Anterior Cruciate Ligament - or ACL - Injuries: *What You Need To Know*

By Todd C. Battaglia, M.D.

Tears of the anterior cruciate ligament (ACL) are among the most common knee injuries, particularly in high demand sports like soccer, football, and basketball. In fact, more than 200,000 ACL injuries occur each year in the United States alone and affect individuals of all levels, from recreational athletes to professionals. In recent years, numerous well-known athletes, including Tom Brady, Ricky Rubio, and Tiger Woods, have suffered well-publicized ACL tears.

The Basics

Ligaments are strong bands of tissue that connect one bone to another. The ACL, one of two ligaments that cross in the middle of the knee, connects your thighbone (femur) to your shinbone (tibia) and helps stabilize your knee joint. It prevents the tibia from sliding forward in front of the femur, as well as provides rotational stability to the knee. The ACL can withstand approximately 500 lbs. of pressure, but only a 25 percent stretch, before failing.

Injured ligaments are considered "sprains" and are graded on a severity scale from a mild stretch (Grade 1) to a complete tear (Grade 3). Partial tears of the ACL are relatively rare; most ACL injuries are complete or near-complete tears. About half of all injuries to the ACL also involve damage to other structures in the knee, such as articular (joint) cartilage, meniscus, or other ligaments. Nearly 80 percent of ACL tears are the result of non-contact injury (cutting, jumping, sudden stops); this is much more common than direct contact or collision ACL tears. Female athletes have a much higher incidence of ACL injury than male athletes (between two and seven times more common). It is thought that this is due to differences in leg alignment, muscular strength, and neuromuscular control. It is also believed that hormone differences play a role, as estrogen may weaken ligaments.

Symptoms

When you injure your ACL, you may hear a "popping" noise and you may feel your knee give out from under you. Most ACL tears are associated with moderate to severe pain. The knee will usually swell (often severely) within four to eight hours of injury. Other symptoms may include loss of motion, tenderness along the joint line and discomfort while walking.

The pain and disability associated with an ACL injury usually prompts most people to seek medical attention. Continued athletic activity on a knee with a torn or malfunctioning ACL can have devastating consequences, resulting in severe cartilage damage and increased risks of arthritis.

Diagnosis

Diagnosis of an ACL tear primarily relies on the physical examination performed by your doctor. Through movement and manipulation of your knee, the physician can usually diagnose an ACL tear without use of any special tests. X-rays may be taken to rule out a bone fracture. But X-rays cannot visualize soft tissues such as ligaments and tendons, so an MRI, which can, is often used to confirm the diagnosis and to evaluate for torn cartilage or other injuries often associated with ACL tears.

Treatment

Initially, treatment for an ACL injury aims to reduce pain and swelling, regain normal knee movement, and strengthen the muscles around your knee. Ultimate treatment, however, will depend on several factors, such as the severity of the injury, presence of associated injuries, and most importantly, the patient's individual needs. If the overall stability of the knee is intact, your doctor may recommend simple, non-surgical options. This might include physical therapy to strengthen the leg or use of a brace during certain activities.

A completely torn ACL will not heal without surgery, and the lack of a functioning ACL greatly increases the risk of other knee injuries, such as a torn meniscus, so sports with cutting and twisting motions are strongly discouraged. For younger patients and those who frequently participate in such sports, surgery will most likely be required to safely return to those activities. But non-surgical treatment may be effective for patients who are elderly or have a very low activity level.

If surgery is chosen, a torn ACL cannot simply be sewn back together. During surgery the ACL is not repaired; instead, it is reconstructed – your doctor will replace your torn ligament with a tissue graft. This graft acts as a scaffold on which a new ligament will grow.

Grafts can be obtained from several sources. Some are taken from the patient's own body (autografts) and include the hamstring tendons or patellar (kneecap) ligament. Alternatively, various cadaver grafts (allografts) can be used. There are different advantages and disadvantages with each graft option; factors to be considered are graft strength, healing time, re-tear rates, and infection risks. Your surgeon should discuss graft choices thoroughly with you prior to surgery to help determine which option is best for you.

