

International Success and Failure of the Treatment of Periprosthetic Knee Infection: A Preliminary Report

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INTRODUCTION: Multiple studies have evaluated the success of different surgical modalities for periprosthetic joint infection (PJI), but most reports are limited to data from single centers/countries. Thus, this preliminary report from the Orthopaedic Device Infection Network (ODIN), which is a collaboration of seven organizations across Australia, New Zealand, the Netherlands, Spain and the United States using standardized data collection/centralized analysis, attempts to overcome that barrier and find an answer to the following questions: What is (1) the success rate of knee PJI treatment, and the postoperative rates of (2) amputation or (3) mortality?

METHODS: Data was collected at 4 institutions. Inclusion criteria was knee arthroplasty treated for PJI (n=227). Study period: 2005 to 2023. Demographics, body mass index (BMI), Charlson Comorbidity Index (CCI), and baseline surgical/infection characteristics such as type of index arthroplasty (primary vs. revision), index arthroplasty indication, infection type (i.e., chronic), infecting organisms, and type of surgery (i.e., single-stage) were noted. Success/failure was assessed according to the Musculoskeletal Infection Society (MSIS) Outcome Reporting Tool (tiers I to III) and a composite outcome (failure: amputation, death, implant revision/removal or infection relapse according to clinician). Postoperative amputations and deaths were also noted. Follow-up range: 6 weeks to 10 years.

RESULTS: Mean age, BMI, and CCI were 65 years, 32.4 Kg/m², and 2.6, respectively. Majority of knees treated for PJI were primaries (n=160), most were chronically infected (n=103), and the most common infecting organism was Staphylococcus aureus (n=58). Surgical/infection characteristics are shown in Table 1A. Postoperatively, 54 and 61% of knees were categorized as success according to MSIS (tiers I/II) and composite outcome tools, respectively. At latest follow-up, six knees (3%) underwent amputation, mortality rate was 15% (n=34) (Table 1B).

DISCUSSION AND CONCLUSION: The reported failure of treatment of PJI after knee arthroplasty is higher than that have been reported in single institution series. The heterogeneity of an international cohort may be more representative of the current PJI treatment outcome. Only a little more than half of the cases were successfully managed regardless of the success/failure outcome reporting tool utilized. These sobering results call for improvement of strategies to treat knee PJI.

Table 1A. Baseline surgical and infection characteristics.

Surgical and Infection Variables	Entire Cohort (N=227)	Staphylococcus spp (coagulase negative)	10
Type of index arthroplasty (reflexion treated for infection) N (%)	Primary	160 (70)	
	Revision	67 (30)	
	Unknown	42 (19)	
	Other	10 (4)	
Indication for index arthroplasty (reflexion for the repair of the non index for infection) N (%)	Dislocation	107 (47)	2 (1)
	Acetabular fracture	1 (0)	
	Rheumatoid Arthritis	8 (4)	
	Malignancy	14 (6)	
	Fracture	2 (1)	
	Other	33 (15)	
Type of Infection N (%)	Early (< 3 months after arthroplasty)	81 (36)	
	Chronic (> 3 months after arthroplasty)	103 (45)	
	Latent (intermittent)	34 (15)	
	Unknown	4 (2)	
	Missing Data	2 (1)	
Culture Results N (%)	Positive	128 (57)	
	Negative	99 (43)	
Infecting Organisms (by dominant index) N (%)	Staphylococcus aureus	58	
	Staphylococcus epidermidis	41	
	Staphylococcus agalactiae	17	
	Enterococcus spp	11	
	Streptococcus dysgalactiae	11	
	Enterococcus faecalis	10	

Table 1B. Treatment results of periprosthetic knee infection.

Results	Entire Cohort (N=227)	
Success or Failure According to MSIS Outcome Reporting Tool (Tiers I/II [Success] vs. Tier III [Failure]), N (%)	Tier I or II	123 (54)
	Tier III	59 (26)
	Missing Data	45 (20)
Amputation , N (%)	No	214 (94)
	Yes	6 (3)
	Missing Data	7 (3)
Death , N (%)	No	187 (82)
	Yes	34 (15)
	Missing Data	6 (3)
Success of Failure According to Composite Outcome (Failure: amputation, death, implant revision/removal or relapse of infection as determined by the treating clinician) N (%)	Success	138 (61)
	Failure	83 (37)
	Missing	6 (3)

MSIS: Musculoskeletal Infection Society.