

Acute Achilles Tendon Rupture in a Collegiate Basketball Athlete

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Abstract

Background: Athlete was a 20 year-old (95 kg and 195 cm) male NCAA Division III athlete. Athlete reported with no prior medical history. Athlete was at basketball practice when he heard/felt a pop in his right calf and fell down holding his right Achilles/calf. The athlete stated that he felt like someone threw a ball at his leg. The mechanism of injury was forced plantar flexion as the athlete was trying to sprint down the floor. He felt the “pop” as soon as he lifted his right foot off the ground. An obvious gait disturbance was noted. Pain and point tenderness was felt at the proximal Achilles and a palpable deformity was also felt in this area. Abnormal ROM was noted both actively and passively for the talocrural joint. The Thompson test was performed and a possible Achilles tendon rupture was revealed. All Neurological and circulatory screening was within normal limits
Differential Diagnosis: Proximal Achilles Tendon Rupture, Gastrocnemius strain, Soleus strain. **Treatment:** The Physician evaluated the athlete and ordered an MRI. MRI revealed a rupture of the athlete’s Achilles tendon and the athlete would require surgical repair. Post-operation treatment consisted of a four-phase rehabilitation plan encompassing a total of eleven months. The first phase lasted for one week and consisted of AROM exercises. The athlete was non weight-bearing during this phase. After progression, straight leg raises and cardiovascular exercises on the stationary bike were added. The third phase, which started four weeks post-op, consisted of balance exercises and weight shifts along with theraband work. In the final phase (three months post-op), the athlete was removed from his boot and was allowed to weight bear without assistance. This phase was the longest phase and lasted until the Athlete’s return to play was initiated. No setbacks were observed during the athlete’s treatment progression. The athlete returned to play eleven months post surgical repair. **Uniqueness:** Most often, Achilles tendon ruptures do not occur in the teenage population. Most Achilles tendon ruptures are seen in older individuals who are not in elite conditioning shape. Acute Achilles tendon rupture’s can also be contributed by previous weakness or injury to the same area. This was not the case for our athlete. **Conclusions:** This case highlighted the diagnosis and treatment of an athlete suffering from an acute Achilles tendon rupture and his successful return to play eleven months after surgery. This case study is unique because of the athlete’s age. Furthermore, Achilles Tendon ruptures are not a common injury to the lower extremity. Athletic Trainers should be aware of predisposing factors that may have contributed to this unique Achilles injury in a young healthy male athlete.

Introduction

The athlete was participating in practice when this injury occurred. After allowing a lay-up on the defensive end, the athlete went to accelerate quickly up the court and immediately fell down in agonizing pain. The AT was instantly called to the gymnasium. The athlete was complaining of intense posterior calf pain at the insertion of his Achilles tendon. After being assisted off the court, a thorough assessment was conducted and the athlete was sent for imaging of his distal ankle. The MRI revealed an Achilles Tendon rupture and surgery was recommended. The case report highlights the athletes treatment and rehabilitation process for this injury.

Purpose

A specific domain of the Athletic Training field is the clinical evaluation and diagnosis of injuries. As important domain of athletic training is the treatment and rehabilitation of an injury. The purpose of this case report was to document the progression of this athlete toward his return to play. Evidenced based practice determined the treatments and outcomes of this case

Background

Athlete was a 19 year old, male, division III Basketball athlete. Athlete was right hand dominant with no prior significant injuries. Athlete weighed 95 kg and had a height of 195 cm