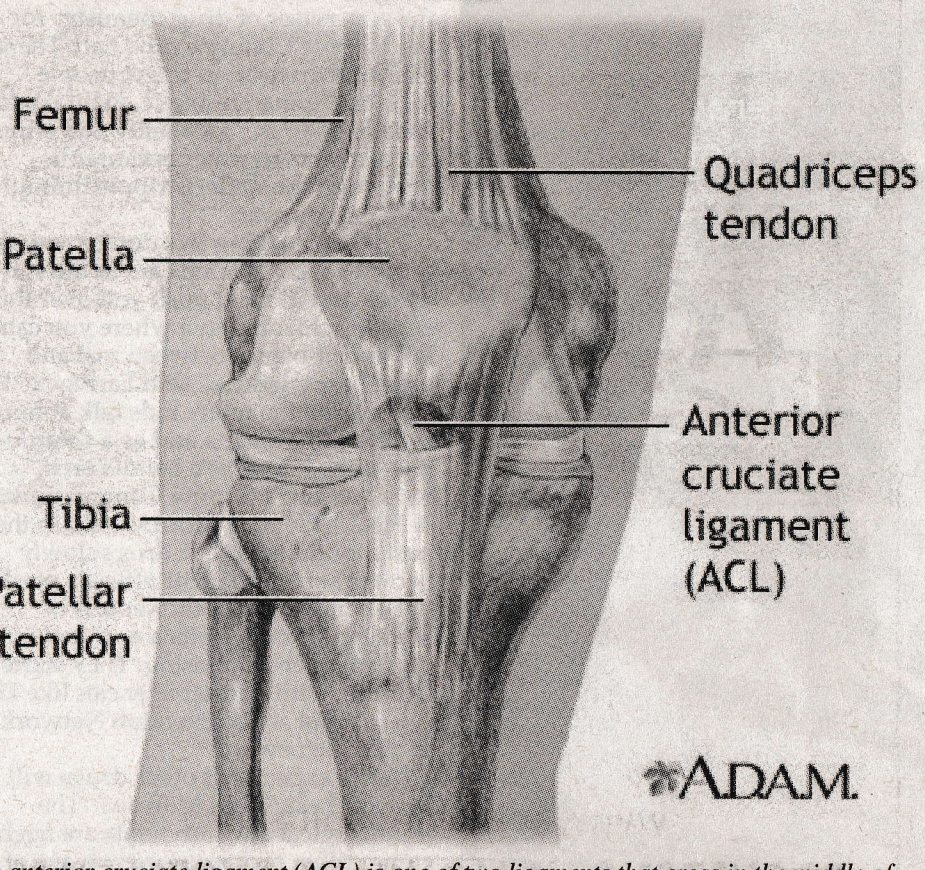
Nearly all ACL surgeries today are performed with an arthroscopic camera, using small, minimally invasive incisions. Although arthroscopic reconstruction has been performed for more than two decades, over the last five years, ACL surgery has undergone a major revolution. New strategies and techniques, particularly with regard to placement sites of the new graft, have shifted dramatically. We have learned, unfortunately, that the techniques used 10 or 20 years ago did not do a good job of placing the new graft in the same location as the patient's original ACL. Our newer techniques have resulted in greatly increased stability, and although not yet proven, we suspect will also reduce the likelihood of subsequent arthritis in these knees.

After surgery, crutches and a brace are typically used for a period of time, usually 2–6 weeks. The rehabilitation process is a very important part of the surgery. There is a long and rigorous course of physical therapy required, first focusing on returning motion to the joint and surrounding muscles. This is followed by a strengthening program designed to protect the new ligament. This strengthening gradually increases the stress across the ligament. The final phase of rehabilitation is aimed at a functional return tailored for the athlete's sport. Because the biologic healing and re-growth process take time, it may be 6 months or longer before an athlete can return to sports after surgery. A surgeon who promises a faster return to sports is doing the patient no favors — early return to sport before appropriate healing has occurred is associated with much higher rates of re-injury to the ACL.

The most common risks of ACL surgery include infection, persistent instability or pain, and stiffness. The good news is that better than 90 percent of patients have no complications with ACL surgery. Most patients are able to return to their previous level of athletic activity; however, for very high-level athletes, this is not always the case. For instance, only 50–60 percent of professional football players return to the NFL after ACL surgery.

Prevention

Some studies have shown that rates of ACL injury can be reduced anywhere from 20 percent to 80 percent by engaging in specific training designed to enhance balance, proper movement patterns, and muscle strength. Not all physicians agree with this, however, and other studies show much less, if any, benefit from these "ACL prevention programs." In addition, although many sports medicine doctors frequently prescribe knee braces, there is no scientific evidence to date that braces significantly prevent ACL tears.



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