



What Is Your Diagnosis?

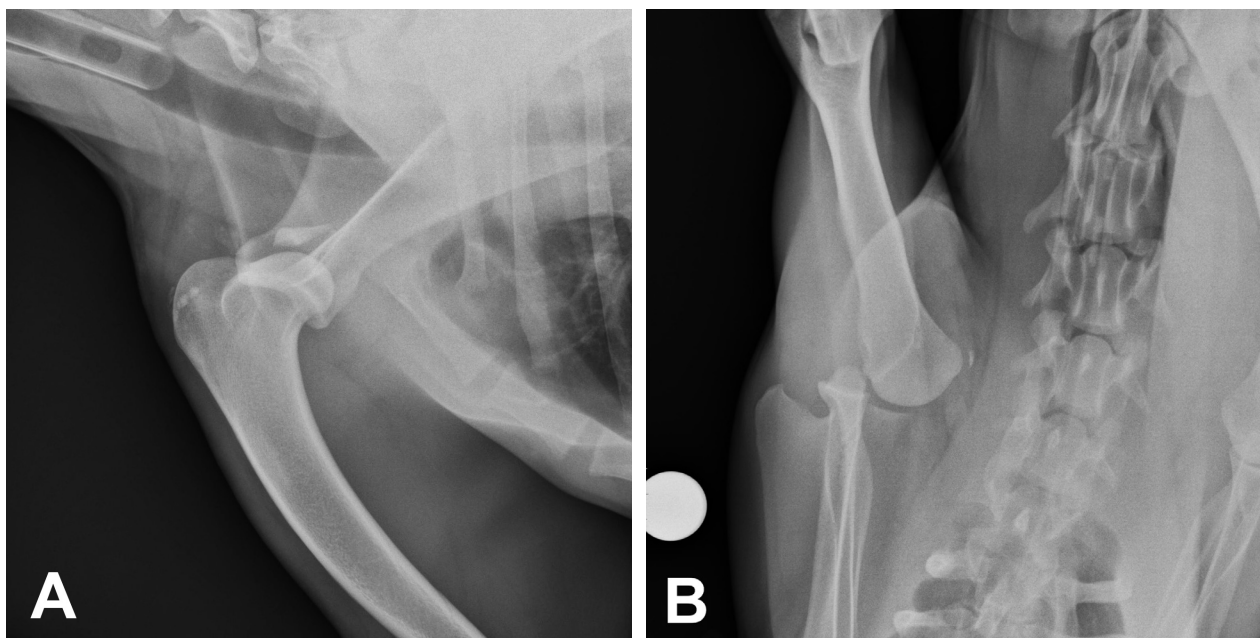


Figure 1—Right lateral (A) and caudocranial (B) radiographic views of the right shoulder joint of a 2-year-old 23.7-kg (52.1-lb) sexually intact male English Setter with a history of acute lameness of the right forelimb that occurred 4 days earlier with no known trauma.

History

A 2-year-old 23.7-kg (52.1-lb) sexually intact male English Setter was referred for evaluation of right forelimb lameness. The owner reported acute lameness of the right forelimb 4 days prior to referral with no known trauma. Radiography of the right forelimb was performed by the referring veterinarian and revealed medial luxation of the shoulder joint. The dog was anesthetized, and closed reduction of the shoulder joint was attempted but was unsuccessful. The dog was prescribed carprofen and referred for surgical consultation.

At the time of referral, grade 4/5 lameness of the right forelimb was appreciated on gait evaluation. Manipulation of the right shoulder joint revealed moderate discomfort and moderate thickening of the joint capsule. No clinically important abnormalities were detected on a CBC and serum biochemical analysis.

