

ACL Reconstruction 2009

Surgery & Graft Selection

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1. ACL injuries commonly occur during deceleration, cutting, or twisting maneuvers

Anterior cruciate ligament (ACL) tears are one of the most common serious sports injuries. It is estimated that 200,000 ACL injuries occur in the United States each year and more than 100,000 ACL reconstructive surgeries are performed annually. The ACL plays a vital role in maintaining knee stability and an ACL deficient knee can result in recurrent instability, meniscus tears and articular cartilage degeneration. Many procedures were done for ACL tears in the past, but beginning in the late 1980's, arthroscopic ACL reconstruction surgery, initially using a central third of the patella tendon, has proved the most successful and has been refined and improved over the past 20 years.

These injuries commonly occur during deceleration, cutting, or twisting maneuvers (*Figure 1*). Patients will often report sensing a pop within the knee and then subsequently swelling, or "water on the knee", with a sensation of instability when they are walking. When associated with an injury to the medial collateral ligament, or inside knee ligament, these injuries are much more painful and appear much more serious. However, patients with isolated ACL injuries may improve over a week or two and the athlete does not recognize the seriousness of the injury until they try to return to sport and experience a buckling or instability sensation in their knee. The diagnosis of an ACL tear is made by a thorough physical examination of the knee, often including X-rays and an MRI. A tear of the ACL has become the most feared injury in sports. These surgical procedures,

described above, have allowed most athletes to return to their respective sports, although usually not before 6 to 12 months of vigorous rehabilitation.

Not all patients with an ACL tear require surgical reconstruction, however, most younger and active patients will require this for the knee to achieve the stability to return to full activity. Physiological age is probably more important than chronological age, and recreational activities and activity level will ultimately dictate whether surgery is necessary. Sometimes the MRI will show associated injuries such as ligamentous injury, meniscal injuries or cartilage damage which would require, at the least, arthroscopic treatment.

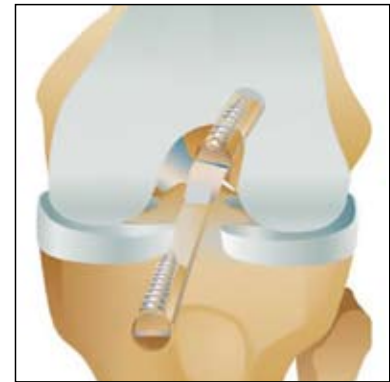
Once the diagnosis of an ACL tear is made there often will be a delay as the knee quiets down from an acute injury, and it is not uncommon for the physician to wait three to six weeks prior to ACL reconstruction. This delay will help prevent stiffness and may improve rehabilitation.

Once the surgeon and the patient have decided that ACL reconstruction will be required, the first important decision the doctor and the patient make is on the type of graft for the ACL reconstruction. In the younger and more athletic patient population a central third patella tendon autograft is often the graft of choice (*Figure 2*). This graft is chosen because of its strength, characteristics, rigid fixation, bone-to-bone healing and favorable clinical outcome. This does, however, make the largest scar of the graft choices, often is somewhat more painful than other types of reconstruction and may result in some anterior knee pain and pain while kneeling. The use of autograft tissue

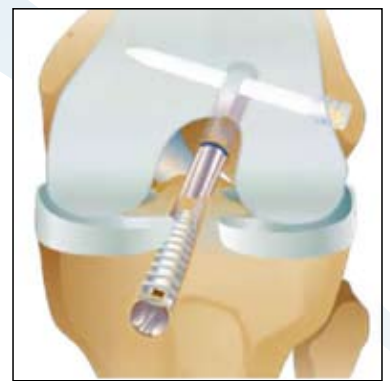
has been shown to have faster healing, greater graft strength at 6 to 12 months and a lower failure rate.

Another excellent graft choice is the hamstring tendons located on the inside and just above the knee in the posterior aspect of the knee (*Figure 3*). In this surgery the gracilis and semitendinosus, which are two of the most easily available hamstrings, are harvested through a small incision just below the knee. These two tendons are then quadrupled and fixed in bone tunnels with a variety of different fixation devices. The hamstring autografts have an advantage of decreased donor site pain and problems, preservation of the extensor mechanism of the knee, excellent graft strength and are the preferred choice in young patients who are still growing. The disadvantage of the hamstring is that without bone plugs they have slightly less secure initial fixation and some studies have shown increased laxity especially in females and mild hamstring weakness. In many parts of the country these are the procedures of choice for all athletes, however, they seem to be ideal in patients whose sports require frequent kneeling such as wrestlers and middle aged athletes who would like autograft tissue, but do not want to go through the pain and rehabilitation of a bone-patella tendon graft.

Allograft, or cadaver, grafts are often chosen for those patients who are older and those who are concerned with cosmesis and want the smallest scar and the easiest rehabilitation. There have been safety concerns regarding the use of allograft and nationally the infection rate has been higher than that of using one's own tissue and there is a very small chance,



2. Bone tendon bone ACL



3. Hamstring ACL Graft


1:1,000,000, of contracting AIDS or hepatitis from this type of tissue. When choosing an allograft tissue for an ACL reconstruction we definitely recommend using an accredited tissue bank (ATB) and at JOI we are very particular as to the source of our allografts and we have an exclusive relationship with the Musculoskeletal Transplant Foundation who have reported no associated infections with almost two million units transplanted. Although allograft surgery represents a smaller procedure to the patient, more recent reports have indicated that these grafts do not have the same strength between six months and a year as autograft tissue and have a somewhat higher failure rate in active individuals.

Today's ACL patients are very savvy. They often do their own



internet research and many make graft decisions depending on how their teammates or friends did with a particular type of procedure. There is no right or wrong answer to graft selection, however, in my practice BTB autografts are generally selected in younger and more active patients and season-to-season athletes. Hamstring grafts can also work for these same patients as well as providing a somewhat easier rehabilitation to middle age and female patients with slightly lower demands. Allograft tissue is usually chosen by older patients, those with back to work concerns and wish an easier rehabilitation, and females with cosmetic concerns.

There has been some recent interest in Double Bundle ACL reconstruction. This type of surgery requires two separate grafts with four separate drill holes in the knee. While this concept more accurately replaces the true anatomy of the ACL and may control rotatory instability better, it is technically more demanding, requires increased surgical time and thus far has not demonstrated clinical superiority in comparison studies with accurately placed and well performed single bundle reconstructions.

While the surgery is certainly an important aspect in a successful result from ACL surgery, the rehabilitation is equally important. Today's rehabilitation is more aggressive than earlier programs and often allows the patient to fully weight bear immediately after surgery with crutches being discontinued after 10 to 14 days. Full range of motion is emphasized early and a complex progressive rehabilitation program requires three to six months, often allowing the patients to run at four months, and a return to the sport when quadriceps strength is 85 to 90% that of the uninjured leg. The average time to full recovery and return to sport, is between six months and a year, depending on the athlete's progress. Often there are some issues during the first year of participation following this surgery, and improvement continues for over two years. High performance athletes may not return to their pre-injury status, but most recreational athletes can return to their sport at some level. Associated injuries such as cartilage damage or meniscus tears often affect the clinical results, and may result in arthritis in years to come. The good news for most, is that while tearing your ACL is never a good idea, the chances to return to play are greater now than ever before.



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