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Background

- Periprosthetic joint infections (PJI) are an uncommon but serious complication following total knee arthroplasty (TKA), with reported rates ranging from 0.5% to 2.0%.
- Intraoperative irrigation is a commonly employed measure to reduce bacterial contamination and biofilm formation during knee arthroplasty to reduce risk of PJI.
- Much of the existing literature combines hip and knee arthroplasty populations, limiting knee-specific guidance.

Irrigants	Saline (n=114)	Betadine (n=35)	Irrisept (n=49)	Combination (n=133)	P- value
Gender (%)					0.379
Female	43	47	31	39	
Male	57	53	69	61	
Age (years, mean± SD)	65 ± 11.4	63.9 ± 12.4	66 ± 9.5	66.4 ± 11.3	0.541
BMI (kg/m ²)	30.1 ± 6.8	29.3 ± 6.1	32.5 ± 5.9	31.3 ± 6.9	0.128
Diabetes Mellitus (%)	29	34	33	22	0.203
CCI (median)	2 (IGR 1)	2 (IGR 1)	2 (IGR 1)	2 (IGR 1)	0.767
ASA (median)	2 (IGR 1)	2 (IGR 1)	2 (IGR 1)	2 (IGR 1)	0.864
Smoking Status (%)					0.539
Never	61	72	71	65	
Current/Former	39	28	29	35	
Causal Organism (%)					0.00003
Gram-Positive	19.3	28.6	24	33.1	
Gram-Negative	4.39	17.1	8	24.8	
Culture-Negative	66.7	37.1	62	29.3	
Multiple Organisms	7.89	8.57	6	9.02	
ESR (mean ± SD)	46.9 ± 32.9	50.2 ± 25.9	46.7 ± 31	55.7 ± 33.2	0.197
CRP (mean ± SD)	4.5 ± 7	8.8 ± 10	4 ± 6.5	6.8 ± 8.2	0.058
HbA1c (mean ± SD)	5.8 ± 1.2	6 ± 0.9	5.9 ± 0.8	5.7 ± 0.7	0.487
Operation Time (minutes, mean ± SD)	213 ± 82	204 ± 84.2	200 ± 121	174 ± 88.2	0.002

