Rehabilitation of a lateral meniscus repair of a USMAPS Soccer Athlete: A case-report and Literature Review

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Abstract

Background: This Level-4 case report identifies an 18 year-old soccer center-back athlete who was injured during a U.S. Military Athlete Performance and Sports (USMAPS) soccer practice. The athlete had a previous history of a lateral meniscus tear in his left knee. Athlete was participating in sport at the time he attempted to pass the ball in the air. The athlete fell immediately to the ground and stopped participating. Initial, on-field evaluation of the athlete indicated potential meniscus injury. McMurray’s meniscal tests were both positive.

Differential Diagnosis: Meniscus Tear, Posterior-Lateral Instability, Lateral Collateral Ligament, Initial Treatment: Athlete was removed from play. Given clinical presentation, imaging was acquired to reduce pain and inflammation. Athlete was given crutches to avoid axial load, and he started with passive range-of-motion exercises. The athlete was allowed to sit-out the next 72 hours post-operation, consisted of full knee flexion and 90 degrees of knee flexion. Phase 2: 7-12 weeks post-operation, consisted of normal gait and stair ambulation as well as full knee ROM. Phase 3: 13-26 weeks of post-operation, consists of jogging at own pace without pain and full leg strength compared to uninjured leg.

Case Report

Patient: This United States Military Academy Preparatory School soccer center-back athlete was an 18 year-old (74.8 kg and 1.75 m) athlete that received a high ankle sprain during the third quarter of competition. The following information will explain the mechanism of injury, clinical assessment, diagnostic findings, treatment and rehabilitation process. Based on available information to this athlete’s unique injury.

Conclusion: This case study highlighted the diagnosis of this injury as well as the treatment and rehabilitation process of a lateral meniscus tear. This case study also covered the uniqueness of this case, being its MCL. This athlete is still in recovery however well on his way to returning to play.

Introduction

Ankle injuries are among the most common injuries affecting athletes in all sports. An estimated 28,000 ankle injuries occur in the United States each year (Kerr et al., 2013) Even though lateral ankle sprains are more common than syndesmotic injuries, syndesmotic ankle sprains result in a larger amount of missed playing time. Syndesmotic ankle sprains are more difficult to diagnose than a lateral or medial ankle sprain, and makes recovery complicated for the athlete and medical staff. The following information will explain the mechanism of injury, clinical assessment, diagnostic findings, treatment and rehabilitation process. Based on available information to this athlete’s unique injury.

Purpose

The purpose of this case report was to introduce an 18-year-old United States Military Academy Preparatory School soccer athlete who received a lateral meniscus tear during competition. In order for this athlete to continue playing soccer and continue education within the Academy, surgical intervention was needed. An overview of this unique injury is presented to obtain additional information and a better understanding regarding the principles of a meniscal rehabilitation protocol.

Anatomy

The meniscus is connective tissue made of fibrocartilage. It is positioned on top of the tibia and is connected to the tibial plateau both anteriorly and posteriorly. The meniscus is made of two parts, which consist of the medial and lateral meniscus. They are wedge-shaped because the outer border of the meniscus is thicker than the inner rim. This creates a concave surface of the tibia which allows for a firm attachment to the femur. The lateral meniscus is more circular in shape and more mobile compared to the medial meniscus. The lateral meniscus will move and shift with the lateral articulation of the femur during the flexion and extension of the tibio-femoral joint. According to Higgins (2011), the function of the meniscus is to deepen the articulation of the tibio-femoral joint throughout its motion, increase load transmission over a greater period of time, provide nutrients, improve lubrication of the articulating surfaces, provide shock absorption, and increase passive joint stability. The attachment sites for the menisci are the patellar tendon, the lateral meniscus attaches to the joint capsule and the intercartilaginous ligaments, ligaments of Wrisberg and Humphrey. The lateral meniscus also attaches to the popliteus by the joint capsule and coronary ligaments. The medial meniscus attaches to the deep layer of the medial collateral ligament. The meniscus is poorly vascularized making it very hard to heal on its own. Both the medial and lateral meniscus are slightly mobile at the anterior and posterior. The outer portion of the lateral meniscus is approximately ten to twenty-five percent of the entire meniscus. The inner rim of the lateral meniscus is thicker than the inner rim. This creates a concave surface of the tibia which allows for a firm attachment of the meniscus, creating a small area of muscle that provide shock absorption and joint stabilization. According to recent literature, the most common mechanism of injury to the menisci is through non-contact forces, shock absorption and joint stabilization. According to literature, the most common mechanism of injury to the menisci is through non-contact forces, shock absorption and joint stabilization. According to recent literature, the most common mechanism of injury to the menisci is through non-contact forces, shock absorption and joint stabilization. According to recent literature, the most common mechanism of injury to the menisci is through non-contact forces, shock absorption and joint stabilization. According to recent literature, the most common mechanism of injury to the menisci is through non-contact forces, shock absorption and joint stabilization.

