

QUESTION 5: Does preoperative swabbing of a sinus tract have a role in the isolation of the infecting organism?

RECOMMENDATION: Superficial cultures obtained from a sinus tract should be discouraged in the setting of an infected arthroplasty. Cultures from superficial swabbing of a sinus tract exhibit a low rate of concordance with deep cultures, thus, the value of obtaining such cultures is limited. Furthermore, these cultures can confound the decision-making process in the management of periprosthetic joint infection (PJI).

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 96%, Disagree: 3%, Abstain: 1% (Unanimous, Strongest Consensus)

RATIONALE

Patients may develop a draining wound in the early postoperative period following hip and knee arthroplasty or a sinus tract in the setting of a chronic PJI. Oftentimes, cultures are obtained from these superficial areas in an attempt to either diagnose a deep infection or identify the infecting microorganisms. The Musculoskeletal Infection Society (MSIS) definition for PJI, and the recent validated definition of PJI introduced in 2018, include the presence of sinus tract communicating with the prosthesis as a major diagnostic criterion for PJI [1,2]. The direct communication of the sinus tract with the epithelial surface of the skin results in contamination of the tract by organisms that may not be the infective agents in causing the underlying PJI. Although culture of the sinus tract and the draining wound is likely to be positive and isolate organism(s), the infecting organisms isolated by such method are not thought to be representative of the underlying PJI.

Historically, the swabbing of the sinus tract most likely derives from clinical practice in the diagnosis and treatment of osteomyelitis, in which it was assumed to accurately identify the causative organism [3]. There is scarce literature regarding to the use of superficial cultures in the diagnosis of PJI [4–6], and previous studies predominantly deal with sinus tract sampling in the setting of chronic osteomyelitis [7,8].

In 2013, the International Consensus Meeting (ICM) on PJI recommended against taking wound swab cultures [9]. Tetreault et al. [4], in a prospective, multicenter study evaluated the utility of culturing draining wounds or sinus tracts following hip or knee arthroplasty. This study included 55 patients, and reported that superficial cultures were concordant with deep cultures in less than half of the cohort (47.3%) and were more likely to generate polymicrobial results (27.3% versus 10.9%, $p = 0.023$). In 23 cases (41.8%), the superficial cultures would have led to a change in antibiotic regimen. Furthermore, in 8 of 10 patients the sinus swab yielded a positive result for an organism which was not supported by other tests. The authors concluded that obtaining superficial cultures of the sinus tract should be discouraged in the setting of a hip or knee arthroplasty. These results were consistent with prior studies in chronic osteomyelitis [7,8], which also demonstrated low correlation between sinus tract and bone cultures.

Similarly, Aggarwal et al. [6], in another prospective study, demonstrated that swab cultures are not as effective as tissue cultures for diagnosis of PJI. They had more false-negative and false-positive results than tissue cultures, leading to an increased risk of not identifying or incorrectly identifying the infecting organisms in PJI.

Based on the available evidence, it can be surmised that sinus tract swabs do not have a role in the isolation of the infecting organism in patients with underlying PJI.

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