ligamentous injured knee (MLIK). Potential disadvantages of delayed treatment of concomitant injuries include longer time to surgery and residual valgus laxity, whereas acute sMCL repair has potential to address these issues. The purpose of this study was to assess short-term outcomes of acute MCL repair. Methods: A retrospective analysis of MLIK patients with grade III MCL injuries, who underwent acute (<6 weeks) MCL repair, and had at least two-year follow-up, was completed. Physical examination at minimum six months and patient-reported outcome measures (PROMs) at minimum two years were utilized to assess patient status. Continuous variables were reported in median with interquartile range (IQR). Results: Twenty-six patients were included with median follow-up of 4.2 years. Valgus laxity was negative in 22 patients (91.7%), grade one in two (8.3%), and there were no MCL failures. Three patients (11.5%) required reoperation, one (3.8%) for arthrofibrosis, one (3.8%) for MCL hardware removal, and one (3.8%) for unicondylar knee arthroplasty. ACL failure was seen in four patients (16.0%), and PCL failure in one (10%). PROMs were excellent with median Lysholm 95.0 (IQR 90.0–100.0), modified Cincinnati Score 89.0 (IQR 84.0–96.0), SANE 90.0 (IQR 80.0–95.0), preinjury Tegner 6.0 (IQR 5.0–6.0), Tegner at follow-up 5.0 (IQR 4.5–6.0), IKDC Subjective Score 82.8 (IQR 79.3–89.7), FJS 77.1 (IQR 67.7–91.7), and ACL-LSI 72.7 (IQR 42.5–81.9). Conclusions: In this heterogeneous cohort of MLIK patients, outcomes of acute percutaneous MCL repair were encouraging with excellent stability and PROMs. MCL repair seems to reliably result in valgus stability, without additional risk of arthrofibrosis and need for additional grafts or risk of tunnel convergence and should be considered in the MLIK when possible.

Category: Knee - Ligaments (Not ACL)

Determining of Patient Acceptable Symptom State and Evaluation of Work and Sports Impact After Multiligament Knee Reconstruction

Abstract ID#: 22745
All Authors: Alexandre Ferreira MD FRANCE
Goulven Rochongar MD FRANCE
Cesar Praz MD FRANCE
Julien Danet MD FRANCE
Jonathan Curado MD FRANCE
Christophe H. Hulet MD, Prof. FRANCE

Summary:
This study defined the PASS threshold value for the subjective IKDC and Lysholm as 67.9 and 80. Predictor of achieving PASS was low intensity trauma. Modern surgical techniques after multiligament knee injuries allow return to work without modification in most cases dependent on the work heaviness. Return to low-intensity sports was feasible for patients practicing regular activity before injury.

