Shoulder Rehab exercises for a Volleyball player suffering a SLAP tear

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Abstract

Introduction

A SLAP tear can occur through many different ways. It can occur from an acute trauma where the head of the humerus gets shifted quickly and creates a tearing of the labrum to the bicep tendon or from repetitive overuse of the bicep muscle. A SLAP tear can also occur from repetitive overuse activity. The mechanics of an overhead throw or overuse is what causes for the head of the humerus to grind on the labrum which can cause the labrum to tear. These types of tears are grouped into four categories. A type 1 SLAP tear involves the fraying of the top of the labrum but the labrum is still attached to the glenoid fossa. This is the most common of the four characterizations of SLAP tears. A type 2 tear is characterized by labral and bicep tendon detachment from the glenoid fossa, which is why a SLAP tear can lead to injuries related to the bicep muscle group. A type 3 tear is known as a bucket-handle tear, Yergason’s test due to pain and popping sensation. Having the athlete perform the O’Brien test, forced the head of the humerus to a full adduction and resisted internal rotation for a period of time. This test performed was positive due to pain and the inability to perform fully. Compression rotation test was performed while the patient lied supine on the table while the examiner placed her shoulder at abduction and elbow flexion to 90 degrees. The examiner would then provide an axial load to the elbow while taking the shoulder to a passive internal and external rotation movement and resulted in a positive sign because of pain at the anterior aspect of the biceps brachii. The Kasegawa test was the last-special test performed that also resulted in a positive sign. This test provided more information on the condition of the biceps tendon in which attached to the bicep labrum.

Radiographic Findings: The team physician performed initial x-rays. These x-rays were taken to show any bone deformities and widening of the GH joint in an open packed position. The x-rays did not show any obvious deformities within the GH joint. The results of the MRI however showed that the athlete received a complete grade I SLAP tear.

Clinical Examination: During physical examination, swelling and tenderness during palpation was inspected. Pain was diffuse, located at the posterior and other similar locations. Various tests used to evaluate SLAP tears included O’Brien, compression rotation, and Yergason’s tests. None of these tests were accurately diagnostic, but the reliability was found to be high towards the conclusion of a SLAP tear. The results of the MRI however confirmed, contrary to the athlete that the lesion was a grade I SLAP tear on her right shoulder. Grade I is not the always most common grade in which involves the fraying of the top of the labrum but the labrum is still attached to the glenoid fossa. This grade I SLAP tear was the choice of surgical procedure was given to the athlete. The athlete resorted to non-surgical rehabilitation, and began treatment immediately.

Case Report

Patient: This junior college volleyball player is a 20-year-old female athlete that suffered a grade 1 SLAP tear during her preseason training. The following information will explain the mechanism of injury, diagnostic tests and treatments and return to play to provide additional information to this athlete’s unique injury.

Mechanism: Familiar (2019) states, “SLAP tears are more commonly created when the shoulder is forward flexed compared with when it is in an extended position.” Their study showed that the superior labrum is detached from the glenoid fossa resulting in a late cocking phase than in the early deceleration phase. Overhead athletes are more prone to these types of injuries than any other athletes. For this specific injury, it was due to a traumatic condition.

Discussion: A SLAP tear can occur through many different ways. It can occur from an acute trauma where the head of the humerus gets shifted quickly and creates a tearing of the labrum to the bicep tendon or from repetitive overuse of the bicep muscle. A SLAP tear can also occur from repetitive overuse activity. The mechanics of an overhead throw or overuse is what causes for the head of the humerus to grind on the labrum which can cause the labrum to tear. These types of tears are grouped into four categories. A type 1 SLAP tear involves the fraying of the top of the labrum but the labrum is still attached to the glenoid fossa. This is the most common of the four characterizations of SLAP tears. A type 2 tear is characterized by labral and bicep tendon detachment from the glenoid fossa, which is why a SLAP tear can lead to injuries related to the bicep muscle group. A type 3 tear is known as a bucket-handle tear, Yergason’s test due to pain and popping sensation. Having the athlete perform the O’Brien test, forced the head of the humerus to a full adduction and resisted internal rotation for a period of time. This test performed was positive due to pain and the inability to perform fully. Compression rotation test was performed while the patient lied supine on the table while the examiner placed her shoulder at abduction and elbow flexion to 90 degrees. The examiner would then provide an axial load to the elbow while taking the shoulder to a passive internal and external rotation movement and resulted in a positive sign because of pain at the anterior aspect of the biceps brachii. The Kasegawa test was the last-special test performed that also resulted in a positive sign. This test provided more information on the condition of the biceps tendon in which attached to the bicep labrum.

