

Emergency Imaging

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Figure 1



Figure 2

A 25-year-old man presents to the emergency department following a bicycle accident with a complaint of left shoulder pain. Physical exam demonstrates tenderness in the region of the acromioclavicular joint. Radiographs are obtained (Figures 1 and 2).

What is the radiographic abnormality?

What is your differential diagnosis?

What additional imaging study (if any) should be performed to make a definitive diagnosis?

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ANSWER

On both the internal rotation and trans-scapular Y views of the shoulder, there is linear lucency in the distal acromion (white arrows, Figures 3 and 4) that corresponds to the site of the patient's tenderness. The acromioclavicular joint appears normal (black arrows, Figures 3 and 4). While both the clinical history and physical exam may suggest that the lucency represents a fracture, the differential diagnosis should include os acromiale, a developmental variant in which the anterior acromial growth center fails to fuse with the remainder of the acromion.

Os acromiale has been reported to occur in 1% to 15% of all patients, with one large anatomic study revealing an os acromiale in 8% of all cadavers.¹ There is a higher incidence in African Americans compared with Caucasians, and it is twice as common in males compared with females. Os acromiale is bilateral in 33% to 62% of cases.^{1,2} The anterior apophysis of the acromion may fuse late in skeletal development, thus the presence of an os acromiale should not be suggested in patients under 21 years of age, since it may just represent a normal unfused growth plate.

The clinical significance of an os acromiale continues to be debated in the literature, with most authors associating the presence of an os acromiale with shoulder impingement and rotator cuff tears. Ouellette et al reviewed the literature and performed a case-control study of 42 patients with os acromiale who underwent MRI evaluation of the shoulder.² A significant increase in incidence of rotator cuff tear was noted only in one specific subset of patients that had a step-off deformity between the unfused acromial ossification center and the acromion.

Regardless of the long-term implications for an os acromiale, it is important to be familiar with the radiographic appearance of this condition in order to prevent mischaracterization as a fracture. Although standard radiographic views are not sensitive or specific for the detection of an os acromiale, two radiographic signs have been described. The first, the double-density sign, refers to the overlap of two transversely oriented cortices, one from the acromion and the other from the os acromiale (white arrows, Figure 5); this finding is present on



Figure 3



Figure 4

82% of anteroposterior radiographs in affected patients, compared with 5% of normal shoulders.³ The second radiographic sign is a cortical irregularity/lucency on the trans-scapular view, which has a reported sensitivity of 74% for the detection of os acromiale. The most sensitive and specific radiographic view for detection/characterization of an os acromiale is the axillary view, which demonstrates a characteristic appearance of the os acromiale in 94% of cases.³

The patient presented in this case returned to the radiology department for an axillary view radiograph that



Figure 5

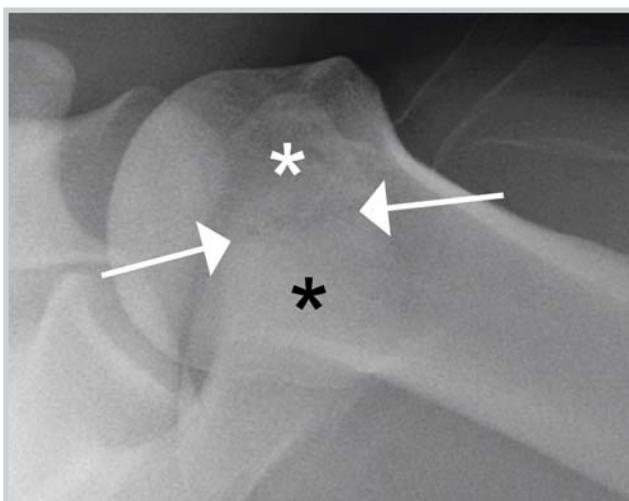


Figure 6

demonstrates the classic appearance of an os acromiale: an acromial segment (white asterisk, Figure 6) separated from the acromion (black asterisk) by nonossified cartilage (white arrows). Without evidence of a fracture, the patient was discharged with no further treatment. **EM**

REFERENCES

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3. Lee DH, Lee KH, Lopez-Ben R, Bradley EL. The double-density sign: a radiographic finding suggestive of an os acromiale. *J Bone Joint Surg Am.* 2004;86-A(12):2666-2670.