Analysis of risk factors for unexpected positive intraoperative cultures in presumed aseptic hip revision surgery

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INTRODUCTION:

The risk factors of unexpected positive cultures (UPC) of specimens taken during presumed aseptic revision total hip arthroplasty (THA) are unclear. The purpose of this study was to identify the risk factors for UPC and the long-term prosthesis survival rate in this patient population.

METHODS: Retrospective analysis of 397 patients who underwent aseptic hip revision surgery from January 2012 to December 2021, including 225 females and 172 males. Based on the culture results of intraoperative specimens, patients were divided into culture-positive group (32 cases) and culture-negative group (365 cases). A univariate analysis was performed, and independent risk factors were identified by including the independent variables with p < 0.20 in the univariate analysis in a logistic regression analysis of dichotomous variables. The Kaplan-Meier survival curve was plotted using the study outcome of any cause as the endpoint event, and the log-rank test was used to compare the 10-year survival rate of the prosthesis in the culture-negative group with that in the culture-positive group.

RESULTS: Univariate analysis showed significant differences between the culture-negative and culture-positive groups when comparing gender, BMI, ASA classification, and preoperative urinary bacterial results (χ 2= 2.37, P= 0.124; χ 2= - 1.65, P= 0.098; χ 2= 14.13, P= 0.003; and χ 2= 7.38, P= 0.007). Logistic regression analysis showed that male, grade IV ASA, and positive preoperative urinary bacteria were independent risk factors for the development of UPC in aseptic hip revision [OR= 2.35, 95% CI (1.08, 5.36), P= 0.04; OR= 37.32, 95% CI (1.80, 1810.63), P= 0.03; OR= 4.11, 95% CI (1.40, 11.12), P=0.01]. The Kaplan-Meier survival curves showed that the 10-year survival rates of the prostheses in the culture-negative and culture-positive groups were 91.5% and 90.0%, respectively, and there was no statistically significant difference in the 10-year survival rate comparing the two groups (χ 2= 0.03, P= 0.66).

DISCUSSION AND CONCLUSION:

Male, positive preoperative urinary bacteria, and grade IV ASA were risk factors for UPC in presumed aseptic hip revision, and the intraoperative culture results did not affect the long-term survival rate of the prosthesis in this patient population.