

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

Thesis submitted for fulfillment of MD degree in orthopedic surgery

By

Ahmed Samir Sayed El Kalyoby
Assistant lecturer of orthopedic surgery
Faculty of Medicine
Cairo University

Supervised by

Prof. Dr. Ahmed Abd Alaziz Ahmed
Professor of Orthopedic Surgery
Faculty of Medicine
Cairo University

Prof. Dr. Hisham Misbah Soliman
Professor of Orthopedic Surgery
Faculty of Medicine
Cairo University

Dr. Amr Samir Rashwan
Lecturer of Orthopedic Surgery
Faculty of Medicine
Cairo University

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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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Contents

Acknowledgements.....	i
Contents.....	ii
List of Tables.....	iii
List of Figures.....	v
List of Abbreviations.....	viii

Part 1

Review of literature

1- Introduction.....	1
2- Anatomy	4
3- Biomechanics.....	21
4- Diagnosis.....	28
5- Clinical evaluation.....	46

Part 2

1- Materials and methods.....	54
2- Results.....	73
3- Case presentations.....	107
4- Discussion.....	120
5- Conclusion and summary.....	125
6- References.....	130

List of Tables

Number	Title	Page
Table 1	Lysholm knee scoring scale.	47
Table 2	IKDC scale.	49
Table 3	Group A patients.	56
Table 4	Group B patients.	56
Table 5	Demographic data of group A and group B.	73
Table 6	The Clinical data of group A and group B.	75
Table 7	Comparison of pre-operative and post-operative Lysholm score (components & total score) of group A	76
Table 8	Limp score pre & post operative group A patients	77
Table 9	Support score pre & post operative group A patients	78
Table 10	Locking score pre & post operative group A patients	78
Table 11	Instability score pre & post operative group A patients	79
Table 12	Pain score pre & post operative group A patients	79
Table 13	Swelling score pre & post operative group A patients.	80
Table 14	Stair climbing score pre & post operative group A patients.	80
Table 15	Squatting score pre & post operative group A patients.	81
Table 16	Total Lysholm knee score pre & post operative group A patients	82
Table 17	pre-operative and post-operative Lysholm score (components & total score) of group B	83
Table 18	Limp score pre & post operative group B patients	84
Table 19	Support score pre & post operative group B patients	84
Table 20	Locking score pre & post operative group B patients	85
Table 21	Locking score pre & post operative group B patients	85

Table 22	Pain score pre & post operative group B patients	86
Table 23	Swelling score pre & post operative group B patients	86
Table 24	Stair climbing score pre & post operative group B patients	87
Table 25	Squatting score pre & post operative group B patients	87
Table 26	Total score pre & post operative group B patients:	88
Table 27	Comparison of post-operative Lysholm score (components & total score) of group A and B	89
Table 28	Comparison of post-operative Lysholm score (components & total score) of group A and B	92
Table 29	Lack of extension and flexion pre and post operatively.	92
Table 30	Lachman test in group A pre and post-operatively	93
Table 31	Valgus test in group A pre and post-operatively	94
Table 32	Grades of knee effusion pre and post operatively	96
Table 33	Lack of extension and flexion pre and post operatively.	96
Table 34	Lachman test in group B pre and post-operatively	97
Table 35	Valgus test in group B pre and post-operatively	98
Table 36	Grades of knee effusion post operatively	99
Table 37	Lack of extension and flexion post operatively.	100
Table 38	Lachman test and Valgus stress test in both groups post-operatively	101
Table 39	pre-operative and post-operative Stress valgus x-ray of group A	103
Table 40	pre-operative and post-operative Stress valgus x-ray of group B	104
Table 41	Comparison pre-operative and post-operative Stress valgus x-ray of group A and B	105

List of Figures

Number	Title	Page
Fig.1	Medial collateral ligament complex anatomy.	4
Fig.2	Photograph of a femur from a bone box specimen.	6
Fig.3	Illustration of the femoral osseous landmarks and attachment sites of the main medial knee structures.	8
Fig.4	Illustration of the main medial knee structures.	9
Fig.5	Illustration of the superficial medial collateral ligament.	10
Fig.6	Photograph of the meniscomfemoral and meniscotibial portions of the deep MCL.	10
Fig.7	Illustration of the three arms of the posterior oblique ligament.	11
Fig.8	Photograph and illustration demonstrating the central arm of the posterior oblique ligament.	13
Fig.9	Photograph of the isolated medial patellofemoral ligament.	15
Fig.10	Photograph of the femoral attachment of the adductor magnus.	16
Fig.11	Illustration of the femoral attachment sites of the medial gastrocnemius and adductor magnus tendons.	17
Fig.12	Illustration of the lateral edge of the pes anserine bursa, demonstrating the distinct attachment sites of the sartorius, gracilis, and semitendinosus tendons.	18
Fig.13	The semimembranosus expansions.	19
Fig.14	The anteromedial rotatory instability.	23
Fig.15	Bird's-eye view of the proposed dynamizing action of the semimembranosus.	25
Fig.16	Intracapsular orientation of the posteromedial corner structures.	25
Fig.17	Valgus stress test. A, In extension. B, In flexion.	33

