

Anterior Cruciate Ligament (ACL) Injuries



Introduction

The ACL (anterior cruciate ligament) is one of the most commonly injured ligaments in the knee. The majority of people who sustain an injury to their ACL are those participating in sports activities. Sports which require frequent and rapid changes in direction, such as basketball or football, are among the most common which lead to ACL tears. As sports have become more competitive with increases in participation over the years, the incidence of ACL injuries has increased as well.

Anatomy

Ligaments are tough bands of tissue which connect bones together. In the case of your ACL, this ligament acts to hold the femur (thighbone) to the tibia (shinbone). The ACL prevents the tibia from moving forward under your femur, also known as anterior translation of the tibia.

Injury & Symptoms

An injury to the ACL is one of the most common sports related injuries. A tear typically occurs as a result of a rapid deceleration, hyperextension, or pivoting in place. A hit to the outside of the knee with a planted foot can also result in an ACL tear.

The symptoms of an ACL tear can vary although most people who sustain an ACL tear hear or feel a pop, although this does not have to occur for a tear to be present. Swelling is one of the most common symptoms after an ACL tear has been sustained and this typically occurs fairly rapidly. There are blood vessels which are damaged during these injuries so they will bleed into the joint which is what causes the significant swelling. Patients also report feelings of instability or state that the knee 'gives out'.

Diagnosis

It is always important to get a good history and physical examination of a patient with any knee injury. There are several special tests that your provider will perform that are used to evaluate for a possible ACL injury.

X-rays are typically ordered with a knee injury to rule out any type of fracture or dislocation. Your ACL is not visualized through a plain x-ray, so if your provider has a high suspicion for a

tear an MRI will be ordered for further evaluation.

Treatment

Non Operative

Initially after an ACL injury, the goal is to address the swelling with ice, elevation, and compression. Occasionally, your provider may do an aspiration at which time they introduce a needle into the knee joint to draw off fluid. Swelling is one of the biggest sources of pain for these patients. Your provider will typically put you in a knee brace and place you on crutches.

A tear that is typically less than 50% is treated with non-operative management initially. We typically will have these patient under a full 3 months of physical therapy before we consider surgical intervention.

Operative

Patients who have gone through physical therapy for a partial tear whom do not show improvements of there stability will typically need and ACL reconstruction. Patient's whom have an MRI which reveal a complete tear typically are recommend for surgical reconstruction fairly quickly. The goal of surgical intervention is to reconstruct an ACL graft which will prevent instability.

Surgical Preparation

How do I prepare for surgery?

Once you have made the decision with your surgeon to precede with surgery, there a several things to do to prepare for surgical intervention. Your surgeon may require that

you get a medical clearance from your primary care physician.

All patients undergo a preoperative evaluation at the hospital. The purpose of this is to get baseline laboratory work as well as to discuss medications. You will discuss some suggested modifications that may be needed at home to help with your recover. You will be advised as to what medications to take the morning of your procedure as well as a cleanser to help with sterility.

An ACL reconstruction can be performed using an allograft, in which we use a donor hamstring graft, or via an autograft, which requires the surgeon to harvest the patient's own hamstring tendon. These options should be discussed with your surgeon preoperatively

Risks and Complications

What can go wrong?

There are risks and complications to any type of surgical intervention. Provided is a list of the most common complications involved with your procedure:

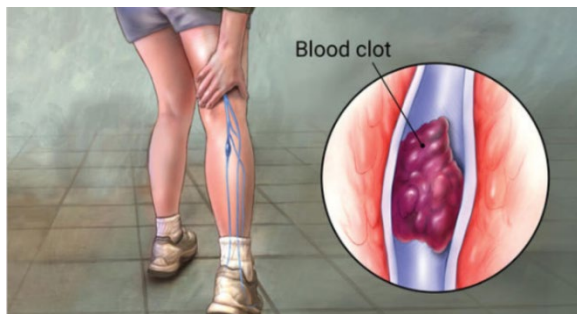
- Anesthesia Complications
- Deep Vein Thrombosis (DVT)
- Infection
- Graft Failure
- Muscle Atropy

Anesthesia Complications

All major surgical procedures require some form of anesthesia and these options will

be discussed in greater detail with that time prior to surgery. There are some patients who have difficulties with anesthesia. It is important that you discuss any previous adverse reactions/complications that you have previously had with your anesthesiologist.

