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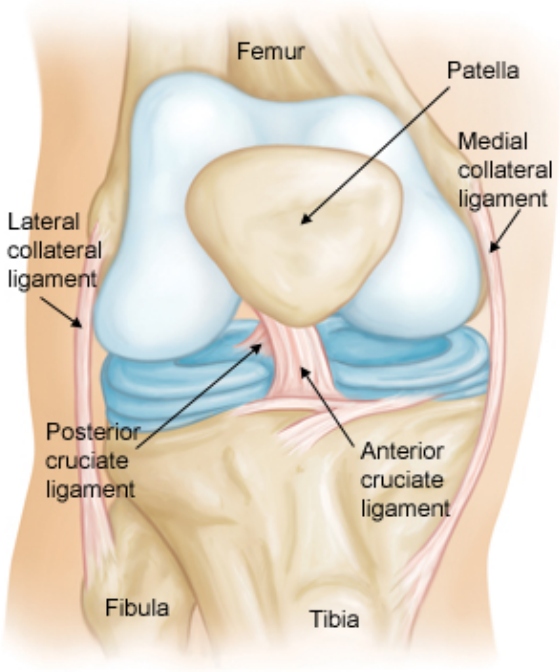
ACL Reconstruction Program

INTRODUCTION

You have injured your knee. This is a very common problem in these times when individuals are active, estimated at 120,000/year. Most knee sports injuries are "non-contact," meaning that the mechanism of injury was not caused by a collision. The foot twists, balance is lost, and the knee torques in a direction and position that is not compatible with the ligament's normal loading potential. This results in a failure of the anterior cruciate ligament (ACL). You may have felt a pop, click, pain, and or tenderness, followed by swelling and painful range of motion. ACL tears are common in skiing, basketball, soccer, and football. Females have an approximate 40% greater number of ACL injuries in most sports compared to males. Many theories have been proposed, including anatomical, physiological, and motor control explanations.

KNEE ANATOMY AND FUNCTION

The knee joint is composed of the femur (thigh bone), the tibia (leg bone), and the patella (kneecap). The parts of these bones which face the joint are covered with articular cartilage that allows weight bearing and motion with a very low coefficient of friction. The tibia is also covered by two half moon shaped soft cartilage (fibrocartilage) structures: medial and lateral menisci that act as shock absorbers and joint stabilizers, and provide joint nutrition/lubrication. The anterior cruciate ligament (ACL) attaches the posterior part of the femur to the anterior part of the tibia and prevents the tibia from sliding too far forward and also helps with rotational stability. When ruptured, active individuals have a difficult time with pivoting, cutting, and changing directions…a major problem for people who ski or play basketball, soccer, football, and volleyball, among others. The posterior cruciate ligament (PCL) and medial and lateral collateral ligaments (MCL and LCL) also help stabilize the femur in relation to the tibia.



MAKING THE DIAGNOSIS

We will carefully evaluate your history (how you injured your knee and your symptoms), perform a physical examination, and may attain imaging studies, including x-rays and/or magnetic resonance imaging (MRI). We will review these findings and take into account your activity level and demands, your overall medical condition, and physical limitations as a result of your injury. ACL injuries can vary in severity, from a stretch to partial tear to complete rupture alone, or complete rupture combined with other knee ligament or cartilage injury. At this time, we will make final determination of your injury and give you recommendations.

WHAT ARE YOUR OPTIONS?

We have determined you injured your ACL. Your initial response may be frustration, disbelief, anger, or depression; all appropriate and expected. After recognizing this, it is important to get on with a decision making progression to find out what is best for you.

My principals:

1) There is no rush, allow this to be an evolution and allow your judgment to surface.
2) Define for us your athletic goals. Where are you on the spectrum from low level recreational to high demand? Only you can define that for us. Remember, it is not appropriate to say, "I am not a professional athlete" to rationalize your objective. Every individual must be dealt with as a separate situation that must be personalized.
3) Timing of the injury must be matched with your agenda, season, goals, and priorities.