An IV catheter was placed, and the patient was premedicated with hydromorphone (0.1 mg/kg [0.045 mg/lb], IV) and midazolam (0.1 mg/kg, IV). Anesthesia was induced with alfaxalone (1.5 mg/kg [0.68 mg/lb], IV), and an appropriate anesthetic plane was maintained with isoflurane gas. Cefazolin (22 mg/kg [10 mg/lb], IV) was administered 30 minutes prior to anesthesia and every 90 minutes during anesthesia. Manipulation of the joint elicited mild crepitus and revealed decreased flexion and extension. Closed reduction under anesthesia of the right shoulder was easily performed, but subsequent medial luxation of the right humerus recurred immediately. Radiography of the right shoulder joint was performed (**Figure 1**).

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

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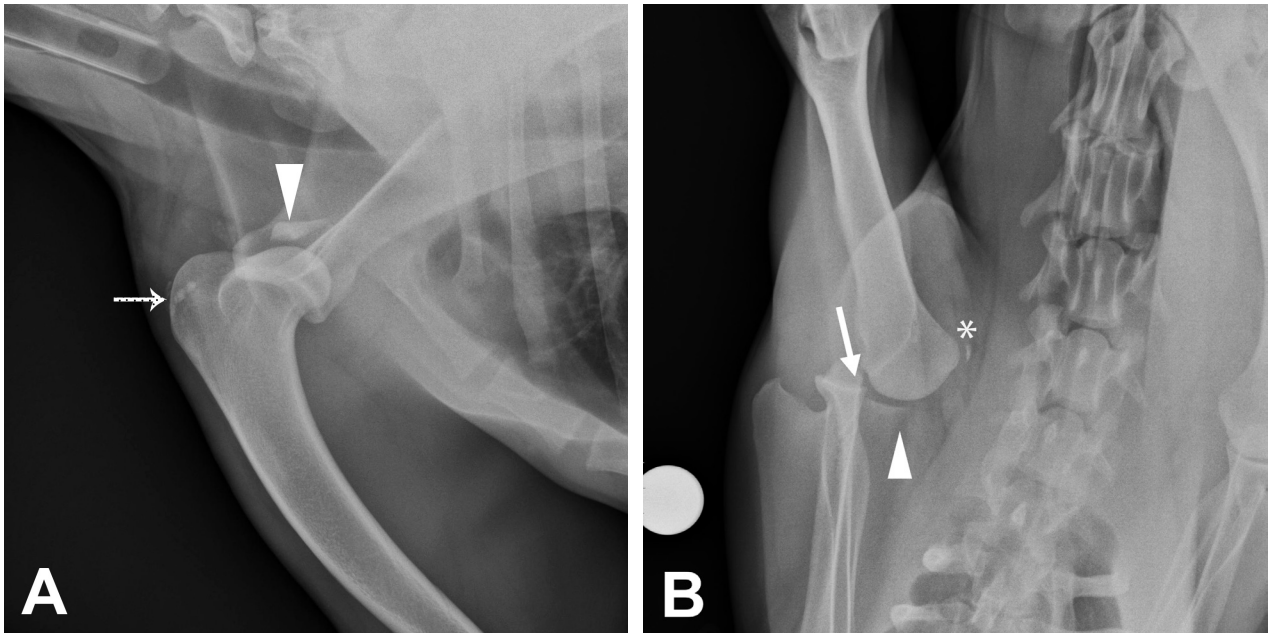


Figure 2—Same radiographic images as in Figure 1. A—A well-defined, triangular mineral opacity is seen dorsal to the right shoulder joint (arrowhead). Ill-defined mineral opacities are overlying the greater tubercle of the proximal aspect of the humerus (dotted arrow). B—A well-defined, triangular mineral opacity is seen dorsomedial to the right shoulder joint (arrowhead). The medial aspect of the glenoid cavity rim is discontinuous and appears truncated (arrow). Mineralization medial to the shoulder joint is consistent with a vestigial clavicle (asterisk).