Deep Vein Thrombosis (DVT)



There is increased risk of a DVT with any surgery however surgeries on the hip, pelvis and knee are most common. Secondary to decreased activity postoperatively, a blood clot can form in one of your extremities which can dislodge and travel to the lungs to form a pulmonary embolism which can be life threatening. A DVT is characterized by pain, swelling, and warmth of the calf most often. Secondary to the severity of this, we take several precautions to avoid this:

- Early ambulation is key
- Anticoagulants
- TED hose

Infection

This is a potential complication for any surgery however in a total knee replacement this is a very serious complication. Infections in a total joint

replacement can lead to subsequent surgeries or sepsis (infection in blood stream). You will receive antibiotics prior to surgery and 24 hours after surgery. You will also need to have prophylactic antibiotics before any dental procedures

Graft Failure

The ACL graft which is placed during surgical intervention can fail for several reason. After surgery your body attempts to revascularize, or develop new blood vessels, into the graft. This typically takes the body 3 months so during this time the graft is at its weakest thus increased risk of re-rupture is at its highest. This typically occurs when patients try to advance their physical activities too quickly after surgery. Additionally, incorrect placement of a graft can increased the risk of tearing your graft.

Muscle Atrophy

Most patients will develop some muscle atrophy after a knee injury and/or surgery. There is a period where your weightbearing is limited so this does increase the risk of this atrophy. Additionally, some reconstructions are performed with the patient's hamstring tendon which can lead to weakness as well. Typically this is avoided and resolves with the appropriate rehabilitation.

Surgical Procedure

Patient will be undergo a peripheral nerve block with or without general anesthesia and then will be placed into a prone position, meaning that they will be placed onto their stomach. Before the procedure

begins, patient back with be prepared with an antiseptic and sterile drapes will be placed.

If the patient has opted for an autograft and incision is made over the front of the tibia and hamstring tendons are harvested at this time. On a back table, grafts are prepared with sutures and tensioned appropriately.

ACL reconstructions are typically performed with the assistant of an arthroscope, or small camera, in the joint. A small incision is made on the front aspect of the lateral knee at which time the camera will be introduced. Once we have visualized the damaged ACL, another portal hole is made on the medial side. A small shaving device is used to remove the injured ACL. Once the notch which your native ACL is cleared, it is now time to prevent your graft tunnels.

Tunnels are drilled in both the tibia and the femur in an attempt to restore the native direction of the ACL. A tunneling device will then be used to pass the graft through the tibia into the joint and up through the femoral tunnel. Graft is then tensioned appropriately and secured to the tibia with a dissolvable screw.

Patient will then be brought through a full range of motion and stability will be checked. All incisions will then be closed with sutures and dressing will be applied. Patient will be placed into a postoperative hinged knee brace and provided with crutches.

After Surgery

After surgery you will be held in recovery for approximately 30-45 until it is felt that you are stable to be transferred to the room with your family while you continue to recover. Dressing can be changed in 72 hours postoperatively.

Patient will follow-up in clinic 2 weeks postoperatively for evaluation of the incision and pain. Until this time, patients are placed on crutches and advised to only be partial weighbearing with their brace. At the follow-up visit, sutures are removed. WE typically will allow the patient to weightbear as tolerated at this time. Most begin physical therapy at this time

Physical therapy is usually continued for at least 3 months postoperatively. During that time, the patient will continue with their postoperative hinged knee brace until their muscle atrophy has resolved. Once muscle mass has been restored, the patient will get fitted for a custom ACL brace which he/she will use for a full year postoperatively.



Patients are typically allowed to increase physical activity at 3 months with supervision of a therapist initially. Recovery for an ACL reconstruction typically takes 6 months at which time patients are typically allowed to return back to play with their ACL brace.