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F- 31 - NUMBER OF CX

F- 31 - What is the optimal number of samples for culture in patients undergoing surgery for foot and ankle infections?

Response/Recommendation:

The optimal number of samples for culture in patients undergoing surgery for foot and ankle infections is unknown. We recommend that four to six samples are taken.

Strength of Recommendation: Consensus

Rationale:

Our search of the literature did not reveal any data regarding the optimal number of culture samples that should be taken during foot and ankle surgery, however, there is high level evidence in the prosthetic joint infection (PJI) literature regarding this topic. Bémer and colleagues conducted a prospective multicenter study evaluating the minimum number of samples required to make an accurate diagnosis of PJI. 2 They determined that four samples were sufficient for diagnosing PJI with the highest mean percentage of agreement (98.1% and 99.7%, respectively) in regards to the bacteriological criterion and diagnosis of confirmed PJI.

Atkins and colleagues performed a prospective study assessing the effect of sample number on the ability to diagnosis PJI. 1 Their study recommended sending five to six specimens and defined a cutoff of three or more positive operative cultures yielding an indistinguishable organism for definite diagnosis. This recommendation achieves an extremity high specificity, but an impractical sensitivity (would require too many samples). In order to achieve both an excellent sensitivity and specificity, five to six specimens with two or more culture-positive samples are recommended to diagnose infection.

The Infectious Diseases Society of America guidelines5 provide moderate evidence from more than one well-designed clinical trial, without randomization (B-II evidence) recommending at least three and optimally five or six intra-operative tissue samples be submitted for aerobic and anaerobic culture to diagnose a periprosthetic joint infection.

Majority of studies related to this subject in regards to the foot and ankle relate to the management of patients with diabetic foot ulcer and osteomyelitis. The available studies have revealed that the yield of culture is dependent on how these culture samples are taken (e.g. swab, bone biopsy, and so on) and did not evaluate the influence of number of culture samples taken.

In 144 diabetic foot ulcer patients with suspected osteomyelitis, ulcer swab and bone biopsy specimens were taken, respectively. The authors found that there is poor reliability of the ulcer swab culture in identifying the pathogens causing osteomyelitis in this patient population. When used in conjunction with bone biopsy specimen culture there may be a more reliable isolate for effective management.3 Another study reported that swab cultures may have utility for guiding the antibiotic selection for management of low grade infection. IN the setting of higher grade infections, deeper tissue culture and biopsy are necessary.4

Although there is limited literature guiding the number of samples necessary to obtain for foot and ankle infections, this indicates the need for research in this area. Given the extent of studies conducted in other areas of orthopaedic surgery, similar studies should be conducted in the foot & ankle area to better guide appropriate management.

Based on available literature, we can recommend that the number of samples to obtain is four to six with a diagnosis being made on two or more culture-positive samples with an indistinguishable organism.

References:

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