

Optimal Treatment for Knee Ligament Injuries

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Have you ever heard someone say they *tweaked* their knee? Has that ever happened to you? You take a step wrong or move in just a way that causes a sudden, sharp pain along the inside (*medial* side) of the knee. You may have just experienced a grade I or II (mild) injury to the *medial collateral ligament* (MCL).

The MCL is made up of several layers of fibers. Some fibers are parallel. Others angle down from the lower end of the *femur* (thigh bone) to the upper part of the *tibia* (lower leg bone). The ligament is made up of multiple layers of fibers that cross the knee joint. It protects the knee from injury along the inside edge when a force is applied to the outside or *lateral* edge of the joint.

MCL injuries are among the most common knee ligament injuries. In this review article, orthopedic surgeons bring us up-to-date on current evaluation and treatment of MCL injuries. Most of the injuries to the MCL occur when the knee is slightly bent or *flexed*. Most of the time, people don't even bother going to the doctor for this. If it happened to you, you probably just took it easy for a few days until the pain went away.

But when a more severe injury occurs or when this happens to a highly competitive athlete, early rehab is advised to protect the knee from further injury. A severe injury may cause a grade III sprain of the MCL. With knee dislocations or combined knee injuries, other ligaments and/or the *menisci* (knee cartilage) could also be involved.

The goal of treatment is to restore full function as quickly as possible. Return-to-sports is allowed as the pain goes away. Athletes often ask about the use of knee bracing to prevent these injuries or to prevent re-injury. There's a lot of debate about this idea.

Some experts have expressed concern that bracing will cause the leg muscles to weaken and atrophy. Others think speed and agility will be compromised by bracing. Players often feel as though the brace gives them the support and protection they need to be able to play their best. But others complain that the brace holds them back and hampers their performance.

What's the real truth about *prophylactic* (preventive) bracing? There isn't much evidence from high-quality studies yet to guide us. What has been published so far shows that injury rates are lower for players at risk for MCL injury who wear a protective knee brace during practices and games. While providing protection for the MCL, the brace doesn't really seem to limit function. That information should help put players' fears to rest that their performance is negatively affected by the brace.

How does a player know for sure the MCL has been sprained? A medical evaluation is needed to make the diagnosis. The team physician or orthopedic surgeon will palpate (feel) along the medial joint line (side closest to the other knee). He or she will be looking for any pain, swelling, or tenderness. There is also a *valgus stress test* that can be performed specifically for the MCL. The injured leg is compared to the normal (uninvolved) knee.

The grades of sprain (I, II, and III) are based on how far the medial joint line gaps open during the valgus stress test. With a grade I sprain, there is minimal (less than five millimeters) of gap or opening. A grade II sprain means the joint line opens five to 10 mm and grade III has more than a 10 mm gapping effect.

Other tests are needed to rule out the possibility of additional injury to other ligaments such as the *anterior cruciate ligament* (ACL) or *posterior cruciate ligament* (PCL). These two ligaments connect the femur to the tibia and criss-cross inside the knee. Depending on the force and type of injury, one or both of these ligaments could be damaged or even ruptured. For example, a force strong enough to dislocate the knee could cause injury to all the knee ligaments.

X-rays and MRIs are the most useful diagnostic imaging studies for MCL injuries. An arthroscopic exam may be needed to assess the overall integrity of the joint, meniscus, articular cartilage, ligaments, and other soft tissues.

Once all the damage has been identified, then a treatment plan can be determined. Conservative (nonoperative) care works well for grade I and II MCL injuries. Joint motion and strengthening exercises are the mainstay of this approach. Bracing is not advised during the healing phase of MCL injuries. Animal studies have shown that movement is important to ligament healing. Immobilization actually slows down the normal process of ligament repair.

A physiotherapist or athletic trainer helps the athlete condition and train with a goal of returning to play as quickly as possible. Usually, this takes 10 days up to three weeks' time. By the end of three months, the athlete should be back to a preinjury level of sports activity.

For athletes with more severe (grade III) MCL injuries, a trial of nonsurgical treatment is usually advised. But if the knee remains unstable despite muscle strengthening, then surgery may be needed. The surgeon uses the valgus stress test to help identify patients who continue to have too much gapping of the joint line, a sure sign of joint *laxity* (looseness) and loss of joint stability.

The type of surgery depends on the location and severity of the damage. Ligaments that pull away from the bone where they attach (either at the femur or at the tibia) are less likely to heal well (compared with injuries closer to the middle of the ligament--further away from the bony insertion sites).

It may be possible to repair minor tears but full tears will require reconstruction. The surgeon uses a tendon taken from the patient's hamstring muscle and converts it to use as a tendon graft. When planning the operation, the surgeon thinks about the patient's goals and expectations. The presence of other associated injuries (such as an ACL tear) must be considered as well.

Sometimes it's possible to treat the MCL injury (grades I or II) nonoperatively but then repair or reconstruct the ACL surgically. Studies show good-to-excellent results with this approach. With an intact ACL providing joint stability, the MCL seems able to regroup and repair itself much faster. Two-thirds of the patients are able to return to full play and even maximize (improve) their performance.

Athletes should be prepared for the possible long-term consequences of combined injuries. Even with surgical reconstruction, there is an increased risk of osteoarthritis developing in that knee. There are also increased risks for reinjury and a second surgery.

Knowing this, researchers are now directing their studies to finding ways to prevent these complications from developing. It may be possible to identify subgroups of patients who should have an MCL repair or reconstruction rather than just conservative care. Right now, they are looking at the location of the injury, differences in recovery between groups who do have surgery and groups who do not, and the usefulness of MRI in predicting the outcomes of various treatment choices.

The authors conclude by offering their own approach to treatment for MCL injuries. All grade I and II injuries are treated with functional rehabilitation. Grade III MCL injuries are treated with nonsurgical efforts first. These patients are put in a knee brace and sent to physiotherapy.

Surgery is considered when there is ongoing joint laxity resulting in chronic knee problems and instability. For patients with both an ACL and a MCL injury, the patient is given a brace, six weeks of therapy, and then surgery to reconstruct the ACL. The MCL is repaired only if joint gapping (more than four millimeters) is present after the ACL is reconstructed (tested while the patient is still on the operating table).

Ryan G. Miyamoto, MD, et al. Treatment of Medial Collateral Ligament Injuries. In *Journal of the American Academy of Orthopaedic Surgeons*. March 2009. Vol. 17. No. 3. Pp. 152-161.