

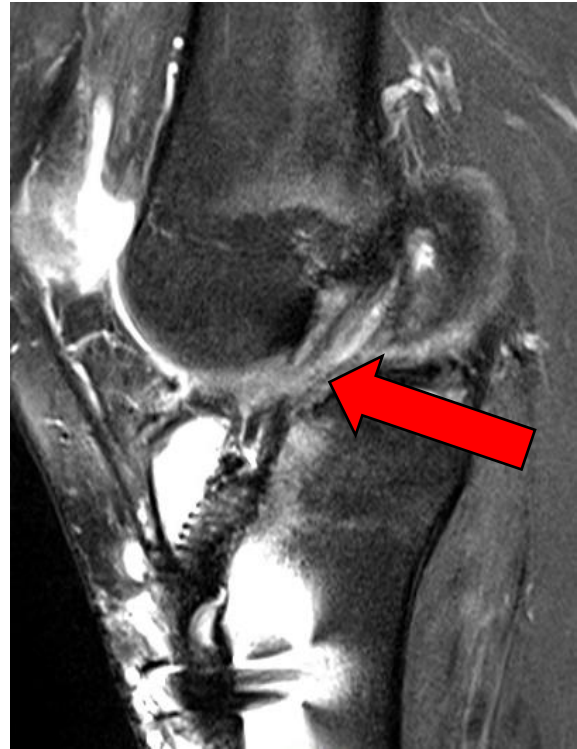
STEVEN CHUDIK MD
SHOULDER, KNEE & SPORTS MEDICINE

Failed Anterior Cruciate Ligament (ACL) Reconstruction

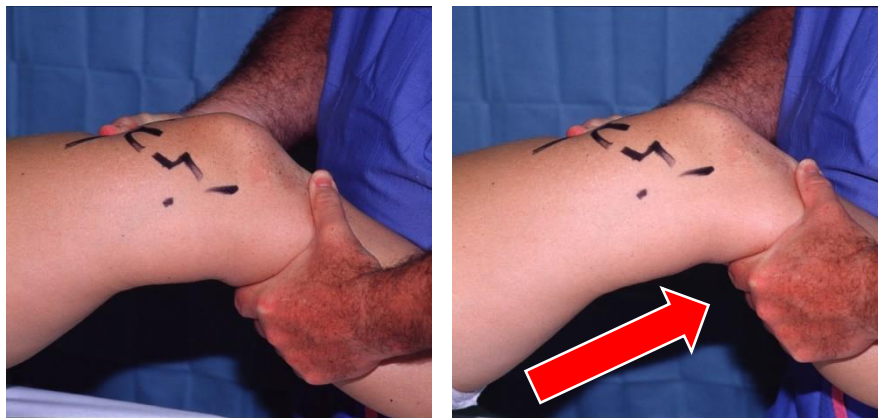
An anterior cruciate ligament (ACL) sprain is a tear of one of the four major ligaments of the knee. The ACL is a ropelike structure in the center of the knee that helps maintain the normal relationship of the femur (thigh bone) and the tibia (leg bone). When torn, the ACL does not heal and the knee can be unstable (shifts or gives way) during sports that require pivoting, changing direction (cutting), jumping, or landing. About half the people who tear their ACL also tear their meniscus in their knee.

The diagnosis of an ACL tear is usually made on physical examination but an MRI can be helpful, especially when the patient is too swollen or guarded to allow a thorough examination. The MRI also is needed to diagnose any associated meniscal or cartilage damage.

Following ACL reconstruction, the graft may fail due to technical errors from the initial surgery, incomplete rehabilitation, returning to sport too soon following reconstruction, graft biologic failure or rejection, failure to retrain good cutting, pivoting, landing mechanics and movement patterns and re-injury.



Sagittal (side) MRI of ruptured ACL graft



The photos above show a Lachman maneuver on a knee before (left) and after (right) that reveals abnormal anterior (forward) shifting of the tibia (shinbone) on the femur (thigh bone) as depicted by the red arrow. This movement indicates a tear of the ACL.



