

E. coli Periprosthetic Joint Infections: Poor Infection Clearance at One Year

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INTRODUCTION: *Escherichia Coli* (E. coli) is a gram-negative rod that causes devastating periprosthetic joint infections (PJIs) in patients with total hip and knee replacements (THA/TKA). However, minimal outcomes data exist. We analyzed E. coli THA/TKA PJI outcomes.

METHODS: This single-center, retrospective cohort study from 2009-2020 identified 21 unique patients (mean age 66.6 years, 47.6% male, 38.1% knee) that met MusculoSkeletal Infection Society criteria for E. coli hip/knee PJI with at least 1-year of follow-up. The primary outcome was 1-year infection clearance: infection eradication sans suppressive antibiotics/surgeries for at least 1 year after antibiotic completion. Statistical analysis included descriptive statistics to compare patients with/without the primary outcome.

RESULTS: We identified 11 acute, 8 acute hematogenous (AH), and 2 chronic PJIs. Several patients had gastrointestinal/urinary tract surgery ≤ 3 months pre-PJI surgery (14.3%), >3 urinary tract infections within 12 months pre-PJI (9.5%), or ≥ 1 E. coli urine culture ≤ 1 -month pre-PJI (14.3%). Surgical treatments included DAIR (66.7%), Arthrodesis/Resection Arthroplasty (A/RA;19.0%), and 2-stage revision (14.3%), with 7.1%, 75%, and 100% 1-year infection clearance, respectively ($p=.001$ clearance between groups), and 33.3% 1-year infection clearance overall. Common reasons for treatment failure were reinfection requiring surgery (57.1%) and chronic antibiotics (38.1%, suppressive antibiotic therapy for >1 year). Patients clear at 1 year had a longer mean time from most recent surgery to index PJI surgery (48.7 vs 7mo; $p=.043$) and more AH than acute/chronic infections (54.6% vs 27.3% vs 18.2%; $p=.0412$). E. coli PJI persisted >1 year after completion of postoperative antibiotics in 23.8% of patients. Outcomes at final follow-up included A/RA (33.4%), original prosthetic (28.6%), new prosthetic (19%), above knee amputation (9.5%), and destination spacer (9.5%).

DISCUSSION AND CONCLUSION: E. coli PJI 1-year infection clearance is poor, with DAIR being the most common yet least effective surgery. Additionally, most E. coli PJIs occurred postoperatively as opposed to hematogenously, as is sometimes assumed. This serves as a foundation for future studies evaluating E. coli treatment outcomes.