Differential Diagnosis

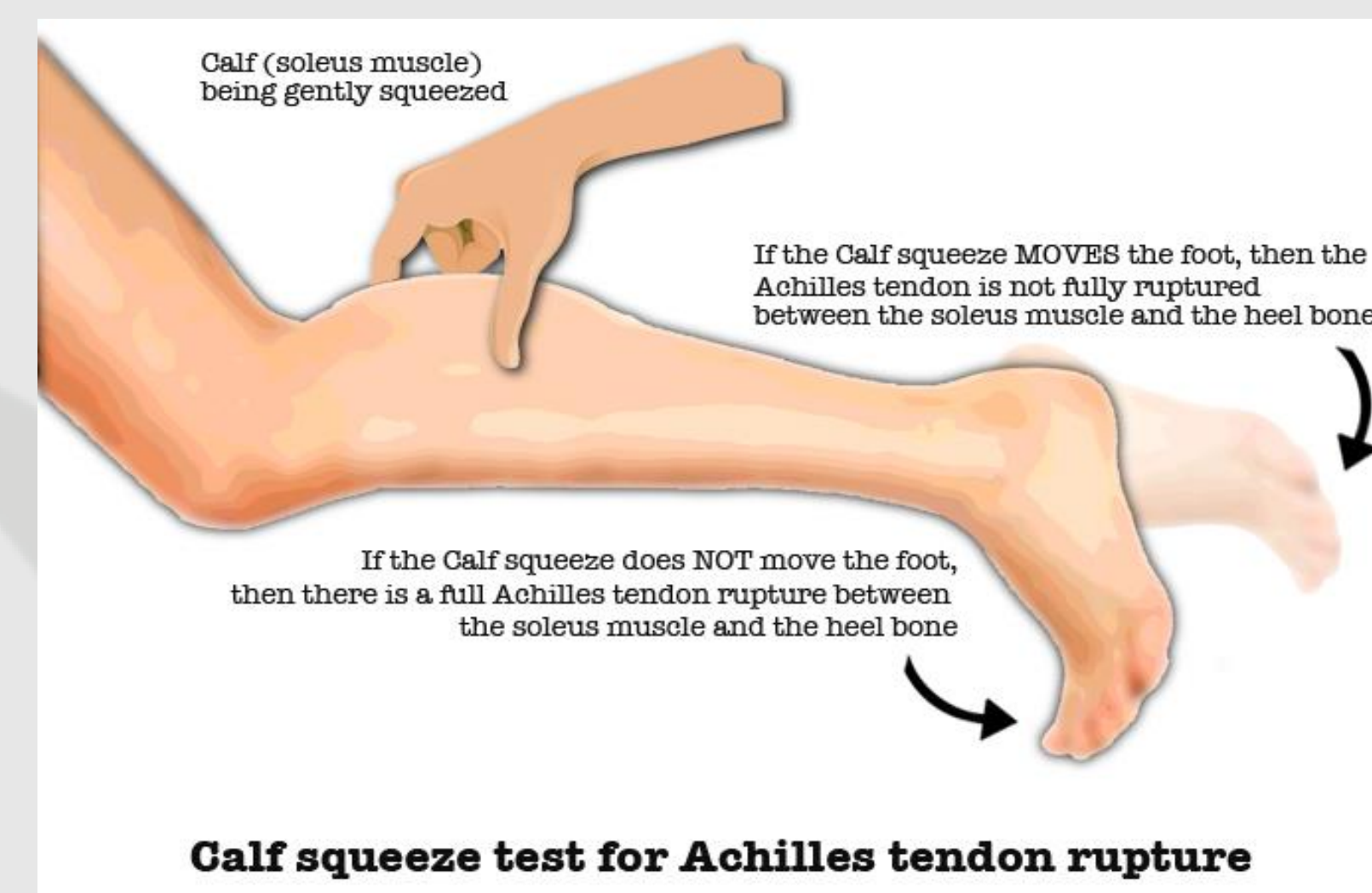
- Achilles tendon Rupture
- Gastrocnemius strain
- Soleus strain

Clinical Evaluation

Upon attending to the athlete, the athlete stated that he felt like someone “threw a ball at his leg”. The mechanism of injury was described as pushing off of the ground as the athlete was trying to sprint down the floor. A “pop” was heard as soon as the athlete lifted his right heel off of the ground. Initial evaluation revealed no obvious deformities or swelling but it did, however, reveal an obvious gait disturbance as well as an intense pain while trying to weight bear. Pain and point tenderness were observed at the proximal Achilles and a palpable deformity was also felt in this area. PROM was within normal limits for plantar flexion but abnormal in dorsiflexion. AROM for plantarflexion was absent. The Thompson test was also performed and a possible Achilles tendon rupture was revealed. The specificity and sensitivity for the Thompson test is on the high end making it a very reliable test. Neurological and circulatory screenings were also within normal limits. An MRI was ordered and revealed a rupture of the athlete’s Achilles tendon and surgery was recommended.

