Posterior back/Shoulder Pain in a College Football Athlete

Andrew Geil

Faculty Advisor: Jason C. Craddock, EdD, ATC, LAT, CSCS

Florida Gulf Coast University, Department of Rehabilitation Sciences, Athletic Training Program

Abstract

Background: For this level 3 case report, a 21 y/o male D2 football wide receiver. Athlete has no prior medical history of shoulder or back injuries. Athlete reported to the athletic trainer complaining of right shoulder pain and upper back pain at the end of practice. Athlete states he heard a pop and felt a posterior dislocation when pushing off the ground getting up from being tackled. Initial evaluation revealed no deformities, abnormalities, swelling, inflammation, or signs of trauma. Athlete has point tenderness over the greater tubercle, anterior/posterior deltoid, supraspinatus, and transverse humeral ligament. Athlete has full ROM with flexion, abduction, internal/external rotation but reports pain toward end ROM for external rotation and flexion. (-) apprehension test, (+) relocation test, (+) empty can test, (-) AC distraction test, (-) Sulcus sign, (+) Hawkin's Kennedy, (+) speed's test, (-) Clunk test (-) AC sheer test. **Differential Diagnosis:** Shoulder impingement syndrome, rotator cuff tendonitis, Biceps tendonitis, instability of the capsule. **Initial Treatment:** Athlete began conservative treatment with athletic training staff. It was determined that the athlete had glenohumeral instability and possible rotator cuff strain. Symptom management in the rotator cuff and general shoulder area utilized ice and NSAIDs. Goal of treatment was to strengthen the shoulder capsule along with pain management. Ongoing therapeutic exercises that are bodyweight based were utilized to strengthen the shoulder joint along with preventing any further stress to the area of concern. Specifically, protraction and horizontal pushing exercises using a forward lean with bodyweight as resistance was used to progress the athlete back to full shoulder strength. Athlete returned to play to continue the season without further complaints or shoulder instability. **Uniqueness:** The number of football related shoulder injuries every year is significantly high. Some of the most common injuries occur in the form of rotator cuff pathologies, AC joint injuries, and glenohumeral instability. There is a high frequency in the amount of shoulder injuries that occur from noncontact, player to player contact, and player to surface contact. The high frequency of shoulder injuries among football athletes highlights the importance of proper management and appropriate treatment of shoulder injuries. This specific case highlights glenohumeral joint instability among football players and the immediate intervention and strengthening of the joint can prevent a worse injury or further injury to the shoulder joint. This case is unique in the respect that bodyweight based therapeutic exercises was utilized and consistent prehab exercises was used to strengthen overall shoulder stability to help prevent any further injuries from occurring in the athlete's future. **Conclusions:** This case highlights the diagnoses and treatment of an athlete suffering from glenohumeral instability and Rotator Cuff tendonapathy. This case further highlights the importance of proper intervention in athletes instead of over utilizing symptom management pieces. Proper and immediate intervention of glenohumeral instability and continued prehabilitation efforts can successfully help rehabilitate and prevent further injuries related to the shoulder joint.

Introduction

Shoulder injuries are among some of the most common injures affecting athletes in many sports. Up to 50% of National Collegiate Athletic Association (NCAA) football players have a history of shoulder injuries. The quarterback specifically has shown to have a higher prevalence. Many shoulder injuries can consist of a number of pathologies, not all require surgical or drastic intervention. However, pathologies such as shoulder impingement could lead to potential rotator cuff failure and other serious shoulder injuries. The following information will explain the mechanism of injury, clinical assessment, and plan of rehab for this athlete's shoulder injury.

Purpose

The purpose of this case report was to introduce a 21 year-old division I football athlete who sustained a shoulder injury. Even though the findings were unremarkable in terms of tendon strength, quality, and ROM, the athlete presents with an overuse injury in which the terms of intervention were insignificant. An overview of this injury is to obtain additional information and a better understanding of how overuse injury occurs what the best course of intervention is to prevent further injuries from occurring.

