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ACL Injuries and the Return to Play

Most people will never understand the many complexities of the world. The same can be said about the human body and the different structures that work together to produce movement. Some people who desire to be in highly competitive sporting environments, will attest to the excruciatingly painful, life-altering moment when they were engaged in play and heard the quintessential “pop” sound from their knee and they are immediately falling to the floor unable to move that knee. This is usually followed by a diagnosis of an anterior cruciate ligament tear and within a few weeks, surgical methods must be taken if the athlete wishes to return to their sport at the same high level. This paper will seek to properly define what the role of the anterior cruciate ligament (more commonly called the ACL) is, shed light on the procedures necessary for an athlete to return to play, and analyze data found through research to determine the likelihood of re-injury and, therefore, the effectiveness of ACL surgery.

The anterior cruciate ligament “is a ligament that connects the femur (thigh bone) to the tibia (lower leg bone) and is one of four major ligaments in the knee” (Putukian 1). It is responsible for stabilizing the knee, especially in sports/activities that require cutting, pivoting, turning maneuvers, landing, sudden deceleration, and planting. It is this ligament that is responsible for also preventing tibial translation onto the femur. Injury to the ACL usually happens when engaging in one of the listed skills, followed by a “pop” and/or loose feeling in the knee. To further understand this occurrence, Marcia Anderson and Gail Parr report in their literature that “in about 80% of all ACL injuries, individuals experience a popping, snapping, or tearing sensation” (Anderson 274). Diagnosis of this injury can be done by a physician or trained personnel who is able to accurately perform the anterior drawer test, the Lelli test, or through more accurate measures such as a magnetic resonance imaging (MRI). “Several factors have been considered as “risk factors” for ACL injury, including anatomical, environmental, hormonal, neuromuscular or genetic” (Putukian 1). The anatomical structure of humans, especially women, plays a very detrimental role in ACL injuries. Females have a tendency based on their anatomical make-up, to land with their knees buckling inwards thus leading to greater risk of ACL injury, in comparison to their male counterparts. As reported on the website for WebMD, “women have more anterior cruciate ligament (ACL) injuries than men: women athletes injure their ACLs up to 8 times as often as men athletes” (WebMD). This further shows the disparity in the greater likelihood that females will acquire this injury. There are a reported “80,000-250,000 ACL injuries occur per year in the United States, with about 50% occurring in athletes 15 to 25 years old” (Putukian 1). These numbers reflect the prevalence of ACL injuries throughout the country; however, with the medical advances of this day and age, ACL replacement surgery is a very effective and minimally invasive and “For athletes who wish to return to pivoting sports, the typical advice is an ACL reconstruction after 4–8 weeks when full range of motion is established and there is no joint swelling” (Bahr 127). Whenever the athletic trainer or physician deems the knee as operable, the injured individual will undergo ACL surgery where the surgeons will remove the damaged ACL and replace it with a graft of a nearby tendon or elsewhere.

