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Background

- Prosthetic joint infections (PJIs) complicate 0.5-2.5% of arthroplasties and up to 25% of revisions.
- This procedure is for patients in the acute setting, defined as within 4 weeks of symptom onset.
- For patients unable to undergo full explant, debridement, antibiotics, and implant retention (DAIR) offers a joint-sparing alternative.
- Irrigants such as Betadine and low dose chlorhexidine gluconate solution in sterile water (CHG) disrupt bacterial biofilm, but no consensus exists on superiority.
- Our institution’s protocol for DAIR includes modular exchange of polyethylene insert and consult to Infectious Disease for organism specific treatment, 6 weeks of IV antibiotics, followed by 6 week antibiotic holiday, and 3 months of suppression for THA and 6 months of suppression for TKA after eradication.

Table 1: Demographics and Clinical Characteristics

Solutions	Betadine (n=13)	Irrisept (n=11)	Combination (n=85)	P-Value
Gender (%)				0.609
Female	54	73	58	
Male	46	27	42	
Age (years, mean ± SD)	67.7 ± 8.8	62.9 ± 7.0	64.5 ± 11.8	0.509
BMI (kg/m², %)				0.681
<25	7.7	36.4	18.3	
25-29.9	53.8	18.2	36.6	
30-34.9	23.1	9.1	22.6	
35+	15.4	36.4	22.6	
Joint				0.256
TKA	69.2	36.4	64.1	
THA	30.8	63.6	35.9	
Drainage (%)	77	45	61	0.291
Diabetes Mellitus (%)	64.1	36.4	23.9	0.758
CCI (%)				0.390
0-2	30.8	54.5	35.6	
3-4	38.5	36.4	43.3	
5+	30.8	9.1	21.1	
ASA (%)				0.572
1-2	16.7	36.4	32.9	
3+	83.3	63.6	67.1	
Smoking Status (%)				0.438
Never	76.9	63.6	54.1	
History	15.4	27.3	37.6	
Current	7.7	9.1	8.2	
Causal Organism Type (%)				0.532
Gram-Positive	50.0	54.5	38.3	
Gram-Negative	25.0	27.3	32.1	
Fungi	0	0	4.9	
Culture-Negative	16.7	9.1	21.0	
Multiple Organisms	8.3	9.1	8.6	
Time from Symptoms to Washout (%)				0.061
0-7 days	30.8	80.0	41.3	
8-20 days	23.1	10.0	32.6	
21+ days	46.2	10.0	26.1	
ESR (Mean ± SD)	69.8 ± 26.5	37.4 ± 28.0	50.9 ± 28.2	0.281
CRP >5 (%)	66.7	60	59.5	0.815
HbA1c (Mean ± SD)	5.13 ± 0.32	5.62 ± 0.94	5.64 ± 0.78	0.619
Prealbumin (Mean ± SD)	25 ± 0	28.25 ± 9.46	26.9 ± 4.6	0.710
Fructosamine (Mean ± SD)	222	235	261.1 ± 27.5	0.472



Figure 1: Clinical image demonstrating acute wound dehiscence after primary total hip arthroplasty

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

Time	30-Day	P-value	90-Day	P-value	1-Year	P-value
ED Visits Related to Surgery	High risk ASA (OR: 7.95, 95% CI: 1.02-61.63), current smokers (OR: 12.0, 95% CI: 1.38-104.2)	0.048 and 0.017, respectively	Culture-negative infections (OR: 0.008, 95% CI: 0.000-0.652), current smokers (OR: 39.12, 95% CI: 1.30-1178.84)	0.032 and 0.032, respectively	-	-
Any ED Visit	-	-	Overweight BMI (OR: 0.18, 95% CI: 0.04-0.76) and Obese CI (OR: 0.09, 95% CI: 0.01-0.57)	0.020 and 0.011, respectively	-	-
Readmission	Intermediate washout time (OR: 6.07, 95% CI: 1.03)	0.047	Moderate CCI (OR: 0.06, 95% CI: 0.006-0.63), Younger age (OR: 0.91/ year increase, 95% CI: 0.84-0.99), Delayed washout time (OR: 7.07, 95% CI: 1.25-39.99), mixed causal organism infection (OR: 185.07, 95% CI: 5.22-6566.52)	0.019, 0.027, and 0.004, respectively	-	0.047
Reinfection	-	-	-	-	Higher CRP (OR: 1.082/ unit increase, 95% CI: 1.000-1.171)	0.050
Reoperation	-	-	-	-	Delayed washout time (OR: 7.95, 95% CI: 1.024-61.63), Younger age (OR: 0.90/ year increase, 95% CI: 0.82-0.99), History of smoking (OR: 8.13, 95% CI: 1.14-58.28), Higher CRP (OR: 1.085/ unit increase, 95% CI: 1.003-1.174)	0.047, 0.037, and 0.042, respectively

Results

- Irrigants included Betadine (n=13), Irrisept (n=11), and combination solutions (n=85; e.g. Xperience, chlorhexidine, and hydrogen peroxide).
- No irrigant differences were found for emergency department (ED) visits, readmissions, reinfection, or reoperation
- Patient and infection-specific factors were more predictive.
- High risk ASA and active smoking increased 30-day ED visit risk.
- Intermediate time to washout predicted 30-day readmission risk.
- At 90 days, culture-negative infections were associated with lower odds of surgery-related ED visits (OR= 0.006, 95% CI 0.000-0.73, p = 0.036), while lower comorbidity and older age reduced readmission.
- At 1-year, delayed washout, smoking history, and younger age predicted reoperation.
- Elevated CRP correlated with reinfection and reoperation.

Methods

- This retrospective study analyzed 109 DAIR cases (July 2017-May 2025) across four hospital by three fellowship-trained orthopedic surgeons.
- Outcomes at 30 days, 90 days, and 1 year were evaluated using multivariable logistic regression.
- Covariates included age, body mass index (BMI), Charlson Comorbidity Index (CCI), American Society of Anesthesiologists (ASA) classification, wound drainage, smoking status, drug use, type of causal organism, diabetes mellitus (DM), and preoperative laboratories (C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), Hemoglobin A1c (HbA1c), prealbumin, fructosamine).

Conclusions

- Betadine, CHG, and combination irrigants are all valid in DAIR, with no solution demonstrating superiority.
 - Culture-negative infections may be less aggressive.
 - Modifiable factors, such as smoking cessation and earlier washout, can reduce reoperation risk.
 - Among labs, CRP best predicted 1-year reoperation.
 - Surgeons should not hesitate to perform DAIR in suspected acute infections.
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