

Painful Os Acromiale Presenting as Septic Shoulder

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Abstract

The unfused acromial apophysis of an os acromiale typically is an undetected orthopedic anomaly with minimal symptoms. In some instances, however, pain and disability can result from motion between the unfused bone fragments. Trauma to the acromion can similarly displace the unfused os acromiale or can result in chronic symptoms of pain and swelling. In this article, we report the case of a young man who had a fractured os acromiale secondary to trauma and presented with the signs and symptoms of a septic glenohumeral joint.

For patients who present to the emergency department (ED) with shoulder pain, numerous causes can be listed in the differential diagnosis. For example, in patients with an acute injury to the shoulder area, the clinician should suspect bone and soft-tissue damage. Similarly, rheumatologic, neurologic (eg, Parsonage-Turner syndrome or shingles), neoplastic, and infectious causes should be considered in patients with insidious onset of pain without trauma. Overlap of symptoms between traumatic and atraumatic causes of shoulder pain can make establishing the diagnosis difficult, particularly when a patient presents with fevers or symptoms of a septic joint.

Scapula and acromion injuries are uncommon presentations in the ED, but acute injury of an os acromiale is even less common. To our knowledge, there are no reported cases of an injury to a preexisting os acromiale causing symptoms that suggest a septic shoulder.

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In this article, we report the case of a young adult man who presented with shoulder pain and symptoms suggestive of a septic shoulder, but who was found to have a fracture of the os acromiale pseudarthrosis. The patient provided written informed consent for print and electronic publication of this case report.

CASE REPORT

While skateboarding, a 20-year-old man fell backward onto his left shoulder blade and felt immediate pain on the top and lateral side of the shoulder. By the next morning, the pain and swelling had increased substantially, and the man presented to the ED. His mother reported that he was febrile (up to 38.9°C) and diaphoretic, that he had not slept all night, and that he felt sick. The patient denied drug abuse and recent sexual activity. He was in good health otherwise and had no history of systemic illness or left shoulder problems.

At presentation, his temperature was 37.9°C, and he was unwilling to move the left shoulder and left arm because of severe pain. The left shoulder was abducted, internally rotated, and diffusely warm, but there was no ecchymosis, erythema, or drainage. The patient was extremely tender over the anterior and superior shoulder and lateral to the acromioclavicular joint area. He was neurovascularly intact and had normal sensation and strength for all peripheral nerves and cervical root levels.



Figure 1. Frontal radiograph shows subtle acromion irregularity caused by os acromiale (arrow).