Data:
Multi-ligament knee injuries have a significant functional impact for the patient. Parameters such as Patient Acceptable Symptom Status (PASS) are new measures to assess patient satisfaction and improve interpretation of patient-reported outcomes measurements (PROMs). In addition to subjective scores, assessment of return to activity is an important issue. The primary purpose of this study was to determine the PASS threshold value for the subjective IKDC and Lysholm scores after multiligament reconstruction with a minimum follow-up of 12 months. The secondary objectives were to determine the predictive factors for achieving this value, to assess impact on professional activity according to heaviness and on return to sport. A retrospective, single-center analysis was conducted on patients treated for knee dislocation (07/2008-12/2019). 42 patients were assessed with a follow up compliance of 85.7%. All patients had knee ligament repair and/or reconstruction with allograft and autograft according to treatment algorithm. Clinical data and postoperative complications were collected at the last follow-up consultation. IKDC subjective knee and Lysholm scores were performed. PASS threshold value was calculated using an anchoring method. Multivariate logistic regressions were conducted to determine predictors of achieving PASS. A self-questionnaire was given to the patient to assess impact on work and sports. Activities were classified according to Tegner scale. With a mean follow-up of 4.8 years, 78.6% of the patients reported satisfactory symptom status. No significant difference was observed between patients who answered ‘yes’ and those who answered ‘no’ to the PASS question showed. Expect for PROMs, IKDC was 75.2 points for patients who answered ‘yes’ to PASS question versus 61.4 for those who answered no (p = 0.003) and a mean Lysholm score of 86.2 points versus 71.6 (p = 0.002). The PASS cutoff for the cohort was defined at 67.9 for the IKDC and 80 for the Lysholm score. A multivariate logistic regression according to the achievement of this threshold value defined that low-intensity trauma was a predictor of achieving this value for the subjective IKDC (Odds Ratio 10.507, 95% CI 1.074 to 102.839, p = 0.043). 34 patients (81%) had returned to work without job modification, 7 (16.7%) patients required job adjustment and 1 (2.4%) patient was classified as invalid. Patients in light work group returned to work significantly more without modification than heavy work group (p = 0.038). Pre-injury, 30 (71.4%) patients were practicing sports. At the last follow-up, 25 (59.5%) patients were involved in sports. 25/30 (83.3%) patients practicing sports had resumed sports but at a lower level before the injury (Tegner: before injury 5.2 vs after reconstruction 4.4; p = 0.014) This study defined the PASS threshold value for the subjective IKDC and Lysholm as 67.9 and 80, with a minimum follow-up of one year. Predictor of achieving PASS for subjective IKDC score was low intensity trauma. Modern surgical techniques after multiligament knee injuries allow return to work without modification in most cases. However, this remains dependent on the work heaviness. Furthermore, return to low-intensity sports was feasible for patients practicing regular activity before injury.

Category: Knee - Ligaments (Not ACL)

Poorer Functional Outcomes in Patients with Multi-Ligamentous Knee Injury with Concomitant Patellar Tendon Ruptures At 5-Years Follow-Up: A Multicenter Study

Abstract ID#: 23484
All Authors: Edward Stephen Mojica BS UNITED STATES
Michael J Alaia MD UNITED STATES
Andrew S Bi MD UNITED STATES
Kinjal Vasavada BA UNITED STATES
Jay Moran BS UNITED STATES
Scott Buzin DO UNITED STATES
Joseph B Kahan MD UNITED STATES
Erlin Alaia MD UNITED STATES
Laith M. Jazrawi MD UNITED STATES
Michael J. Medvecky MD UNITED STATES

Summary:
Using propensity score matching, the purpose of this study was to compare the outcomes of MLKIs with and without patellar tendon ruptures and to investigate the overall predictors of these outcomes.

Data:
Purpose: Multi-ligamentous knee injuries (MLKIs) are high energy injuries that may infrequently present with concomitant patellar tendon rupture. There is limited information in the literature regarding these rare presentations, with even less information regarding clinical outcomes. Using propensity score matching, the purpose of this study was to compare the outcomes of MLKIs with and without patellar tendon ruptures and to investigate the overall predictors of these outcomes. Methods: Twelve patients who underwent surgical repair for combined MLKI and patellar tendon rupture from February 2011 to April 2020 with minimum 1-year follow-up data were identified from two separate institutions. Patients were propensity-score matched with a 1:1 ratio with controls based on age, body mass index (BMI), gender, and time from surgery. Patient-reported outcomes included International Knee Documentation Committee (IKDC) Subjective Knee Form, Lysholm and Tegner scores, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score. Results: Twelve MLKIs with concomitant patellar tendon injuries were identified out of a multicenter cohort of 237 (5%) patients sustaining MLKI and were case matched 1:1 for all elements including associated concomitant injuries. MLKI mean 79.3 ± 19.6, P < 0.001) and Lysholm scores (Patellar Tendon mean 10.7, P < 0.001) between the two, illustrating poorer outcomes for patients with concomitant patellar tendon ruptures. Conclusion: In the setting of MLKI, patients who have a concomitant patellar tendon rupture have worse functional outcomes compared to those without. This information will be important for patient counseling and might be considered to be added to Schenck classification, reflecting its prognostic value.

