



Anterior shoulder capsular tears in professional baseball players

Lawrence V. Gulotta, MD*, Daniel Lobatto, MD, Demetris Delos, MD, Struan H. Coleman, MD, PhD, David W. Altchek, MD

Sports Medicine and Shoulder Service, Hospital for Special Surgery, New York, NY, USA

Background: Tearing of the anterior capsule of the shoulder is a rare but debilitating injury for throwing athletes. However, there is very little in the literature to guide its diagnosis and treatment. In this case series, we outline our experience with anterior capsular tears of the shoulder in professional baseball players.

Methods: Five professional baseball players were diagnosed with midsubstance tears of their anterior capsule. A trial of rest and rehabilitation failed in all patients, and they eventually underwent surgery. These patients were retrospectively reviewed. The presenting symptoms and findings were documented, and outcomes were assessed by the player's ability to return to play.

Results: The mean age was 33.5 years (range, 31-37 years), and all patients presented with anterior shoulder pain and the inability to throw. No patient had an acute traumatic injury. Magnetic resonance imaging provided the correct diagnosis in 4 patients, and the diagnosis was made with diagnostic arthroscopy in the fifth. Three underwent arthroscopic repair, and 2 underwent open repair of the anterior capsule. Of the 5 players, 4 (80%) returned to their preinjury level by a mean of 13.3 months (range, 8-18 months).

Conclusions: Anterior capsular tears can occur in older throwing athletes. Surgical repair, whether arthroscopic or open, can yield good results in most patients.

Level of evidence: Level IV, Case Series, Treatment Study.

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Keywords: Throwing athletes; baseball; shoulder; shoulder capsule

Anterior capsular lesions of the shoulder are often associated with traumatic glenohumeral instability episodes. However, repetitive microtrauma of the shoulder without frank dislocation can also lead to capsular attenuation or discrete capsular tears. This entity is poorly understood and not well characterized. Case reports have described lesions of the anterior capsule in the absence of frank instability in

overhead athletes.^{6,10} However, they have never been described in a series of baseball players.

Midsubstance tears of the anterior capsule without discrete instability have been observed by the senior author (D.W.A.) in a subset of professional throwing athletes. These athletes tend to be older overhead throwers. They had no history of a discrete instability episode, yet nonetheless they reported shoulder pain and apprehension in the throwing position that resulted in decreased throwing ability and overall performance.

This case series is the first, to our knowledge, to report on midsubstance glenohumeral capsular tears in professional baseball players. In this case series, we report on the outcomes of 5 professional athletes and hope that by

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*Reprint requests: Lawrence V. Gulotta, MD, Sports Medicine and Shoulder Service, Hospital for Special Surgery, 535 E 70th St, New York, NY 10021, USA.

E-mail address: GulottaL@hss.edu (L.V. Gulotta).

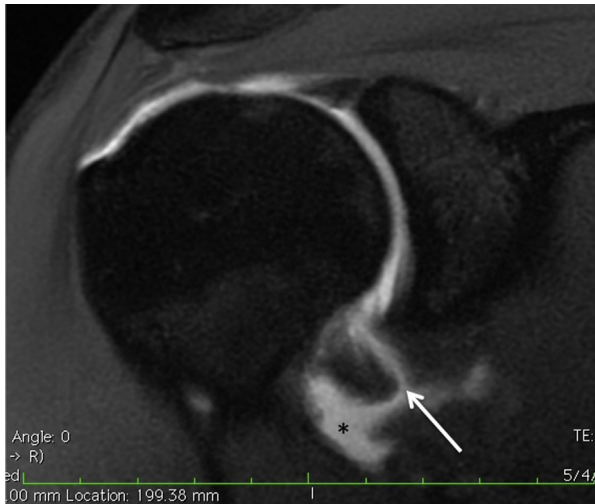


Figure 1 Coronal T2-weighted magnetic resonance arthrogram showing anterior capsular tear (*arrow*) with extracapsular leakage of contrast (*asterisk*).

presenting our experience we can increase awareness of this clinical phenomenon and enhance decision making.