Once these principals are considered, we are ready to discuss options:

Option 1: Non-operative care

This option is best for low demand athletes who do not require the ability to aggressively pivot, run, or jump. You will be started on an ACL program in physical therapy in order to strengthen the muscles around the joint and maximize range of motion. If you change your mind at any time, or find that your knee is not stable enough for activities you enjoy, then you can always move on to option 2 or 3. This is not recommended in a majority of younger and active patients as insufficiency of the ACL can lead to associated damage of the cartilage surfaces and/or menisci. Unfortunately, our options to treat cartilage and meniscal injury are not as proven as an ACL reconstruction.

Option 2: Knee arthroscopy and meniscus care only

This option allows for a quicker recovery, but functional instability of the knee may persist. This option may be indicated for "partial injuries" of the ACL in certain individuals.

Option 3: Arthroscopic ACL reconstruction

This option is preferable for mid to high level recreational, elite, and professional athletes. This procedure has evolved over a 30 year period to a level that we are now 90-95% successful in returning athletes to sport. It is an outpatient procedure followed by an accelerated rehabilitation program.

WHAT ARE MY OPTIONS FOR GRAFT RECONSTRUCTION?

You have decided to "fix" your ACL. The three main options (although there are others) for ACL reconstruction are

1. Autograft Patellar Tendon
    a. This was previously the most common procedure performed for ACL reconstruction. It involves removing 10-11mm from the middle of your patellar tendon with bone blocks on either side. 5-10% may have soreness in the front of the knee from where the graft was taken.

2. Autograft Hamstring tendons
    a. This uses your distal hamstring tendons to reconstruct the ACL. The overall results have been similar to the patellar tendon. There has been some donor site weakness reported, though the clinical/functional significance has not been proven.

3. Allograft Anterior or Posterior Tibialis Tendon/ Achilles Tendon
    a. The use of allograft avoids graft harvest site problems, there is less pain, swelling and limitation of motion, shorter operating time, and better cosmesis (smaller incisions). However, there is always a chance of disease transmission when using an allograft, with accepted probability being 1 in 1 million. Since new screening techniques have been employed, this problem has not been reported at our center. In younger patients, allografts have been associated with a three times higher failure rate compared to autografts and thus is typically reserved for patients >40 years of age.

WHAT ARE THE RISKS OF SURGERY?

Risks are present at any part of surgery, for ACL reconstruction, the risks include:

1) anesthesia
2) infection (1/200-1/300)
3) recurrent laxity or graft failure (2-5/100)
4) chronic stiffness (1-2/100)
5) nerve and/or blood vessel injury (1/500)
6) blood clot (1/500)

We take precautions against all of these risks, and this lowers the complication rate. We use pre-operative antibiotics, compression stockings and blood thinners when necessary, meticulous surgical technique to enhance graft fixation, and accelerated rehabilitation.

THE TIMING OF SURGERY

Several studies suggest it is optimal to wait 3 weeks for ACL injury to prevent the risk of knee stiffness after surgery. This is flexible and revolves around obtaining full extension and flexion in the knee prior to surgery.

Two exceptions are 1) the elite athlete in which time to return to play is critical and 2) if there is a displaced meniscus tear that will not allow a full range of motion.

Studies also suggest that it is best to perform ACL reconstruction within one year of injury. A higher rate of meniscus and cartilage injury is seen inactive individuals who have an unstable knee and continue to perform high level activities. This can potentially contribute to early arthritis.

THE DAY OF SURGERY

On the day of arthroscopy you will need to:

-wear loose, comfortable clothing
-remove all jewelry
-go to bathroom just before surgery

Before surgery, you will be in the "pre-operative holding area" where the nurse or anesthesiologist will start an intravenous line, or "IV." Your anesthesiologist will meet with you to go over the options for anesthesia which include local anesthetic with sedation and general anesthesia.

How is arthroscopy performed?

The length of time for knee arthroscopy varies, depending on what is done during the surgery. Generally, it takes 45 to 90 minutes for the surgery.

Two or three small incisions (approximately 3 millimeters in length) are made around the knee to insert the arthroscopy camera and necessary instruments. Attached to this is a camera and light source which is also attached to a TV monitor. A pump is used to precisely monitor the amount of fluid (sterile saline) to irrigate and fill the joint space for better viewing. Pictures and video may be taken and saved for later reference.