Category: Knee - Ligaments (Not ACL)

Fibular Versus Tibiofibular-Based Reconstruction of The Posterolateral Corner Of The Knee: A Systematic Review and Meta-Analysis

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All Authors:
Khalis Bokh MBChB, BSc, MRCS UNITED KINGDOM
Prithish Narayan BM BS, MRCS UNITED KINGDOM
Pip Divall MA, MSc, MCLIP UNITED KINGDOM
Arijit Ghosh MBBS, MSc, FRCS UNITED KINGDOM
Randeep Singh Aujla MBChB ChM FRCS (Trk&Orth) FMSE UNITED KINGDOM

Summary:
Fibular based techniques have similar outcomes to tibiofibular based techniques for posterolateral corner injuries. The fibular-based technique seems to be the more viable treatment option in view of being less technically demanding and invasive and requiring fewer grafts with a quicker operative time.

Data:
Background: Anatomical reconstruction is the gold standard treatment for posterolateral corner (PLC) injuries of the knee. They are classified into either fibular- or tibiofibular-based reconstructions based upon distal constructs.

Despite comparable outcomes in biomechanical studies, clinical results comparing these constructs remain elusive with no consensus reached regarding the best treatment option. Purpose: To perform a systematic review and meta-analysis to compare if one construct is superior to the other in both clinical outcomes and restoration of stability.

Study Design: Meta-Analysis Methods: The Cochrane Controlled Register of Trials, PubMed, Medline and Embase were used to perform a systematic review and meta-analysis using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) criteria with the following search terms (‘posterolateral corner’ OR ‘fibular collateral ligament’ OR ‘lateral collateral ligament’ OR ‘popliteus tendon’ OR ‘popliteofibular liga-
ment’) AND (‘reconstruction’ OR ‘LaPrade’ OR ‘Larsen’ OR ‘Arciero’). Data pertaining to all patient reported outcome measures (PROMs), post-operative complications and valgus and rotational stability were extracted from each study.

The pooled outcome data were analysed by random- and fixed-effects models. Results: After abstract and full-text screening, 6 clinical studies were included. In total there were 183 anatomical reconstructions of which 90 were fibular-based and 93 tibiofibular-based. The majority of studies had similar surgical technique regarding tunnel orientation, attachment sites and graft fixation sequence. There were no differences between the groups in terms of PROMs at a mean of 20.3 months (range, 3.6 to 27.9 months). They were both equally effective in restoring varus and rotational stability, but there was a trend in quicker operative time with the fibular-based technique. Subgroup analysis revealed the stability of a posterior cruciate ligament reconstruction post-operatively was not affected by either anatomical construct. Conclusion: Both constructs had comparable clinical outcomes and were equally as effective in restoring varus and rotational stability for PLC knee injuries. The fibular-based technique seems to be the more viable treatment option in view of being less technically demanding and invasive and requiring fewer grafts with a quicker operative time. However, further higher quality studies are required to reinforce or refute such conclusions, as majority of studies in this review were poor to fair quality.

Category: Knee - Ligaments (Not ACL)

Medial Collateral Ligament Reconstruction with Autograft vs. Allograft: A Systematic Review

Abstract ID# 22620
All Authors:
Nigel Oliver Blackwood Student UNITED STATES
Jack A Blitz MS UNITED STATES
Bryan Vopat UNITED STATES
Victoria K Ierulli MS UNITED STATES
Mary K. Mulcahey MD UNITED STATES

Summary:
MCL reconstruction with allograft compared to autograft provides superior improvement in valgus stress measured on radiograph, but patient reported outcomes, graft failures, and post operative complications are similar in both treatments.

