

## Abstract

**Background:** This is a clinical case study of an athlete who sustained a grade III acromioclavicular joint sprain. In this case, the athlete sustained the injury by getting hit on the lateral part of his shoulder and arm while his arm was at his side. The initial treatment was putting the athlete in a sling for three days, then going the nonoperative route by starting a progressive rehabilitation which consisted of range of motion exercises, strengthening exercises, and sport-specific activities.

**Patient:** The athlete is an 18-year-old male college football athlete who was diagnosed with a grade III acromioclavicular joint sprain. He has no prior medical history of any shoulder issues. The athlete complained that he hurt his shoulder after he got hit during a play. During the observation portion of the initial evaluation, there was an obvious deformity at the acromioclavicular joint. Athlete was point tender and did not have full active range of motion or full strength. Strength showed to be a 2/5 in all directions. Differential diagnosis includes acromioclavicular joint sprain, clavicle fracture, clavicular contusion, acromioclavicular joint Shear test (+), acromioclavicular joint distraction test (+), acromioclavicular joint Piano Key test (+), and palpation revealed no signs of a fracture.

**Intervention or Treatment:** The athlete was removed from competition and put in a sling for three days. After this initial immobilization of the affected arm, the athlete completed a rehabilitation program over the next three weeks which followed a progression of basic range of motion exercises with the goal of increasing range of motion before moving on to the next part of rehabilitation. During this phase of the rehabilitation program, the athlete used ice and electrical stimulation that was on the premod setting to treat pain. Next was the strengthening exercises, which the athlete did until he was ready to be tested for his performance during sport specific activities. After this progression through rehabilitation, he was able to return to play with no issues.

**Outcomes:** The athlete had great success following this method of rehabilitation which focused first on immobilization, basic range of motion exercises, strengthening and testing how well the athlete can perform sport specific exercises before returning to play. At the end of the rehabilitation, the athlete had full active range of motion, full strength and reported no pain.

**Uniqueness:** This case is unique because it is a grade III sprain that had no damage to any other structures. Another interesting aspect of the case is that this athlete had full strength as well as range of motion and was able to return to play after three weeks of rehabilitation. It was also interesting that he did not need any operative treatment to repair the acromioclavicular ligament.

**Conclusions:** This clinical case highlights the non-operative process this athlete followed for the diagnosis, to the initial treatment, rehabilitation exercise progression, and return to play of an athlete with a grade III acromioclavicular joint sprain, which took three weeks. The athlete in this case did not take much time to recover from this injury.

## Introduction

AC joint sprains are a common injury amongst athletes, and it is one of the most common injuries that occurs at the shoulder. It is especially common in contact sports, because the common mechanism of injury has a higher chance of occurring in those sports. In the clinical case that will be discussed in this presentation, the athlete presented with a grade III AC joint sprain. The athlete took three weeks to go through a rehabilitation program that focused on healing the damaged AC ligament and strengthening the muscles in the area to both promote healing and prevent further injury. The purpose of this poster is to discuss this clinical case and compare it to how common AC joint sprains are among athletes, the common mechanism of injury, the different treatment options and the goals based on the grade of the sprain, and talk about the suspected return to play for athletes with an AC joint sprain based on the grade of the sprain.

## Purpose

The purpose of this case report was to evaluate an 18 year-old football athlete who received a grade III AC joint sprain during competition. The athlete returned to play in three weeks after following a rehabilitation protocol. This is a unique case as the return to play was faster than expected, and this case is presented to gain more knowledge about this injury and what factors can cause athletes to experience both fast and safe return to play.

## Anatomy

AC joint, the distal clavicle and the medial facet of the acromion along with the AC ligament, costoclavicular (CC) ligament and the fibrocartilaginous disc all make the AC joint (Lee & Bedi, 2016). There is surrounding musculature that can help stabilize this joint and other tendons that cross this joint as well that could be affected during an AC joint sprain. The trapezoid ligament being one, which helps stabilize the AC joint (Lee & Bedi, 2016). Muscles that could be affected based on the grade of the injury is the deltoid and the trapezius. According to Virtanen and colleagues, in a grade V injury the origin of the deltoid and the insertion of the trapezius are torn (Virtanen et al., 2013). It is important to consider all muscles that either connect to the clavicle or crosses the clavicle, because the change in position of the clavicle could affect how the muscles work and how much laxity is noted during an evaluation. It is also important because it can have indirect effects on other muscles and joints.

