Reconstruction Of The Knee Superficial Medial Collateral Ligament With And Without Reconstruction Of The Posterior Oblique Ligament: A Comparative Study

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Abstract

The medial collateral ligament is the most commonly injured knee ligament. Most of the medial sided knee injuries that require surgical intervention are associated with posterior oblique ligament injury. There are different techniques for reconstruction of the medial collateral ligament. Some of them anatomically reconstruct the superficial medial collateral ligament only and more recent techniques reconstruct both superficial medial collateral ligament and posterior oblique ligament.

Key word

Pcl- St- Reconstruction-Knee- **Orthopedic**

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List of Abbreviations

- **MCL:** Medial collateral ligament
- **PMC:** Posteromedial corner
- **POL:** Posterior oblique ligament
- **PCL:** Posterior cruciate ligament
- **AMRI:** Anteromedial rotator instability
- **MRI:** Magnetic resonance imaging
- **ACL:** Anterior cruciate ligament
- **IKDC:** International Knee Documentation Committee
- **ASSOM:** American Orthopaedic Society Of Sports Medicine
- **ESSKA:** European Society of Sports Traumatology, Knee Surgery and Arthroscopy
- **GA:** General anesthesia
- **ST:** Semitendinosus
- **GS:** Gracilis
- **ROM:** Range of motion

CHAPTER 1: INTRODUCTION

Introduction

The medial collateral ligament (MCL) is the primary static stabilizing structure on the medial aspect of the knee, contributing up to 78% of the restraining force to valgus loads.(1)

The medial ligament complex of the knee includes one large ligament and a series of capsular thickenings and tendinous attachments. The superficial medial collateral ligament is commonly called the tibial collateral ligament, whereas the deep medial collateral ligament is also called the mid-third medial capsular ligament.(2)

The posteromedial corner (PMC) encompasses medial-sided structures posterior to the MCL, including the posterior oblique ligament, semimembranosus tendon, posterior horn of the medial meniscus, and the associated joint capsule.(3) The posterior oblique ligament (POL) consists of three fascial attachments that coursed off the distal aspect of the semimembranosus tendon at the knee and are termed the superficial, central (tibial), and the capsular arms.(4) The PMC and the POL in particular are biomechanically separate structures from the superficial MCL.(3) The PMC is a primary stabilizer of the extended knee.(5)

Injury to the medial collateral ligament (MCL) is the most common knee ligament injury.(6) Injuries to the MCL may occur as an isolated entity or as a component of a combined traumatic ligamentous disruption to the knee. Sims and Jacobsen reported that 99% of medial

injuries requiring operation had an associated injury to the posterior oblique ligament, which was overlooked in many reports.(7)

It is generally accepted that incomplete tears and isolated complete tears of the MCL can be treated nonoperatively with early functional rehabilitation.(8) This is mainly due to the excellent healing capability of this ligament found in both animal and human clinical studies.(9) However, grade-3 injuries of the MCL, especially those associated with other ligamentous injuries, sometimes lead to chronic instability followed by disability.(10)

Over the past years, various surgical techniques have been described for the treatment of chronic medial instability, such as proximal advancement of the MCL or reconstruction of the MCL with the pes- anserinus. Anatomical reconstruction of the anterior component of the MCL with the semitendinosus and gracilis tendons was introduced by Yoshiya et al in 2005.(11) Three techniques for reconstructing the MCL and the POL have been described. Two use semitendinosus autografts with the pes anserinus insertion of the tendon left intact.(12)

Aim of the work

The aim of this study was to evaluate the clinical outcome of concomitant reconstruction of both superficial MCL and POL compared to reconstruction of the superficial MCL alone in a prospective randomized trial. The hypothesis of the study was that reconstruction of both superficial MCL and POL might be clinically advantageous in regaining valgus stability compared to superficial MCL reconstruction alone. Both groups were compared regarding the following parameters; clinical evaluation according to the Lysholm and the IKDC rating scoring systems and stress valgus x-ray.

The Anatomy of the Medial Side of the Knee

The MCL complex has been described with several different names in several different publications. Warren et al(2) described 3 distinct layers. Layer I is the first fascial plane encountered that circumferentially wraps the knee. The next fascial plane, layer II, consists of the superficial MCL (Figure 1A). The superficial MCL originates in a depression 3.2 mm proximal and 4.8 mm posterior to the medial epicondyle of the femur; it remains extracapsular; and it initially inserts on so ssue approximately 4.5 cm below the articular surface of the tibia. The broad insertion site continues distally, approximately 7.8 cm, eventually blending with the periosteum. Layer III is the medial joint capsule. Directly under the parallel fibers of the superficial MCL, the capsule thickens into a vertically oriented band of short fibers representing the deep MCL (Figure 1B).

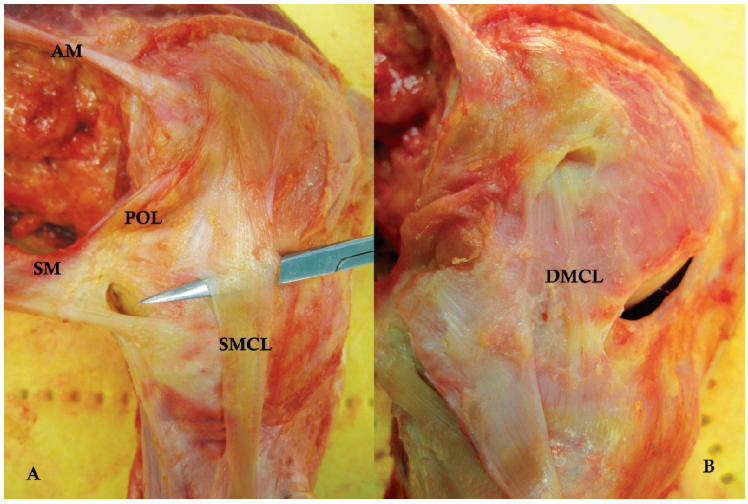

Figure (1). Medial collateral ligament complex anatomy.
A, cadaveric dissection of layer II, demonstrating the origin and insertion of the superficial medial collateral ligament (SMCL) and the relationship of other associated structures, including the posterior oblique ligament (POL), semimembranosus (SM), and the insertion of the adductor magnus (AM).
B, cadaveric dissection of layer III, demonstrating the deep medial collateral ligament (DMCL), represented by a thickening of the medial capsule.(2)

More recently, LaPrade et al(13) quantified the attachments of the medial-sided structures and recommended minimizing use of the 3-layered anatomy description. They verified the qualitative anatomy of medial knee structures and performed a quantitative evaluation of their anatomic attachment sites as well as their relationships to pertinent osseous landmarks as follows:

1. *Medial Femoral Osseous Landmarks:*

Qualitative analysis of the femora from the bone box specimens revealed that the medial epicondyle was the most anterior and distal osseous prominence over the medial aspect of the medial femoral condyle. The adductor tubercle was located at the distal edge of a thin ridge of bone, called the medial supracondylar line, along the medial aspect of the distal part of the femur. The adductor tubercle was located proximal and posterior to the medial epicondyle. A third osseous prominence, which we have called the gastrocnemius tubercle, was identified; this structure was slightly distal and posterior to the adductor tubercle and was close to a small depression, which corresponded to the location of the attachment of the medial gastrocnemius tendon (Figs. 2&3).