

Introduction

Knee injuries are a very common problem among active individuals. It is important for us to understand how your knee was injured. Most knee injuries are associated with non-contact mechanisms.

It is sometimes difficult to describe how your knee was injured. In certain situations, a friend, the trainer or coach can describe the specifics. With most injuries the foot twists, balance is lost and the knee torques in a direction and position that is not compatible with the normal load potential of the structures within the knee. This results in a force and load that causes failure of the meniscus or the ligament(s) of the knee. With these injuries patients will often report: pops, clicks, pain and tenderness. Subsequently, you may have swelling, tenderness, and a painful range of motion. It is this complexity of signs and symptoms that causes you to seek medical care.

Knee Anatomy and Function

The knee joint is well designed to allow synchronous load and motion. The complex relationship between bone, ligament(s), articular cartilage and meniscus fibrocartilage allow the knee to move and operate in a dynamic fashion. Let us take a closer look at these structures and their functions.

The femur is the upper portion of the knee bone. It is covered with a surface of articular cartilage that allows weight bearing and motion with a very low coefficient of friction. This articulates with the lower portion of the knee which is the tibia. The tibia is covered with articular cartilage that has two semilunar fibrocartilages (medial and lateral menisci) that sit on the surfaces. The menisci are resilient structures that function to distribute load, lubricate and to provide additional stability for this articulation. The ligaments work in concert with these structures to achieve optimal stability through a range of motion. The anterior cruciate ligament or ACL has an attachment to the femur in the back and to the tibia in the front. The major function of the ACL is to prevent the tibia from moving forward or anteriorly. The ACL also provides some stability with side to side motion. Thus, an ACL tear is a major problem for an athlete who desires pivoting, cutting and changing direction as part of their athletic lifestyle. The posterior cruciate ligament or PCL attaches the femur and tibia and is principally responsible in stabilizing the tibia from moving backward (posteriorly) on the femur. PCL injuries occur during sports, when the knee is bent or during motorcycle/motor vehicle accidents. Several studies have demonstrated that it is possible to do quite well in sports even if the PCL is torn. The medial collateral ligament or MCL, and the lateral collateral ligament, or LCL, are primarily responsible for maintaining side to side or varus and valgus stability.

The unique anatomy of the knee allows the forces of compression, tension and shear are distributed effectively. Once the integrity of this system is lost or diminished (through injury) there is a resultant functional disability or instability and a higher potential for degeneration of the joint (arthritis).

Making the Diagnosis

You have injured your knee. Each knee injury is associated with a wide spectrum of pain, decreased range of motion, swelling, stiffness and an inability to perform your activities, sports or possibly return to work.

We will often use a variety of diagnostic tools to help us establish an accurate diagnosis of your knee injury. Work-up and evaluation of your knee injury will include a history (our patient information injury forms), physical exam and a variety of imaging studies. These may include X-ray, MRI and possibly CT scan. MRI is the best test to evaluate ligament and cartilage injuries of the knee.

It is important we understand the severity of the injury and the damage to the menisci, ligaments, and other structures. After you have undergone an MRI, your medical provider will diagnose the specific cartilage and/or ligament injury to your knee and subsequently formulate an optimal treatment plan.

What Are Your Options?

We have now determined that you have injured your knee. We have arrived at this diagnosis using a systemic and comprehensive approach. Your initial response to this may be frustration, disbelief, anger or depression. All of these responses are appropriate and expected.

What is Best for you?

First, there is no rush to any decision. Take the time to understand your diagnosis and all treatment options as explained to you by your medical provider.

Second, you must define your athletic goals for us. Try to define the type of sports or lifestyle to which you wish to return. Your particular line of work may also be relevant if your knee injury would disable you from working to your full capacity. Every individual is handled as a separate situation that must be personalized.

Third, timing is essential. There is never a good time for a knee injury. Athletic goals and/or seasons as well as work demands may certainly play a role in optimal treatment planning.

Conservative Treatment

Conservative treatment may be the best option for those individuals who are not healthy surgical candidates. Conservative treatment will start immediately and will focus on regaining range of motion, conditioning and possibly physical therapy. The ultimate goal is to return to all functional activities without limitation.

