What Is Your Diagnosis?

**History**

A 6-month-old 18.5-kg (40.7-lb) spayed female Golden Retriever was referred for evaluation of an intermittent right forelimb lameness of 2 months' duration. Diagnostic tests performed by the referring veterinarian included radiographic evaluation of the right elbow joint, CBC, and serum biochemical analysis; all findings were within reference range.

On physical examination, the patient had no visible lameness at a walk and had a grade 2/5 right forelimb lameness at a trot. Manipulation of the right shoulder joint resulted in a moderate pain response to flexion and extension. No other abnormalities were found on orthopedic examination. Radiographic images of both shoulder joints were acquired (Figure 1).

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

On the supinated-mediolateral image of the right shoulder joint, subchondral sclerosis of the glenoid cavity is present with small, multifocal ill-defined, < 1- to 2-mm-diameter, round radiolucent foci (Figure 2). The lesion is seen in the lateral and pronated-mediolateral views and is seen, albeit more faintly, in the craniocaudal projection. Abnormalities of the caudal aspect of the right humeral head are not evident. Differential diagnoses for the subchondral radiolucent foci of the articular margin of the right scapula include osteochondrosis, atypical bone cysts, erosive immune-mediated joint disease, septic arthritis, or neoplasia.

A large, 6.6-mm-diameter, round, subchondral lucency with moderate surrounding sclerosis was seen along the articular margin of the left glenoid cavity on the supinated-mediolateral projection of the left shoulder joint. Radiographic measurements were corrected for magnification (Figure 3).

No abnormalities were seen in soft tissue structures in all views. Given the bilateral nature of the disease process, preferential consideration was given to bilateral osteochondrosis of the glenoid cavity as the diagnosis.

The patient was sedated with hydromorphone (0.05 mg/kg [0.02 mg/lb], IV) and dexmedetomidine (5 µg/kg [1.4 µg/lb], IV) for bilateral CT evaluation of the shoulder and elbow joints to further identify, define, and characterize the lesions. Helical scanning was performed with the dog in dorsal recumbency. No abnormalities were detected on CT evaluation of the elbow joints. The articular margin and subchondral bone of the midaspect of the right glenoid cavity was irregular and characterized by several small, partially coalescing and hypointenuating (142 to 220 Hounsfield units [HU]) foci measuring 1.3 mm in diameter and surrounded by a thin rim of mild sclerosis (Figure 4). Moderate scapulohumeral incongruity was present bilaterally. Increased concavity of the midaspect of the right glenoid cavity was seen, creating the impression of a widened joint space centrally with concurrent narrowing of the joint space cranially and caudally; this finding may have been attributable to the patient’s non-weight-bearing position during CT. Bilaterally, no abnormalities were found on CT evaluation of the caudal aspects of the humeral heads. Computed tomography of the left shoulder joint revealed a large, hypointenuating (34 to 92 HU) subchondral defect measuring 6.4 mm in diameter along the articular margin of the glenoid cavity.
margin of the mid-aspect of the left glenoid cavity, with mild surrounding sclerosis.

### Treatment and Outcome

Shoulder joint arthroscopy was performed bilaterally. Arthroscopy of the right shoulder joint revealed a 2 x 3-mm, irregularly margined indentation of the articular cartilage of the right glenoid fossa. The lesion was debrided with a 2.3-mm ball head burr until subchondral bone with hemorrhage was noted. Debridement revealed a 1.5 x 2-mm defect within the underlying subchondral bone. Five cartilage fragments, from a cartilage flap overlying the defect in the subchondral bone (not visualized on radiographs or CT images), measuring up to 2 mm were collected during curettage of the lesion of the right glenoid fossa and were submitted for histologic evaluation. Arthroscopy of the left shoulder joint revealed a similar 4 x 5-mm subchondral defect. The lesion of the left shoulder joint involved a larger portion of the articular cartilage of the left glenoid fossa. Given the absence of left forelimb lameness and absence of positive clinical examination findings, the cartilaginous lesion of the left glenoid cavity was not debrided. Arthroscopic inspection of the articular cartilage of the caudal aspects of both humeral heads revealed that they appeared grossly normal, as did the unaffected portions of the glenoid cavities bilaterally.

Histologic evaluation of the fragments obtained from the right glenoid cavity revealed chondrocyte degeneration and necrosis, supporting the diagnosis of osteochondrosis. A presumptive diagnosis of osteochondrosis was also made for the left forelimb.

The patient recovered uneventfully from anesthesia. Hydromorphone (0.05 mg/kg, IV, q 6 h, for 3 doses) and carprofen (4.4 mg/kg [2 mg/lb], SC, once immediately after surgery) were administered. The following day, the patient was comfortable and ambulating without lameness at a walk and with mild (grade 2/5) right forelimb lameness at a trot, identical to the preoperative lameness. The dog was discharged from the hospital within 18 hours after surgery, with carprofen (2.2 mg/kg [1 mg/lb], PO, q 12 h for 1 week) and owner instructions to restrict exercise for 4 weeks, followed by a gradual return to normal activity. At the 4-week follow-up examination, the patient was comfortable on shoulder joint manipulation and had no lameness at a walk and trot.

### Comments

Osteochondrosis and osteochondritis dissecans are orthopedic conditions identified in juvenile medium- to giant-breed dogs. The disease process is characterized by a disturbance in endochondral ossification that results in thickened, potentially irregular, epiphyseal cartilage and an associated defect of the underlying subchondral bone. Osteochondrosis and osteochondritis dissecans of the shoulder joint occur most frequently along the caudocentral or caudomedial aspect of the humeral head. Osteochondrosis of the glenoid cavity has been reported once in the veterinary literature and may represent...
an atypical manifestation of osteochondrosis or osteochondritis dissecans in dogs. Osteochondrosis and osteochondritis dissecans lesions of the caudal aspect of the humeral head are typically identified by use of the mediolateral radiographic projection. In the patient of the present report, the mediolateral projection of the shoulder joint allowed visualization of the larger lesions of the glenoid cavity of the left shoulder joint; conversely, the smaller lesion of the right shoulder joint was less apparent on the mediolateral projection because of superimposition of the acromion. Supinated- or pronated-mediolateral projections of the shoulder joints also yielded images with identifiable lesions in the patient of the present report. The value of this radiographic approach to identify osteochondrosis and osteochondritis dissecans of the caudal aspect of the humeral head is well accepted, but is not described for the detection of osteochondrosis and osteochondritis dissecans of the glenoid cavity.

In the dog of the present report, CT imaging was useful for confirming the presumptive diagnosis of osteochondrosis and was helpful in ruling out additional or concurrent structural abnormalities of the humeri and elbow joints. One dog with osteochondritis dissecans of the glenoid cavity, occurring with concurrent supraspinatus enthesopathy, has been described. Computed tomography was similarly a useful diagnostic modality for that affected dog. The incidence of osteochondritis dissecans of the glenoid cavity in dogs, however, has not been reported. In humans, osteochondritis dissecans of the glenoid cavity is reported in juvenile athletes that are baseball pitchers and is likely secondary to repetitive microtrauma in combination with poor vascular supply associated with the concave glenoid fossa, compared with the more robust vascular supply of the convex articular surface of the humeral head. In dogs, a preexisting defect in endochondral ossification could possibly be exacerbated by repetitive microtrauma within the glenoid fossa, leading to the development of osteochondrosis or osteochondritis dissecans.

References