

High failure rates following repeat two-stage revision for chronic knee periprosthetic joint infection at long-term follow-up: A multicentre study

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INTRODUCTION:

Recurrent periprosthetic joint infection (PJI) following two-stage revision total knee arthroplasty poses significant treatment challenges. Repeat two-stage revision remains a salvage option, however the outcomes of this procedure are poorly defined, with limited data from small, single-centre series. This study aimed to evaluate success rates of repeat two-stage revision arthroplasty of the knee and identify risk factors for treatment failure using a multicentre cohort.

METHODS:

We conducted a retrospective review of prospectively maintained databases from two tertiary centres to identify patients who underwent repeat two-stage revision for chronic knee PJI between 1995 and 2022 to allow for a minimum of 2 years follow-up. Sixty-one patients were identified. Of these 13 (21.3%) did not undergo second stage reimplantation, leaving forty-eight patients for review. Mean age was 67 (48 – 82) and 31% were female (Table 1). McPherson Host Grade was A in 40%, B in 56%, and C in 4% (Table 1). Mortality rate was 35.4%, with two deaths within 2 years of surgery for causes unrelated to PJI. Mean follow-up was 12.1 years (1.5 – 29.5 years). The primary outcome was treatment success according to the 2019 Musculoskeletal Infection Society (MSIS) Tier 1 criteria. Kaplan–Meier survivorship was calculated for all-cause and PJI-specific revision. Cox regression assessed predictors of failure.

RESULTS: Treatment success was achieved in 21 of 48 patients (39.6%). Among failures (n = 27), 21 required further infection surgery, two remained on lifelong suppressive antibiotics, and four underwent aseptic revision. Amputation was performed in 11 cases (22.9%). Survival for all-cause revision was 42.3% (26.2 – 57.5) at 10 years (Figure 1). PJI-specific survival was 47.7% (95% CI 30.3 – 63.2) at 10 years. Younger age was the only independent predictor of failure (OR 0.898 per year; 95% CI 0.836–0.965; p = 0.003). Excluding culture-negative cases, 31% demonstrated a new infecting organism at repeat revision. Polymicrobial infection rates increased at re-revision (12.5%).

DISCUSSION AND CONCLUSION: Repeat two-stage revision for recurrent knee PJI results in low long-term infection control and substantial morbidity, including a 23% amputation rate. Younger patients face higher failure risks. These findings highlight the need for careful patient selection, optimised protocols, and exploration of alternative management strategies.

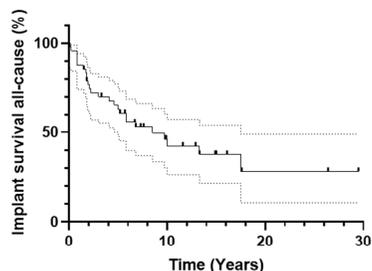


Figure 1: Kaplan-Meier analysis of implant survival for all-cause revision. Survivorship was 42.3% (57.5 – 26.2) at 10 years.

Table 1: patient demographics

Mean age (range)	67 (48 – 82)
Sex (% female)	31%
Median ASA (IQR)	3 (1)
Mean BMI (range)	34.6 (23.4 – 58.7)
McPherson systemic host grade	A – 19 (40%) B – 27 (56%) C – 2 (4%)
Median Charlson comorbidity index (IQR)	4 (2)