Methods

This study is Health Insurance Portability and Accountability Act compliant.

Patients

We retrospectively reviewed the database of the senior author (D.W.A.) inclusive of the years 1995-2012 seeking the charts and records of patients who were diagnosed with isolated mid-substance anterior capsular tears. Five professional baseball players were identified who fulfilled the criteria. All reported anterior shoulder pain and the inability to maintain velocity in their pitches (ie, “dead arm”). Additional inclusion criteria were as follows: a minimum of 1 year of postoperative follow-up and no documented history of prior glenohumeral dislocation or subluxation event. Because this was a retrospective review, patient consent was not needed for inclusion in this study.

Preoperative evaluation

All patients were evaluated preoperatively by the senior author (D.W.A.). Shoulder range of motion (ROM) and strength were recorded. Provocative maneuvers for instability testing, including load-and-shift tests, apprehension-relocation tests, and tests for laxity such as the sulcus test were performed and recorded. All patients underwent preoperative magnetic resonance imaging (MRI) of the affected shoulder before surgery (Figs. 1 and 2). All players were initially treated with a trial of rest and rehabilitation. This consisted of at least a 6-week period of not throwing. During that time, the shoulder was rehabilitated with a concentration on restoration of internal rotation, rotator cuff strengthening, and periscapular muscle strengthening and coordination. Before attempting to return to competition, all patients went through an interval throwing program. However, none of them were able to

return to their previous level of performance after nonoperative treatment, and all elected to undergo surgical repair.

Examination under anesthesia

All patients underwent thorough shoulder examination under anesthesia in the operating room before the surgical procedure. The load-and-shift test was performed with the patient in the supine position with the shoulder abducted to 90° to evaluate for shoulder laxity. Grading was recorded according to the classification of Altchek et al.¹

Operative technique

Open repair

Open repair of the capsular tear was performed for lesions that were determined to be difficult to access by arthroscopic means (2 of 5 patients, 40%). This was the case for tears that were laterally based. Once diagnostic arthroscopy was completed and the decision was made to proceed with open repair, a standard deltopectoral approach to the shoulder was used to gain access to the joint. The subscapularis was split longitudinally in line with its fibers. If necessary, a portion of the inferior subscapularis tendon was taken down off its insertion on the lesser tuberosity to gain access to the inferior capsule. This was performed in 1 patient. The capsular tear was identified, and the capsular edges were repaired in side-to-side fashion with suture. Plication was not performed so as to minimize the risk of over-constraining the shoulder.

Arthroscopic repair

Most of the lesions were repaired arthroscopically (3 of 5 patients, 60%). Diagnostic arthroscopy was carried out initially, and the extent of the tear was determined. An anterior portal through the rotator interval and an accessory anterolateral portal were used. Repair was carried out in side-to-side fashion through mattress suture repair (1 patient) or with suture anchors in the glenoid for medially based tears (2 patients) (Figs. 3 and 4).

Postoperative management

All patients were placed in a shoulder immobilizer for 3 weeks with immediate elbow ROM. During this time, patient-directed passive elevation in the plane of the scapula was allowed, and scapular isometrics were initiated. At 4 weeks, patients were enrolled in a formal physical therapy program and weaned off of the immobilizer. Between 4 and 8 weeks, concentration was placed on restoration of full active-assisted shoulder motion. Light rotator cuff and periscapular strengthening exercises were also started. Between weeks 8 and 16, more aggressive strengthening started. Patients and their therapists were allowed to begin passive stretching if contractures remained. Shoulder plyometrics were also begun during this phase. At 16 weeks, if motion and strength were symmetric with the contralateral side, then an interval throwing program was started. This program was designed to progress over a period of 7 months.

Postoperative evaluation

All patients were evaluated postoperatively by the senior author (D.W.A.). Shoulder ROM and shoulder strength were recorded.

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