Treatment

Post-operative treatment consisted of a four-phase rehabilitation plan encompassing a total of eleven months. During phase one of rehabilitation, the athlete was NWB with crutches. This phase lasted for one week and consisted of AROM exercises for the toes, knee, and hip. After progression, straight leg raises and cardiovascular exercises on the stationary bike were added. In the third phase (four weeks post-op), more weight bearing exercises were introduced to help prepare the athlete for weight bearing without a boot. During this phase, balance exercises and weight shifts along with theraband work were introduced. The final phase (three months post-op), the athlete was removed from his boot and was allowed to weight bear without assistance. The athlete was able to start jogging just short of six months post surgery and was fully able to jump/run around seven months. The athlete returned to play eleven months after surgery just in time for tryouts without complaints or problems.



Implications

Though the Achilles tendon is the largest tendon in the human body that does not make it exempt from rupturing. In fact, the prevalence of Achilles tendon ruptures has been reported in numerous studies, with a range of 6 to 37 out of 100,000 persons per year, and it seems to increase with each calendar year. An Achilles tendon rupture can be a career threatening injury for athletes. one third of the national sport players who suffered an Achilles tendon rupture, could never play at the same sports level again. However, this could be due to the vast majority of ruptures being suffered by “weekend warrior” type athletes. The most common location for an Achilles tendon rupture is 3-6 cm above the calcaneal insertion due to the peak stress observed at this location. According to Claessen, De Vos, Reijman, & Meuffels (2014), “The etiology of Achilles tendon rupture is shown to be multi-factorial and includes local factors, biomechanical factors, histological factors, medication and genetic factors.” Moderate evidence was found for an association between Achilles tendon rupture risk and decreased fibril size. There was limited evidence for an association with body mass index. A loss of larger fibrils in the core and periphery of the Achilles tendon was a common predictor for an Achilles tendon rupture. When a ruptured Achilles was compared to a control tissue sample, the ruptured Achilles contained significantly fewer fibrils of medium to large size. More research must be conducted on this point to determine if this is the main reason for Achilles tendon ruptures.

Uniqueness

Typically, Achilles tendon ruptures do not occur in teenage athletes. The occurrence of such injuries is mostly found in middle-aged men that do not compete in athletic participation on a daily basis, will experience this injury due to the fact that they are doing more than their body is usually accustomed to, causing the rupture. In this case, the nineteen-year-old (at the time of the injury) athlete was in elite conditioning shape and was finishing up his last practice before his first game of the season. The athlete also had a history of competing in multiple other sports at the high school level. Furthermore, the uniqueness of this acute injury is that the athlete had no prior injuries to this leg. Acute Achilles tendon rupture’s can be contributed by previous weakness or injury to the same area. In this case, this was not the case

Discussion

Further research must be conducted into the minimally invasive technique of surgical repair and determine whether this technique is superior to the traditional open surgery. If it truly is superior, more surgeons could use this technique to surgically repair an Achilles tendon rupture. More research must also be conducted into the debate over immobilization vs. early mobilization following surgery. Recently, research is starting to lean toward early mobilization of the joint over complete immobilization and this technique should be used more often if this is true. The last recommendation is regarding the use of surgery in general to treat Achilles tendon ruptures. More recent research has begun to shift toward a non-operative approach for repairing a ruptured Achilles tendon.

Conclusions

There are several factors that go into the handling of an Achilles tendon rupture. Due to the Achilles tendon’s pure size and force production, a ruptured Achilles tendon is an extremely debilitating injury. Though more research must be conducted on which treatment is the most beneficial for certain athletes, from what can be concluded, the minimally invasive technique seems to be the most beneficial if surgical treatment is chosen. Though the common practice is to immobilize the extremity after surgery, recent research is beginning to suggest that early mobilization may be just as beneficial if not more beneficial. Rehabilitation of this injury can be a long process but milestones are important to set for your athlete to give him something to strive for. A major milestone to have the athlete strive for is a single legged calf-raise. Once the athlete progresses to this point, he is almost ready to return to play. When looking into return to play, though most athletes do return to play, they often notice a decline in their production due to the injury. Though this is the case with most major injuries, it is important to look at the sheer amount of production decline and try to determine how we can lower that decline.

References

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