Dr. Patel will inspect the entire joint first. He may use a motorized "shaving" instrument to clean up torn cartilage or excessive growth of tissues. He will also repair meniscal tears that are amenable to repair.

ACL reconstruction generally requires an additional incision (described in clinic) for the graft harvest and placement. The surgery is done as an outpatient. In certain situations (uncommon), the patient will stay overnight. You will have crutches, and knee bracing will depend on other factors and pathology (meniscus) dealt with at the time of surgery. You should use the crutches to assist your weight bearing until you can walk without a limp. Again, modifications will be made based on other arthroscopic treatment, and will be individualized for each patient.

What happens immediately after surgery?

After your arthroscopy you will go to the recovery room. You will remain there until the effects of your anesthetic have begun to wear off. You will remain in the recovery room.

YOUR SURGERY HAS BEEN COMPLETED

You will be asked to do the following exercises immediately after surgery:

-Straight leg raises: elevate for 10 seconds and repeat 10 sets, do this 3-5 times per day
-Range of motion as tolerated. The early goal/emphasis is to obtain full extension (0 degrees).
-Use the icing unit continuously for 4 days after surgery, then intermittently throughout day as schedule allows

Pain control—"No pain is your GAIN". Prescriptions will be given for:

NORCO or PERCOCET: 1-2 tablets every 4-6 hours as needed.
NSAIDs: As needed for break through pain

THE ACCELERATED ACL PROGRAM

Stable fixation of the graft allows early exercise and weight bearing within a safe zone. Our goal is to keep you there. Progression from one phase to the next is based on you demonstrating readiness by achieving **functional criteria rather than the time elapsed since surgery**. The timeframes identified in my protocol after each Phase are approximate times for the average patient, **NOT** guidelines for progression. Some patients will be ready to progress sooner than the timeframe identified, whereas others will take longer.

Early exercise and partial weight bearing has been proven to be safe and effective without any decrement in result or graft ligament laxity. In fact, we have found the contrary. At all levels of rehabilitation, conditioning and return to sport is a progression.

During the program, it is essential to exercise 6 days/week. Here are some specifics:

-ride a bike 6 days/week, goal of 1 hr/day
-aqua jogging is OK after 3 weeks
-jogging on soft ground OK at 12-16 weeks, depending on the individual
    -start with walking without a limp
    -then walk x 30 minutes with no pain or limp
    -then walk x 5 minutes and jog for five minutes
    -then walk x 5 minutes and jog for 10 minutes
    -then walk x 5 minutes and jog for 15 minutes and so on
    -remember: cyclical progression of increases followed by decreases

Higher level agility training: The Box (under the guidance of a physical therapist)

-following running progression
-usual is around 4/5 months (running portion)

-4 cones 5 yds apart making a box. The box is initially walked slowly, then rapidly, then jogged, then sprinted. Progress length of box to 10, 20, 30, and then 40 yds. This program helps with proprioception and agility, and a transition to a functional return to sport. Often times "The Box" is replaced with a similar regimen aimed at achieving the exact same goals.

RETURN TO SPORTS

This is also a very individual transition and is always a progression. Each sport is different. Here are some examples:

1) Soccer: start field progression with box training, with and without ball
2) Basketball: start in gym after 4th week, walking around court, shooting free throws, followed by box progression (when jogging begins)
3) Skiing: mountain progressions start after 80% of experienced skier motion and strength. Start with intermediate slopes for 1.5 hrs, then progress appropriately
4) Tennis: after the 4th week, the athlete will start to hit balls lightly against a wall to re-acquaint eye-hand coordination
5) Volleyball: after 4th week, the athlete will start gentle hitting

Full return to competitive cutting sports is often around 6-8 months, but can vary. Full return to sports is based on strength, agility, aerobic and anaerobic fitness, vertical leap, joint stability, quadriceps bulk, and sport specific issues

After your surgery, you will have a specific rehabilitation program set up for you based on these guidelines. The purpose of this document is to help you understand the complexities of your ACL injury, reconstruction, and rehabilitation. It is important to contact us if you have any questions at (847) 324-3096.

Further information can be obtained at:

http://orthoinfo.aaos.org/topic.cfm?topic=a00549