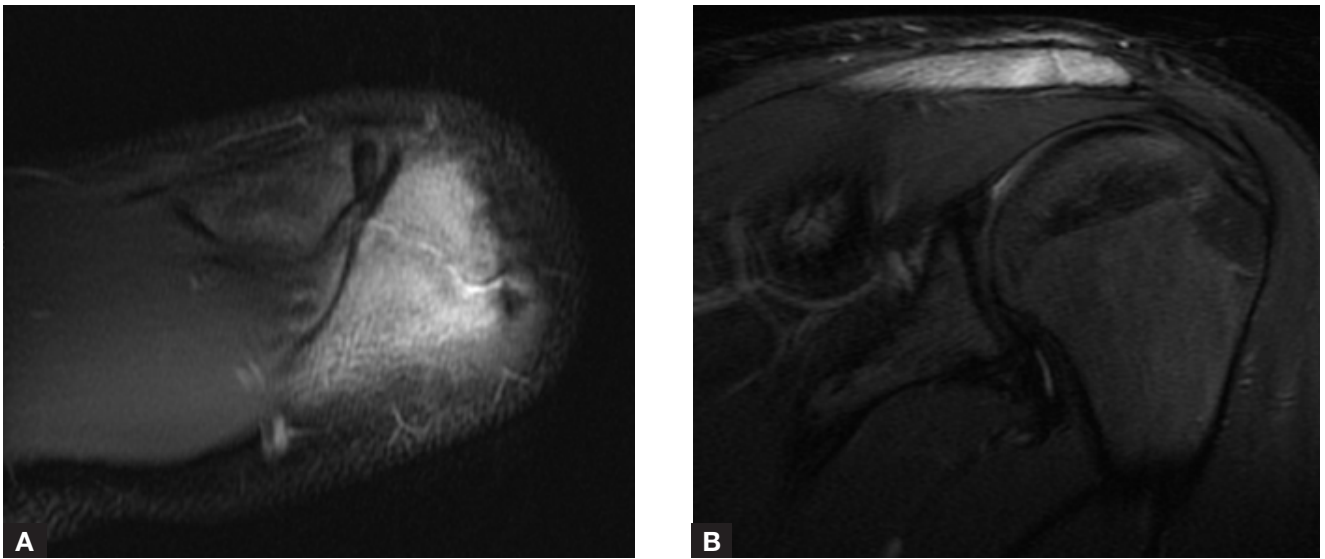


Figure 2. Fat-suppressed T_2 -weighted magnetic resonance imaging shows intense bone-marrow edema involving acromion and os acromiale. (A) axial (repetition time, 4500 ms; echo time, 70 ms) and (B) coronal (repetition time, 5000 ms; echo time, 72 ms) views.

Conventional radiographs showed no abnormalities, except for an os acromiale (Figure 1). Blood tests revealed an elevated C-reactive protein level (7.0 mg/dL; reference range, 0.08-3.1 mg/L) and an elevated white blood cell (WBC) count (13,000 cells/ μ L; reference range, 4500-11,000 cells/ μ L). Given the patient's extreme shoulder pain and tenderness, febrile history, and elevated erythrocyte sedimentation rate (ESR), the ED physicians decided to rule out a glenohumeral joint infection. Fluoroscopically verified aspiration of the shoulder produced 4.0 mL of noncloudy fluid; immediate microscopic evaluation showed no pathogenic organisms or leukocytes. Arthrography revealed no rotator cuff tear. Although the initial clinical impression was that of an infected shoulder, antibiotics were not prescribed given the aspirate evaluation. The patient was given pain medication and an arm sling and was instructed to follow up with an orthopedic surgeon as soon as possible.

Two days later, during an office visit, the patient reported continued pain in the acromioclavicular joint and superior lateral acromion. On physical examination, the superior shoulder area was slightly swollen and very tender but not hot or red. The left arm could be actively elevated to only 90° but passively elevated to 160°, which matched that of the right arm. Cultures of the shoulder aspirate showed no growth.

Because of the patient's continued pain, a magnetic resonance imaging study was obtained. It showed bone-marrow edema of the anterior acromion and the scapular spine on both sides of the os acromiale, consistent with an acute injury to the os acromiale site (Figures 2A, 2B). Computed tomography confirmed irregular cortical margins of the os acromiale and opposing surface of the acromion but no clear fractures (Figure 3).

Given the evidence, we made a working diagnosis of

fractured os acromiale. The patient was treated with cryotherapy, nonsteroidal anti-inflammatory drugs (NSAIDs), and physical therapy. By 5 weeks after injury, the pain had resolved, and he had full range of motion. He returned to full athletic activity 21 weeks after injury.

DISCUSSION

Our patient's case illustrates the challenges of evaluating a patient with an acute os acromiale injury and subsequent shoulder pain. Such an injury can produce not only local pain at the top of the shoulder but also anterior and lateral shoulder symptoms. The differential diagnosis for acute, severe shoulder pain after trauma includes rotator cuff injury, proximal humerus fracture, and scapular fracture, and it is uncommon for shoulder trauma to present with symptoms mistaken for those of a septic shoulder.

Os acromiale is an acromion that has failed to ossify completely and that is joined to the scapular spine by fibrous attachments rather than bony fusion. Os acromiale is a relatively common finding and is thought to be present in up to 15% of the population.¹ To our knowledge, Sammarco¹ has reported the largest cadaveric study of os acromiale (1198 subjects); in that study were 128 instances (11%) of os acromiale, and one-third of those cases were bilateral. However, estimates of the incidence of os acromiale in the general population have ranged from 1%² to 15%.³ In most affected people, the unfused acromial epiphysis remains asymptomatic and undetected,^{1,4} but in other instances the condition can cause pain, clicking, and disability of the affected shoulder.⁴