Rehabilitation and Results

When creating a rehabilitation program after meniscus repair, there are a few things a clinician must consider. A clinician must consider the pre-injury condition of the athlete, to determine if an elite level athlete may have a more aggressive rehabilitation process due to their level of strength in the lower limbs, whereas a non-elite athlete may have a more conservative rehabilitation process post-operation. Cavanaugh (2012) states that clinicians need to consider the axial alignment of the foot to the knee joint to evaluate correct position and foot/ankle varus/valgus deformities. The athlete must avoid loading in their respective compartments. Fortunately, the athlete in this case study had no varus or valgus deviation which creates a safe environment while the athlete is doing their rehabilitation. The athlete must avoid loading in their respective compartments. Fortunately, the athlete in this case study had no varus or valgus deviation which creates a safe environment while the athlete is doing their rehabilitation.

Athlete is an 18 year-old (74.8 kg and 1.75 m) athlete that received a high ankle sprain during the third quarter of competition. The following information will explain the mechanism of injury, clinical assessment, diagnostic findings, treatment and rehabilitation process. Based on available information to this athlete’s unique injury.

Discussion and Summary

In summary, the meniscus is a vital structure within the tibio-femoral joint. It plays an important role in providing shock absorption, providing a larger articulating surface, increasing load transmission, and providing nutrients inside the joint capsule. The rehabilitation process typically takes four to six months post-operation. Return to play depends on the type of rehabilitation. Evidence based practice states that there should be three phases of rehabilitation each with progression and precautions. In this particular case, the athlete is taking slightly longer due to his compliance and activities during phase II. This athlete is able to ascend and descend 8 inch stairs with good leg control and no pain with therapeutic exercises and functional activities. However, the athlete should avoid pain during functional activities. The athlete should avoid running and sport activity.

Phase II guidelines of post-operation includes weeks 6-14. The goals of this phase includes emphasis on full passive extension, control post-operative pain and swelling in the tibio-femoral joint, and regaining quadriceps control. A large aspect to this phase include pain management and overall comfort of the athlete. Bizzini (2018) states, in isolated meniscal repair, it has been advised that the athlete should avoid heavy weight bearing for four to six weeks while using a brace. Some precautions of this phase include: avoid active flexion of the tibio-femoral joint, and lastly the athlete should avoid prolonged standing or walking.

Phase III guidelines of post-operation includes weeks 6-14. The goals of this phase include restoration of full active range of motion. The athlete should have normal, non-antalgic gait. The athlete should be able to ascend and descend 8 inch stairs with good leg control and no pain with therapeutic exercises and functional activities. The athlete should avoid activities of daily living with increased endurance. The athlete should incorporate activities that include: full range of motion, full weight-bearing, and activities of daily living. The athlete should avoid activities that include: avoid descending stairs regularly, avoid activities of daily living with increased endurance. The athlete should avoid activities that include: avoid descending stairs regularly, avoid activities of daily living with increased endurance. The athlete should avoid activities that include: avoid descending stairs regularly, avoid activities of daily living with increased endurance. The athlete should avoid activities that include: avoid descending stairs regularly, avoid activities of daily living with increased endurance.

References