Data:
Introduction: Medial collateral ligament (MCL) reconstruction is performed after failed non-operative treatment or high grade MCL injuries with associated valgus instability. The purpose of this study was to evaluate clinical outcomes following MCL reconstruction with autograft versus allograft. Methods: A systematic review was performed according to PRISMA guidelines. Several databases were searched (PubMed, CINAHL, EMBASE, and Cochrane Database) to identify studies comparing outcomes of MCL reconstruction with autograft versus allograft. Studies were included if they evaluated clinical outcomes following MCL reconstruction using autograft and/or allograft. Studies with concomitant knee ligament injury other than the anterior collateral ligament were excluded. A quality assessment was performed using the modified Coleman Methodology Score, and risk-of-bias assessment was performed using the Risk of Bias In Non-randomized Studies–of Interventions and the Cochrane Collaboration tools. Results: The initial search identified a total of 524 studies, 22 of which met inclusion criteria and were included in the study. There were 332 patients (60% male, 40% female), 159 (47.4%) underwent MCL reconstruction with autograft and 173 (52.5%) with allograft. 31.2% of patients undergoing MCL reconstruction with allograft had concomitant anterior cruciate ligament (ACL) reconstruction, as compared to 0 patients undergoing MCL reconstruction with autograft and ACL reconstruction. The most common autografts used were semitendinosus (82, 96.4%) and bone-patellar tendon-bone (3, 3.5%). The most common allografts were the achilles tendon (124, 48.4%), semitendinosus (29.4%), and tibialis anterior (22.1%). Patient reported outcomes such as pain and functionality show strong improvement after MCL reconstruction and indicate greater long-term success compared to MCL repair, regardless of the use of autograft or allograft. Pain (measured by Lysholm scores) improved on average from 54.4 to 89.6 and post-operative functionality (measured by International Knee Documentation Committee (IKDC) scores) improved on average from 53.1 to 88.3 in patients with MCL reconstruction. There was no significant difference in post-operative Lysholm and IKDC scores between MCL reconstruction with autograft or allograft. Two of the 22 studies included data on 63 MCL repair patients, all of which experienced statistically significant lower Lysholm and IKDC scores than their reconstruction counterparts. Radiographic analysis demonstrated that 16 (10.1%) patients who underwent MCL reconstructions using autograft had post-operative valgus instability, whereas about 5 (2.8%) patients who underwent MCL reconstructions using allograft led to the same outcomes. Graft survivorship was slightly higher in MCL reconstruction using allograft when compared to autograft, but this was not statistically significant. Additionally, compared to MCL-only reconstruction, 82 patients underwent MCL reconstruction and primary or revision ACL reconstruction. 36 (43.9%) of these patients presented with knee extension deficits and failure of valgus stress tests, most of them undergoing MCL reconstruction and revision ACL reconstruction. Conclusions: MCL reconstruction with either autograft or allograft leads to similar clinical outcomes. Graft failure and post-operative functional limitations occurred more frequently in patients who underwent MCL reconstruction with autograft. MCL reconstruction combined with primary or revision ACL reconstruction results in a higher rate of valgus stress and flexion deficits. Allograft may be the preferred option for MCL reconstruction owing to lower failure rate.

Category: Knee - Ligaments (Not ACL)

What Is the Meaning of Popliteal Hiatus Widening on Magnetic Resonance Imaging?

Abstract ID# 23060
All Authors:
Sang Hak Lee MD, PhD KOREA, REPUBLIC OF
Tae Wook Kim MD KOREA, REPUBLIC OF
Bo Seung Bae MD KOREA, REPUBLIC OF
Tae Young Ko MD KOREA, REPUBLIC OF

Summary:
Patients with unstable tear on discoid lateral meniscus and lateral meniscus demonstrated large hiatus width that should carefully be evaluated in meniscus repair around the popliteal hiatus.

Data:
Introduction: Previous studies have shown that the widening of the popliteal hiatus of the lateral meniscus (LM) on magnetic resonance imaging (MRI) led to recurrent subluxation of LM. Discoid lateral meniscus (DLM) has a high rate of peripheral rim instability, high predisposition to tear, and common mechanical symptoms. However, MRI studies evaluating the popliteal hiatus of DLM and LM have rarely been reported. This study aimed to evaluate the association between popliteal hiatus width on MRI, torn DLM, and LM tears. Materials and Methods: We included 193 lateral meniscal disorder knees (mean age, 34.6 ± 14.2 years) treated with arthroscopic meniscus repair or partial meniscectomy by senior surgeon from January 2011 to August 2020. The inclusion criteria were as follows: 1) torn DLM 2) LM tear, and 3) a stable knee. In addition, 50 subjects with normal knees were enrolled as controls. All patients were divided into four