present study derives from the deepening of the knowledge in MLKI and their long-term outcomes which can help the surgeons to set patient’s expectations.

Category: Knee - Ligaments (Not ACL)

Comparative Study Of Superficial Medial Collateral Ligament Reconstruction Combined With Posterior Oblique Ligament Reconstruction Or Postero-medial Capsule Advance In Grade III Injuries Of The Medial Compartment In A Complex Knee Injury Scenario

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All Authors:
Camilo P. Helito MD, PhD, Prof BRAZIL
Andre Giardino Moreira Da Silva MD BRAZIL
Marcel F. Sobrado MD BRAZIL
Pedro N. Giglio MD BRAZIL
Riccardo Gomes Gobbi MD, PhD BRAZIL
José R. Pécora Prof. BRAZIL

Summary:
Both techniques present good functional results and a low rate of complications. However, the advancement technique showed greater flexion loss, which should be considered when choosing the best surgical option.

Data:
Introduction: The purpose of this study is to compare the combined reconstruction of the superficial medial collateral ligament (sMCL) and the posterior oblique ligament (POL) with the reconstruction of the sMCL associated with the advancement of the postero-medial capsule in a complex knee injury scenario. We hypothesize that both techniques will present similar knee stability and failure rates. Methods: This is a retrospective case-control study designed to compare the results of the two reported techniques for grade III MCL instability. Patients undergoing MCL reconstruction associated with anterior cruciate ligament, posterior cruciate ligament or both, from 2010 to 2019, were included. The following parameters were evaluated: demographic data, type of graft, time from injury to surgery, associated meniscus injuries, follow-up time, mechanism of trauma, post-operative objective IKDC, subjective IKDC and Lysholm scales, range of motion, reconstruction failure and complications. Results: 78 patients were evaluated. 37 of whom underwent reconstruction of the sMCL and POL, and 41 underwent reconstruction of the sMCL with advancement of postero-medial structures. There was no difference in any pre-operative variable. Patients undergoing reconstruction of the sMCL + advancement had greater loss of flexion (Group 1 3.4±4.6 vs. Group 2 8.4±7.9; p = 0.002) and more individuals with flexion loss greater than 10° (Group 1 seven patients (18.9%) vs. Group 2 17 patients (41.5%); p = 0.031). Post-operative knee stability, failures and complications were similar between groups. Conclusion: Both techniques present good functional results and a low rate of complications. However, the advancement technique showed greater flexion loss, which should be considered when choosing the best surgical option.

Category: Knee - Ligaments (Not ACL)

The Effect of Failed Posterior Cruciate Ligament Reconstruction on Chondral Injury

Abstract ID# 22364
All Authors:
Ryan T. Lin BS UNITED STATES
Ian D. Engler MD UNITED STATES
Ehab M Nazal MD UNITED STATES
Philipp Wilhelm Winkler MD AUSTRIA
Balint Zsida MD SWEDEN
Kristian Samuelsson Prof, MD, PhD, MSc SWEDEN
James J. Irgang PT, PhD, FAPTA UNITED STATES
Volker Musahl MD UNITED STATES

Summary:
Concomitant injury patterns between isolated, multiligament, and revision posterior cruciate ligament reconstruction show increased rates of medial meniscal condyle, medial tibial plateau, and lateral femoral condyle cartilage injuries in the revision setting and demonstrates a unique approach in confirming the detrimental effects of PCL injury on the medial compartment.

