## Association Between Timing of Cellulitis Diagnosis Prior to TKA and Risk of 2-Year PJI: A Stratum-Specific Likelihood Ratio Study

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INTRODUCTION: Periprosthetic joint infection (PJI) remains one of the most devastating complications following total knee arthroplasty (TKA). Although active infections are generally contraindications to surgery, little is known about how the timing of prior infections such as cellulitis impacts long-term outcomes. This study aimed to evaluate whether the timing of cellulitis diagnosis before TKA is associated with differential 2-year PJI risk.

METHODS: A retrospective cohort study was conducted using the Mariner dataset within the PearlDiver database, which spans 2010–2022 and contains over 165 million patient records. Patients undergoing primary TKA with at least 2 years of active follow-up were included in this study. Patients with malignancy, who underwent TKA for fracture indications, or received multiple TKAs were excluded. Stratum-specific likelihood ratio (SSLR) analysis was utilized to define different timing strata based on PJI likelihood. The primary outcome of the study was 2-yr PJI. Multivariable logistic regression was utilized to control for clinical comorbidities.

RESULTS: A total of 14,890 patients were included in this study. SSLR analysis identified two timing strata: 0-8 weeks and 9-52 weeks prior to TKA. On average, patients who were diagnosed with cellulitis between weeks 9-52 prior to TKA were less likely to receive extended oral antibiotics than those were were diagnosed between weeks 0-8. Patients who were diagnosed with cellulitis between 9-52 weeks prior to TKA experienced a significantly increased odds of 2-yr PJI (OR 1.9, 95% CI 1.7–2.2, $p<0.001$) when compared to those who were diagnosed between 0-8 weeks prior.

DISCUSSION AND CONCLUSION: The timing of cellulitis diagnosis prior to TKA is associated with differential PJI risk. Paradoxically, earlier cellulitis diagnosis was associated with lower infection rates. This is potentially due to the higher rates of extended antibiotic use within this cohort. Ultimately, the findings of this study may support extended antibiotic strategies in patients with more remote cellulitis undergoing TKA.