

Abstract

Objective: To review the mechanism, surgical procedures, and rehabilitation techniques used with an athlete suffering from chronic anterior glenohumeral instability and glenoid labral tear.

Background: The patient is a 21 year old football player (body mass=200 lb; height=71 in), defensive back, with bilateral anterior glenohumeral instability.

Differential Diagnosis: The physician identified right shoulder derangement, right shoulder anterior labral tear, right shoulder anterior instability upon physical examination.

Treatment: Surgical intervention included a right shoulder arthroscopy with labral repair, a capsulorrhaphy, and a subacromial bursectomy. Rehabilitation goals included decreasing pain and inflammation, increasing strength, proprioception and stability, as well as maintaining cardiovascular fitness.

Uniqueness: Bankart Lesion was identified and repaired during arthroscopy that was not originally detected by magnetic resonance imaging (MRI).

Conclusions: Surgical procedure and rehabilitation protocols were successful resulting in increased glenohumeral stability and prompt return to play.

Key Words: Labral tear, Capsulorrhaphy, Joint Capsule, Bankart Lesion, Anterior/Posterior Apprehension Tests

A 21 year old defensive free safety (body mass=200 lb; height= 71 in) participating in Division I-A football reports the athletic training room complaining of reoccurring right shoulder dislocations, resulting in chronic instability and chronic, diffuse shoulder pain. He reported two dislocations in his right shoulder, both of which occurred during football practice in his second year of participation.

History of Present Complaint

The athlete had a capsulorrhaphy of his left shoulder in the summer of 2002. He was 16 years of age when he received his first operation. At this time he reported similar complaints: instability and anterior shoulder pain. He reported multiple dislocations in the case of his left shoulder, but could not report a definitive number. He dislocated his right shoulder twice before being referred to a physician for further treatment.

Result of Physical Examination

Although the patient was experiencing symptoms prior to the initial evaluation by a physician, he was treated symptomatically in the athletic training room. Due to the patient's past history with shoulder dislocations, the observation of a pathology was overlooked until the athlete was seen by the doctor following an incident at football practice on April 14, 2007. The physical examination revealed positive Anterior Apprehension and Relocation tests, negative Posterior Apprehension, full range of motion and full strength. The apprehension and relocation tests are typically indicative of shoulder instability¹. The physician immediately suspected a labral tear, although special tests for labral pathologies were not documented in the medical referral form. The patient was referred for magnetic resonance imaging (MRI), which confirmed the presence of an anterior labral tear.

Medical History

Aside from the bilateral shoulder instability that the patient has experienced through most of his athletic career, the patient has few other medical situations that are worth attention. His family does have a history of Diabetes, he is allergic to Codine, and he has a history of concussion.

Diagnosis

Again, the athlete was not given a differential diagnosis by a Certified Athletic Trainer (ATC[®]), but was immediately referred by a physician for further diagnostic testing after the physical examination suspected a labral tear. Diagnosis of the labral tear was confirmed by MRI, as well as significant anterior glenohumeral joint instability.

Treatment and Rehabilitation Protocol

The postoperative diagnosis, as written in the Operative Report by the physician, was anterior and inferior glenohumeral instability. The presence of loose bodies in the joint and the discovery of the Bankart Lesion were also noted. The surgery included an arthroscopic labral repair, capsulorrhaphy (Laser Assisted Capsular Shift), synovectomy, removal of osteochondral loose bodies within the joint, and subacromial bursectomy. The Laser Assisted Capsular Shift (LACS) was used to tighten the capsule and eliminate multidirectional instability². This procedure is a thermal capsulorrhaphy technique that utilizes a laser to raise the temperature in collagen fibers, causing them to denature and

shorten. As for his Bankart Lesion, a debridement was performed to shave down the frayed labrum, and this procedure requires only symptomatic healing time³. Figure 1 shows an example of a Bankart Lesion on an MRI⁴.

The patient began his rehabilitation protocol within 48 hours of the surgery. Research on the LACS procedure and its corresponding rehabilitation protocol suggest that postoperatively, the patient should progress at their own pace and within their own limitations². The athlete's protocol began with simple passive ROM exercises with the assistance of an ATC[®], and progressed through active and resistive ROM. Passive ROM consisted of forward flexion, abduction, and internal/external rotation. In week two of the patient's protocol, these PROM exercises were limited to 70° of forward flexion and abduction, and 20° of internal/external rotation. Progress was not monitored via goniometry, but rather visually compared bilaterally. Wrist and elbow active ROM was also incorporated at this time. Isometric strengthening exercises were incorporated on day 2, and included forward flexion, extension, and abduction.

