

# Medial Collateral Ligament Sprain -- Part I

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The medial collateral ligament (MCL) is the most frequently injured ligament of the knee. Structurally, the MCL is more firmly attached to the knee than the lateral collateral ligament and most injuries usually occur on the more exposed lateral side, which exerts most of the stress onto the medial side. A clip to the outer knee may create initial pain only on the lateral knee, but hours later the medial knee pain may exhibit itself.<sup>1</sup> Clipping represents a contact injury, but more often the injury is of a non-contact variety such as skiing where the inside edge of the ski catches and forced-valgus in external rotation occurs.

With a straight valgus-force, the menisci are not torn since usually compression and shear forces are necessary to tear a meniscus. The worst that usually happens with a direct valgus-force is that the meniscotibial (coronary) ligament may detach.<sup>2</sup> It is important to elicit a complete history of the mechanism of the injury to determine the direction of the stress. But at least a complete functional knee examination will be invaluable if the history is hazy.

The MCL is made up of a superficial ligament which is now called by itself the tibial collateral ligament which originates from the medial epicondyle of the femur, just below the adductor tubercle, and inserts on the medial tibia three to four inches below the joint line, posterior and deep to the pes anserinus. This ligament lies slightly posterior to the joint line which is important to know if you use friction massage. The deep portion of the MCL originates from the medial epicondyle and inserts on the tibia near the joint line. The deep portion is a thickening of the joint capsule and blends with the medial meniscus. It is known as the middle one-third medial capsule.<sup>2</sup>

When the medial knee joint is injured with a valgus-force, the superficial portion is injured first while the capsular portion acts as a secondary restraint. Depending on the site of injury, the maximum pain may occur at its origin, at the joint line, or at the insertion three to four finger-breadths below the joint line. There may be local extra-articular swelling rather than the intra-articular large, diffuse effusion found with intra-articular lesions (cruciate, capsular, etc.). Of course the amount of effusion is not always indicative of the amount of injury since, if the capsule is torn, the fluid may extravasate into the soft tissues.

The principle test for MCL sprain is the valgus stress test with the knee flexed 30 degrees, because at 30 degrees the cruciates and posterior capsular ligaments are more relaxed. In the acute stage the best way to test the MCL is with the patient lying supine with his thigh resting on the table. The examiner allows the leg to flex off the table and puts the tibia in external rotation. Applying a valgus stress with the thigh on the table compensates for the usual hamstring spasm. The first tissue to be stressed with a valgus-force is the tibial collateral ligament and then the deep capsule. Next in order of injury would be the posterior oblique ligament, and then the anterior cruciate and/or posterior cruciate ligament. If the deeper structures are involved (cruciates) then there would be excessive

motion on a valgus test with the knee fully extended. When the medial collateral ligament is involved by itself, the valgus stress at 30 degrees will be positive and the valgus stress in knee extension will be negative. Passive lateral tibial rotation may also be positive.

It is important to determine the grade of sprain. In a first degree sprain compared to the normal knee, there may be up to 5 mm of motion with a firm endpoint, indicating only microscopic ligament tearing. In a second degree sprain there is 6 to 10 mm of motion with a firm endpoint indicating partial disruption of the ligament and some loss of function. Grade 3 indicates up to 15 mm of motion without a firm endpoint (mushy) indicating a complete tearing of the ligament and complete loss of function.

Next month my article will discuss the conservative care of the above sprains.

### *References*

1. Gersoff, W.K.; Clancy, W.G. Diagnosis of Acute and Chronic Anterior Cruciate Ligament Tears. Clin in Sports Med 1988; 7:727-737.
2. Zarins, B.; Boyle, J. Knee Ligament Injuries. Nicholas JA. Hershman, E.B. The Lower Extremity and Spine. Sports Medicine St. Louis, CV Mosby, 1986; pp 929-982.

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### **Editor's Note:**

Dr. Hammer will conduct his next Soft Tissue seminar on March 10-11 in Chicago, Illinois. Call 1-800-327-2289 to register.

FEBRUARY 1991