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Summary:
The presence of a Varus thrust, which is a biomechanical marker characterized by a sudden lateral shift of the knee during walking, pre- and post- total knee arthroplasty, may influence clinical outcome measures after surgery.

Data:
Introduction: The Varus thrust, a biomechanical marker characterized by a sudden lateral shift of the knee during the loading phase of gait, has been largely studied in knee osteoarthritis patients. This dynamic marker is associated with faster disease onset and progression, poorer functional scores, and greater pain levels. While the varus thrust is of great interest in conservative management, little is known about its impact on overall knee arthroplasty (TKA). Thus, the aim of this study was to assess if a varus thrust pre- and/or post-surgery influences clinical outcome measures post-TKA. Methods: This was a secondary data analysis from a TKA prospective study on nineteen patients (63.2% of women, mean age of 61 years). Varus thrust was objectively quantified during gait before and 1-year after surgery with a knee kinesiography exam (KneeK® system, Emovi inc.). Knee Injury and Osteoarthritis Outcome Score (KOOS) was completed 1-year post-surgery. Scores on this questionnaire range from 0 (extreme symptoms) to 100 (no symptoms). T-tests for independent samples were performed between patients who present with a varus thrust post-surgery (i.e., >2.5°) and those who did not, on all five KOOS subscales. Additionally, comparisons on the KOOS were performed between patients who corrected their varus thrust with the surgery (i.e., varus thrust pre-surgery >2.5° and varus thrust post-surgery <2.5°) and those who developed one after surgery (i.e., varus thrust pre- <2.5° and varus thrust post >2.5°).

Results: Five (26.3%) patients presented with a varus thrust post-TKA. They reported significantly (i.e., statistically and clinically) poorer KOOS scores on pain, function during daily living activities (ADL), sport-recreation, and quality of life (QOL) subscales compared to those who did not present a varus thrust post-TKA (respectively 53.0 vs 74.9, 59.0 vs 77.4, 16.0 vs 46.1, 37.6 vs 68.9; all p<0.05). Four patients (21.1%) had their pre-surgery varus thrust corrected with TKA while four others developed a varus thrust after surgery. Patients with varus thrust correction showed significantly (i.e., statistically and clinically) better KOOS scores post-TKA in terms of pain (80.0 vs 50.3), ADL (81.3 vs 56.5), and QOL (65.6 vs 31.3) compared to patients who developed a varus thrust (all p<0.05). Conclusions: The presence of a varus thrust post-TKA is characterized with poorer patient reported outcome measures. Furthermore, the evolution of this biomechanical marker with the surgery (i.e., correction or development) may influence pain, function, and quality of life one year after TKA. Results support the need to objectively assess the varus thrust pre-surgery and integrate this measure in surgical planning to achieve better clinical outcomes. Furthermore, assessing varus thrust post-TKA is clinically valuable since it can be corrected through rehabilitation programs including targeted conservative interventions.

Category: Knee - Arthroplasty
Robotic Handpiece-Assisted Total Knee Arthroplasty - Analysis of the Learning Curve for Operative Time and Alignment Accuracy

Abstract ID# 22689
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Summary:
Imageless robotic handpiece-assisted total knee arthroplasty is associated with a learning curve for operative time that might be longer than reported in current literature and implementation of the intra-operative plan is accurate for implant placement and limb alignment except for the tibial component’s sagittal slope.

Data:
Purpose: The use of robotics-assisted techniques is increasing in total knee arthroplasty (TKA). The adoption of any new step in surgery is associated with a learning curve and potentially associated with extra complications. The aim of this study was to determine the learning curve necessary to minimize the time of surgery and to evaluate the accuracy of component and limb alignment after imageless, robotic handpiece-assisted TKA. Materials and methods: In a prospective case-control study, the first 100 consecutive robotic-assisted (RA) TKAs performed by a single surgeon were analysed and compared to 100 consecutive conventional TKAs operated in the same period. Operative times, implant and limb alignment (comparing intra-operative plan with post-operative alignment) and robot-related complications were evaluated. Cumulative summation (CUSUM) analyses were used to assess learning curves for operative time and implant alignment in RA TKA. Results: 4 RA TKA cases had to be completed with conventional instrumentation due to challenges faced in the RA system workflow, including registration errors. The learning curve for operative time when using the imageless robotic system for TKA was completed after 16 cases. Complete normalization of operative times, equaling conventional TKA time was not seen even after 100 cases. The learning curve did not influence the accuracy of component or limb alignment. The coronal HKA, LDF, MPTA and sagittal femoral component placement showed an average deviation of 0.90 (SD 2.1), 0.40 (SD 1.4), 0.60 (SD 1.1) and 0.50 (SD 2.7) from the intra-operative plan. The post-operative tibial component sagittal placement showed a significant deviation of 1.60 (SD 2.4) from the intra-operative plan. No minor or major robot-related complications were observed. Conclusion: Imageless robotic handpiece-assisted TKA is associated with a learning curve for operative time that might be longer than reported in current literature. Implementation of the intra-operative plan was accurate for implant placement and limb alignment except for the tibial component's sagittal slope.

Category: Knee - Arthroplasty
Comparison of Early Postoperative Pain Between Same-Day Bilateral and Staggered Bilateral Total Knee Arthroplasties In Centrally Sensitized Patients

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Summary:
If medical comorbidity is not a matter, performing same-day bilateral TKA is more advantageous in postoperative pain control in CS patients.

Data:
Introduction: The purpose of this study was to compare the early postoperative pain patterns in both knees after same-day and staggered bilateral total knee arthroplasty (TKA) in Central sensitization (CS) patients. Methods: Thirty-six patients in each group corresponding to CS were compared. For staggered bilateral TKA, only those with a one-week interval were included. CS was assessed using a Central Sensitization Inventory preoperatively. Postoperative pain was investigated 1st, 3rd, 5th, and 7th postoperative day using pain visual analogue scale (VAS) in resting, walking, night, and 24 hours average. The amounts of patient-controlled analgesia (PCA) were also investigated. The first and second knees in staggered bilateral TKA were compared with the knee on the first and second operating side in simultaneous bilateral TKA. Results: There was no significant difference in pain VAS between the first knee of staggered TKA and the knee of the same surgical site in same-day TKA (all p>0.05). However, all pain VAS scores were higher in the second knee of the staggered TKA compared to the same side in same-day TKA (all p<0.05). The amount of PCA usage was also significantly more in 2nd knee of staggered bilateral TKA patients even compared to patients with simultaneous TKA. (p<0.05). Conclusion: When staggered bilateral TKA was performed in CS patients, early postoperative pain in the 2nd knee was more severe than the pain amount of the same side knee in same-day bilateral TKA. If medical comorbidity is not a matter, performing same-day bilateral TKA is more advantageous in postoperative pain control in CS patients.

Category: Knee - Arthroplasty
Can Varus-Valgus Constrained Implants Provide Sufficient Stability in the Presence of Complete Medial Collateral Ligament Insufficiency?

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