Does the Time from Intra-operative Culture Harvest to Incubation Impact Culture Positivity?

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INTRODUCTION:
Orthopaedic infections, including periprosthetic joint infections (PJI) and fracture-related infections (FRI), present noticeable challenges in both diagnosis and treatment. Intraoperative cultures are essential for identifying causative pathogens; however, culture-negative infections continue to be a concern, often leading to suboptimal treatment strategies. This study aims to assess whether reducing the time from tissue harvest to incubation can improve culture positivity rates.
METHODS: We conducted a matched case-control study at a single institution, comparing a standard culture protocol (January to mid-June 2024) with an accelerated processing protocol (mid-June to November 2024). A total of 108 patients (54 per group) were included in the analysis.
RESULTS: Under the accelerated protocol, the time from the operating room to the microbiology lab was reduced to a mean of 27 minutes, compared to the historical mean of 122 minutes. Additionally, incubation began in a mean of 48 minutes, down from the previous 125 minutes. The culture positivity rate increased significantly from 48.1% (26/54) in the standard protocol group to 70.4% (38/54) in the accelerated group ($p = 0.019$). No significant differences were observed in sex distribution between the two groups.
DISCUSSION AND CONCLUSION: These results indicate that minimizing delays in processing tissues significantly improves microbiological diagnostic yield, which could enhance treatment accuracy. Optimizing laboratory workflows may reduce the risk of false-negative cultures and contribute to more effective management of orthopaedic infections.