Escalating PJI Risk After Multiple Aseptic Revision THAs: 5500 Cases with Long-Term Follow-Up

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INTRODUCTION: The risk of periprosthetic joint infection (PJI) is thought to increase with each subsequent revision total hip arthroplasty (THA). However, there is limited literature to support this claim and cumulative risk of each subsequent revision is unknown. We evaluated the long-term risk of PJI following aseptic revision THAs when stratified by number of prior revisions in a large series with extended follow-up.

METHODS: We identified 5679 aseptic revision THAs performed from 2000-2022 at a single institution. Patients with prior PJI were excluded. Patients were stratified as having 0, 1, 2, or ≥3 previous revision arthroplasties on the affected hip. The 15-year survivorship free of PJI was evaluated based on number of prior revision arthroplasties and select demographics. The mean age was 67, 55% of patients were female, and mean BMI was 29 kg/m^2. The mean follow-up was 7 years.

RESULTS: The 15-year survivorship free of PJI when stratified by number of prior revision THAs (0, 1, 2 or ≥3) was 97%, 92%, 92%, and 85%, respectively. When controlling for age, BMI and ASA score, the relative risk of infection when compared to a first-time revision was two times higher for hips with 1 (RR 2, $p<0.01$) or 2 (RR 2, $p<0.01$) prior revisions. Hips with ≥3 prior revisions had five times the relative risk of PJI (RR 5, $p<0.01$).

DISCUSSION AND CONCLUSION: First-time aseptic revision THA demonstrated excellent long-term survivorship, with 97% free of PJI at 15 years. However, each additional revision increased both absolute and relative infection risk. Hips with one or two prior revisions faced a twofold increase in PJI risk, while those with ≥3 revisions faced a fivefold increase and over a 10% absolute decline in survivorship. This data underscores the escalating infection risk with each re-revision and the need for strategic decision-making in complex revision scenarios.