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Rehabilitation and Results

Following the decision of surgical repair of the injured shoulder, conservative treatment is usually recommended for athletes with a grade 1 SLAP tear. With this patient, the sports medicine staff devised a rehabilitation protocol in which the athlete was to follow for 4 weeks. The protocol was designed with three phases with particular criteria is for the athlete to progress to the next phase. Phase I criteria consisted of diminishing pain and inflammation, restoring range of motion, maintaining muscular strength and flexibility of involved and uninvolved muscle groups. In order to reduce inflammation the use of modalities such as electrical stimulation under the IFC settings was used for treatment. We also told our athlete that she could take anti-inflammatory drugs until inflammation decreased. In order for the athlete to progress to phase II, minimal pain, and range of motion limitations must be normalized. Phase II goals were to restore postural deficits found in our evaluation. This was done using soft tissue massage along postural muscle groups, trapezius, and teres minor. We also introduced scapular activation to help restore proper scapular activation. Criteria to progress to phase III was being able to restore her postural deficits with proper scapular activation. Throughout this time, the athlete was fully out of practice and only undergoing rehab in the ATR. Phase III goals consisted of strengthening the muscles found weak such as serratus, rhomboids, and the rotator cuff muscle groups (RTC). During this phase, the athlete was introduced to the thrower’s ten strength program. This helped with strengthening the muscles found to be weak while properly activating her scapula. We also introduced stabilization exercises to better target her RTC muscles. Each of these exercises were done in different days with some sort of recovery modality used afterwards. Towards the end of the second week and beginning of the third, the athlete was back practicing with her team but with limited time. Her service were limited to 15 serves a practice and only setting and no swings. By the fourth week, the athlete was able to increase her serves to 20 serves a session and started to do 10-15 swings as well. After the fourth week, the athlete was fully recovered and as able to return to full practice with her teammates. Thromboc mobility was introduced as an activation exercise to better prevent any other complications.

Discussion and Summary

A type 1 SLAP tear involves the fraying of the top of the labrum but the labrum is still attached to the glenoid fossa is not mainly common if not captured on time. A grade 2 SLAP tear is the most common based on mechanism of injury. These must occur mainly with overhead athletes such as baseball players, volleyball players, and even quarterbacks in a football team. Blackburn mentions that there is not a specific protocol for patients who have varying types of shoulder instability or labral injuries. He does mention that some research supports a progressive ROM and strengthening rehabilitation program. It is important that we combine the basic science of healing with the biomechanics for each type of surgical procedure to begin a rehabilitation program that will not worsen the subluxation line. The mechanism of injury may be created in a different manner, but similarly consists of conspicious external rotation with adduction. Physical examinations that include proper palpitations, special tests, and clinical findings are imperative in a correct diagnosis. Once a diagnosis is hypothesized, radiographic findings maybe necessary for some patients depending on severity and confidence of the diagnosed injury. Conservative treatment is followed and created with a rehabilitation protocol from the sports medicine staff.

This injury process was accurately assessed similarly during the injury of the junior college volleyball player. The uniqueness of this athlete was the fraying of the top of the labrum but the labrum is still attached to the glenoid fossa that did not result in surgical procedures due to the athlete being a junior college athlete. The athlete followed the assigned rehabilitation protocol from the sports medicine staff where the time lost resulted in only 4 weeks. Injuries to the shoulder can hinder any athletic populations and it is important to understand the sequence, severity, and significance associated with injury to the athlete to provide a better understanding of such a complex and diverse injury that will assist the athlete in returning in a faster time period.

References


