

What Is the Role of Repeat Aspiration in the Diagnosis of Periprosthetic Hip Infection?

Jeffrey D. Hassebrock, MD, Michael G. Fox, MD, Mark J. Spangehl, MD,
Adam J. Schwartz, MD, MBA

Introduction: The American Academy of Orthopaedic Surgeons (AAOS) clinical practice guideline currently recommends repeat joint aspiration when workup of periprosthetic joint infection (PJI) reveals conflicting data. This guideline is based upon a single study of 31 patients published twenty-five years ago. We sought to determine the correlation between first and second aspirations and factors that may play a role in variability between them.

Methods: Sixty patients with less than 90 days between aspirations and no intervening surgery were identified at our institution and classified by MSIS criteria as infected, not infected, or not able to determine after both aspirations. Culture results from both aspirations were recorded. The rates of change and correlation in clinical diagnosis and culture results between aspirations were determined.

Results: Repeat aspiration changed the diagnosis in 26 cases (43.3%, 95% CI: 31.6%-55.9%, Kappa coefficient 0.32, $p < 0.001$), and the culture results in 25 cases (41.7%, 95% CI: 30.1% to 54.3%, Kappa coefficient 0.27, $p < 0.01$). Among patients initially MSIS negative, the proportion who changed to MSIS positive was greater for those with history of prior PJI compared to those without (66.7% vs. 0%, $p < 0.05$), and the first aspiration mean volume was higher for those changed to MSIS positive compared to those that remained MSIS negative (12.0 ml vs. 3.0 ml, $p < 0.01$). Among patients initially MSIS positive, the proportion of patients changed to MSIS negative was greater for those with history of adverse local tissue reaction (ALTR) to metal debris compared to patients without suspicion of ALTR (100% vs. 7.7%, $p < 0.05$).

Conclusions: Repeat aspiration is particularly useful in patients with conflicting clinical data and prior history of PJI, suspicion of ALTR, or high clinical suspicion of infection.