



**Thorp J. Davis, M.D.**  
*Knee & Shoulder Surgery*  
*Sports Medicine*

## Anterior Cruciate Ligament Tears

### What is an ACL and why do we do surgery to fix it.

Ligaments join bone to bone, tendons join muscles to bone. In the knee, there are four ligaments that hold the joint together. The Anterior Cruciate Ligament (ACL) controls rotation of the knee, and prevents the tibia (shin bone) from sliding forward out from underneath the femur (thigh bone). When the ACL tears, it will not heal on its own, so the patient is left with the choice of living without the ACL, or having ACL reconstructive surgery to put a new ACL ligament in the knee.

Typically an ACL tear is a painful and memorable event. Frequently the patient feels the knee dislocate and slide back in. The knee usually swells and stays sore for two to three weeks. About 60% of ACL tears are accompanied by tears of the meniscus or damage to the articular cartilage. Articular cartilage is the enamel on the end of the bone that allows the joint to slide and glide smoothly. Arthritis is a condition in which this articular cartilage develops holes. An ACL tear will show up on an MRI, but also can be detected with physical exam in the office, so an MRI is not always needed.

Once the initial injury calms down, your knee may feel rather normal. In the old days, athletes would not go to the doctor, assume it was just a 'sprain', and return to sports a month later. It was only when they returned to sports that they realized something was 'not right' in their knee. Two-thirds of patients will feel shifting of the knee with pivoting sports; sports that require a lot of sudden change of direction like soccer or basketball. But all patients with ACL tears have enough looseness in the knee to cause eventual meniscus and cartilage tears. Repeated dislocations or 'giving way episodes' can cause accelerated damage to the articular cartilage and/or meniscus in the knee.

Studies show that knees with torn ACL's develop **new** meniscal tears or articular cartilage damage at the rate of 1% a month. Articular cartilage damage, if severe enough, eventually leads to arthritis. While we are really good at fixing torn ACL's, we do not yet have a good cure for arthritis, so our emphasis is on replacing torn ACL's before the arthritis comes.

So ACL surgery is done for two reasons. First, to allow the athlete to return to sports. Second, and probably more importantly, to try to prevent early arthritis.

Some people ask about using a brace instead of doing surgery. Braces work well in controlling knee motion in some planes, but are not effective in controlling rotation of the knee, and therefore, are not a suitable replacement for surgery in most patients.

### **Graft Choice**

We have three choices; your hamstring, your patellar tendon, or a cadaveric (dead person) graft. Each has disadvantages and advantages. Generally speaking, in young athletes who want to get back to sports quickly, I use either their own hamstring or patellar tendon grafts. In people who need to get back to work/ parenting more quickly, but don't necessarily care how fast they go back to sports, I use their own hamstring grafts or cadaver grafts. Bone-patellar-bone grafts heal about 6 weeks faster, but probably hurt a little more early on. There is a small risk of disease transmission from cadaver grafts, and I think the failure rate is a little higher with cadaver grafts, but overall most patients do fine with cadaver grafts. My first choice is using your tissue, usually the hamstring graft.

### **The Surgery**

Surgery is done in an outpatient surgery center and takes about an hour and a half. It is done under general anesthesia. The anesthesiologist will also give you a nerve block in your femoral nerve to help numb your leg for the first 12 hours at home. The surgery is done arthroscopically (through little holes). One incision is made about 2 inches long on the front of your knee to harvest the graft. If I discover any tears of the meniscus at the time of surgery, I will either repair the tear or remove the torn meniscus. This decision of whether or not a meniscus is repairable has to do with where the tear is, whether it is a nice new fresh tear or an old degenerative tear, and whether there is enough blood supply for the tear to heal. If I do repair your meniscus, it will slow down your rehabilitation because we have to hold back while the meniscus heals. If you do have a meniscus repair, you will have another 2 inch incision on the side of your knee.

### **After the Surgery**

You will be discharged home with crutches and an ice cooling unit and a knee immobilizer. You will go home with both the ice cuff and the brace on, but that will be the last time you use both together at once. Once home, you will just use one or the other at any given time. When you are down on the couch, just use your cryo-cuff, no brace. When you get up to walk around the house, remove the cryo-cuff, put on the brace, and use your crutches. You should use your brace until your quadriceps muscle 'wakes up', which takes one to two weeks in most patients (your therapist will explain what I mean by this). You are allowed to put all your weight on your leg right away, the

crutches are just to help you and slow you down a little. At nighttime, while asleep, put the brace on your knee. You won't like it, it's not very comfortable. But if you sleep all night with it on, your knee will be fully straight in the morning. Your ability to get your knee fully extended is a critical part of your early recovery, and sleeping with the brace on facilitates this early goal of full extension.

