

Positive Culture from the Liquid Medium Only after Total Joint Arthroplasty: Is it Reliable?

Rachael Wynne, RN, Jenny Cai, BS, Mitchell Maltenfort, PhD,
Robert P. Good, MD, **Eric B. Smith, MD**

Background: During revision total joint arthroplasty (TJA), infection may be the root cause for implant failure or pain. Therefore, routine intraoperative cultures are obtained. Culture results may not be finalized for several days after surgery and have a significant impact on the postoperative care for these patients. Typically, if a positive culture is obtained, long-term intravenous antibiotics are started. However, when cultures are analyzed, a portion of the specimen is treated in a liquid medium (broth) prior to being applied to the agar medium. This technique may subject the specimen to contamination. We sought to determine the reliability of cultures that were reported as positive from only the liquid medium after revision TJA.

Methods: A single-institution retrospective chart review was performed on 257 consecutive revision TJA cases from 2009 through 2010. 190 (74%) of cases had cultures for review. All culture results, as well as treatment, if any, were recorded and patients were followed for a minimum of one year for evidence of periprosthetic joint infection. Cultures were measured as positive, positive broth-only, or negative.

Results: Positive broth-only cultures occurred in 22 cases (11.6%). None of these cases would be considered positive based on the Musculoskeletal Infection Society criteria. The most common organism identified was coagulase-negative staphylococcus (CNS) in 14 (64%) of these cases. Only 2 of the 22 cases (9.1%) developed a clinical infection requiring additional surgery. Interestingly, one of these two cases grew a different organism (*E. coli*) at the time of irrigation and debridement than what was identified from the positive broth-only specimen at the index procedure (CNS). The sensitivity, specificity, positive predictive value, and negative predictive value were 20%, 87%, 9%, and 94%, respectively.

Conclusions: A positive culture from only the broth (liquid medium) obtained during revision TJA is a poor indicator of actual periprosthetic infection. Thus, it may not be necessary to subject these patients to prolonged antibiotic therapy.

