Time to Reimplantation: Does Waiting Longer Increase the Risk of Subsequent Failure?

Saad Tarabichi[1], David Deckey, Jens Taylor Verhey[2], Benjamin Kurt Wilke, Cody Wyles[3], Zachary Christopher[3], Henry D Clarke[3], Mark J Spangehl[3], Joshua Bingham
[1]Rothman Orthopaedic Institute, [2]Mayo Clinic Arizona, [3]Mayo Clinic

INTRODUCTION:
Despite the popularity of two-stage exchange for the management of chronic periprosthetic joint infection (PJI), the optimal timing of reimplantation in these patients remains unclear. To date, no study in the literature has been able to determine an association between the time from resection to reimplantation and subsequent outcomes. The purpose of this study was to evaluate the impact of time to reimplantation on the risk of failure in two-stage exchange patients.
METHODS:
This retrospective study identified 576 chronic knee PJI patients that underwent two-stage exchange with minimum 1-year follow-up. PJI was defined using the 2013 MSIS criteria. Patients with an extended time to reimplantation (>1 year from resection arthroplasty) were excluded (n=31). Treatment failure was defined as any reoperation for infection at latest follow-up or mortality within 1-year following surgery. Multivariate regression controlling for demographics, history of failed surgical treatment for PJI, and organism virulence was used to determine whether time from resection to reimplantation was a risk factor for failure.
RESULTS:
545 patients with a mean follow-up time of 6.6 ± 3.3 years were included. Of these, 111 (20.4%) experienced treatment failure. Median time from resection to reimplantation for all patients was 94 days (IQR [71 to 132]). Patients with a time to reimplantation of >=94 days were more likely to experience treatment failure (24.8% vs. 15.7%, p=0.008). Upon regression analyses, time to reimplantation of >=94 days was identified as an independent risk factor for treatment failure (OR, 2.5 [95% CI, 1.1 to 6.2]; p=0.032).
DISCUSSION AND CONCLUSION:
This is the first study to have identified a relationship between the time to reimplantation and risk of subsequent failure. We found that an interstage interval of >=94 days was a poor prognostic indicator and resulted in a more than two-fold increase in the risk of treatment failure in PJI patients undergoing a two-stage exchange.