

KNEE DISLOCATIONS

What is a knee dislocation?

A knee dislocation is a violent injury resulting in severe knee trauma. Three of the four major ligaments that provide stability to the knee joint must be torn to be classified as a knee dislocation. Vascular and nerve damage are possible after a knee dislocation (20-30%). Loss of limb has occurred in 20-30% of patients in some reported series. Historically, knee dislocations have been treated non-surgically, however, with the development of better surgical instrumentation and improved technique, the treatment for multiple ligament knee injuries has become primarily surgical.

What structures are injured in a knee dislocation?

As mentioned above, at least three major ligaments that help hold the knee together will be torn when one suffers a knee dislocation. Ligaments are like "cables" that hold the thigh bone to the shin bone. In most cases, the two "cruciate" ligaments, the anterior cruciate ligament (ACL) and the posterior cruciate ligament (PCL) will tear, as well as one of the ligaments on either side of the knee, the medial collateral ligament (MCL), on the inner part of the knee, or the lateral collateral ligament (LCL) on the outer part of the knee. The posterolateral corner of the knee may also be damaged. It consists of the LCL, as well as several other soft tissues in that area. Meniscal (cartilage) injuries and associated fractures are seen fairly commonly in knee dislocations. In unusual situations the knee can be dislocated without tearing both of the cruciate ligaments.

Nerve and blood vessel structures are also at risk of injury. The popliteal artery may be at most risk in a knee dislocation. If this artery is injured, sufficient blood flow to the lower leg cannot be maintained, and can, potentially, result in a loss of the lower limb. The peroneal nerve is also at risk. Because of its location near the outer part of the knee, the mechanism of a knee dislocation can result in a traction injury to this nerve. This can result in a temporary "foot drop", or, in more severe cases, a permanent one.

Knee dislocations can be associated with fractures about the knee, fractures of the limb (femur, tibia). They may be associated severe soft tissue injury. They can have severe swelling associated with them with resultant compartment syndrome. With high energy injuries there may be associated "poly trauma" with associated injuries to other extremities, the spine, abdomen, chest, and /or head.

What causes a knee dislocation?

Dislocations are caused by sports injuries that involve falls, such as football, basketball and gymnastics. They can also result from motor vehicle accidents or industrial accidents. They can be classified as low energy (most sports) and high energy (motor vehicle, pedestrian-motor vehicular, motorcycle, fall from a height). Depending upon the mechanism, the dislocation may be classified relative to the direction of the lowerleg

(tibia) relative to the femur (upper leg). The tibia may be displaced in any of 4 directions and there can be a rotatory component as well. Sometimes the dislocation may be irreducible secondary to incarceration of tissue between the bones which preclude realigning the limb.

What are the signs and symptoms of a knee dislocation?

A dislocated knee may appear visibly deformed or out of place. It may also be swollen, discolored, intensely painful and immovable. You may also experience numbness or tingling down to your ankle and foot if an associated peroneal nerve injury is present. A knee dislocation is a medical emergency and should be evaluated in a hospital emergency room as soon as possible. While waiting for medical attention, the knee should be splinted in its current position and ice should be applied to help minimize pain and swelling.

How is the diagnosis made?

Your orthopedic physician or emergency room physician will perform a physical examination of your knee which may give them a strong suspicion of a knee dislocation. Your foot and ankle should also be examined for the presence of pulses, sensation and motor function. X-rays should be obtained to reveal any broken bones or bone misalignment that would be consistent with a knee dislocation. Subsequently, an MRI should be ordered to focus in on exactly what structures are damaged. An arteriogram should be ordered to assess the status of the popliteal artery which provides the blood supply to the lower leg. Damage to this artery that goes undetected can potentially result in a loss of limb. If there is clinical evidence of nerve damage, such as a "foot drop", an EMG (nerve conduction study) are obtained 4-6 weeks post injury to help determine if the condition will be temporary or permanent.

What is the treatment for a knee dislocation?

The nerve, vascular and boney status take priority in the initial management of the dislocated knee. The key issue is whether the popliteal artery is transected. If so this is an absolute surgical emergency to attempt to repair the vascular injury. In this setting the pulses in the foot may be absent. If the pulses are present and then disappear after reduction of the dislocation, imaging of the vessels is mandatory to determine the vascular status of the knee. Even if pulses are present it is frequently customary to obtain an imaging study (arteriogram, MR angiogram, ankle brachial ratios).

Knee dislocations were initially managed conservatively with casting or brace immobilization. The outcomes for these patients were reasonable, but, over time, the orthopedic community suggested that a surgically stabilized knee would fare better in the long term. Studies concluded that better results were obtained with early repair of the ligaments in a multi-ligament injured knee. Treatment however must be tailored to the patients' demands, associated injuries, ability to properly rehab the extremity, etc.

Through the 1990's, the technique of arthroscopically-assisted ACL / PCL reconstruction became more popular. The availability of allograft (donor) tissue, better surgical instrumentation and improved surgical technique helped make multi-ligament reconstructions possible. The results of these reconstructions are favorable. Most patients are able to return to normal daily activities and their workplace. In cases of associated MCL/LCL and posterolateral corner injuries, it is imperative that these structures are surgically reconstructed as well, or the results of ACL/PCL reconstruction alone will not be optimal.

Post-operative follow-up studies on patients who have undergone these procedures conclude that a high percentage of them were able to return to their desired levels of activity.

It is important to note that the surgical treatment for knee dislocations is somewhat controversial in terms of the timing of surgery and the graft tissues chosen for reconstruction. An orthopedic surgeon with experience in multi-ligament knee reconstructions should be chosen to counsel you with regards to these issues and to give you the best possible surgical outcome.

What will physical therapy consist of after surgery?

Physical therapy protocols will vary slightly based on exactly what structures were reconstructed. Your orthopedic surgeon will provide his or her rehabilitation protocol to you and your physical therapist. Generally speaking, there will be a brief period of immobilization post-operatively to allow for some initial healing. Your time on crutches will be determined by your surgeon. In some cases 4-6 weeks of non-weight bearing is required, based on what exactly is done at the time of surgery. Progressive range of motion and closed chain strengthening exercises will follow. Return to sports and heavy labor can be expected at 6-9 months post-operatively. It should be noted that some patients may lose 5-10 degrees of knee flexion following a complex knee reconstruction. This does not cause a functional knee problem and patients should still be capable of returning to high levels of activity.