The fundamental question only you can answer with our help is whether or not you can co-exist with the problem (knee pain from your injury) in relation to your personal goals and objectives

During the execution of this option you will periodically see us in the clinic to assess your progress. There are scenarios that may occur which will cause some adjustments to your treatment plan. Sometimes we may even select a different option based on your clinical findings or symptoms if indicated.

Additionally, conservative treatment may include:

- Viscosupplementation-Supartz injection. These injections are a series of injections (weekly for 5 weeks). The injections function to improve the resilience of the knee while nourishing the cartilage, improving lubrication and hopefully slowing down the progression of knee arthritis.
- Cortisone injections
- Anti-inflammatory medications

In most circumstances you can change your treatment plan at any time. It is often best that conservative treatment options be exhausted before moving forward with surgical intervention.

Surgical Options

Knee arthroscopy should be selected for those individuals who have a meniscus tear or an articular cartilage defect. Knee arthroscopy is performed as an outpatient. It includes an examination under anesthesia to objectively determine the severity of instability and laxity followed by knee arthroscopy. During arthroscopy we can make an exact determination of articular cartilage damage, meniscus and ligament tears. Our surgical objective is to preserve and repair all meniscal and articular cartilage defects at all times, methods include:

- **Meniscus repair.** Sometimes it is best to tack or suture repair the meniscus. Unfortunately, only about 10 percent of meniscus tears are suitable for meniscal repair. Following a meniscus repair you must remain on crutches for 3 weeks to aid with healing and to help protect the repair.
- **Partial meniscectomy.** This is performed if the meniscus tear is not amenable to meniscal repair. A partial meniscectomy involves removing the unstable fragments of meniscus (cartilage) and re-contouring the meniscus structure so it can distribute forces appropriately. A partial meniscectomy does not include removal of the complete meniscus and our goal is to preserve as much as possible.
- **Meniscus allograft transplantation.** This technique, popularized in the last decade, replaces a previously resected meniscus and is only performed as a secondary or tertiary procedure. If it is determined that a meniscus allograft transplant is the best procedure we will discuss the details with you at that time.
- **Articular cartilage repair**
- **Partial thickness articular cartilage defects are treated with debridement,** which means smoothing it down. Debridement of these defects is aimed at relieving your knee pain and minimizing future arthritis.
- **Microfracture.** This is a technique that we utilize to treat full thickness articular cartilage defects. We place small holes in the exposed bone to stimulate a healing response from the marrow that includes the mesenchymal stem cell. In approximately 80 percent of these defects there is some degree of healing with repair cartilage that is not as good as the original but may be satisfactory. Following microfracture you will be on crutches for four to six weeks as the repair cartilage forms. During this time you will be non-weight bearing on your operative leg.
- **Osteochondral grafting.** This technique involves taking plugs of bone and cartilage from a non-weight bearing portion of the knee and transfers it to the defect to resurface the articular cartilage defect.
- **Autologous Chondrocyte Implantation (ACI).** A relatively new technique (ACI) involves a biopsy of your articular cartilage which is then used to 'clone' 12 million of your chondrocytes (the cells that make up articular cartilage) to implant back into the defect under a patch of periosteum (bone lining tissue). This technique has been used to resurface large defects and is good for selective situations and patients. Individuals with osteoarthritis are not candidates for this procedure. It is important to realize this technique requires 2 surgeries.

Prognosis and Expectations

Knee arthroscopy procedures have a 90 % success rate but exact probability of success depends upon:

- The spectrum of injury.
- The complexity of injury and surgery
- Age of the patient
- Presence of articular cartilage injury or degenerative arthritis
- Time since injury
- Physical fitness and body mass index (BMI)
- The patient's compliance, discipline and execution of the rehabilitation program

What are the Risks of Surgery?

It is our responsibility to make sure you have a realistic understanding of the risks and potential complications of surgery. They are the following:

- Risk of Anesthesia- As a general rule all anesthesia options are safe and effective. Regardless of the anesthesia option selected, complication rates are generally low. The most important issue is making sure you are healthy with no underlying medical conditions. In some situations you will be asked to see your general physician for a "preoperative clearance" in order to ensure that you are medically fit for surgery.
- Infection - To minimize this risk potential you will receive pre- and post-operative antibiotics.
- Chronic stiffness
- Re-operation
- Nerve and blood vessel injury
- Deep vein thrombosis or blood clots
- Persistence of pain – this is typically due to:
 - 1) Degenerative articular cartilage changes or arthritis that can cause persistent pain, soreness and swelling.
 - 2) Osteonecrosis or avascular necrosis of bone.
 - 3) Other causes of pain in extremities:
 - a) Loose bodies
 - b) Gout
 - c) Fibromyalgia
 - d) Complex regional pain syndrome

Making Your Decisions

Complete understanding of your knee injury is challenging and that is why we are here. As with all surgical decision making, it is important to remember:

- There is no rush to make a decision
- It is important that you understand each option in full detail. If you do not, ask again.
- Timing may be an important issue.

