

Comparison of Five vs. Fourteen-Day Bacterial Incubation in Total Hip Periprosthetic Joint Infection

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INTRODUCTION: Periprosthetic joint infections (PJI) are among the deadliest complications in total hip arthroplasty (THA). It is unclear what is the ideal incubation time for intraoperative cultures for PJI diagnosis. This study compares 5 and 14-day cultures for positivization rates and organism detection.

METHODS: This is a retrospective cohort study of 102 consecutive THA PJI cases performed between May 2014 and May 2020 at a single institution. Demographic, surgical, and intraoperative culture data were obtained. Analyses compared 5 and 14-day cultures and pre-specified subgroup analysis by organism type. A total of 150 cultures were collected from 102 patients (57.8% females, 42.2% males), of which 66% were 5-day cultures (n=99) and 34% were 14-day cultures (n=51).

RESULTS: There was an overall culture-negative rate of 33%. MRSA and MSSA were the two most common pathogens at 13.3% each. The culture-positive rate was not significantly different between groups (64% 5-day vs. 36% 14-day, $p=0.236$). Fourteen-day cultures had a significantly higher rate of polymicrobial growth (27.8% vs. 9.4%, $p=0.016$) and fungi (5.6% vs. 0%, $p=0.01$) and a lower rate of gram-negatives (2.8% vs. 12.5%, $p=0.01$) than 5-day cultures. Time-to-positivization was significantly longer for 14 than 5-day cultures (mean 5.50 vs. 3.34 days, $p=0.002$). Subgroup analysis by organism showed no significant differences in positivity rates or time-to-positivization.

DISCUSSION AND CONCLUSION: Fourteen-day cultures did not increase the positivity rate, had higher rates of polymicrobial infections and slow-growth pathogens, and had longer time-to-positivization than 5-day cultures. Longer culture holds may provide a more thorough organism detection for PJI without increasing positivization.