

The Influence of Medial Collateral Ligament and Lateral Collateral Ligament Pie Crusting in Primary Total Knee Arthroplasty on Patient Reported Outcomes

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Background and Hypothesis:

Pie-crusting of the collateral ligaments can help achieve balanced gaps in total knee arthroplasty (TKA) in knees with varus or valgus deformity. However, the effect of this technique on patient-reported outcome measures (PROMs) is unknown. The purpose of this study was to compare PROMs following primary TKA for patients with and without medial collateral ligament (MCL) or lateral collateral ligament (LCL) pie-crusting.

Experimental Design or Project Methods:

We retrospectively reviewed 1,305 primary TKAs. Intraoperative MCL or LCL pie-crusting was documented in all operative reports and recorded. Prospectively collected preoperative, 4-month postoperative, and minimum 1-year postoperative PROMs related to overall knee health, pain during functional activities, activity level, and overall satisfaction were compiled and compared between patients with and without MCL or LCL pie-crusting. Medians were evaluated with Kruskal-Wallis test adjusted for ties.

Results:

The cohort was 67% female with mean age 66 years and BMI 34.0 kg/m². MCL or LCL pie-crusting was performed in 13.0% of the cohort. There were no intraoperative or postoperative ruptures of the MCL or LCL. 6.3% of conforming bearing TKAs required a collateral ligament pie crusting versus 21.5% of standard bearing TKA ($p < 0.001$). No significant differences were found in preoperative, 4-month, minimum 1-year, or change from preoperative baseline to minimum 1-year PROMs with and without pie-crusting of the collateral ligaments ($p \geq 0.095$). However, the LCL pie-crusting group had slightly better PROMs at minimum 1-year.

Conclusion and Potential Impact:

These study results corroborate existing literature that pie-crusting of collateral ligaments is safe and effective to achieve a balanced TKA. Additionally, no significant outcome differences were found between groups with and without MCL or LCL pie-crusting. However, LCL pie-crusting for valgus knee correction had slightly better PROMs. Interestingly, conforming bearings may impart enhanced stability and mitigate the need for pie-crusting ligament releases in TKA.