Fig.18	Valgus stress test in 30° flexion by placing the leg on the table edge.	34
Fig.19	Demonstration of the Swain test.	36
Fig.20	The Slocum test.	37
Fig.21	valgus stress radiographs.	39
Fig.22	Coronal T2-weighted MRI demonstrating a grade I MCL complex.	41
Fig.23	Coronal T2-weighted MRI demonstrating grade III MCL complex injury.	41
Fig.24	Coronal T2-weighted MRI demonstrating a Stener lesion of the knee.	42
Fig.25	A scopic image of the medial compartment in acute combined ACL, PCL, and posteromedial corner injury.	43
Fig.26	Stress valgus test: A. In full extension.B.In 30° flexion	59
Fig.27	Meniscal rise sign and degree of opening of the medial compartment by the scope.	60
Fig.28	Graft harvesting.	61
Fig.29	Cleaning the tendon.	61
Fig.30	The tendon is looped with placing of running sutures.	62
Fig.31	Testing the isometry in extension and flexion.	62
Fig.32	Making the femoral shuttle using cerclage wire.	63
Fig.33	Making the tibial tunnel and checking the position of the wire with the image intensifier.	63
Fig.34	Making a tibial shuttle using cerclage wire.	64
Fig.35	Pulling the graft into the femoral shuttle and fixation using interference bioscrew.	64
Fig.36	The tendon is pulled into the tibial shuttle and fixation with interference bioscrew.	65
Fig.37	Hinged knee brace was applied post-operative.	67
Fig.38	Age groups of group A and group B.	74
Fig.39	Sex Distribution of group A and group B.	74
Fig.40	Total Lysholm knee score pre & post operative group A patients.	82
Fig.41	Total score pre & post operative group B patients.	88

Fig.42	Total Lysholm Knee score at pre and post operatively in group A &B patients.	90
Fig.43	Lachman test in group A pre and post-operatively	94
Fig.44	Valgus test in group A pre and post-operatively	95
Fig.45	Lachman test in group B pre and post-operatively	98
Fig.46	Valgus test in group B pre and post-operatively	98
Fig.47	Grades of knee effusion post operatively of group A and B.	99
Fig.48	Lack of extension post operatively of group A and B.	100
Fig.49	Lack of flexion post operatively of group A and B.	101
Fig.50	Post-operative Lachman test.	102
Fig.51	Post-operative Valgus test.	102
Fig.52	pre-operative and post-operative Stress valgus x-ray of group A.	103
Fig.53	pre-operative and post-operative Stress valgus x-ray of group B.	104
Fig.54	Comparison pre-operative and post-operative Stress valgus x-ray (in extension) of group A and B.	105
Fig.55	Comparison pre-operative and post-operative Stress valgus x-ray (in flexion) of group A and B.	106

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

CHAPTER 1: INTRODUCTION

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)

CHAPTER 1: INTRODUCTION

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 soft tissue 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).

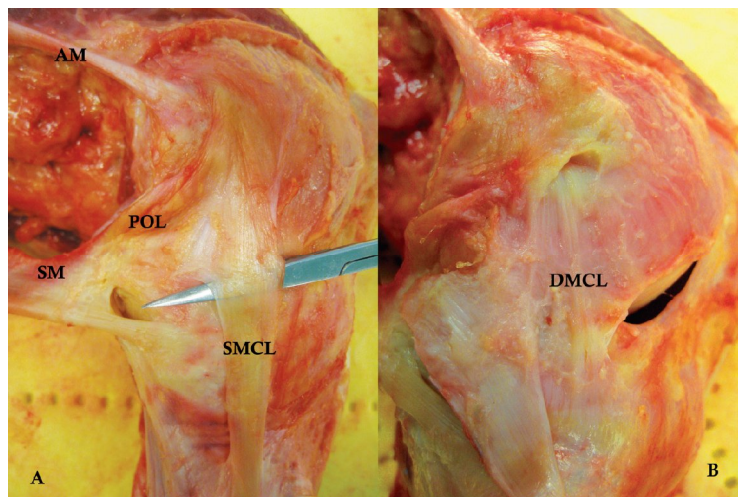


Figure (1). Medial collateral ligament complex anatomy.

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)

CHAPTER 2: ANATOMY

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).