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**Summary:**
A critical step in multiple-ligament knee reconstruction techniques is to avoid short tunnels or convergences among them. Recent studies have recommended to drill the bone tunnels following different angulations on the coronal and axial planes to avoid any coalescence among them. The aim of the study was to compare the accuracy of 3D printed patient-specific instrumentation (PSI) with a "freehand" of an expert surgeon for drilling lateral and medial femoral tunnels following these recommended angulations in multiple-ligament knee injuries. Methods Ten cadaveric knees were scanned by computed tomography (CT) to identify anatomical femoral attachments of the lateral collateral ligament (LCL) and the Popliteal Tendon (PT) at the lateral side, and the Medial Collateral Ligament (MCL) and Posterior Oblique Ligament (POL) at the medial side. Using a specific computed software, we planned four bone tunnels for each knee starting from the anatomical attachment of LCL, PT, MCL and POL applying the directions described above. Ten 3D printed surgical guides (5 medial and 5 lateral) specifically designed for five knees were used to perform LCL, PT, MCL and POL tunnels. The tunnels of the others five knees were made freehand by the experienced knee surgeon. Postoperative CT scans were made to each cadaveric knee. We assessed the accuracy of the tunnels by superimposing postoperative CT images onto preoperative ones and analyzed the deviation of performed tunnels from the planning, specifically the cortical entry point and the angular deviations. Results For all continuous data, the median was used as the measure of variance. For comparing variables among groups, we used Mann-Whitney test, with \( p < 0.05 \) counting as significant. In “freehand” group, the mean entry point deviation was 5,45mm and interquartile range (Q1-Q3) was 2,59 - 8,84mm. In “PSI” group and in PSI group the mean entry point deviation was 4,23mm and (Q1-Q3) was 3,59 - 5,73mm. In “freehand” group, the mean angular deviation (*) was 22,28° and (Q1-Q3) was 17,65 - 25,21°. In “PSI” group the mean angular deviation (*) was 5,59° and (Q1-Q3) was 4,04 – 8,25° (\( p < 0.001 \)). Conclusions The use of 3D printed PSI provided significantly more accurate results relative to angular deviation than the skill of an experienced knee surgeon and may be a promising tool to be used in the clinical practice.
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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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 posteromedial 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, 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]/posteroscapular 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%).

Conclusions: 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
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Summary:
Concomitant injury patterns between isolated, multiligament, and revision posterior cruciate ligament reconstruction showed increased rates of medial meniscal condyle, medial tibial plateau, and lateral meniscal 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]/posteroscapular 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%).

Conclusions: 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)

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

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Summary:
Concomitant injury 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).

Method: 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),...