In Week 3, external rotation was added to the patient's isometric exercises. Wrist and elbow isotonic exercises were incorporated during Week 3, as well as shoulder shrugs to begin strengthening the upper trapezius. During Week 5, shoulder joint mobilization exercises were incorporated to further increase flexibility. Anterior/posterior glides were performed, as well as traction techniques. The athlete was also able to warm up on the Upper Body Ergometer (UBE) starting at Week 5. During Week 5, the patient began performing forward flexion and abduction with a 2 lb weight, as well as internal/external rotation with a Theraband[™]. Isokinetic exercises on the HUMAC[®] machine were also incorporated with the patient during Week 5. The goal for isokinetic exercises was to increase flexibility, and also to determine any strength imbalances that needed to be corrected.

The ATC[®] utilized modalities to aid in the healing process of the patient's repair. The Rest/Ice/Compression/Elevation (RICE) technique was utilized immediately post-operative to reduce pain and swelling. Once swelling was controlled, thermotherapy was introduced to increase metabolism to the area and help with pain control. The patient began utilizing hydroculator packs at the beginning of Week 3. At the start of each session, the patient would place a pack on his shoulder for 5-10 minutes to warm up the area. Electrical stimulation was used for both muscle re-education and pain control. Finally, milk massage techniques were used to reduce edema, and also cross friction massage was utilized to reduce scar tissue formation.

The patient progressed to proprioception training once an increase in strength and flexibility had been established. Elbow proprioceptive neurological facilitation (PNF) techniques were incorporated during Week 2. In week 5 the ATC[®] incorporated rhythmic stabilization with the patient standing and holding a light dumbbell. PNF techniques for the shoulder were incorporated during Week 6. Lastly, weight bearing stabilization techniques were accomplished by the athlete incorporating ball push ups in Week 5. These proprioception exercises were introduced to strengthen the patient's joint awareness and increase his ability to know where his upper extremities are in space.

Throughout the rehabilitation protocol, the athlete maintained cardiovascular fitness with the stationary bike was utilized. Eventually he was able to participate in the same conditioning exercises with the team, which included running, agility and plyometric exercise. He also managed to maintain his core and lower body strength by

attending team weight lifting in the gym and completing weight lifting protocols that did not aggravate his shoulder.

Typically, a LACS, or capsulorrhaphy, procedure results in an 11-week recovery period². In this case, the patient returned to participation in 8 weeks, three weeks earlier than suggested research⁵.

Criteria for Return to Play

The ATC[®] discussed specific goals with the athlete prior to the beginning of his rehabilitation protocol. The main goals that were discussed included full strength, as well as ROM, as compared bilaterally. Range of motion was visually compared, as previously mentioned, and strength imbalances were noted and corrected with the HUMAC[®] machine before the patient was returned to full participation. Also, the ability to perform sports specific activities free of pain was a major goal for this patient's release to full competition.

Deviations for Expectations

The Bankart Lesion revealed during surgical intervention deviated from the expected surgical procedure and rehabilitation. The lesion was found during the arthroscopy, and corrected by using an arthroscopic shaving device to remove the lesion and increase joint contingency. Also during surgery the physician identified the presence of bone fragments. The diagnosis was also corrected from exclusively anterior instability, to anterior and inferior instability (both of which were corrected with the capsulorrhaphy).

Summary

The patient involved in this case study suffered from chronic anterior shoulder instability and pain. MRI revealed a labral tear, and the patient underwent surgery to repair the torn labrum and to increase the strength and stability of his joint capsule. His rehabilitation protocol focused, initially, on decreasing pain and edema, and ultimately focused on a prompt return to play for the athlete. Increasing his flexibility, strength, and proprioception, as well as maintaining his cardiovascular endurance and lower body strength were all goals for his rehabilitation program. Rehabilitation for this athlete progressed as planned, and the athlete was able to return to full participation in less time than expected.

References

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Figures: