Effect of Duration of Wound Drainage on Treatment Success After Prosthetic Joint Infection Surgery: How Long is Too Long?

Alberto Telias, Sanjula Costa, Paul E Beaule[1], Hesham Abdelbary[2], George A Grammatopoulos[2], Simon Garceau
[1]The Ottawa Hospital General Campus, [2]The Ottawa Hospital

INTRODUCTION: Persistent leaking wounds (PLW) after primary hip and knee arthroplasty are associated with prosthetic joint infections (PJI). Current recommendations suggest early repeat surgery if present. In PJI revision surgery, there are currently no clinical studies/guidelines timing of repeat surgery for PLW. This study aims to evaluate the temporal association between PLW and treatment failure, as well as factors associated with persistent drainage after hip PJI surgery.

METHODS: A retrospective cohort study of THA PJI patients was conducted at our center from March 2019 to December 2022, with a minimum follow-up of one year. Baseline patient/surgical characteristics were collected including duration of wound leakage. Multivariate logistic regression was performed to assess for factors associated with treatment failure and PLW. Failure of treatment was defined as per the modified Delphi criteria. A prediction model was developed to assess for optimal cut-off point for failure with PLW, and for probability of failure at different time-points.

RESULTS: 159 cases in 100 patients were identified: 96 females (60.4%) and 63 males (39.6%), with a mean age of 68.8±14 years. Failure of treatment was 38% after the first, 47% after the second, and 50% after more than three PJI surgeries. The mortality rate was 6.9% at 1 year, and five (3.1%) patients suffered from persistent PJI. Multivariate regression analysis demonstrated that PLW >14 days was associated with failure [OR 3.517 (95% CI: 1.757-7.041), p=0.0004)]. Moreover, prediction analysis demonstrated that with PLW at 14 days, a 35.8% failure is to be expected. PLW was associated with malnutrition [OR: 2.887 (95%: CI: 1.449-5.752), p=0.0026] and multiple PJI surgeries [OR: 1.46 (95% CI: 1.052-2.035), p=0.0239].

DISCUSSION AND CONCLUSION: Wound drainage >14 days is associated with an elevated risk of failure after PJI surgery. Surgeons should consider early repeat surgery on patients with PLW prior to 2 weeks after PJI revision surgery.
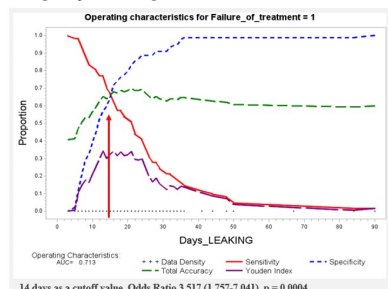

Figure 1. Prediction Analysis Demonstrating Days Leaking Versus Failure of Treatment

Table 1. Factors Affecting Failure of Treatment in THA PJI Patients

	Odds Ratio	95% CI		P
Malnutrition	1.707	0.839	3.471	0.1399
Unit RBC tranfusion	1.199	0.899	1.599	0.2171
>14 Days wound leaking	3.026	1.476	6.203	0.0025*

Table 2. Factors Affecting Persistent Leaking Wounds (PLW) in THA PJI Patients

	Odds Ratio	95% CI		P
Malnutrition	2.887	1.449	5.752	0.0026*
Number of previous PJI surgeries	1.463	1.052	2.035	0.0239*