Data:
Introduction: Evaluation of patients undergoing revision posterior cruciate ligament reconstruction (PCL-R) can identify pathology associated with PCL deficiency and failed reconstruction. Study of revision PCL-R, which is scarce, may further elucidate the role of the PCL in knee stability by demonstrating the consequences of multiple instances of PCL deficiency on the menisci and cartilage. The purpose of this study was to investigate the demographic profile and concomitant injury patterns in patients undergoing primary isolated PCL-R, multiligament involving PCL-R, and revision PCL-R. Methods: A retrospective review was performed on all patients undergoing PCL-R at a single academic institution between 2008 and 2020. Demographics, injury and surgical details, and concomitant ligament, meniscus, and cartilage data were extracted. Exclusion criteria included PCL repair and incomplete surgical data. Multiligament PCL-R was defined as concurrent surgery on at least one other knee ligament (i.e., anterior cruciate ligament [ACL], medial collateral ligament [MCL]/postero-medial corner [PMC], or lateral collateral ligament [LCL]/posterolateral corner [PLC]). The differences in demographics and injury profiles across groups were analyzed. Categorical variables were analyzed with chi-square or Fisher’s exact tests, and continuous variables were analyzed with t-test or Kruskal-Wallis test. Post-hoc comparisons were adjusted for multiplicity with the Bonferroni-Hochberg procedure. Results: Of 225 patients undergoing PCL-R, primary isolated PCL-R was performed in 60 patients (27%), multiligament PCL-R in 152 patients (67%), and revision PCL-R in 13 patients (6%). Demographics and mechanism of injury were similar between groups. Concomitant ligament injuries in patients undergoing multiligament PCL-R most commonly involved the ACL (65%), followed by LCL/PLC (58%) and MCL/PMC (41%). The prevalence of associated medial and lateral meniscus lesions was not statistically significant between groups. Evaluation of associated cartilage injuries showed that two-thirds of all revision PCL-R cases demonstrated chondral injury. The prevalence of cartilage injury on the medial femoral condyle was significantly greater in the revision (64%) compared to the multiligament (26%) and isolated groups (24%; p = 0.03). Cartilage injury on the medial tibial plateau was significantly more prevalent in revision (36%) and multiligament (20%) PCL-R compared to isolated PCL-R (7%; p = 0.02). Revision and multiligament PCL-R had significantly more cartilage injury on the lateral femoral condyle compared to the isolated group (27% vs. 14% vs. 3%, p = 0.03). Conclusion: Concomitant injury patterns between isolated, multiligament, and revision PCL-R show increased rates of cartilage injuries in the revision setting, specifically localized to the medial femoral condyle, medial tibial plateau, and lateral femoral condyle. This is a unique approach to demonstrating the detrimental effects of PCL injury on the medial compartment, likely due to altered kinematics. Surgeons should be aware of the high prevalence of medial compartment chondral pathology during preoperative planning and patient counseling for revision PCL-R.

Category: Knee - Ligaments (Not ACL)

Delayed Multiligament PCL Reconstruction Results in a Greater Prevalence of Intraarticular Injury and Influences Treatment

Abstract ID# 22502
All Authors:
Balint Zsida MD SWEDEN
Ian D. Engler MD UNITED STATES
Eric Narup SWEDEN
Philipp Wilhelm Winkler MD AUSTRIA
Ryan T. Lin BS UNITED STATES
Ehab M Nazal MD UNITED STATES
Kristian Samuelsson Prof, MD, PhD, MSc SWEDEN
James J. Irgang PT, PhD, FAPTA UNITED STATES
Volker Musahl MD UNITED STATES

Summary:
Concomitant injury and treatment patterns differ between patients undergoing early (<12 weeks) and delayed (>12 weeks) multiligament PCL reconstruction (PCL-R).

Data:
Introduction: The optimal timing of surgery for multiligament knee injuries (MLKIs) is currently unclear. Persistent instability in MLKIs involving the posterior cruciate ligament (PCL) may contribute to further intraarticular and ligamentous injury. The aim of this study was to investigate differences in concomitant injury patterns and their treatment in patients undergoing early (<12 weeks) and delayed (>12 weeks) multiligament PCL reconstruction (PCL-R). Methods: This retrospective chart review included patients undergoing multiligament PCL-R at a single institution between 2008 and 2020. Multiligament PCL-R was defined as PCL-R and concurrent surgical treatment of one or more additional knee ligaments, including the anterior cruciate ligament (ACL),
medial collateral ligament/posteromedial corner, and lateral collateral ligament/posterolateral corner (LCL/PLC). Exclusion criteria included isolated PCL-R, PCL repair and missing surgical data with respect to any variable. Patients were dichotomized into early and delayed surgery groups based on whether time elapsed between injury and surgery was shorter or longer than 12 weeks. Demographics, injury mechanism, and concomitant ligament, meniscus, and cartilage injury data were extracted. Between-group comparisons of categorical variables were conducted with Chi-square or Fisher’s exact tests, and continuous variables were compared with independent samples t-tests. Post-hoc comparisons were adjusted for multiplicity with the Bonferroni-Hochberg procedure.

Level of significance was set at \( p < 0.05 \). Results: A total of 148 patients were deemed eligible for analysis. There were 57 (38.5%) patients in the early multiligament PCL-R group, and 91 (61.5%) patients in the delayed multiligament PCL-R group. The mean time from injury to surgery was 6.1±3.1 weeks in the early PCL-R group, compared to 63.7±11.3 weeks in the delayed PCL-R group. While concomitant LCL/PLC reconstruction was performed in 55 (60%) of delayed multiligament PCL-Rs and 23 (40%) of early PCL-Rs (\( p = 0.02 \)), there was no significant between-group differences in the frequencies of other concomitant ligament surgeries performed. There were no significant differences in the prevalence of meniscus tears between the early (n = 28, 49%) and delayed (n = 36, 40%) multiligament PCL-R groups (\( p = 0.25 \)). Concomitant meniscus surgery was significantly more prevalent in the early (n = 25, 44%) versus delayed (n = 19, 21%) multiligament PCL-R group (\( p = 0.003 \)), with a significantly greater proportion of meniscal tears in early compared to delayed multiligament PCL-R group (n = 13, 14%) versus delayed (n = 6, 11%) PCL-R group (\( p = 0.04 \)).

