

Impact of Preoperative Screening for *Staphylococcal* Colonization on Patient-Reported Outcomes Following Primary Total Hip Arthroplasty: A Propensity Matched Study

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INTRODUCTION: Nasal colonization with methicillin-sensitive or methicillin-resistant *Staphylococcus aureus* (MSSA/MRSA) is a risk factor for surgical site infections and periprosthetic joint infections. Given the health and cost burden of subsequent complications, preoperative nasal screening and treatment are the standard of care prior to primary THA. However, to our knowledge, no study to date has investigated whether pre-operative MSSA/MRSA test results influence the patient perception of recovery after primary THA. This study aims to compare the potential association between preoperative MSSA/MRSA test results and minimal clinically important difference (MCID) in patient-reported outcome measures (PROMs) following primary THA.

METHODS: This retrospective study obtained IRB approval and included 8,085 consecutive patients who underwent primary THA at a single tertiary institution. Patients without preoperative and postoperative PROMs were excluded. Patients who had either MSSA or MRSA positive results were combined into the MSSA/MRSA cohort. A propensity-matched analysis using a 1:3 ratio adjusting for age, sex, body mass index, diabetes status, chronic kidney disease, heart failure, osteoporosis, and American Society of Anesthesiologists scores. The average scores of the following preoperative and postoperative PROMs were included: Hip Disability and Osteoarthritis Outcome Score – Physical Function Short Form (HOOS-PS), Physical Function Short Form (SF-10a), and PROMIS Global Physical and Mental domains. Deltas for each PROM score were calculated and used as reference points to define clinically relevant superior or inferior outcomes after primary THA, as determined by the MCID for improvement (MCID-I) and worsening (MCID-W). Thresholds for the MCID-I and MCID-W in each cohort were calculated as one-half of the standard deviation of mean delta scores. Postoperative medical and surgical complications following 90 days, one year, and two years were recorded for each group.

RESULTS SECTION: After propensity-matching, 315 MRSA/MSSA positive and 945 MRSA/MSSA negative patients remained for analysis. No demographic differences were observed between groups ($p > 0.05$). Ninety-day and one year complication rates were similar between cohorts ($p > 0.05$). Absolute preoperative scores were equal between cohorts in every PROM ($p > 0.05$). The MRSA/MSSA positive group demonstrated lower absolute postoperative PROMIS Mental (53.14 vs 51.86, $p = 0.0349$) and Physical (49.05 vs 47.74, $p = 0.0397$) scores. Only the PROMIS Physical had a significantly different delta score between groups, with the negative group having a greater mean change in score (8.56 vs 7.36, $p = 0.0488$). Proportions of clinically significant improvement, no change, and worsening were equal between cohorts in all PROMs ($p > 0.05$).

DISCUSSION: Nasal testing for MSSA/MRSA colonization and subsequent treatment remains a standard of care before patients undergo primary THA. Our study found no differences in the proportion of patients who achieved MCID-I across all four PROMs. These findings suggest that the MSSA/MRSA colonization alone does not influence patient-perceived improvement in functionality and mental wellness after THA surgery. Patients who have either MSSA or MRSA positive results can be counseled on their expectations prior to undergoing primary THA.

SIGNIFICANCE/CLINICAL RELEVANCE: Preoperative methicillin-resistant and methicillin-sensitive *Staphylococcus aureus* colonization does not have a significant impact on patient-perceived outcomes following primary total hip arthroplasty.

Variable	MRSA/MSSA Negative (N = 945)	MRSA/MSSA Positive (N = 315)	P-value
Age (years)	64.7 ± 10.0	64.0 ± 9.7	0.091
Body mass index (kg/m ²)	28.8 ± 5.2	29.0 ± 5.6	0.731
Female	500 (52.9%)	167 (53.0%)	1.000
Diabetes	164 (17.4%)	60 (19.0%)	0.551
Chronic kidney disease	59 (6.2%)	20 (6.3%)	1.000
Heart failure	66 (7.0%)	25 (7.9%)	0.66
Osteoporosis	158 (16.7%)	51 (16.2%)	0.896
ASA score distribution			0.730

Table 1. Propensity-matched demographics between MRSA/MSSA positive and negative patients undergoing primary total hip arthroplasty.

Patient-Reported Outcome Measure	MRSA/MSSA Negative	MRSA/MSSA Positive	P-value
SF10-a	N = 886	N = 296	
Postoperative score	45.58 ± 9.07	44.84 ± 9.78	0.2882
Delta score	9.87 ± 8.45	9.09 ± 8.46	0.2411
MCID-I	664 (75%)	226 (76%)	0.683
PROMIS Mental	N = 901	N = 297	
Postoperative score	53.14 ± 8.85	51.86 ± 10.27	0.0349
Delta score	2.99 ± 7/35	2.87 ± 7.27	0.9722
MCID-I	410 (46%)	148 (50%)	0.219
PROMIS Physical	N = 901	N = 297	
Postoperative score	49.05 ± 9.26	47.74 ± 10.06	0.0397
Delta score	8.56 ± 8.42	7.36 ± 8.62	0.0488
MCID-I	646 (72%)	203 (68%)	0.3041
HOOS-PS	N = 749	N = 249	
Postoperative score	82.90 ± 16.44	81.80 ± 16.70	0.3529
Delta score	26.54 ± 18.89	25.76 ± 19.04	0.5885
MCID-I	639 (85%)	210 (84%)	0.7857

Table 2. Patient-Reported Outcome Measures for patients undergoing primary total hip arthroplasty with positive and negative preoperative MRSA/MSSA colonization.