

## CASE REPORT: CONCURRENT ANTERIOR SHOULDER DISLOCATION AND ROTATOR CUFF TEAR IN A YOUNG ATHLETE

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Shoulder dislocation is a common consequence of athletic activity in the younger population, occurring in up to 7% of this population.<sup>1</sup> Bankart and Hill-Sachs lesions, where the glenoid fractures or impales the posterolateral humeral head, are frequently seen when the dislocation is anterior.<sup>1</sup> Dislocation, more common in males, has not been associated with rotator cuff tears in the younger population.<sup>2</sup> However, rotator cuff tears are often seen in shoulder dislocations in patients older than 35 years.<sup>2</sup> We present a young athlete with a rotator cuff tear that occurred concurrent with a shoulder dislocation and Bankart lesion. The purpose of this case is to emphasize the need to look for rotator cuff tears when evaluating shoulder dislocations in this population and to detail the management plan that successfully returned him to action.

An 18 year old football player presented to our clinic five days following an initial left anterior shoulder dislocation. He was recovering a fumbled ball when he was struck by two other players and felt his left shoulder dislocate. When on the field reduction was unsuccessful, he was taken to the local ER where reduction was performed under conscious sedation. He noted persistent numbness and tingling in his left hand and over his left deltoid, as well as a significant amount of pain after the reduction. However, at presentation to our clinic 7 days later he was experiencing only occasional paresthesias in the left ring and little finger.

Exam revealed a muscular 315 pound, eighteen year old collegiate football player with minimal left shoulder swelling. His range of motion on the left was significantly decreased, particularly to abduction and external rotation. His supraspinatus was also weak and very painful to strength testing but both anterior and posterior portions of the deltoid were intact. Neurovascular exam revealed no deficits. His shoulder was protected in a sling and he performed limited pendulum exercises for the first six weeks. Preliminary x-rays showed an anterior shoulder dislocation without bony Bankart lesion. An MRI was done to evaluate the patient's rotator cuff and glenoid which showed an anterior labral tear, a supraspinatus tendon tear, and a possible posterior labral tear (Figure 1).



Figure 1A. Axial view of the right shoulder arthrogram-MRI displaying an anterior labral tear. Also noted is the subscapularis tendon traversing anterior to the glenoid and inserting onto the humerus.



Figure 1B. Coronal view of the same shoulder demonstrating a complete tear in the supraspinatus tendon. At the time of surgery, this proved to be a 2 cm tear in the central portion of the tendon leaving the anterior and posterior borders intact.

Exam under general anesthesia revealed no shoulder instability, but some crepitus with range of motion. Arthroscopic evaluation showed an extensive detachment of the anterior labrum and a 2 cm full thickness supraspinatus rotator cuff tear, but no evidence of a posterior labral tear or Hill-Sachs lesion. No SLAP lesion was identified. The labral tear was repaired arthroscopically followed by mini-open rotator cuff repair.

Postoperatively, the patient did well with no complications. By the time of the initial follow-up examination there had been an obvious reduction in the level of shoulder pain. His range of motion continued to improve without apprehension but his shoulder girdle muscles did undergo noticeable atrophy. At 12 weeks, the patient progressed through physical therapy from passive to active exercises. At seven months post-op, the patient was back to full strength with a full range of motion except for a mild decrease in external rotation and some residual weakness without pain in his supraspinatus. This continued over the following three months despite an off-season rehabilitation program. The patient was then started on an aggressive PT program for supraspinatus strengthening. At one year post-op, the patient showed no instability, 90-95% supraspinatus strength, full range of motion, and no pain. He was released to resume football practice with a shoulder brace. He completed the entire season with any problems.

## DISCUSSION

A case concerning a young athletic patient with an anterior shoulder dislocation and concurrent rotator cuff tear has not been reported in the English literature to our knowledge. While this dual lesion is common in older individuals, possibly due to the weakening of posterior structures in this population, younger patients, particularly athletes, have stronger posterior shoulder structures and are thus less prone to a rotator cuff tear when a shoulder dislocation is sustained.<sup>1</sup>

Three recent studies have examined shoulder dislocations in young patients. Taylor and Arciero have reported a series of anterior shoulder dislocations in patients less than 24 years old at the United States Naval Academy. Of the 63 patients managed arthroscopically, 97% had evidence of a Bankart lesion, but no rotator cuff tears were found.<sup>3</sup> Norlin's series of 24 initial anterior shoulder dislocations did not identify any rotator cuff tears.<sup>4</sup> Finally, Baker et al reported a similar series on 45 young patients. This study found a 12% incidence of rotator cuff tears with acute anterior shoulder dislocations. However, this study failed to detail the presentation, post surgical management or outcome of any of these patients.<sup>5</sup>

