

Periprosthetic Infection Risk Factors for Recurrence in Revision Shoulder Arthroplasty

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INTRODUCTION:

The surgical treatment of periprosthetic infection about the shoulder is controversial. The purpose of this study was to apply the classification system developed by the 2018 consensus statement to determine if 1) higher classifications (IS Score) correlated with higher rates of recurrence, 2) 1-stage revision in patients in the higher infection classification groups had higher rates of recurrence, and 3) high virulence organisms had higher recurrence rates than low virulence organisms.

METHODS:

A database of 790 revisions performed by a single surgeon from 2004-2020 was reviewed for patients with minimum 2-year follow up and at least 1 positive culture or positive pathology. One-hundred-fifty-seven cases performed in 144 patients met inclusion criteria. Cases were then categorized by infection probability according to the 2018 consensus statement. Forty-six of 157 (29%) cases were classified as probable or definitely infected, 25/157 (16%) were classified as possibly infected, and 86/157 (55%) were classified as unlikely to be infected.

RESULTS:

The 86 cases in the unlikely group were treated with 81 one-stage and 5 two-stage revisions and had a recurrence rate of 1%. The 25 cases in the possibly infected group were treated with 24 one-stage and 1 two-stage revision and had a recurrence rate of 12%. The 46 cases in the definite/probable group were treated with 33 one-stage revisions and 13 two-stage revisions with a recurrence rate of 17%. Patients in the definite/probable group had a higher rate of recurrence ($p=0.0005$). The IS score was higher in the recurrence group than the non-recurrence group (7.54 vs. 3.94; $p=0.001$). Overall, one-stage revision had a 5% recurrence rate, but of the 33 patients with an infection classification of definite/probable who underwent a one-stage revision, the recurrence rate was 6%. Highly virulent methicillin-resistant *Staphylococcus aureus* (MRSA) also had a recurrence rate of 31% compared to 4% and 6% in *C. acnes* and Coagulase-negative staphylococci, respectively ($p=0.005$).

DISCUSSION AND CONCLUSION: The categories delineated in the 2018 consensus statement do predict recurrence rates of periprosthetic infections, with the unlikely group having a 1% recurrence rate, the possible infection group 12% recurrence rate, and the definite/probable infection group a 17% recurrence rate. Additionally, even in the definite/probable infection group, one-stage revision surgery has a low reinfection rate (6%). High virulence organisms have a higher recurrence rate (31%) than low virulence organisms such as *C. acnes* and coagulase negative staph (5%).