

# EMERGENCY IMAGING

Kevin Mennitt, MD, and Keith D. Hentel, MD

FIGURE 1



FIGURE 2



A 50-year-old woman presents to the emergency department with shoulder pain after a fall from her bicycle. Radiographs are obtained (Figures 1 and 2).

**What is the probable diagnosis?**

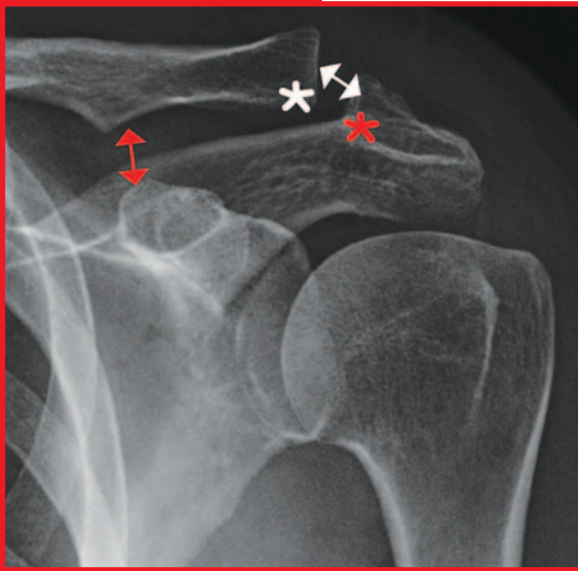
**What additional imaging could be done to confirm the diagnosis?**

**Dr. Mennitt** is an assistant professor of radiology at Weill Cornell Medical College in New York City and an assistant attending radiologist at NewYork-Presbyterian Hospital/Weill Cornell Medical Center in New York City. **Dr. Hentel**, editor of "Emergency Imaging," is an associate professor of clinical radiology at Weill Cornell Medical College. He is also chief of emergency/musculoskeletal imaging and the vice-chairman for clinical operations for the department of radiology at NewYork-Presbyterian Hospital/Weill Cornell Medical Center. He is a member of the EMERGENCY MEDICINE editorial board.

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## ANSWER

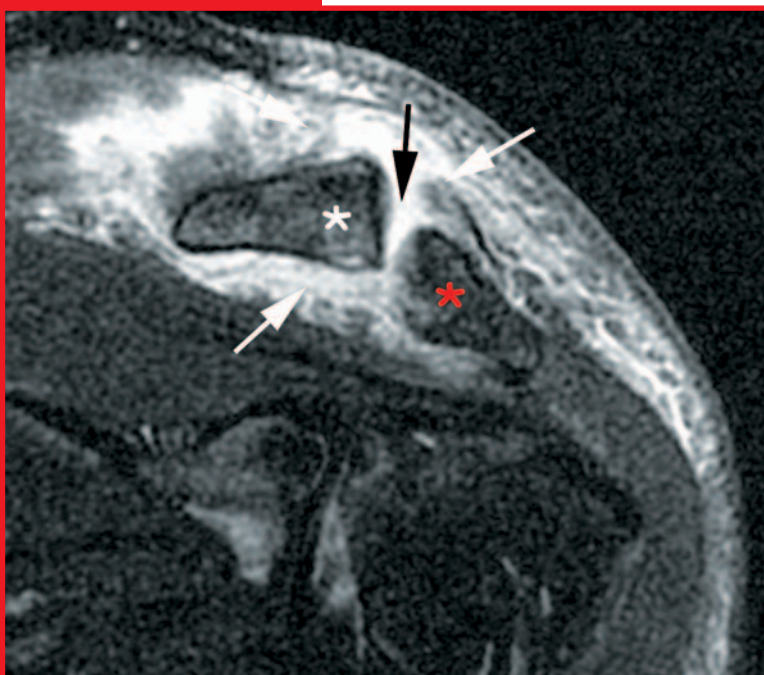
FIGURE 3



On the external rotation view of the shoulder (Figure 3), there is widening of the acromioclavicular (AC) joint (white arrow), for which the accepted upper limit of normal is considered to be 6 to 7 mm.<sup>1</sup> There is also malalignment of the inferior margins of the distal clavicle (white asterisk) and the distal acromion (red asterisk). The space between the coracoid and the clavicle, ie, the coracoclavicular (CC) interval (red arrow), is within the normal limit of less than 11 to 13 mm. These findings are suggestive of an AC joint separation.

AC joint separations account for approximately 10% of all shoulder injuries.<sup>2</sup> They typically occur with direct trauma or a fall onto an outstretched hand.<sup>1</sup> The most commonly used classification of these injuries is the Rockwood classification, which is based on the extent of injury. A type I injury represents a sprain to the AC ligaments and appears normal on radiographs. In type II, there is a tear of the AC ligaments without tearing of the CC ligaments. This presents with widening and misalignment of the AC joint but

FIGURE 4



a normal CC distance, as in the case presented. Type III is a tear of both the AC and CC ligaments and presents with widening and misalignment of the AC joint and widening of the CC interval. The remaining three types of injury are less common and involve posterior dislocation of the clavicle (type IV), tears of the deltoid and trapezial fascia (type V), and inferior dislocation of the clavicle (type VI).

Radiography should be performed as the initial evaluation of an AC joint injury. It is useful to obtain images of both AC joints, as normal variation in the appearance of the AC joint is typically bilateral and thus may be distinguished from injury.<sup>2</sup> Weight-bearing views have traditionally been used to assist in classifying AC joint

injuries (particularly type II and III injuries). However, research has found stress views to have low utility, and they are no longer commonly obtained.<sup>3</sup> MRI is used increasingly in these cases due to its ability to visualize the AC and CC ligaments directly, allowing any radiographic abnormality to be assessed as either acute or chronic. In a 2011 study by Nemeč et al, MRI findings altered the Rockwood classification from that determined by initial radiographic assessment in almost 50% of patients with AC joint injury.<sup>4</sup> Figure 4 is a coronal fat-suppressed T<sub>2</sub>-weighted MR image of the shoulder of the case patient. It confirms the misalignment of the distal clavicle (white asterisk) and the acromion (red asterisk). The AC ligament is not visualized in its expected location (black arrow), indicating tear. The large amount of surrounding edema (white arrows) proves that this is an acute injury. Another slice (not shown) demonstrated the CC ligaments to be intact, confirming the classification as a type II injury.

Type I and II injuries are typically treated nonoperatively, while surgery is routinely performed for type IV, V, and VI injuries. Type III injuries are most commonly treated nonoperatively. However, surgery may be a primary approach (especially in high-performance athletes) or a secondary option if conservative treatment fails.<sup>1</sup> This patient responded well to conservative treatment.

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### REFERENCES

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