Anatomy

Understanding the anatomy of the shoulder in relation to rotator cuff tendonapathy of the supraspinatus tendon is essential in understanding the injury and why it occurs. The four rotator cuff muscles consist of the supraspinatus, infraspinatus, supscapualris, and teres minor. The shoulder joint is made up of four joints including the scapularthroacic joint, acromioclavicular joint, stern clavicular joint, and the glenohumeral joint. The rotator cuff works to keep the head of the humerus to the casual space within the glenoid fossa of the scapula along with external rotation and stability of the glenohumeral joint. The long head of the biceps also plays a role as the highway to the shoulder where it crosses the bicipital groove to insert in the superior portion of the labrum. The delicate balance between these 5 muscles stabilizes the humeral head and allow for motion across the coronal, sagittal, and transverse planes of motion. As one particular muscle becomes weaker or stronger the others become weaker and cause instability within the shoulder joint. The repetitive motion created from throwing a football creates overuse of the firing muscle where the tendon becomes inflamed that may be due to a change in routine or a substantial increase in activity.

Case Report

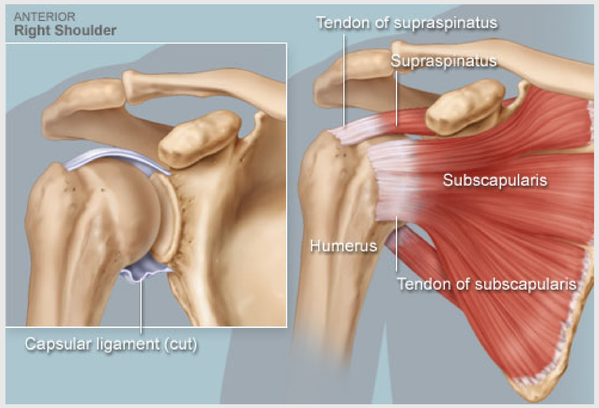
Patient: This Division I football player is a 21 year-old wide receiver with rotator cuff tendonapathy and shoulder instability. This injury was due to overuse of the rotator cuff muscles and had an insidious onset. The following information will explain the mechanism of injury, clinical findings, diagnosis, treatments, and outcomes to provide additional information to this athlete's injury.

Mechanism of Injury: Rotator cuff tendonapathy and shoulder instability can be caused from a number of imbalances and pathologies. Although contact sports have been found to have more cases of shoulder injuries, overuse injuries can occur in a variety of sports and nonathletics. Halfway through the season, the wide receiver came into the trainer rooming complaining of shoulder pain. It had become mildly worse over the course of 4 weeks. Athlete reports trauma with no previous injuries to the shoulder. He had been trying out to become a quarter back and had been throwing the ball consistently every practice. His pain is specifically located in the superior lateral aspect of the shoulder proximal the subacromial space. The supraspinatus tendon runs through this space and when inflamed can cause pain in shoulder motion and cause instability along with weakness.

Clinical Examination: Initial evaluation revealed no deformities, abnormalities, swelling, inflammation, or signs of trauma. Athlete had point tenderness over the greater tubercle, anterior/posterior deltoid, supraspinatus, and transverse humeral ligament. Athlete has painful full ROM with flexion, abduction, internal/external rotation. (-) apprehension test, (+) empty can test, (-) AC distraction test, (-) Sulcus sign, (+) Hawkin's Kennedy, (+) speed's test, (-) Clunk test (-) AC sheer test. Special tests indicate a biceps and rotator cuff pathology. Empty can tests for the supraspinatus tendon; a positive test indicates a supraspinatus pathology that can either be a complete tear or strain. Hawkin's Kennedy tests for shoulder impingement which further indicates supraspinatus as the inflammation can cause rubbing on the subacromial space. Speed's tests for biceps tendon and positive test indicates biceps pathology.

Radiographic Findings: Radiographs include left AP and axillary lateral views dated (today) revealed no acute fractures or dislocations. Osseous and soft tissue structures within normal limits. There are age appropriate amounts of glenohumeral joint arthritis with a concentric reduction. The glenoid is normal in contour. The humeral head is normal in contour. No acromial spur.

Clinical Examination: Examination revealed rotator cuff tendonapathy, shoulder instability, and biceps tendonitis due to an increase in throwing and muscle imbalance. This may be due to throwing mechanics or overuse of the rotator cuff musculature. The plan is to rehabilitate athlete using a variety of interventions. The primary rehabilitation plan will be used with Bodyweight exercises and resistance increase through mechanical disadvantage and change in degree of force.