## Case Report

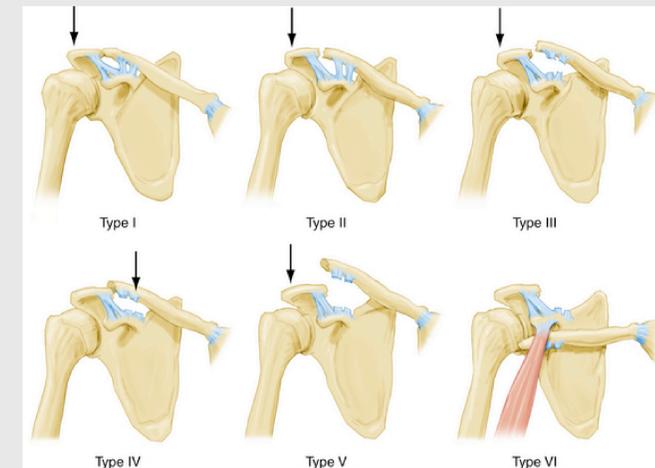
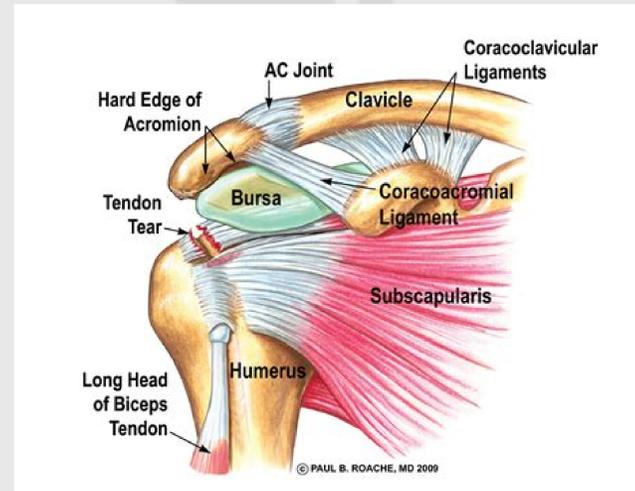
**Patient:** The athlete is an 18-year-old male college football athlete who was diagnosed with a grade III acromioclavicular joint sprain. The information provided will cover the mechanism of injury, clinical examination, imaging techniques, rehab and it's results.

**Mechanism of Injury:** AC joint sprains are common injuries both in non-contact and contact sports, making up about 12% of all shoulder injuries, and half the shoulder injuries in contact sports (Warth et al., 2013). According to Gorbaty and colleagues, the injury is most common with athletes around college age, with a total of 44% of these injuries occurring in this population (Gorbaty, Hsu & Gee, 2016). AC joint sprains mostly occur because of a force against the lateral part of the adducted shoulder (Warth et al., 2013). Along with a common mechanism of injury, there is a shared presentation of this injury among the different grades. Some of these common presentations include supporting the injured extremity at the elbow, swelling, point tenderness, limited range of motion, and some provocative tests (Warth et al., 2013). The athlete is a defensive player and went to make a tackle and hit the ball carrier with the lateral shoulder and an adducted arm.

**Clinical Examination:** The athlete was able to come off the field on his own and went straight to the Athletic Trainer because of the pain in his shoulder. During the observation portion of the initial evaluation, there was an obvious deformity at the acromioclavicular joint. Athlete was point tender during palpation over the acromioclavicular joint and did not have full active range of motion or full strength. The athlete could not recall if there was a "pop". Strength showed to be a 2/5 in all directions. Differential diagnosis at this point of the evaluation included acromioclavicular joint sprain, clavicle fracture, clavicular contusion. The special tests that were done included acromioclavicular joint Shear test (+), acromioclavicular joint distraction test (+), acromioclavicular joint Piano Key test (+), and palpations. Palpations revealed no signs of a fracture. These special tests were chosen because of the mechanism of injury. The Shear test was chosen because it tests the ability of the AC ligament to prevent anterior and posterior translation. The acromioclavicular joint distraction test was chosen to test the ligaments ability to resist distraction force. The last test that was performed was the acromioclavicular joint piano key test, which tests the ability of the ligament to prevent superior and inferior translation at the acromioclavicular joint. All of the special tests presented as positive for an AC joint sprain.

**Radiographic Findings:** Some of the imaging techniques that can be utilized in the case of a suspected fracture would be the MRI, X-ray, ultrasound, and computed tomography (CT). Since no fracture was expected, there was no imaging utilized in this case. These imaging techniques are all seen as acceptable imaging techniques to use for an AC joint injury. No imaging was needed, so a non-operative approach was used.

**Clinical Examination:** The evaluation the next day revealed the same results as the on the field evaluation. For this reason, the non-operative choice remained the method of treatment and the athlete started a return to play protocol after the immobilization phase.



## Discussion and Summary

With AC joint injuries being so common among athletes competing in both noncontact and contact sports, it is important to have an in-depth knowledge of the anatomy of the shoulder and surrounding structures, what structures could be affected during different grades of AC joint sprains, the common mechanism for this injury, the different treatment options for this injury based on the grade and the return to play for the different grades of AC joint sprains. Proper diagnosing of an AC joint injury is also important for medical professionals to diagnose to prevent the athlete from further injuries. Different grades of the injury all follow the same process of rehabilitation. This presentation has covered research covering the anatomy, a case that represents this and the rehabilitation and the return to play that should be expected for this type of injury.

After the mechanism of injury, the athlete followed that initial immobilization phase for three days with the goal of preventing further damage, as well as the range of motion and strengthening phases that help both the return to play of the athlete as well as preventing injuries in the future. The final phase, which focused on sport specific exercises, ensured that the athlete was able to meet the demands of his position at that level of football. The return to play of this clinical case was faster than what the research has said for an AC joint injury of the same grade. However, some of the grades take longer to recover based on the grade and if surgery is used. Surgery is not a good option for the early grades (I – II) and is not always necessary for a grade III, but it has shown to be beneficial for the higher grades (IV – VI) of AC joint sprains. The athlete was out for three weeks before returning to play.

## References

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