The data in the older population is strikingly different, where rotator cuff tears commonly occur in conjunction with anterior shoulder dislocation. The current literature reports incidences ranging from 35% to 86% in patients over 40 years old.<sup>2</sup> For instance, Penvy et al reported a series of 52 initial dislocations in patients older than age 40 and found that 18 (35%) had concurrent rotator cuff tears.<sup>6</sup> Toolanen et al reported the same incidence using ultrasound as the diagnostic test.<sup>7</sup> Neviasser et al used arthrograms to find an 86% incidence of rotator cuff tears in first-time anterior dislocators over the age of forty.<sup>8</sup> Finally, Ribbans et al found an intermediate incidence of 61% in an older population.<sup>9</sup>

Magnetic resonance imaging and arthroscopy were used to confirm diagnosis in this case. When diagnosing suspected anterior dislocations of the shoulder, plain films are the confirmatory diagnostic test of choice. Anteroposterior, lateral scapular, and axillary views are usually sufficient to diagnose anterior dislocations. CT scan may be used to better identify bony lesions.<sup>1</sup> However, Iannotti et al have shown MRI to be both sensitive and specific for diagnosing labral tears, making it an attractive option when a concurrent rotator cuff tear is suspected.<sup>10</sup> Further, because MRI may not differentiate between partial and full-thickness rotator cuff tears, arthroscopy is suitable for subsequent diagnostic inquiry.<sup>11</sup> Thus, both methods were used in making this unusual diagnosis.

Because of the size of the patient and the nature of the combined injury, an extensive incision would have been necessary for repair of both lesions on an open basis. Therefore, we elected to perform arthroscopic repair of this patient's Bankart lesion and mini-open rotator cuff repair in hopes of minimizing the tissue damage and maximizing the chance of regaining full motion. It has been previously shown that conservative management of shoulder dislocations in young athletes results in a poor outcome with very high recurrence rates; most require surgery to return to activity.<sup>1</sup> Further, Gumina and Postacchini have shown that surgery is superior to conservative management for dislocations and rotator cuff tears in patients over forty.<sup>12</sup> Considerable controversy still exists in the literature regarding open versus arthroscopic management for traumatic anterior shoulder instability.<sup>13</sup> Upon review of five series, Cole and Warner concluded that open stabilization of the anterior shoulder is superior to arthroscopic management when recurrence rates are the outcome of primary interest.<sup>12</sup> However, Arciero et al<sup>4</sup> and Uribe and Hechtman<sup>15</sup> reported excellent results in active, young, West Point Cadets who were first-time traumatic dislocators where arthroscopy was performed early.

Following repair of this patient's Bankart lesion, a mini-open, or arthroscopically assisted, repair was performed. Though conservative treatment for rotator cuff tears is often attempted first, particularly in older patients, young and athletic patients are indicated for early operative intervention.<sup>1</sup> Further, most series report superior results with rotator cuff repair as compared with arthroscopic debridement.<sup>11</sup> The mini-open technique has become well-accepted for small and medium-sized full-thickness rotator cuff tears, particularly of the supraspinatus as in this case. It has achieved results that compare favorably to those of the traditional open procedure. For instance, Levy et al reported all patients managed with mini-open repair achieved satisfactory outcomes with 80% of those being good or excellent.<sup>16</sup> Weber and Schaefer subsequently conducted a retrospective trial comparing the mini-open and traditional open methods. There was no significant difference in outcomes between the two groups but the mini-open group suffered significantly less peri-operative morbidity.<sup>17</sup> Baker and Liu conducted a similar trial. The open repair group achieved 80% good or excellent results and 88% satisfaction. Comparatively, the mini-open group achieved 85% good or excellent results and 92% satisfaction.<sup>18</sup> Thus, when comparing mini-open and traditional open methods of rotator cuff repair, it appears that outcomes do not significantly differ. However, the advantages of mini-open repair, which include preservation of the deltoid origin, lower peri-operative morbidity, enhanced cosmesis, shortened rehabilitation, and arthroscopic evaluation of the glenohumeral joint for additional pathology, make it an overall superior method.<sup>19</sup> Finally, though fully arthroscopic rotator cuff repair is promising, studies comparing this method to mini-open repair are not yet available, making the mini-open technique the preferred procedure for rotator cuff repair in this young, high demand athlete.

In conclusion, we present the case of a traumatic anterior shoulder dislocation with Bankart lesion and concurrent rotator cuff tear in a young patient. The relatively unique nature of this case derives from the patient's young age and status as a competitive athlete. Thus, rotator cuff tears are not an exclusive complication of anterior shoulder dislocations in the older population. Indeed, rotator cuff tear should not be excluded based solely on the patient's age. Instead, careful clinical evaluation is needed to avoid neglecting this associated injury. The significant finding that should raise the examiner's index of suspicion for coexistence of a rotator cuff tear is persisting severe pain after reduction of the dislocation. While the results were excellent, no treatment recommendations can be made based on this single case. Finally, it is of note that the twelve month period to full recovery and return to competition was limited by healing of the rotator cuff tear.

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