In the human body, bony fusion of all sites generally occurs by age 25. Incomplete fusion of the acromion and the scapular spine is termed os acromiale. The most common finding of os acromiale is nonunion between the mesoacromion and the meta-acromion,⁵ although

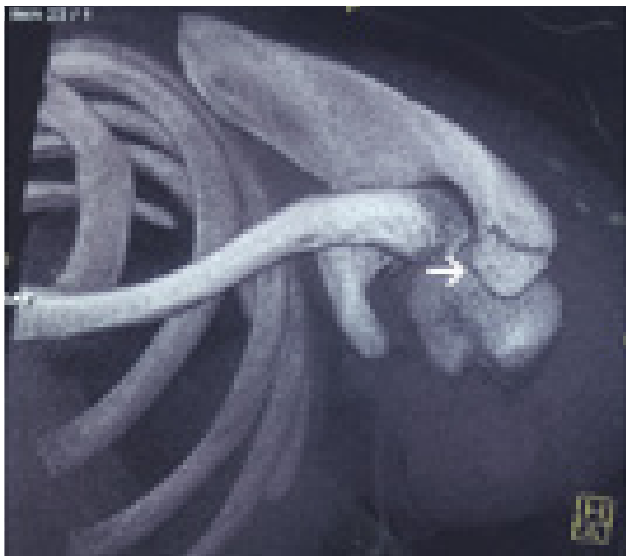


Figure 3. Coronal volume-rendered 3-dimensional computed tomography image reconstructed in axial oblique projection shows the os acromiale (arrow) to best advantage. However, bone-marrow edema, clearly visible on magnetic resonance imaging, is not identifiable with computed tomography.

the acromial fragment usually is not free-floating. Rather, it is physically and functionally connected to the acromial base by a fibrous or ligamentous band that may persist undetected throughout a patient's life.⁶ This false joint is the pseudarthrosis of the os acromiale. In a small percentage of cases, the radiographic line between the distal and proximal segments persists despite a bony (nonfibrous) union, or a fused os acromiale.¹

Acromial fracture generally results from severe trauma, particularly trauma caused by forces directed downward on the superior aspect of the acromion or humeral head forces directed superiorly on the inferior aspect of the acromion.⁷ Because a fractured acromion can bear a striking resemblance to an os acromiale, and because bilateral os acromiale can occur in up to 60% of patients,⁸ comparison with the contralateral shoulder often proves useful for diagnosis when differentiating between an acute fracture of the acromion and a preexisting os acromiale.

In os acromiale, the 3 centers of acromion ossification fail to fuse completely and are joined to one another and to the scapular spine by fibrous or ligamentous attachments.⁵ Anatomical studies have shown that, even with radiographic evidence of os acromiale, there can be partial or complete bony union at the site.¹ Typically, the unfused acromial epiphysis remains asymptomatic and is detected only on shoulder radiographs obtained for other indications. However, motion between the unfused bone fragments can cause pain and disability.⁵

The gold standard for diagnosis of a septic joint is synovial fluid showing frank pus or growth on culture. A joint aspirate WBC count of less than 50,000 cells/ μ L is commonly thought to rule out a septic joint, but this value has low sensitivity.⁹ Other potentially helpful laboratory studies are serum WBC count and ESR. Of all 3 laboratory tests, ESR has the highest sensitivity.⁹

Initial management for a symptomatic os acromiale is the same as that for subacromial impingement syndromes: rest, NSAIDs, and subacromial injections of corticosteroids.⁵ When such nonoperative management fails, surgical management (typically internal fixation of fragments, plus bone grafting) has been recommended.⁵

CONCLUSION

The present case shows that a patient who has an os acromiale and sustains acute trauma may present with symptoms suggestive of a septic shoulder or acromioclavicular joint. Because delayed management can lead to permanent loss of glenohumeral joint mobility, clinical suspicion of a septic glenohumeral joint should prompt joint aspiration for synovial fluid analysis. When the aspirate and examination are consistent with an infection, antibiotics should be administered,¹⁰ and an orthopedic surgeon should be consulted. When the aspirate is not consistent with an infection, other symptom causes (eg, a fracture, as in our patient's case) should be considered.

AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

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This paper will be judged for the Resident Writer's Award.