Pre-Operative Visit

The purposes of this visit are:

- To further help you understand your options
- To review the risks of surgery and all details of the procedure, including post-operative, recover and rehabilitation programs
- To review all logistical issues
- To provide prescription medication including:
 - Vicodin or Percocet: This is an excellent pain reliever that is a combination of a codeine analogue plus Tylenol. You can take up to two tablets every four to six hours as necessary. Since we have been using the present protocol of local anesthesia, patients require much lower amounts of pain medications.
- To make sure we have adequately screened you medically with respect to physical exam, blood and other tests
- To provide necessary crutches, knee braces, etc.

Anesthesia Options

- **Local with sedation:** This option is reserved for those individuals to have arthroscopy with meniscus care only.
- **Spinal/epidural:** Widely accepted, but rarely used for knee arthroscopy
- **General:** Widely accepted and most used for knee arthroscopy

What to Expect at Surgery

All patients have a level of nervousness in the days prior to surgery. The best thing to do about all concerns is to talk with friends, family and us. We have dealt with this many times and we want to make your experience as enjoyable as we can. There are some important rules to follow:

- Do not eat or drink after midnight the night before surgery.
- Make sure you have someone to drop you off and pick you up from the surgical center. The staff will review for you the best times.
- Read all material given to you the night before surgery. Make sure you understand all logistics, options risks and benefits in full detail. If you have any questions, ask them. Remember, the key to an optimal result is information, comfort and confidence.

After Surgery

You are in the recovery room and perhaps groggy or still somewhat sedated from the anesthesia. In this period it is essential we:

- Minimize pain and nausea
- Ice your knee to minimize swelling and pain.
- When you are feeling good enough to go home, you will be discharged. The nurse will review all issues including exercises, icing protocols, medication, and follow-up appointments.

Once you are home our goals remain much the same:

Pain control

Our goal is to minimize or eliminate pain with this procedure. You will have prescriptions for the following:

Vicodin or Percocet: You may take one to two tablets every four to six hours as needed. In most cases, we recommend taking one tablet every six hours. As most pain subsides, you can just take two tablets of Tylenol every four to six hours.

- **Post-Operative Visit: What to Expect**

- Make sure medications are effective and not causing problems.
- Change your dressings.
- Review the basic exercises again.
- Review the operative findings, procedures, and photos.
- Schedule physical therapy visits. We will give you the referral and appropriate authorizations as needed.
- Schedule follow-up visits and make sure you have all necessary notes and documentation for school or work.

Issues and Problems

- **Expectations.** This is a very subjective and personal issue. Some individuals have unrealistic expectations as to the speed of recovery. We will be assessing your healing progression but everyone is different. It is important to control the things you can, such as daily commitment to the exercise program which will help enormously.
- **Swelling in the knee.** Most procedures have some swelling. If it is in excess we may need to remove the fluid in clinic.
- **Pain.** Most people have little or minimal pain with this procedure. If it is unmanageable please call us.
- **Numbness.** Loss of function of foot or ankle and tremendous swelling of the leg rarely occur. If this happens please contact us immediately.

Return-to-Sport: The Ultimate Goal

Every patient/athlete is different. The return to sport and/or work is always a progression. It can never occur without attention to the details of the sports progression. Each sport is different and has a specific protocol for that sport. All knee arthroscopic surgeries are different and each injury unique.

Typically patients are able to return to work between 3-6 weeks after knee arthroscopy depending on the nature and demands of their workplace. We are happy to support you every step of the way throughout the recovery and rehabilitative process.

Questions

The CORE Institute is dedicated to your outcome. If any questions or concerns arise, please call The CORE Institute at 1.866.974.2673.