Rehabilitation and Results

Following the decision to use bodyweight exercises rather than traditional shoulder strengthening exercises, with this patient a 3 week rehabilitation protocol was established. The protocol was designed in three phases with specific focus on mobility, scapular stabilization, and inflammation control. Phase one focused on inflammation control and mobility of the glenohumeral joint. Use of anti-inflammatory medication instead of modalities such as ultrasound and e-stimulation was used and a set of mobility exercises using a wall and light weight bands were used until athlete's mobility improved and pain decreased with the use of the anti-inflammatory medication. In order for the athlete to continue onto phase two the athlete's mobility improved and pain decreased. Phase two goals where to establish pain free Range of motion and focus on scapular stabilization, shoulder external rotation strength, and strength of the capsule. This was done through bodyweight exercises rather than traditional light weight application to build strength. Criteria for progression to phase three consisted of notable increase in shoulder stability, further decrease in pain, and advancement to intermediate bodyweight exercises. The athlete was able to complete the first two phases within the first two weeks and no set backs were noted. Athlete progressed to phase three with the goals of returning to full muscular strength, pain free, and increased shoulder stability. Athlete successfully completed all three phases with notable outcomes of accomplished goals in all three phases. The athlete continued a condensed prehabilitative protocol for the rest of the season and did not have a reoccurrence of injury and notes significantly stronger stabilization than pre-injury.

Discussion and Summary

Shoulder injuries are a common occurrence among colligate athletes. Specifically Rotator cuff pathologies such as tendonitis or tendonapathy may not be a debilitating injury but overtime can develop into an acute injury and have lasting consequences. With proper intervention and preventative care, overuse injuries can be decreased and managed. The shoulder joint is a complex mechanism that relies on multiple muscles to hold in alignment. Imbalances can occur that leads to an insidious onset of pathologies and eventually failure of the structure. Physical examinations to determine biomechanics, frequency of play, and cross structural analysis can reveal small deficits in athletes causing minor pain and discomfort during play.

The injury process was accurately assessed. The uniqueness of this athlete was multiple shoulder pathologies that could have led to failure of structures within the shoulder over the course of the season. From the initial onset to full functional return to play the athlete followed the assigned rehabilitation protocol. With the proper management and diagnosis of the injury, rehabilitation was efficient and is to be believed the best possible outcome for the athlete.

References

Alizadeh, A., Mardani-Kivi, M., Ebrahimzadeh, M. H., Rouhani, A., Hashemi, K., & Saheb-Ekhtiari, K. (2018). A Randomized Prospective Comparative Study of Four Methods of Biceps Tendonitis Treatment: Ultrasound, Low-Level Laser Ultrasound, Intra-Sheath, and Extra-Sheath Corticosteroid Guided Injection. *Shiraz E-Medical Journal,In Press*(In Press). doi:10.5812/semj.67138

Carbone, S., & Gumina, S. (2016). Rotator Cuff Biomechanics. *Rotator Cuff Tear,*45-51. doi:10.1007/978-3-319-33355-7_3

Fotiadou, A. (n.d.). Biceps tendon-Biceps tendinosis. *Radiology Intelligent Assistant.* doi:10.5832/m833-1-414-0

Humetz, L. (2016). Isokinetic rehabilitation in the chronic former instability of the shoulder: For individualized rehabilitative care. *Annals of Physical and Rehabilitation Medicine,59.* doi:10.1016/j.rehab.2016.07.351

Humetz, L. (2016). Isokinetic rehabilitation in the chronic former instability of the shoulder: For individualized rehabilitative care. *Annals of Physical and Rehabilitation Medicine,59.* doi:10.1016/j.rehab.2016.07.351

Rotator Cuff Tendinosis. (n.d.). *SpringerReference.* doi:10.1007/springerreference_109926

Sanchez-Sotelo, J. (2018). Shoulder Instability and the Labrum. *Mayo Clinic Principles of Shoulder Surgery,*171-214. doi:10.1093/med/9780190602765.003.0007

Tyson, A. (1995). REHAB TIPS: Posterior Rotator Cuff Strength: Part 2. *Strength And Conditioning Journal,17*(6), 37. doi:10.1519/1073-6840(1995)0172.3.co;2

Wellmann, M., & Habermeyer, P. (2012). Recognition and management of combined instability and rotator cuff tears. *Shoulder Instability: A Comprehensive Approach,*466-474. doi:10.1016/b978-1-4377-0922-3.00050-2