Acromioclavicular Separation

Patrick Graham

Introduction

Acromioclavicular (AC) separation, also known as a "separated shoulder" or AC sprain, is most commonly the result of a direct trauma to the shoulder. Forceful loading causes a disruption of the ligamentous complex, which supports the articulation of the clavicle with the acromion. There may also be injury to the coracoclavicular ligamentous complex, which maintains the distance between the clavicle and the coracoid (Frank et al., 2019; Koehler, 2018; Willimon, Gaskill, & Millett, 2011; Wylie et al., 2018).

The degree of injury, graded as I–VI, is defined by the amount of separation, which is directly associated with the amount of force involved at time of injury, as well as the disruption of associated ligaments. This ultimately dictates the course of treatment. Lower grade injuries are more common and can be treated conservatively, whereas higher grade injuries typically require surgical intervention. These injuries are more common in males and, consistent with the mechanism, are more frequently associated with contact sports (football, hockey, rugby, etc.) (Frank et al., 2019; Koehler, 2018; Pallis et al., 2012; Willimon et al., 2011; Wylie et al., 2018).

Case Presentation

A 40-year-old, right-hand dominant man presented with 4 days of left shoulder pain. He had caught an edge while playing hockey and, leading with his shoulder and head, slid forcefully into the boards. He noted extreme shoulder pain and came out of the game. He was able to remove his pads and, after a few minutes of rest, could gently move his shoulder. He rested and iced his shoulder that evening. The next day, he noted stiffness and mild aching shoulder pain. He continued with rest and took non-steroidal anti-inflammatory drugs (NSAIDs) as needed. He had some difficulty finding a comfortable position for sleep but otherwise was able to get along with his normal day-to-day activities.

On presentation he was an alert, oriented, affect-appropriate man in no apparent distress. Inspection revealed asymmetry of the left shoulder, about the distal clavicle, without abrasions or discoloration (see Figure 1). There was mild effusion of the shoulder without skin tenting. He noted tenderness overlying the AC joint, extending anterior and inferior along the anterior aspect of the shoulder. There was no tenderness about the sternoclavicular joint. He was able to perform grossly equal active range of motion, with pain noted about the AC joint on end-range flexion, abduction, and horizontal adduction in 90° degrees of flexion (+ cross-over sign). His strength was 5/5, with mild discomfort noted. He displayed a positive lift-off empty can test.

Radiographs, obtained at the time of evaluation, revealed widening of the AC joint with superior displacement of the clavicle (see Figure 2). Given the amount of displacement, measured in the clinic as 1.7 cm, the patient was referred for magnetic resonance imaging (MRI) to better define the extent of trauma and grade the AC separation appropriately. The magnetic resonance image revealed a complete disruption of the AC ligament as well as the coracoclavicular ligaments (see Figure 3).

Management

Given the MRI findings, consistent with a Grade III–IV AC separation, the patient was referred to a sports medicine surgeon for definitive management. There are several options for surgical intervention discussed within the literature. Unfortunately, there is no consensus as to the optimal technique with a myriad of complications, including fracture, hardware failure, chronic instability, and pain, reported with varying degrees of success. The best course of treatment, surgical or conservative, for Grade III injuries remains controversial and should be discussed with the patient (Frank et al., 2019; Koehler, 2018; Pallis et al., 2012; Willimon et al., 2011; Wylie et al., 2018).

Lower grade AC separations can be successfully treated conservatively. It is important for the patient to understand that, with the exception of Grade I injuries, some amount of asymmetry may persist but functionally they will be able to return to all previous activities, including sports. Utilization of rest, ice, and NSAIDs during the acute phase after injury is typically sufficient for pain management. One should be wary of potential

Patrick Graham, RN, MSN, ANP-BC, Advanced Practice Provider and Advanced Practice Nurse, Northwestern Medicine, Chicago, IL.

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Correspondence: Patrick Graham, RN, MSN, ANP-BC, Northwestern Medicine, 259 E. Erie, Ste 1300, Chicago, IL 60611 (graham.pw@gmail.com).

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Figure 1. Clinic photograph—Note asymmetry of the left shoulder acromioclavicular joint.

higher grade injury, or concomitant shoulder pathology, if pain is not adequately controlled with these measures. Some patients may require a sling in the initial 2–3 weeks but should be encouraged to wean it as soon as tolerated. Early mobilization has proven to be a primary indicator in recovery and return to sport. Coordination with physical therapy is paramount in achieving optimal outcomes for those who wish to return to higher level of activities such as sports, most notably in the overhead athlete (Frank et al., 2019; Kennedy et al., 2019; Koehler, 2018; Pallis et al., 2012; Willimon et al., 2011; Wylie et al., 2018).

