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Editorial

Anterior Cruciate Ligament Injury and Return to Sport: A Commentary on the Different Factors Impacting the Relation

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Abstract

Since the 1960s and up until now, the diagnosis of Anterior Cruciate Ligament (ACL) injury has been evolving. ACL injury is highly prevalent in contact sports such as the National Basketball Association (NBA) and National Football League (NFL). This critical commentary highlights the significant tests used throughout history to diagnose and treat ACL injury. The factors affecting the return to sports after this injury are also accentuated along with the possibility of getting a second ACL injury after return to play. Our commentary demonstrates the need for greater awareness of comorbidities because it is known that they affect how an ACL tear is treated.

Keywords: Anterior Cruciate Ligament, Orthopedics, Tear, Reconstruction Surgery, Athletes Injury, Return to Sports.

The Anterior Cruciate Ligament (ACL) is one of the four ligaments of the knee with the responsibility of preventing excessive forward sliding of the tibia in relation to the femur [1]. With such an important function, an injury to this ligament due to excessive work during vigorous exercises or accidents may impact the quality of life of many individuals, especially athletes. ACL tear is one of the most common sports injuries and it usually manifests as an immediate "snap" followed by swelling and pain [1]. Due to its high prevalence at around 100,000 to 200,000 injuries among athletes per year in the sports field [2], a hot topic of research was the focus on the return to sport after ACL reconstruction. With many important studies searching its variables [3, 4], the heterogeneity in results was not something to be denied.

Another factor that may have affected the results of the different studies was highlighted in a 2011 article written by Thomeé & Al, where they shed light on muscle function tests as being not sensitive or demanding enough to assess the capabilities of a professional to return to sport [6]. This was a very important point to be made since as the writers said, the prevalence obtained in some studies manifesting a decrease in the performance of athletes may actually be lower in reality if allowed for a proper, longer recovery period [6]. A decrease in performance may also be affected by other variables that may be somewhat hidden or only remarked after a thorough analysis. In fact, illnesses such as depression have been correlated with lower clinical outcomes after ACL reconstruction but studies focusing on explaining this phenomenon have been scarce [7]. Such findings highlight the need to study comorbidities that may be present in athletes and their potential influence on a better outcome.

Although the importance of studying the return to sport after an ACL tear is of high importance, it is also crucial to not forget about the incidence of a second ACL tear after the players come back to play. It was shown that players with a previous anterior cruciate ligament tear and surgery were more likely to get a second injury to their ACL than players with no clinical history of ACL problems [8]. This is supported by a systematic review done by Wiggins et al. [9] who showed that nearly 1 in 4 young athletes who suffer an ACL injury and return to high-risk sports will eventually suffer another ACL damage; most likely, they will do so early in the return-to-play period.

However, this range of outcomes was due to many factors such as different sports and positions played as well as personal characteristics and even the type of surgery adopted. In this commentary, our focus will be directed toward an analysis of the return to sport after ACL injury as well as the different factors impacting it.

The study of Anterior Cruciate Ligament injury is not a new interest and has been there for quite a time. A systematic review done by Ross & Al englobed 442 unique studies, from which 17 met the inclusion criteria [3]. The studies varied in their time frame with some starting as early as 1980 and others ending in 2015 [3]. Overall, it was shown that the average return to sport was 67.2% but it was mentioned that the results obtained were mainly specific to the National Football League (NFL) and that heterogeneity was seen between the 17 studies worked on. Another study done by Harris & Al focused on the National Basketball Association (NBA) and showed a return to the sport of around 86% (50 players of 58). In addition, to the well-known fact of heterogeneity in studies especially when it comes to topics impacted by multiple factors such as the type of sport, positions played, and individual demographics, the evolution of the science of Orthopedic Surgery and its approach toward improving the care of ACL tear is an important element to focus on. The technique employed to approach the injury is a huge contributor to the variability of different studies as treatments between different hospitals have some differences without forgetting the emergence of new surgical procedures in ameliorating the outcome.

Back in the 1960s, the diagnosis of ACL tear was not so easy and was based on tests such as the "Pivot Shift" described by Mac Intosh (Figure 1) [5]. One of the first techniques to be proposed was the anterolateral tenodesis using the fascia lata to limit the gliding [5], a technique talked about by many surgeons such as Matti and Lemaire. Later around 1978, a free patellar tendon graft was the new technique to be shed light on but was later replaced by the Hamstrings grafts (Figure 2) [5]. In the 21st century, surgical procedures such as the Double Bundle (Figure 3), Partial Reconstructions, and Reconstruction with preservation of ligament tissue emerged [5]. This small history was told to emphasize the rapidity with which the field of orthopedics and the treatment of choice changed and to shed light on the impact it had on the different studies that ranged from 1980 to 2015 [3].

In conclusion, many factors played a role in the variability of the results obtained. These factors ranged from the sports being played with an internal difference due to the different positions and the impact of their roles on the load and work on the Anterior Cruciate Ligament to internal variabilities among players. The development of the field of Orthopedic Surgery is promising with new techniques on the way and the rapid change in the numerous techniques used was the main factor affecting the return to sports analysis. Also, comorbidities should be shed more light on as they have been proven to impact the outcome of ACL tear treatment. The goal of medicine is to achieve the best care for our patients and there is a need to always research and assess the efficacy of new treatments and their strengths to improve meeting the needs of patients such as return to sports and pain relief. We have come a long way and still have a lot to discover, but our future is promising if we keep this motivation and desire to help patients in the best way possible.

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The development of new techniques is related to a better understanding of the biomechanics of the knee, the ACL, and its interactions with its surrounding structures [5]. Many more techniques are yet to be discovered with only one goal to improve the outcome of treating an ACL injury and improving the quality of life and return to the sport of affected athletes.

Figure 1: Pivot Shift Test for Diagnosing ACL Tear

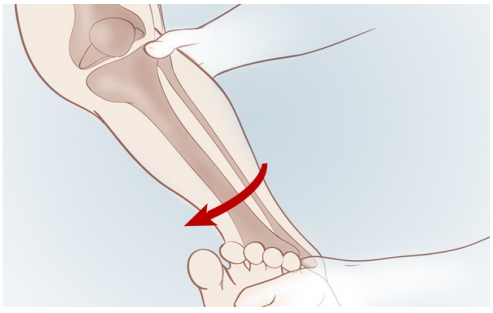


Figure 2: Free Patellar Tendon Graft and Hamstring Grafts for ACL Reconstruction

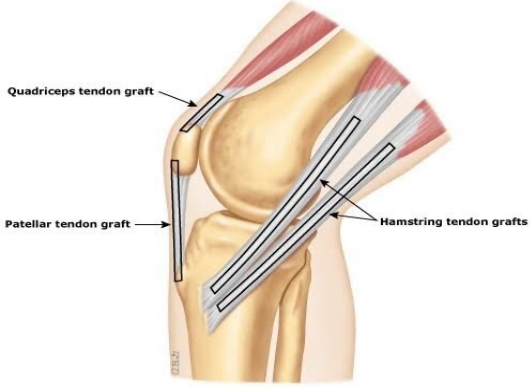
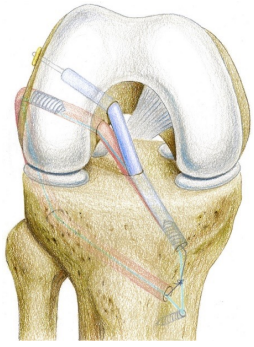


Figure 3: Double Bundle Procedure for ACL Reconstruction



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