The prevalence of knee cartilage injury was significantly different between the early (n = 12, 24%) and delayed (n = 41, 46%) multiligament PCL-R groups (\( p = 0.01 \)), with a more frequent involvement of the lateral (n = 17, 19% vs. n = 3, 5%, respectively; \( p = 0.04 \)) and medial (n = 31, 34% vs. n = 6, 11%, respectively; \( p = 0.005 \)) femoral condyles in the delayed compared to the early PCL-R group. Conclusion: Patients undergoing delayed multiligament PCL-R demonstrated a higher rate of cartilage pathology, specifically of the lateral and medial femoral condyles, when compared to patients undergoing early PCL-R. Delayed multiligament PCL-R may lead to increased chondral damage, potentially due to knee instability. Despite similar rates of medial meniscus injury in both groups, medial meniscus surgery is more prevalent in early multiligament PCL-R and suggests that surgical timing may impact the treatability of concomitant meniscus pathology. Additionally, acute management of instability in this population may prevent the development of posterolateral knee instability.

Category: Knee - Ligaments (Not ACL)

**Comparison of Three Surgical Techniques of Postero lateral Knee Reconstructions: A Cadaveric Study**

Abstract ID: 22755

All Authors: Nicolas Pujol MD FRANCE

Charles Pogier FRANCE

Summary:

This study reported that the 2 so-called anatomic reconstruction procedures were significantly more effective than the modified Larson for external rotation control. Consequently, it remains preferable to use anatomic techniques in multiligament injuries involving the PLC.

Data:

Background: While injuries to the posterolateral corner (PLC) of the knee are often overlooked, these lesions required reconstruction in order to restore varus and rotational stability. Among PLC reconstructions techniques (anatomical or not), the modified Larson (LMR), the LaPrade reconstruction (LR) and the “Versailles” reconstruction (VR) procedures are commonly used. Hypothesis: The hypothesis was that anatomical reconstructions (VR and LR procedures) of the PLC provides better restoration and control of external rotational laxity. Patients and Methods: Fifteen fresh-frozen cadaveric knees were tested to compare the 3 procedures. Varus laxity on stress radiographs in full knee extension and external rotational laxity with dial test at 30° of flexion were quantified during 3 phases: intact knee, PLC sectioned and PLC reconstructed. Results: Mean varus values did not differ significantly regardless the technique used in the intact knees (\( p = 0.14 \)), after sectioning the PLC (\( p = 0.14 \)) or after PLC reconstruction (\( p = 0.71 \)). After PLC reconstruction, varus laxity was restored with no statistical difference from the intact testing between LMR, VR and LR (respectively, -1.0, -1.3 and -1.5, \( p = 0.98 \)). Mean external rotation laxity in the 3 groups was not significantly different when dial test at 30° of knee flexion was quantified on intact knees (\( p = 0.32 \)) or after sectioning the PAPL (\( p = 0.15 \)). After PLC reconstruction, the modified Larson technique was found to be significantly less effective to restore rotational stability compared with VR and LR (\( p = 0.025 \)). Discussion: The VR provides similar outcomes to the LR for restoring stability in varus and external rotation. This study reported that the 2 so-called anatomic reconstruction procedures (VR and LR) were significantly more effective than the modified Larson for external rotation control. Consequently, it remains preferable to use anatomic techniques in multiligament injuries involving the PLC.

Category: Knee - Ligaments (Not ACL)

**Clinical and Patient-Reported Outcomes of Acute Percutaneous Repair of Medial Collateral Ligament in the Multiligamentous Injured Knee**

Abstract ID: 21391

All Authors: Kurt S. Holuba BA UNITED STATES

Harmen D. Vermeijden M.D. UNITED STATES

Xiuyi A Yang M.S. UNITED STATES

Robert O'Brien MHS, PA-C UNITED STATES

Jelle P. van der List MD, PhD NETHERLANDS

Gregory S. Difelice MD UNITED STATES

Summary:

Acute MCL repair in the setting of multiligamentous knee injuries results in minimal valgus laxity, minimal complications, good subjective outcomes and excellent stability at short-term follow-up.

Data:

Introduction: It is unclear whether to treat grade II superficial medial collateral ligament (SMCL) tears nonoperatively or operatively in the setting of a multi-