Discussion

Acromioclavicular separation should top the list of differential diagnoses in any patient presenting with a direct trauma to the shoulder, with associated physical examination findings as noted previously. Radiographs are sufficient for diagnosis and treatment of low-grade injuries, which are more common. The patient should be counseled on the expectations of therapy and timeline to return to sport, which varies with grade of injury but is usually around 4–6 weeks. The timeline is longer with a higher grade injury and in those who play overhead sports (basketball, tennis, volleyball, etc.). Strength training should be approached in a gradual fashion as to avoid re-aggravation (Frank et al., 2019; Kennedy et al., 2019; Koehler, 2018; Pallis et al., 2012; Willimon et al., 2011; Wylie et al., 2018).

Although there is discussion on the utilization of ultrasonography for further diagnosis of higher grade

Figure 2. Radiographs—anteroposterior, Grashey, and Y-views of the left shoulder. Note widening of the acromioclavicular joint with superior displacement of the clavicle.

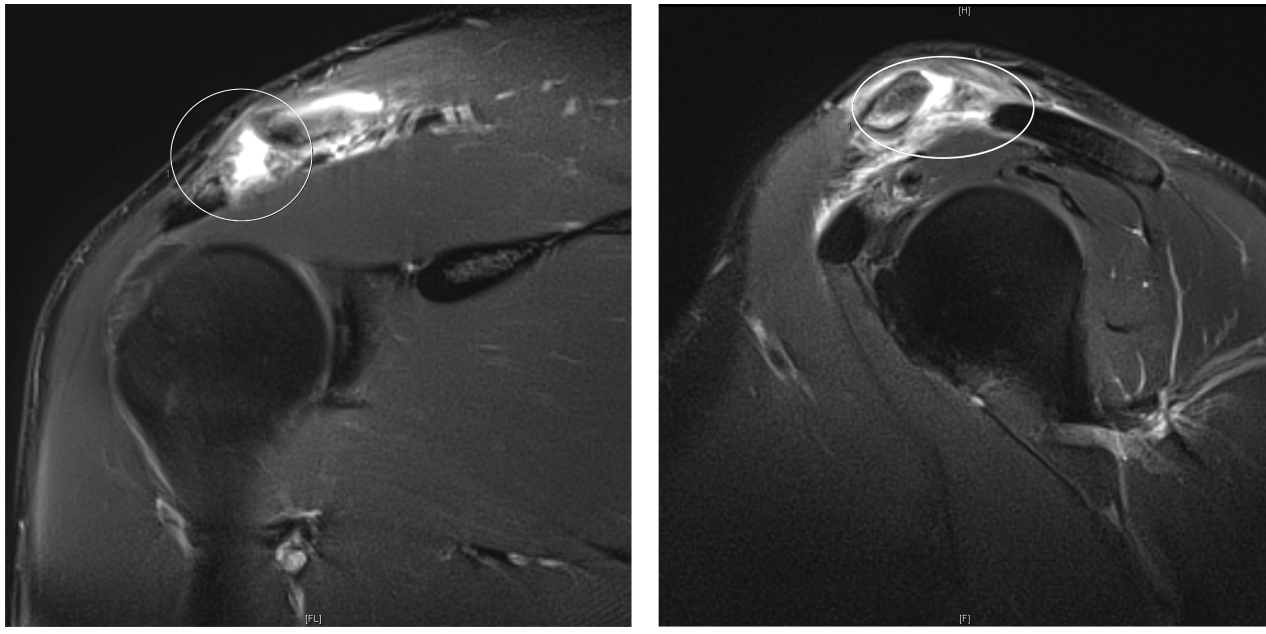

Figure 3. Magnetic resonance imaging—Coronal and sagittal T2-weighted images with fat suppression. Ellipse denotes acromioclavicular separation. There is complete disruption of the acromioclavicular ligament and coracoclavicular ligaments with surrounding edema (bright signal).

injuries, this is dependent on the proficiency of the ultrasonographer and their ability to reliably note abnormality with dynamic testing. Given this inherent variability, it is this author's recommendation that magnetic resonance images should be obtained if there is suspicion for a higher grade injury. When found, these patients should be promptly referred to a sports medicine or orthopaedic shoulder specialist for discussion of definitive management (Frank et al., 2019; Kennedy et al., 2019; Koehler, 2018; Pallis et al., 2012; Willimon et al., 2011; Wylie et al., 2018).

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