The return to play following an ACL reconstructive/replacement (ACLR) surgery is a very extensive and slowly progressive process. “The usual time to heal and return to full functional activities is 6 to 9 months,” as reported by Putukian in her article (1). This is the typical recovery time when the surgery is followed up with a proper rehabilitation program in conjunction with a certified, high quality athletic trainer or physical therapist. “After ACL repair and reconstruction, there are five phases of rehabilitation: maximum protection, moderate protection, minimum protection, return to activity, and activity and maintenance” (Paulos 140). The first stage of maximum protection consists of, quite simply, protecting the knee from moving around, which could cause the site of the sutures to re-open, allowing the operation site to properly heal. The second phase, occurring in weeks two to six post op, is a period which is centered on improving the patients’ range of motion. This stage of moderate protection is also characterized by bouts of light weight lifting sessions in an effort to strengthen the injured knee of the individual. In order to accomplish this “a balance of quadriceps and hamstring forces is necessary for proper knee kinematics” (Paulos 140). Exercises that build strength during knee flexion and extension are usually prescribed during this phase of the recovery process. The final stages are tailored to help the patient develop dynamic stability, in endurance, strength, and coordination. The minimum protection stage, usually week’s six through twelve, consists of protected activity which eventually transitions to a light activity period until about the 12th week, when activities such as jogging are typically allowed. “The running period begins when the operated leg has at least 75% of the strength and power of the normal leg” (Paulos 141). Restrictions of this phase usually include no activities that include excessive impact (for example, jumping), and most importantly, the full time use of a knee brace. The fourth stage, usually beginning in the 16th week through week 24 post surgery, consists of rehabilitation to ensure that the patient has full, pain-free range of motion. It is during this phase that the possibility of returning to sport exists, due to the fact that the individual should have adequate strength to begin easing back into their sport. More advanced weight-lifting exercises are usually conducted in this phase as well as the introduction of customized activities that are geared to the athlete’s specific sport and level. Six months following surgery (the fifth phase) is the typical point at which athletes are cleared by their physician to return to play if they meet their return to play (RTP) criteria. Exercises such as the broad/vertical jump are used to measure the double limb performance, with the single limb performance usually being evaluated with the single leg hop/cross over hop. If an athlete is unable to meet all the requirements set forth by the physician, he/she will have to continue the rehabilitation process for upwards of nine months and possibly, longer than a year. The reason physicians check if the athlete meets all criteria is to ensure a safe return to their sport, thereby reducing the risk of re-injury for the athlete due to a lack of strength, mobility, or flexibility.

Although one of the main ideas of ACL rehabilitation is to educate the injured individual of the potential risks/limitations and strengthen them to be able to play again, many athletes may suffer a secondary ACL or other ligament injury post operation. In a study conducted by R.W. Wright, on the rate of injury to the previously uninjured knee as well as the re-injury rate for ACL reconstruction, it was determined that “the risk of ACL tear in the contralateral knee (11.8%) is double the risk of ACL graft rupture in the ipsilateral knee (5.8%)” (Wright 1159). The percentage of potential risk of ACL re-injury/injury are significant; however, with continued advances in medicine and the quality of, ACL reconstruction and the RTP timeline continues to diminish and the prevalence of re-rupture is and continues to diminish. The reason for this is attributed to the advances in allied health, which seeks to properly train individuals in having good mechanics in an attempt to preemptively prevent ACL injuries. In a study conducted by Patrick Sadoghi, it was determined that there is a “substantial beneficial effect of ACL injury prevention programs, with a risk reduction of 52% in the female athletes and 85% in the male athletes” (Sadoghi 1). It is because of these injury prevention programs that many athletes are at a reduced risk for ACL injuries. I know that many college sport programs, including our own Houston Baptist University, have implemented a full-year strength and conditioning program in an attempt to minimize the number of sports related injuries to their athletes. Though many successful injury prevention programs have been created, some may differ on the specific exercises that should be performed to promote prevention; however, improving balance, strength (especially in the legs, hips, and core), agility, flexibility, and your ability to jump and land safely, is the common aim of all successful programs.

In conclusion, the ACL is responsible for a multitude of essential operations in the knee. It is responsible for connecting the femur and the tibia and, therefore, is responsible for preventing tibial translation on the femur. The anterior cruciate ligament provides stability to the knee joint and is usually affected in sports that involve cutting, pivoting, rapid acceleration and deceleration, and landing. Many individuals who have had ACL injuries have reported hearing a “pop” sound coming from the knee after conducting one of the previously listed movement maneuvers, with only a seldom occurrence of direct contact leading to an ACL tear. ACL tears are not career ending injuries, however, the process of rehabilitation for an individual who has undergone ACL reconstructive surgery, is very long and usually takes six to nine months before the athlete is able to return to play and the rehabilitation process can last upwards of a year. Anyone who undergoes ACL reconstructive surgery will also have to be cleared by a physician if they wish to return to their sport. Overall, it has been determined that ACLR surgery has been quite effective; nevertheless, it has been also proven that ACL preemptive methods have been successful and it is widely recommended by athletic and physical trainers that these preemptive methods be taken to reduce the risk of future ACL injuries.

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