

Impact of Organism Profile on Ideal Timing of Reimplantation in Patients Undergoing Two-Stage Exchange Arthroplasty

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INTRODUCTION: No study to date has examined the association between organism profile and ideal interstage duration in patients undergoing two-stage exchange arthroplasty. The purpose of this study was to evaluate the impact of the type of infecting organism on the optimal timing of reimplantation in this patient population.

METHODS: This retrospective study identified 576 patients with chronic periprosthetic joint infection (PJI) of the knee that underwent two-stage exchange arthroplasty with a minimum 1-year follow-up. PJI was defined using the 2013 Musculoskeletal Infection Society (MSIS) criteria. Patients with a time to reimplantation >180 days from resection arthroplasty (n=76) and those that underwent spacer exchange were excluded (n=49). Treatment failure was defined as any reoperation for infection or PJI-related mortality. Receiver operator characteristic (ROC) curve analyses were used to identify whether the optimal interstage duration differed by infecting organism. Multivariate regression analyses were performed to identify risk factors for failure.

RESULTS: 451 patients with a mean follow-up time of 5.8 ± 3.6 years were included. Of these, 71 (15.7%) patients experienced failure and 380 (84.3%) experienced success. ROC curve analyses demonstrated that the optimal interstage duration was longest for patients infected with “high-virulence” pathogens (129 days), followed by those with MSSA (117 days), culture negative PJI (98 days), and coagulase-negative *Staphylococci* (86 days). After controlling for co-variables, regression analyses showed that an interstage duration above the identified cutoff for each pathogen group was a predictor of treatment failure (all $p < 0.05$).

DISCUSSION AND CONCLUSION: We found that the ideal interstage duration varied considerably by the type of infecting organism in patients undergoing two-stage exchange. Greater awareness of this data may help guide the optimal timing of reimplantation in this patient population.

