# C. difficile Infection Prior to Total Knee Arthroplasty Independently Increases the Risk of Prosthetic Joint Infection

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INTRODUCTION:
Prosthetic joint infection (PJI) is a relatively rare but devastating complication of total knee arthroplasty (TKA) associated with prolonged illness burden and high economic cost. A growing body of evidence suggests that the gut microbiome plays a pivotal role in immune system function and correspondent risk of PJI. In particular, *C. difficile* infection (CDI) is an indicator of poor gut microbiome health and has been previously associated with increased 90-day complication rates in TJA. However, no studies to date have addressed the independent risk of CDI on long-term rates of PJI in total knee arthroplasty.
METHODS:
Patients undergoing TKA from 2010 to 2021 were identified in the PearlDiver database (n = 1,453,574). Patients with a history of CDI within 2 years prior to TKA (n = 2,853) were included and propensity matched to a control group. The exposed CDI cohort was also stratified into four groups by time of CDI prior to TKA (0-3 months, 3-6 months, 6-12 months, and 1-2 years). The incidence of PJI within 2 years following TKA was compared between the exposed and control cohorts. Logistic regression was used to evaluate the association of CDI occurring in each time interval prior to TKA and PJI after TKA.
RESULTS:
CDI anytime within 2 years prior to total knee arthroplasty was independently associated with higher odds of prosthetic joint infection (OR: 1.82 [95% CI 1.44-2.31]). Proximity of CDI to arthroplasty was associated with increased risk of PJI (CDI 0-3 months before TKA: OR 3.17 [97.5% CI 2.24-4.49], CDI 3-6 months before TKA: OR 2.24 [97.5% CI 1.51-3.32], CDI 6-12 months before TKA: OR 1.96 [97.5% CI 1.40-2.74], CDI 1-2 years before TKA: OR 1.20 [97.5% CI 0.88-1.65]. Patients with a history of CDI within 2 years prior to TKA were associated with higher odds for post-surgical CDI complication in a 2 year window compared to the control group (OR: 22.64 [95% CI 15.79-32.46, p<0.001]).
DISCUSSION AND CONCLUSION:
History of enteral *C. difficile* infection is an independent risk factor for prosthetic joint infection. Furthermore, proximity of CDI to arthroplasty acts in a “dose-dependent” manner for PJI risk. Surgeons should strongly consider delaying TKA until one year after CDI, particularly in patients with concomitant risk factors.