Diagnostic Imaging Findings and Interpretation

Marked dorsomedial luxation of the humerus and a large, triangular mineral opacity proximal to the humerus can be seen in the lateral radiograph of the right shoulder joint (**Figure 2**). On the caudocranial view, the mineral opacity is observed proximal to the humeral head and medial to the distal aspect of the scapular neck. The medial aspect of the glenoid cavity rim is truncated and discontinuous. There are ill-defined mineral opacities seen overlying the greater tubercle of the proximal aspect of the humerus on the lateral view. This is likely dystrophic mineralization in the tendon of the supraspinatus or bicep muscle. It is likely incidental to the current problem. There is mineralization seen medial to the shoulder joint consistent with a vestigial clavicle. No other radiographically important findings were identified. A diagnosis of medial humeral luxation and fracture of the medial aspect of the glenoid cavity rim was made on the basis of radiographic findings.

Fluoroscopy was performed to obtain more definitive information on location and shape of the mineral opacity. The truncated appearance of the glenoid cavity and the adjacent bone opacity, indicating a fracture of the medial aspect of the glenoid cavity rim, were fluoroscopically evident. These findings were consistent with the inability to maintain reduction after manual reduction was attempted.

Treatment and Outcome

Reconstruction surgery of the shoulder joint was performed. The bone fragment was approximately 1

cm wide at its base and 1.5 cm long at its apex. During general anesthesia, a brachial plexus block was performed with a 0.5% solution of bupivacaine. A cranio-medial approach to the right shoulder joint was made, and fluoroscopy was used to locate the glenoid cavity rim fracture fragment. Reduction of the luxation of the shoulder joint was performed and secured with manual traction. Fluoroscopic-guided anatomic reduction of the glenoid cavity rim fracture fragment to the intact lateral aspect of the glenoid and scapula was achieved with bone-holding forceps. Rigid stabilization was performed with a 2.7-mm lag screw, and an antirotational Kirschner wire was placed in a medial-to-lateral direction. The medial aspect of the shoulder joint capsule was imbricated, and the remaining closure of the incision was routine. A Velpeau sling was applied after surgery.

Hydromorphone (0.1 mg/kg, IV, q 6 h, for 3 doses) and tramadol (3 mg/kg [1.4 mg/lb], PO, q 8 h, for 2 doses) were administered. The patient became febrile the morning after surgery, and antimicrobial administration was continued. The patient became normothermic 1 week after surgery.

Physical examination and recheck radiography were performed 8 weeks after surgery. Radiography of the shoulder joint revealed appropriate joint reconstruction, stable implants, and bone healing at the fracture site. The dog appeared comfortable during manipulation of the right shoulder joint, and a grade 1/5 lameness of the right forelimb was appreciated on gait observation.

Comments

Fractures of the medial aspect of the glenoid cavity rim are uncommon, but result in substantial fore-

limb dysfunction.¹ Disruption of the medial articular surface of the shoulder joint results in medial joint instability and subsequent shoulder joint dislocation.^{1,2}

In the present report, plain-film radiography detailed the general size and location of the fracture fragment. Orthogonal radiographic views were necessary to clearly delineate the truncation and discontinuous appearance of the medial aspect of the glenoid cavity, which were more clearly visualized in the caudocranial view. The glenoid cavity rim fracture fragment was more radiopaque in the lateral view of the shoulder joint because of summation as well as the imaging capturing the thicker aspect of the fragment in this view. After surgery, evaluation of a caudocranial radiographic image of the right shoulder joint revealed appropriate reduction of the glenoid cavity rim fracture fragment, thereby restoring the articular surface of the glenoid cavity.

Fracture fragments of the medial aspect of the glenoid cavity rim are often very small and necessitate the careful use of a fixation technique to prevent damage to the bone fragments. Fluoroscopy facilitated the appropriate identification of the fragment and its reduction during fixation in the dog of the present report. Anatomically correct reconstruction of the articular surface of the scapula is paramount to good joint function and decreased degenerative joint disease.¹

References

1. Newton CD. Fractures of the scapula. In: *Textbook of small animal orthopaedics*. Philadelphia: Lippincott Williams & Wilkins, 1985.
2. Piermattei DL, Flo GL, DeCamp CE. Fractures of the scapula. In: *Handbook of small animal orthopedics and fracture repair*. 4th ed. St Louis: Saunders Elsevier, 2006;255-261.