Periprosthetic Joint Infection in Unicompartmental Knee Arthroplasty: Debridement, Antibiotics, and Implant Retention or Revision to Total Knee Arthroplasty?

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INTRODUCTION:

Periprosthetic joint infection (PJI) after unicompartmental knee arthroplasty (UKA) is a devastating complication with limited data available regarding appropriate management. This study aimed to compare success rates of the various treatment options for UKA PJIs and identify risk factors for reinfection.

METHODS: A retrospective review of patients undergoing revision for PJI of a UKA between 2006-2024 at a single large academic referral center was performed. Patients who did not meet the 2018 Musculoskeletal Infection Society (MSIS) criteria for PJI or had <90 days of follow-up were excluded. The primary outcome was treatment failure, defined as persistent or recurrent infection, after revision. Univariate and survivorship analysis were performed controlling for age, McPherson classification, preoperative lab values, and culture data. A total of 39 patients were included in our analysis. Median follow-up was 21.4 months.

RESULTS: Of the procedures included, 33 (84.6%) were debridement, antibiotics, and implant retention (DAIR), 4 (10.3%) were two-stage revision to total knee arthroplasty (TKA), and 2 (5.1%) were one-stage revision to TKA. There were 16 (41.0%) acute postoperative infections, 12 (30.8%) acute hematogenous infections, and 11 (28.2%) chronic infections. Methicillin-sensitive *S. aureus* (n=8, 23.5%) and methicillin-resistant *S. aureus* (n=4, 11.8%) were the most common infecting organisms, with 12 culture negative infections (30.8%). A total of 13 patients (33.3%) were reinfected following the index revision procedure. Survivorship free of reinfection was 77.0% and 52.5% at 2 and 5 years, respectively. There was no difference in risk of reinfection for one- and two-stage revision compared to DAIR (hazard ratio: 0.90; p=0.918).

DISCUSSION AND CONCLUSION:

Our study found a high rate of reinfection among patients treated for UKA PJI, with no significant difference in reinfection risk between DAIR and either one- or two-stage revision to TKA. These findings warrant additional investigation to guide optimal treatment of infected unicompartmental knee arthroplasty.

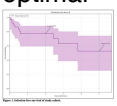

Figure 1. Kaplan-Meier curve of all study cohort.

McPherson classification	n (%)
1A1	10 (25.6%)
1A2	3 (7.7%)
1B1	5 (12.8%)
1B2	1 (2.6%)
1C1	1 (2.6%)
2B1	1 (2.6%)
3A1	8 (20.5%)
3A2	1 (2.6%)
3B1	5 (12.8%)
3C1	2 (5.1%)
3C2	2 (5.1%)

Table 2. McPherson classification.

Variable	Control Subjects (n = 20,000,000)	Hospitalized patients (n = 4,000,000)	p value
Age (years) (range)	50.0 (0.0-99.0)	49.0 (0.0-99.0)	0.047
Sex (%)			0.000
Male (%)	7,100,000	50.00 (%)	
Female (%)	10,700,000	50.00 (%)	
Hospital stay (range)	2.0 (0.0-365.0)	3.0 (0.0-365.0)	0.000
Smoking status			0.000
Never smoker (%)	11,000,000	50.00 (%)	
Former smoker (%)	7,000,000	35.00 (%)	
Current smoker (%)	2,000,000	15.00 (%)	
Primary procedure (%)	4,000,000	15.00 (%)	0.000
Total THA (%)	2,000,000	5.00 (%)	
Total TKA (%)	2,000,000	5.00 (%)	
Pre-Study Actual (%)	1,000,000	2.50 (%)	
Pre-Study (%)	1,000,000	2.50 (%)	
Prosecution (%)	1,000,000	2.50 (%)	
Prosecution (%)	1,000,000	2.50 (%)	
Primary infection (%)	1,000,000	2.50 (%)	
Primary infection (%)	1,000,000	2.50 (%)	
Primary infection