Introduction
In the United States ACL tears are one of the few things that cannot be blamed for discrimination; men, women, and even children suffer the repercussions of this same statistic. Some statistics report 350,000 ACLRs are performed per year, keep in mind, these statistics does not include everyone who tears their ACL, just those who have this invasive operation.

Inefficient movement patterns and muscle imbalances are a key predictor of musculoskeletal injury particularly to the ACL. Movement patterns and muscle imbalances exist in all athletes, and play a huge role as athletes move to the collegiate level of athletics. Single-limb activities are faster, higher in intensity, and of longer duration than high school. Once movement patterns have been developed and practiced for a long period of time they are very hard to change. Athlete trainers and coaches are constantly battling athlete’s inefficient biomechanical patterns. Any athlete is at risk for establishing inefficient movement patterns at a young age and carrying them through their lives.

Purpose
The purpose of this case report is to introduce an 18 year-old Division IA football athlete who received an anterior cruciate ligament rupture during competition. This athlete has a lengthy complicated history of ACL ruptures and surgeries in the same knee. The athlete prior to the time of this case report had a history of recurrent patellar dislocation and patellar tendinitis.

Despite this history of recurrent patellar dislocation and patellar tendinitis, the knee joint was able to continue his football career. The team physician and sports medicine staff decided that ACL reconstruction surgery was necessary. The team physician felt that the athlete would benefit from the reconstruction surgery to allow the athlete to continue his football career.

Anatomy
The anatomy of the knee and the surrounding musculature must be understood to help understand the potential damaging morphological effects that may occur in the knee. The knee is composed of the tibial and femoral condyles, the patella, the femoral sulcus, the intercondylar notch, the intercondylar roof, and the anterior cruciate ligament (ACL). The ACL is composed of the anteromedial and posterolateral bundles. Together, these bundles provide approximately 85% of the restraining force of anterior translation. It also prevents excessive tibial medial and lateral rotation, as well as varus and valgus stress.

To a lesser degree, the ACL checks extension and hyperextension. Together with the posterior cruciate ligament (PCL) the ACL guides the tibial condylar center of rotation of the knee, therefore controlling joint kinematics. Muscles surrounding the knee joint further contribute to knee stabilization during the weight-bearing phase of gait.

Primary muscles include the quadriceps anteriorly, hamstrings posteriorly, gluteus medius and tensor fascia lata/Tib band laterally and the ilopadductors medially. The repetitive, eccentric nature of muscular activity about the knee during sports may lead to fatigue related injuries.

Case Report
Patient: Athlete is an 18 year-old (195.58 centimeters and 194.71Kg) male NCAA division one football player. Athlete’s prior medical history included two right knee anterior cruciate ligament reconstructions (ACLR) performed a year, keep in mind, this statistic does not include everyone who tears their ACL, just those who have this invasive operation.

The athlete was referred to the Orthopedic surgeon for an anterior cruciate ligament rupture in the right knee. The athlete underwent an arthroscopic surgical examination to repair the anterior cruciate ligament and the meniscus. The graft used for the surgery was an autograft harvested from the contralateral patellar tendon. The athlete was immediately allowed to begin a rehabilitation program focused on quadriceps strengthening, range of motion, and return to play to provide additional information to this athlete’s current injury.

Mechanism of Injury: Athlete reported to athletic trainer during practice complaining of anterior knee pain and instability after the completion of a drill. Mechanism of injury was a hyperextended knee accompanied by a twist. Initial evaluation revealed signs of trauma (swelling, heat, and redness). Athlete was joint point tender over the medial joint line, Biceps Femoris, and semitendinosus. The athlete did not have full ROM and understood the surgical procedure in a high level athlete.

Discussion and Summary
Young men competing in collegiate football would be in the best position to recover from an ACL tear with less re-tear rate if their graft is a patellar tendon autograft. The literature has shown that the patellar tendon is able to efficiently replace an ACL without compromising the ligaments original strength (Fuji et al., 2016, p.2773-2777). Comparatively, to other ACL reconstruction graft options the patellar tendon has highest tensile strength and the lowest amount of morphological damage. People who have had patella tendon autografts used for their ACLR surgery normally have some long term anterior knee morbidity. Those who have this graft most often complain of and are diagnosed with: anterior knee pain, patellar malalignment, quadriceps weakness, patellar tendon rupture, kneeling pain, extension loss, and patellofemoral crepitation (Dopirak et al., 2004, p.837-842).

Rehabilitation and Results
Following the decision of surgical repair of the complete rupture of the anterior cruciate ligament, conservative treatment was recommended because the graft harvest site was on the contralateral limb. With this in mind, the sports medicine staff and team physician worked together to devise a rehabilitation protocol in which the athlete was to follow for 36 weeks. The protocol was designed with four phases with a particular criteria for the athlete to progress to each new phase. The rehabilitation plan was comprehensive and planned to treat both legs. The left leg was treated as a typical patella tendonitis case. Phase I consisted of immobilization and protection of the right knee (at least two weeks in crutches), the diminishing of pain and inflammation, range of motion, and managing muscular strength and flexibility of both sides. In order to reduce inflammation, besides the use of modalities and treatment, the team physician prescribed anti-inflammatory for the athlete until inflammation decreased. The athlete progressed to phase II when he had minimal pain, no active or passive range of motion limitations, and gait was normal without assistance. Phase one was completed in 7 weeks. Phase II goals were to: increase cardiovascular endurance, and progressively increase muscle strength and endurance. Criteria to progress to phase III is the time at which four months. Four months is the minimal time required by the team physician to allow the surgical repair to fully heal. During phase III, the athlete began running, working on neuromuscular coordination, and vertical/lateral agility. The sports medicine staff utilized the anti-gravity treadmill and the Hydroxox underwater treadmill.

The athlete followed a progression of running which transitioned from level one to level four. The athlete was custom-fitted into a functional anti-rotation knee brace. This brace prevents rotational and shearing forces that will protect the new anterior cruciate ligament. This brace was worn during football and vertical agility drills. Phase III goals consisted of restoring the muscular and cardiovascular endurance, and optimized neuromuscular control. Once phase V was reached, the return to sport goals. Activities levels in sport specific drills were applicable under the completion of all phases of the rehabilitation protocol. The athlete completed his entire rehabilitation plan and returned to activity with no long term issues 37 weeks post op.

References


