Timing of Failure of Two-Stage Exchange Arthroplasty for Periprosthetic Joint Infection of the Hip and Knee

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INTRODUCTION: While numerous risk factors have been associated with failure following two-stage exchange for periprosthetic joint infection (PJI), little prior research has evaluated specifically when failure tends to occur postoperatively. The purpose of this study was to investigate the timing of failure following two-stage exchange for chronic PJI and to determine if any patient- or organism-specific risk factors are associated with early failure.

METHODS: From our institutional total joint registry, we identified 589 two-stage exchanges performed for PJI of the hip or knee from 2010 – 2021. After excluding patients for lack of failure (n=357) and inadequate chart information (n=142), we were left with 90 (15% of 589) total joint arthroplasties (56 knees and 34 hips) in 90 patients that failed following two-stage exchange. These 90 patients were divided into two groups based on timing of failure: early (within 5 years postoperatively) and late (>5 years postoperatively). Potential patient- and organism-specific risk factors for failure were compared between these groups.

RESULTS: Median time to failure was 579 days (IQR, 204-1246 days). The cumulative percentage of patients who failed within 1 year, 5 years, and 10 years following reimplantation were 40%, 84%, and 98%, respectively. The only patient-specific risk factor found to be associated with early failure was systemic inflammatory disease (n=21 early failures v. n=0 late failures; p=0.03). A resistant organism identified intraoperatively trended towards being significantly associated with early failure (n=16 early failures v. n=0 late failures; p=0.10).

DISCUSSION AND CONCLUSION: The majority of failures following two-stage exchange (84%) occurred early, within 5 years following reimplantation. Patients with systemic inflammatory disease and/or a resistant organism identified intraoperatively were most at risk for early failure. These data may guide surgeons and patients regarding follow-up monitoring and duration of suppressive antibiotic therapy.