You usually will have two prescriptions for pain, Hydromorphone (Morphine pills, Dilaudid) and Oxycodone (Percocet). Don't take both together at once. You are given both so you can choose which one you like better. If the Morphine pills are too strong, switch to the Percocet. If you are switching pain pills, be sure and wait two hours to allow the first one to wear off before taking the other pills.

Typically you will miss one week of work if your work is office work, similarly one week of school if in high school or college. Obviously if you dig ditches for a living, you will miss more than that.

You can drive an automatic car in one week if you had surgery on your left knee and you are off pain pills. If it's your right knee, count on three weeks before you can drive safely.

### **Rehabilitation**

Therapy starts 2-4 days after surgery, and averages twice a week for the first 8 weeks, then maybe once a week for 8 weeks after that. In addition, you will need to do a lot of exercises on your own.

It takes about 12 weeks for the graft to heal in the bone tunnels, so I ask you to be very gentle with your knee until then. From month 3 to 6 is when we work hard on getting your strength and coordination back in your knee and leg. Most people return to sports about 6 months after surgery.

The rehabilitation period should be thought of as consisting of four phases:

The first phase is week one. In this first week the emphasis is on getting and keeping full extension (getting your knee locked out straight), and controlling swelling and bleeding by using the Cryo-Cuff as much as possible and keeping off your knee as much as possible. Use both crutches in this phase, but you are allowed to put all your weight on your bad leg.

Phase two is week 1 through week 6. In this phase, we concentrate on letting the soft tissues heal, and on getting range of motion in the knee. We don't care much about strengthening the leg in this phase, and it is a mistake to do too much strengthening in this phase. Over-working the knee early on leads to excessive swelling, which in turn,

hurts motion, which is bad. A stiff strong knee is no good. Concentrate on keeping the swelling down and working on range of motion in this phase, strength comes later. A swollen knee won't strengthen anyway, so don't waste your time. You will wean down to one crutch under the good arm, and when you lose the limp, you lose the crutches completely.

Phase three is week 7 to 12. In this phase we hopefully have achieved full motion, and now we start working on more strengthening...but not too much. Remember, the graft isn't healed until week 12, so we are still taking it easy in this phase, just letting time pass and waiting for the graft to heal.

Phase four is week 12 and on. Now the graft is healed, so we can hit the weights hard and regain strength and coordination in leg. Many of you will be able to do this on your own in a gym rather than continuing to go to P.T.

### Complications

You may have a patch of numb skin lateral to your skin incision about 3 inches around. There is a very small branch of the Saphenous nerve that runs directly under the incision that is commonly cut during the surgery. This is unavoidable, but has no bearing on how your knee works. Frequently the patch of numb skin gets smaller over time as the other sensory nerves take up the slack in the numb spot.

The most serious complications are infection and blood clots. Infections are rare (I have only had 2 in 12 years/1000 ACL's), and I will give you antibiotics before surgery. Blood clots are also rare (I have only had 1 of these), but you must be alert to any swelling or pain in your calf or thigh and alert us if you feel this- we will send you to the hospital and order an ultrasound to make sure you don't have one. High risk patients may be asked to give themselves blood thinner injection after the operation, and all patients are asked to take a coated 325 mg aspirin once daily for three weeks to help thin the blood.

Re-tears of the reconstructed ACL can happen, but you statistically have a higher chance of tearing your normal ACL than your reconstructed ACL (3% vs. 1% in one study). We think this might be because the graft we use to make your new ACL is stronger than your original ACL. Naturally our goal is to restore normal knee function, and part of that includes allowing you to return to sports. Any athlete who is playing those higher risk sports can of course tear his or her ACL, be it a re-tear of the reconstructed ACL or a new tear of the 'good' knee.

## **Expectations**

Overall, ACL reconstruction leads to a stable knee 95% of the time, and overall patient satisfaction is over 90%. Whether or not you score your knee 80/100 or 90/100 a year after surgery has mostly to do with other damage you may have suffered at the time of your ACL tear. By other damage, I mean meniscal tears and articular cartilage injuries. During your surgery, I will remove or repair any meniscal tears, and smooth off any articular cartilage holes. But we don't yet have a good way of filling in those holes, so you can get soreness and swelling from these early arthritic lesions, which may make your knee ache after activity. We do know that stabilizing your knee by doing the ACL Reconstruction does slow down the rate of arthritic deterioration. Overall, patients report very high success in terms of the surgery restoring stability to the knee.