT (B). In both images, the dog's right side is toward the left. The images are displayed in a bone window display (window width, 2,500 HU; window level, 250 HU) with a slice thickness of 0.625 mm.

rowing **(Figure 3)**. There was laterally smooth, dorsally lobular periosteal proliferation along the right ilium. The medial iliac, internal inguinal, and sacral lymph nodes were mildly rounded.

Presumptive radiographic diagnoses included right sacroiliac septic arthritis, ilial osteomyelitis, and right hind limb disuse muscle atrophy with reactive medial lymphadenopathy. Other causes of aggressive bone lesion, such as neoplasia, were considered unlikely.

Treatment and Outcome

A fine-needle aspirate sample from the region of the right sacroiliac joint was obtained under ultrasound guidance, and cytologic examination of the sample revealed mild macrophagic inflammation, nondegenerate neutrophilic inflammation, and reactive bone. A fine-needle aspirate sample was also submitted for bacterial culture. No other diagnostic procedures, such as blood bacterial cultures or infectious disease testing, were performed. The dog was admitted to the hospital and treated with broad-spectrum antimicrobials, analgesics (NSAIDs and opioids), and IV fluid therapy.

Antimicrobial treatment included ampicillin-sulbactam (30 mg/kg, IV, q 8 h) and enrofloxacin (10 mg/kg, IV, q 24 h) while in hospital, and amoxicillin–clavulanic acid (16.8 mg/kg, PO, q 12 h) and enrofloxacin (9.1 mg/kg, PO, q 24 h) once discharged approximately 36 hours later. Shortly after discharge, the owner reported the dog's limb use greatly improved. Bacterial culture performed on a fine-needle aspirate sample from the region of the right sacroiliac joint isolated *Streptococcus canis*; enrofloxacin was discontinued, and amoxicillin–clavulanic acid was continued.

At recheck examination 9 weeks later, orthopedic examination revealed no hind limb lameness, mild residual right thigh muscle atrophy, and resistance to full extension of right and left hip joints, but no signs of discomfort on direct palpation. Pelvic CT showed remodeling of the right sacroiliac joint and resolution of aggressive bone changes and soft tissue inflammation, including resolution of lymphadenomegaly (Figure 3). Antimicrobial treatment was discontinued.

Comments

The initial pathology in this case was suspected to have been septic arthritis of the right sacroiliac joint. The sacroiliac joint in dogs is a combined synovial and fibrocartilaginous joint, and there is little data on septic arthritis in this type of joint; therefore, most of this discussion is pulled from information about septic arthritis in synovial joints. Septic arthritis is most commonly caused by bacterial organisms and can occur due to hematologic seeding, spread from local bone or soft tissues, or trauma, surgery, or other intra-articular treatments.[1,2] Septic arthritis is most commonly a monoarthropathy, although septic polyarthropathy can occur with hematogenous spread.[1,2] The presence of preexisting osteoarthritis increases the risk of developing septic

arthritis, and the commonly affected joints include larger joints, such as the elbow, hip, stifle, or hock joints.[1,3,4] The current case is unusual because to our knowledge, no previous reports of septic arthritis of the sacroiliac joint in veterinary species have been reported; however, septic arthritis of the sacroiliac joint has been reported very rarely in humans.[5]

Radiographic findings consistent with septic arthritis include secondary changes such as increased soft tissue opacity within and surrounding joints, osteophytosis, osteolysis or mixed lytic and proliferative changes to the epiphysis, and increased or decreased joint space.[2] An increase in soft tissue opacity within (effusion and synovitis) and surrounding the joint, with or without osteophytosis, may be the only radiographic finding in the earlier stages of septic arthritis,[2] which must be differentiated from a variety of other conditions such as instability, trauma, and neoplasia. More advanced cases of septic arthritis will show aggressive bony changes including a lytic or mixed lytic and proliferative appearance of the juxta-articular bone.[2] Importantly, bony changes associated with septic arthritis affect all bones contributing to the joint, which aids in differentiating from other conditions, such as primary osteomyelitis or primary bony neoplasia, which more commonly affects a single bone.[2] Differential diagnoses for juxta-articular aggressive bony changes affecting multiple bones include immune-mediated arthropathy, neoplasia (eg, soft tissue sarcoma), and severe osteoarthritis.[2] Of these, immune-mediated arthropathy is typically polyarthropathy of the carpus and tarsus, whereas septic arthritis is typically a monoarthropathy of a larger, more proximal appendicular joint.[1] Although imaging provides evidence of secondary changes associated with septic arthritis, definitive diagnosis of septic arthritis requires the combination of history, physical examination, and synovial fluid sampling for cytology and culture.[1]

In this case of septic arthritis of the sacroiliac joint, the radiographic changes to the joint were somewhat obscured by the superimposition of other bony and soft tissues (particularly gastrointestinal anatomy). Although radiography enabled general anatomic localization, CT further characterized the extent of pathology and assisted in monitoring the response to antimicrobial treatment.

References

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