

Medial Patellofemoral Ligament (MPFL) Reconstruction

What is the medial patellofemoral ligament (MPFL)?

The medial patellofemoral ligament is a part of the complex network of soft tissues that stabilize the knee. The MPFL attaches the inside part of the patella (kneecap) to the long bone of the thigh, also called the femur.

Together, the patella and femur compose the patellofemoral joint.

Injury to the MPFL can occur when the patella dislocates or partially dislocates due to a trauma experienced during athletics or an accident, as a result of naturally loose ligaments or due to individual variations in bony anatomy. People with these injuries are described as having patellar instability.

What is MPFL reconstruction?

MPFL reconstruction is a surgery in which a new medial patellofemoral ligament is created to stabilize the knee and help protect the joint from additional damage.

The procedure is relatively new. Historically, although some patients benefitted from surgery to tighten the damaged ligament, as recently as around 2006, many individuals with damage to the MPFL had few treatment options beyond immobilization and rehabilitation.

Injury to the MPFL

In the healthy knee, the bones that make up the patellofemoral joint move smoothly against one another as the joint is flexed or extended. The patella glides in a trochlea (groove) of the femur. The MPFL plays a particularly important role in keeping the patella on track (that is, in this groove) by acting like a leash that restrains the patella's movement.

When patellar dislocation occurs, soft tissues are damaged as the patella “jumps” the track and then comes forcibly back into place. Because the kneecap dislocates toward the outside of the leg, the ligament on the inside of the knee (the MPFL) gets torn.

Left untreated, an injured MPFL can heal on its own. However, when left alone, the ligament heals in a loosened, lengthened position. This causes instability that makes it easier for the patella to become dislocated again in the future. This, in turn can cause damage to the cartilage in the knee. While the pain, swelling and disability associated with a dislocated kneecap are

problems in themselves, the greater concern is subsequent injury to the cartilage that covers the bones. Once this cartilage is damaged, you are put at a high risk of developing arthritis, a significantly more difficult condition to treat. For this reason, it is always advisable to get treatment that will help prevent further dislocations of the kneecap.

MPFL reconstruction protocol

At HSS, patients with patellar instability undergo a thorough assessment that includes a physical examination and review of the patient's medical history. A magnetic resonance imaging (MRI) is also performed to help the doctor understand the condition of the cartilage in the patellofemoral joint and helps determine whether the patient is a candidate for MPFL or a bony procedure, such as tibial tubercle transfer. Often, these images can be obtained on the same day as an initial visit.

Although non-operative treatment does not have a significant role in the treatment of patellar instability, if the patient has experienced a dislocation without a cartilage injury on MRI, he or she will be treated with short term immobilization and physical therapy before surgery.

Patients undergoing MPFL reconstruction receive regional anesthesia — a spinal nerve block that numbs the lower half of the body — and sedation so they can sleep. The orthopedic surgeon then replaces the injured ligament with a portion of a tendon taken from donor tissue. An *arthroscope* is used to view the surgical area, and the ligament reconstruction is conducted using two small incisions. The entire surgery takes about an hour, and patients return home the same day, with their knee stabilized in a brace.

MPFL reconstruction produces excellent results and has a very low rate of complication. Rare complications can, however, include fractures, infections or blood clots. The procedure can be performed safely in children with open growth plates (the area where bone grows), as opposed to surgical approaches that change bone alignment and which are not appropriate in young patients. With no alternative available, in the past, children were sometimes placed in a brace, but remained at risk for additional dislocations until they reached skeletal maturity, at which time a surgical reshaping of the bone (osteotomy) would become an option. Today, MPFL reconstruction is a safe option for children and teenagers.

MPFL reconstruction as a revision to prior, unsuccessful surgeries

Orthopedic surgeons also perform MPFL reconstruction on patients who have had other, less successful surgeries to address the condition. Such prior surgeries may include:

- Arthroscopic, minimally invasive surgery in which torn tissue in the patellofemoral joint is “cleaned up”
- Medial imbrication, a procedure in which the surgeon tightens the MPFL by taking a “tuck” in it, similar to tightening a garment.
- Lateral release, in which the ligament on the outside part of the patellofemoral joint is loosened

Although a lateral release alone is not an effective surgical option for patellar instability, this procedure may be done in conjunction with an MPFL reconstruction to address other problems in the joint and to restore balance in the knee.

Tubercle tibial transfer or osteotomy may also be done in conjunction with an MPFL in patients who have significant mal-alignment of the bones in the patellofemoral joint. This procedure is recommended for patients who have an anatomical abnormality in which the patella tendon attaches to the tibia in such a way that there is a severe sideways pull on the patella.

Those who undergo MPFL reconstruction as a revision surgery generally experience a considerable improvement in stability of the patellofemoral joint.

What to expect after MPFL reconstruction

Immediately following MPFL reconstruction, patients can bear weight on the affected leg, which is placed in a brace that is worn for six weeks. The brace keeps the leg straight during walking. Once the quadriceps (the major muscle in the thigh) is strong enough to support the joint, the patient can unlock the brace. This is usually about four to six weeks after surgery. Other measures that can speed up recovery include devices that provide electric stimulation to the muscles around the knee (Cymedica) and Game Ready, a machine that compresses and cools the leg, thereby reducing swelling and pain.

Most people can generally return to sport or play sometime between four to seven months after MPFL reconstruction. If you are considering the surgery, be aware that recovery times may vary and can be dependent on your individual anatomy, capacity to heal and general health prior to surgery.