

Is Operative Time a Predictor for Postoperative Infection Following Total Knee Arthroplasty?

Hiba Anis, MD, Alison K. Klika, MS, Michael A. Mont, MD, Wael K. Barsoum, MD, Carlos A. Higuera, MD, Robert M. Molloy, MD

Introduction: Determining risk factors is crucial in potentially avoiding surgical site infections (SSI) and prosthetic joint infections (PJI) after total knee arthroplasty (TKA). The purpose of this study was to evaluate the association of SSI and PJI with operative time in primary TKA.

Methods: A retrospective review was conducted using an institutional database yielding 12,541 primary TKA procedures performed between 2014 and 2017. Medical records were reviewed for diagnoses of SSI (skin and superficial wound infections) and PJI (deep joint infections requiring surgery) over an average 2-year postoperative period. Multivariate logistic regression was performed to adjust for gender, age, BMI, Charlson Comorbidity Index, year of surgery, hospital volume, and surgeon volume. Volume was determined as low, intermediate, or high by mean TKAs/year at each hospital (<250, 250-500, or >500, respectively) and by each surgeon (<50, 50-150, or >150, respectively).

Results: 324 patients with subsequent SSI had longer mean operative times (118±41 min) compared to non-infected patients (108±35 min, $p<0.001$). 82 procedures complicated by PJI (136±47 min) had longer mean operative times compared to non-infected patients (108±35 min, $p<0.001$). Multivariate analysis showed operative time was an independent predisposing factor for SSI (odds ratio [OR]=1.006; 95% confidence interval [CI], 1.003-1.009; $p<0.001$) and PJI (OR=1.010; 95% CI, 1.006-1.015; $p<0.001$). This corresponded to a 9% increased risk for SSI and a 15% increased risk for PJI for every 15-minute increase in operative time.

Conclusions: Identifying risk factors that are easily measurable and modifiable, such as procedure duration, can aid in risk-stratifying postoperative surveillance. These findings support recent studies. Moreover, this study differentiated effects of operative time on SSI and PJI and demonstrated these associations remain significant after adjusting for patient and hospital/surgeon factors. This study highlights the importance of minimizing intraoperative delay to significantly improve patient outcomes.