STEVEN CHUDIK MD

SHOULDER, KNEE & SPORTS MEDICINE

Frequent Signs and Symptoms

- Pop or tear heard or felt at the time of re-injury
- An inability to continue playing after the injury
- Large amount of swelling in the knee noticed within six to eight hours after the injury (often within three hours)
- Inability to straighten knee after an injury
- Knee instability, (shifting or giving way), particularly when trying to pivot, cut (rapidly change direction), or jump
- Swelling with repeated giving way
- Occasionally, locking (knee gets stuck intermittently) when there is concurrent injury to the meniscus.
- Knee giving way, swelling, pain

Etiology (Causes)

- Seventy to 80 percent result from non-contact injury (landing awkwardly or cutting)
- Contact injury where the knee sustains a direct hit from another player such as getting tackled at the knee
- Failure to complete the rehabilitation or train proper running, cutting, landing mechanics which increases risk for re-injury
- Failure to pass a validated post-ACL surgery functional testing program
- Technical errors from initial surgery
- Infection may also require revision ACL surgery

Risk Factors

- Return to high risk sports that require pivoting, jumping, cutting, or changing direction (basketball, soccer, volleyball) or contact sports (football, rugby)
- Too early return to sport
- Poor physical conditioning (strength and flexibility)
- Female gender (women have two and one-half to ten times higher risk than men)
- High playing surface to shoe friction coefficient or traction



STEVEN CHUDIK MD

SHOULDER, KNEE & SPORTS MEDICINE

Prevention

- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning:
 - Thigh, leg, and knee flexibility
 - Muscle strength and endurance
 - Cardiovascular fitness
- Train to use proper technique when cutting and landing.
 - There are specific ACL prevention programs that can lower the risk for injury.
- Use proper equipment (appropriate length of cleats for surface).
- Do not return to athletics before completing a proper rehabilitation, ACL prevention training, and ACL functional return to sport.

Outcomes

For those who want to return to sports that require pivoting, cutting, and jumping and landing, revision surgery is usually required. Surgery also is recommended for ACL injuries combined with other ligament, meniscus, or cartilage injuries. Outcomes for revision ACL surgery depend on the ability to address the cause of the failure, i.e., technical problems with the first surgery, infection, incomplete rehabilitation, poor pivoting, cutting, landing mechanics, etc.

Potential Complications

- Recurrent instability episodes of instability (shifting or giving way)
- Further injury to the meniscus resulting from recurrent instability episodes (shifting or giving way) which can change the loading of the articular cartilage of the knee and cause premature arthritis
- Injury to other structures of the knee, including the articular cartilage, resulting in arthritis of the knee
- Injury to other ligaments of the knee
- Knee stiffness (loss of knee motion)
- Injection from surgery
- Re-injury. Patients who have injured their ACL grafts may be at higher risk for a failure of revision surgery.

Treatment Considerations

Initial treatment is focused on returning the knee back to its pre-injury status by reducing the pain and swelling and restoring the range of motion, strength, and gait. Walking with crutches until you walk without a limp is often recommended. Range-of-motion, stretching, and



STEVEN CHUDIK MD

SHOULDER, KNEE & SPORTS MEDICINE

strengthening exercises may be carried out at home, although a referral to a physical therapist or athletic trainer is often recommended. If other ligaments are injured along with the ACL, Dr. Chudik may recommend a brace to help hold the knee stable.

After a failed ACL surgery, it is most important to determine the cause for the failure so that issue can be addressed, and the ACL reconstruction successfully revised. Revision surgery often is more complex because it must address other issues such as limited graft options, scar tissue, old hardware, bone loss or infection.

For those patients who do not perform sports requiring frequent pivoting, cutting, jumping and landing, surgery is not required and rehabilitation is recommended. Individuals usually can continue to jog, cycle, lift weights and swim without ACL surgery; however, they are at a greater risk for progressive damage to their meniscus and cartilage from abnormal knee mechanics. Rehabilitation of ACL tears usually concentrates on reducing knee swelling, regaining knee range of motion, regaining muscle control and strength, functional training and education to avoid sports/activities that require pivoting, cutting, changing direction, jumping and landing.

For those who perform sports that require frequent pivoting, cutting, jumping and landing, surgery to reconstruct the ACL is usually recommended to allow return to these sports. Surgery also is appropriate for ACL injuries in young active children and in people who have combined injuries to other ligaments, the meniscus, or the articular cartilage. Most patients elect to undergo revision ACL reconstruction to obtain a stable knee, return activities without restriction and protect the remaining cartilage and meniscus from injury.

Possible Medications

- Nonsteroidal anti-inflammatory medications, such as aspirin and ibuprofen (**DO NOT** take within seven days before surgery), or other minor pain relievers, such as acetaminophen, are sometimes recommended. Take these as directed by your physician. Contact your physician immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.
- Pain relievers are usually not prescribed for this condition

Modalities

- Cold is used to relieve pain and reduce inflammation. Cold should be applied for 15 to 20 minutes every two to three hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage with a cloth between the ice and your skin to prevent burning /freezing your skin.

Notify My Office if Symptoms Worsen