Table 1: Patient Demographics and Clinical Characteristics

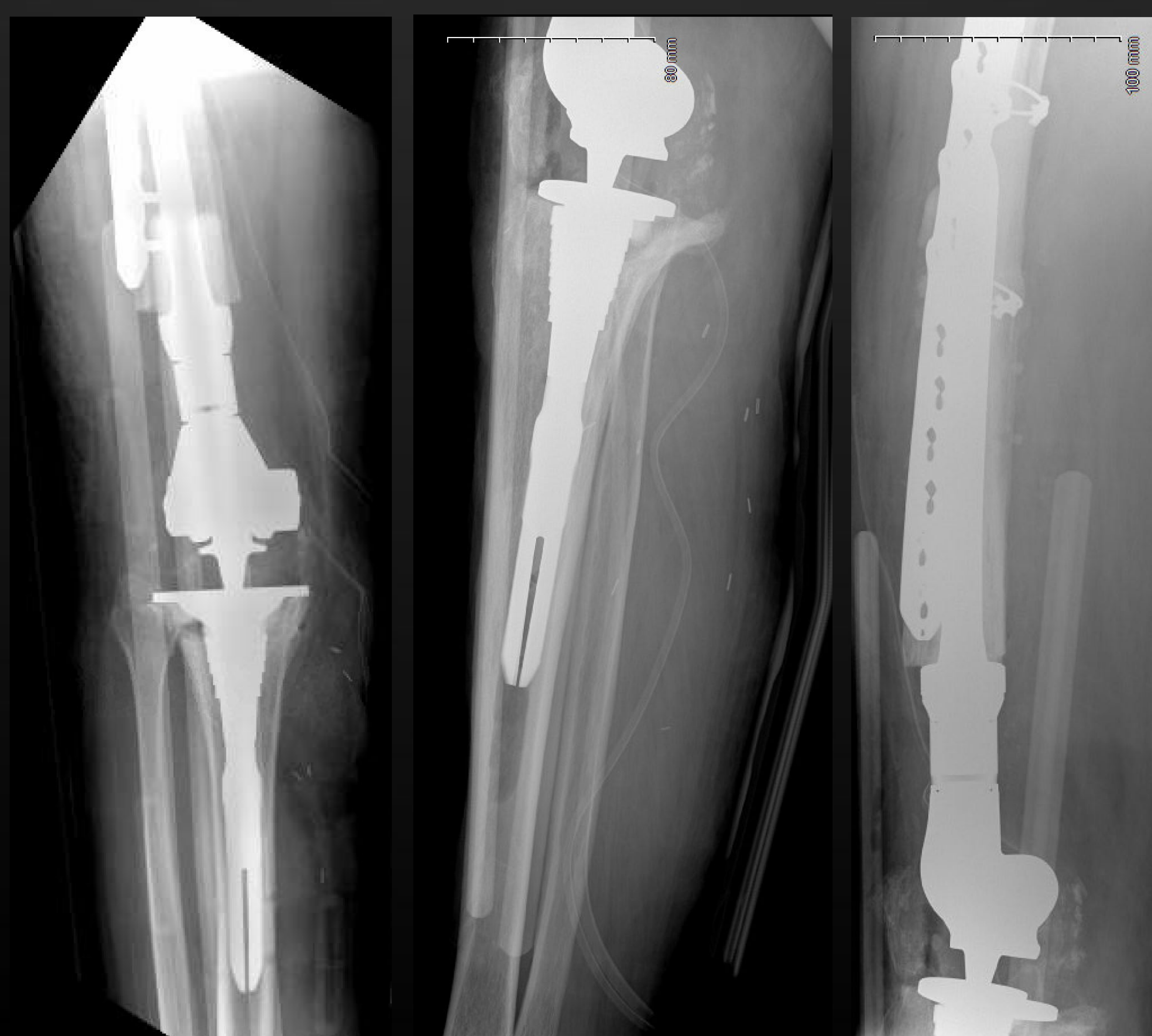


Figure 1: Definitive distal femoral replacement after two-stage revision

	Return to ED related to surgery (n, %)	Readmission (n, %)	Reinfection (n, %)	Reoperation (n, %)	Mortality (n, %)
30-days	S: 14 (13) PI: 4 (12) CHG: 4 (8) C: 22 (17) P = 0.423	S: 11 (10) PI: 4 (12) CHG: 5 (10) C: 21 (16) P = 0.529	-	-	-
90-days	S: 8 (7) PI: 2 (6) CHG: 3 (6) C: 13 (10) P = 0.743	S: 13 (12) PI: 6 (18) CHG: 3 (6) C: 26 (20) P = 0.082	-	-	-
1 year	-	-	S: 19 (20) PI: 7 (20) CHG: 4 (9) C: 30 (24) P = 0.231	S: 29 (30) PI: 12 (34) CHG: 10 (23) C: 40 (32) P = 0.639	S: 4 (4) PI: 1 (3) CHG: 4 (8) C: 8 (6) P = 0.557

Table 2: Significant Outcomes Between Irrigants at 30-Days, 90-Days, and 1-Year

Results

- In a Firth logistic regression model, **female gender** was associated with **reduced odds of 30-day ED visits (OR 0.40, 95% CI 0.18–0.83, p = 0.014)**.
- Higher BMI** was significantly associated with increased odds (**OR 1.64 per SD increase, 95% CI 1.12–2.35, p = 0.010**).
- In respect to readmission, combination irrigation shows a borderline significant association for increased risk of 30-day readmission (**OR 2.73, 95% CI 1.00–8.50, p = 0.049**).
- Gram-negative infections** increased the odds of **30-day readmission (OR 4.09, 95% CI 1.39–12.90, p = 0.011)**, and **higher BMI increased risk (OR 1.75 per SD increase, 95% CI 1.18–2.63, p = 0.006)**.
- Female gender** and **diabetes** were associated with **lower odds of 90-day ED visits (OR 0.26, 95% CI 0.10–0.63, p = 0.002; OR 0.35, 95% CI 0.11–0.96, p = 0.041, respectively)**, although the diabetes finding was counterintuitive.
- Smoking** increased the odds of **reinfection (OR 4.18, 95% CI 1.14–4.18, p = 0.019)**, and **multiple causal organism infections** were also associated with higher odds (**OR 10.20, 95% CI 1.09–10.20, p = 0.036**).

Methods

- Retrospective study
- 275 infected TKA
- Three hospitals
- July 2017 to April 2025
- Performed by three fellowship-trained orthopedic surgeons,
- Excluding 19 fungal infections and 58 patients with missing key variables from an initial cohort of 352.
- The joint was irrigated with either: saline, 10% povidone-iodine, 0.05% chlorhexidine gluconate, or combination irrigation.
- Patients underwent either: polyethylene exchange, revision arthroplasty, or a staged-revision.
- Outcomes were measured at 30-days, 90-days, and at 1-year.

Conclusions

- Antiseptic irrigation appears to reduce infection risk in revision TKA, although the **optimal solution remains unclear**.
- Combination irrigation use may do worse in short-term outcomes related to readmission.