Racial Disparities in Rotator Cuff Repair: Operative Time, Arthroscopic Techniques, and Complications

Steven H. Liu BS, Allen Bramian BS, Rachel A. Loyst BS, Kenny Ling MD, David E. Komatsu PhD, Edward D. Wang MD
Stony Brook University Department of Orthopaedics, Stony Brook, NY
steven.h.liu@gmail.com

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INTRODUCTION: Racial disparities persist throughout the field of orthopedics and include the differential utilization of resources as well as outcomes following surgery. This study investigates racial differences between Black and White patients in the surgical treatment of rotator cuff repair (RCR) and 30-day postoperative complications following RCR.

METHODS: The American College of Surgeons National Surgical Quality Improvement (NSQIP) database was queried for all patients who underwent RCR between 2015 and 2019. Information related to patient demographics and comorbidities, operative time and technique, and 30-day postoperative complications following RCR were collected. Patients were separated into Black and White racial groups. Bivariate logistic regression analysis was used to identify significant differences in patient factors and postoperative complications associated with racial groups. Subsequently, multivariate logistic regression analysis was used to identify significant postoperative complications associated with racial groups.

RESULTS: A total of 32,073 patients were included in this study: 28,755 White and 3,318 Black. Black patients were significantly associated with female sex ($P<.001$), younger age groups ($P<.001$), greater BMI groups ($P<.001$), American Society of Anesthesiologists (ASA) classification ≥3 ($P<.001$), smokers ($P=.010$), and comorbid congestive heart failure ($P<.001$), diabetes ($P<.001$), and hypertension ($P<.001$). White patients were significantly associated with bleeding disorders ($P=.034$). After accounting for patient demographic and comorbidity factors, Black patients were independently significantly associated with a greater likelihood of undergoing arthroscopic RCR (odds ratio [OR] 1.15, 95% confidence interval [CI] 1.03-1.28; $P=.010$) versus open RCR and experiencing a longer total operation time of ≥80 minutes (OR 1.26, 95% CI 1.20-1.32; $P<.001$). Independently significant predictors of ≥80 minutes operative time in Black patients were male sex (OR 1.66, 95% CI 1.44-1.91; $P<.001$), ASA classification ≤2 (OR 1.21, 95% CI 1.05-1.40; $P=.008$), and arthroscopic RCR (OR 2.06, 95% CI 1.68-2.53; $P<.001$). Independently significant predictors of undergoing arthroscopic RCR procedure in Black patients were male sex (OR 1.24, 95% CI 1.01-1.52; $P=.039$), smoker (OR 1.62, 95% CI 1.27-2.08; $P<.001$), and total operative time ≥80 minutes (OR 2.06, 95% CI 1.68-2.53; $P<.001$). There were no significant differences in 30-day postoperative complications between races.

DISCUSSION: This study revealed no significant differences in 30-day postoperative complications after RCR between races. However, Black patients were more likely to undergo an arthroscopic procedure for RCR and were more likely to have a longer operation time. As the surgical volume for RCR continues to grow, racial disparities must continue to be investigated to address inequalities and provide equitable care. This study used a large sample size and adjusted for patient demographics, comorbidities, and operative variables. This study was limited by the inherent limitations of the NSQIP database.

SIGNIFICANCE/CLINICAL RELEVANCE: A better understanding of the racial disparities in the operative time, utilization of arthroscopic techniques, and perioperative complications following RCR may help orthopedic surgeons recognize and address inequality in the operative care of RCR.

IMAGES AND TABLES:

Table I. Patient demographics and comorbidities for patients of Black race compared to patients of White race. Bold *P* values indicate statistical significance with *P*<.05.

	White Number (%)	Black Number (%)	*P* value
Overall	28,755 (100.0)	3,318 (100.0)	
Sex			**<.001**
Female	11,801 (41.0)	1,731 (52.2)	
Male	16,954 (59.0)	1,587 (47.8)	
Age			**<.001**
18-39	1,225 (4.3)	224 (6.8)	
40-64	18,167 (63.2)	2,484 (74.9)	
65-79	7,526 (26.2)	524 (15.8)	
≥ 80	1837 (6.4)	86 (2.6)	
BMI (kg/m^2)			**<.001**
< 18.5	111 (0.4)	10 (0.3)	
18.5-29.9	14,143 (49.2)	1,260 (38.0)	
30-34.9	7,930 (27.6)	983 (29.6)	
35-39.9	3,871 (13.5)	607 (18.3)	
≥ 40	2,700 (9.4)	458 (13.8)	
ASA classification			**<.001**
≤ 2	18,217 (63.4)	1,970 (59.4)	
≥ 3	10,538 (36.6)	1,348 (40.6)	
Smoker			**.010**
No	24,442 (85)	2,764 (83.3)	
Yes	4,313 (15)	554 (16.7)	
Comorbidities			
Congestive heart failure	30 (0.1)	13 (0.4)	**<.001**
Diabetes	4,719 (16.4)	802 (24.2)	**<.001**
Hypertension	13,384 (46.5)	1,999 (60.2)	**<.001**
COPD	998 (3.5)	102 (3.1)	.235
Bleeding Disorder	449 (1.6)	36 (1.1)	**.034**
Disseminated Cancer	16 (0.1)	2 (0.1)	.915
Operative procedure			**.002**
Open	4,529 (15.8)	453 (13.7)	
Arthroscopic	24,226 (84.2)	2,865 (86.3)	
Total operation time (minutes)			**<.001**
0-79	15,217 (52.9)	1,490 (44.9)	
80-128	9,371 (32.6)	1,225 (36.9)	
≥ 129	4,167 (14.5)	603 (18.2)	

BMI, body mass index; ASA, American Society of Anesthesiologists; COPD, chronic obstructive pulmonary disease.

Table II. Bivariate analysis of 30-day postoperative complications in patients of Black race compared to patients of White race. Bold *P* values indicate statistical significance with *P*<.05.

	White Number (%)	Black Number (%)	*P* value
Any complication	866 (3.0)	102 (3.1)	.842
Sepsis	12 (0.0)	3 (0.1)	.231
Septic shock	4 (0.0)	0 (0.0)	.999
Pneumonia	42 (0.1)	2 (0.1)	.221
Unplanned reintubation	14 (0.0)	2 (0.1)	.778
Urinary tract infection	57 (0.2)	5 (0.2)	.556
Cardiac arrest or myocardial infarction	25 (0.1)	4 (0.1)	.544
Stroke	9 (0.0)	1 (0.0)	.971
Blood transfusions	8 (0.0)	0 (0.0)	.999
Deep vein thrombosis	42 (0.1)	7 (0.2)	.367
Pulmonary embolism	48 (0.2)	8 (0.2)	.335
On ventilator >48 hours	8 (0.0)	3 (0.1)	.082
Surgical site infection	77 (0.3)	5 (0.2)	.212
Wound dehiscence	6 (0.0)	1 (0.0)	.734
Acute renal failure	3 (0.0)	0 (0.0)	.999
***Clostridioides difficile* infection**	10 (0.0)	1 (0.0)	.891
Non-home discharge	0.6 (0.6)	23 (0.7)	.472
Readmission	325 (1.1)	41 (1.2)	.588
Unplanned reoperation	107 (0.4)	9 (0.3)	.361
Length of stay >2 days	247 (0.9)	37 (1.1)	.137
Mortality	7 (0.0)	1 (0.0)	.842