

## **No Effect of Methicillin Resistance on Two-Stage Revision Procedures for Gram-Positive Periprosthetic Joint Infections**

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**INTRODUCTION:** Periprosthetic joint infections (PJI) after total joint replacements are devastating complications that result in increased patient morbidity, disability, and mortality. The current gold standard surgical treatment is a two-stage revision procedure. Treatment success is affected by many perioperative factors including the type of infecting organism. Gram-positive cocci are the most common cause of PJI and the presence of methicillin resistance (MR) is associated with poor outcomes. The purpose of this study is to compare the outcome of two-stage revision procedures for PJI caused by Gram-positive cocci, with and without MR.

**METHODS:** This was a single-institution retrospective review of all two-stage revision procedures for PJI caused by Gram-positive cocci after total hip or knee arthroplasty from 2017 to 2022. Infecting organisms were identified via intraoperative culture results. Polymicrobial infections were excluded. We defined Gram-positive cocci to be MR if resistant to methicillin or oxacillin. The primary outcome, all-cause revision, was then compared between the two cohorts. The secondary outcome, revision for re-infection, was also compared between the two cohorts.

**RESULTS:** 176 patients with PJI caused by Gram-positive cocci underwent two-stage revision procedures. Mean follow-up time was 4.5 +/- 1.7 years. With respect to MR status, there were 130 (73.9%) non-MR cases and 46 (27.1%) MR cases. No differences in baseline patient characteristics between the non-MR and MR cohorts were detected. Thirty patients (17%) underwent revision surgery. The incidence of all-cause revision did not differ between non-MR (20 patients) and MR cohorts (10 patients) (21.7% vs 15.5%, p=0.3). Among all revision cases, 8 (22%) patients underwent revision specifically for re-infection. When stratified by MR status, the incidence of revision for re-infection was 4.6% in the non-MR cohort and 4.3% in the MR cohort.

**DISCUSSION AND CONCLUSION:** Despite prior publications suggesting a prognostic role of MR status after two-stage revision for PJI, our study showed no difference in the incidence of all-cause revision between non-MR and MR cases. Furthermore, there does not appear to be a difference in the incidence of revision for re-infection between these groups. These findings suggest that two-stage revision remains an effective treatment for PJI even in cases of MR Gram-positive coccal infections.