Impact of a Standardized Surgical Protocol on Outcomes Following DAIR Surgery for Acute Postoperative and Acute Hematogenous Periprosthetic Joint Infection

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INTRODUCTION: Debridement, antibiotics, and implant retention (DAIR) is employed when treating acute periprosthetic joint infection (PJI). Unfortunately, post-DAIR outcomes are inconsistent in the literature. In addition to patient and pathogen–specific factors, inconsistent surgical technique has been attributed to hindering DAIR treatment success. The aim of this study is to examine early survivorship in a standardized vs. non-standardized DAIR. We hypothesized that implementing a standardized DAIR protocol will improve infection-related outcomes.

METHODS: We identified 60 patients undergoing DAIR for acute postoperative or hematogenous PJI at our institution from 2018 to 2024. The standardized protocol included tissue debridement, complete synovectomy, and serial soaking with a betadine solution and an anti-biofilm solution. We then found historical controls that received an anti-biofilm solution with no other protocol guidelines. Patients were matched on ASA score (+/- 1), PJI chronicity, and dates of DAIR (+/- 1 year). Patients received between 6 months and 1 year of oral antibiotic suppression following initial IV treatment. The primary outcome was prevalence of cases without revision for infection at 90 days, 6 months, 1 year, and 2 years post-DAIR. Descriptive statistics and survival probability were calculated. A log-rank test was used to identify differences between curves.

RESULTS: At 90 days, infection-free survival was 95.0% (57/60) in the standardized cohort and 83.3% (50/60) in the non-standardized cohort (p =0.041). At 6 months, standardized infection-free survival was 91.7% (55/60) while non-standardized was 76.7% (46/60) (p=0.026). At 1 year, infection-free survival was 85.0% (51/60) for standardized and 73.3% (44/60) for non-standardized (p=0.088). At 2 years, standardized infection-free survival was 81.7% (49/60) whereas non-standardized remained at 73.3% (44/60) (p=0.19).

DISCUSSION AND CONCLUSION: Our findings indicate that a structured surgical approach to DAIR has promising short term outcomes in acute PJI. Further studies are required to refine surgical technique and to continue prospective observation.