

Worse Postoperative Outcomes and Higher Reoperation in Smokers Compared to Nonsmokers for Arthroscopic Rotator Cuff Repair

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INTRODUCTION:

Smoking significantly impairs healing potential and is a significant risk factor for complications after various orthopaedic surgeries. The purpose of this study was to determine if a cohort of former or current smokers at time of surgery met the minimally clinical important difference (MCID) for Patient-Reported Outcomes Measurement Information System Upper Extremity (PROMIS-UE), Depression (PROMIS-D), and Pain Interference (PROMIS-PI) scores in comparison to nonsmoking patients.

METHODS:

A retrospective review of a prospectively collected database of patients undergoing arthroscopic rotator cuff was performed. Patients who completed preoperative and 6-month postoperative PROMIS scores were included. The MCID was calculated using a distribution technique with a threshold of 0.5 standard deviations above the mean. A cohort of nonsmokers was compared to a cohort of patients currently or former smokers at time of surgery in terms of their clinical outcomes and PROMIS scores. A subanalysis was also performed where a cohort of nonsmokers were propensity matched 1:1 to a cohort of current/former smokers via age, body mass index (BMI), and tear size.

RESULTS:

A total of 182 patients, 80 current or former smokers and 102 nonsmokers, who underwent rotator cuff repair were included in the study. Smokers had statistically different sized tears with more rated massive and more reoperations (16.3% vs. 5.9%, P=0.02). No differences were found in preoperative PROMIS scores, change in PROMIS scores, proportion meeting MCID for PROMIS scores, and retear rate. In the subanalysis, 74 current or former smokers were matched to 74 nonsmokers. Smokers had a lower change in PROMIS-UE (8.6 ± 9.8 vs. 12.3 ± 10.0 , P=0.007) and PROMIS-PI (-9.1 ± 8.5 vs. -12.8 ± 10.1 , P=0.03) postoperatively. Fewer met MCID for PROMIS UE postoperatively (60.3% vs. 82.4%, P=0.003) and more had reoperations (16.2% vs. 4.1%, P=0.02).

DISCUSSION AND CONCLUSION:

Patients who smoke currently or had a history of smoking preoperatively demonstrated smaller improvements in function, pain scores, and were less likely to meet MCID for PROMIS-UE when compared to nonsmokers after arthroscopic rotator cuff repair. Smokers were more likely to undergo reoperations within 6 months.

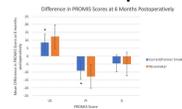


Figure 1. Differences in PROMIS Scores at 6 Months

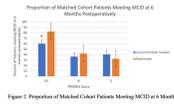


Figure 2. Proportion of Matched Cohort Patients Meeting MCID at 6 Months

Table 1. Demographic Characteristics		
	Current/former smokers	P Value
Age (years)	56.7 ± 13.1	.86
Sex		
Male (%)	47.6 (25)	.76
Female (%)	52.4 (26)	
Race		.02*
White	4	
Black	1	
Hispanic/Latino American	2	
Asian	2	
Other	1	
Education		
High school or less	2	
Some college	2	
College graduate	2	
Postgraduate	2	
Marital status		.03*
Married	31.3 ± 4.2	
Never married	38.7 ± 4.1	
Divorced	15.0 ± 1.0	
Widowed	15.0 ± 1.0	
Other	15.0 ± 1.0	
Employment		.02*
Employed	20.0 ± 1.0	
Unemployed	20.0 ± 1.0	
Retired	20.0 ± 1.0	
Other	20.0 ± 1.0	
Occupational Tear Size		.03*
Small	4	
Medium	11	
Large	11	
Massive	11	
Other	11	
Number of Tears		.02*
1	21	
2	21	
3	21	
4	21	
5	21	
6	21	
7	21	
8	21	
9	21	
10	21	
11	21	
12	21	
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100	21	
101	21	
102	21	

Age represented by years. BMI, Body Mass Index; D, Dominant; MCID, Minimal Clinically Important Difference; N, number; PI, Pain Interference; PROMIS, Patient-Reported Outcomes Measurement Information System; UE, Upper Extremity.

Table 2. Patient Reported Outcomes at 6 Months Postoperatively		
	Current/former smokers	P Value
Preoperative PROMIS-UE	56.7 ± 13.1	.86
Preoperative PROMIS-D	56.7 ± 13.1	.86
Preoperative PROMIS-PI	56.7 ± 13.1	.86
Postoperative PROMIS-UE	65.3 ± 11.7	.02*
Postoperative PROMIS-D	48.1 ± 8.5	.03*
Postoperative PROMIS-PI	48.1 ± 8.5	.03*
Change in PROMIS-UE	8.6 ± 9.8	.007*
Change in PROMIS-D	-8.6 ± 9.8	.007*
Change in PROMIS-PI	-8.6 ± 9.8	.007*
Proportion meeting MCID	60.3%	.003*
Reoperation	16.2%	.02*
Reoperation within 6 months	4.1%	.02*

Age represented by years. BMI, Body Mass Index; D, Dominant; MCID, Minimal Clinically Important Difference; N, number; PI, Pain Interference; PROMIS, Patient-Reported Outcomes Measurement Information System; UE, Upper Extremity.

Table 3. Patient Reported Outcomes at 6 Months Postoperatively (Propensity Matched)		
	Current/former smokers	P Value
Preoperative PROMIS-UE	56.7 ± 13.1	.86
Preoperative PROMIS-D	56.7 ± 13.1	.86
Preoperative PROMIS-PI	56.7 ± 13.1	.86
Postoperative PROMIS-UE	65.3 ± 11.7	.02*
Postoperative PROMIS-D	48.1 ± 8.5	.03*
Postoperative PROMIS-PI	48.1 ± 8.5	.03*
Change in PROMIS-UE	8.6 ± 9.8	.007*
Change in PROMIS-D	-8.6 ± 9.8	.007*
Change in PROMIS-PI	-8.6 ± 9.8	.007*
Proportion meeting MCID	60.3%	.003*
Reoperation	16.2%	.02*
Reoperation within 6 months	4.1%	.02*

Age represented by years. BMI, Body Mass Index; D, Dominant; MCID, Minimal Clinically Important Difference; N, number; PI, Pain Interference; PROMIS, Patient-Reported Outcomes Measurement Information System; UE, Upper Extremity.

Table 4. Patient Reported Outcomes at 6 Months Postoperatively (Propensity Matched)		
	Current/former smokers	P Value
Preoperative PROMIS-UE	56.7 ± 13.1	.86
Preoperative PROMIS-D	56.7 ± 13.1	.86
Preoperative PROMIS-PI	56.7 ± 13.1	.86
Postoperative PROMIS-UE	65.3 ± 11.7	.02*
Postoperative PROMIS-D	48.1 ± 8.5	.03*
Postoperative PROMIS-PI	48.1 ± 8.5	.03*
Change in PROMIS-UE	8.6 ± 9.8	.007*
Change in PROMIS-D	-8.6 ± 9.8	.007*
Change in PROMIS-PI	-8.6 ± 9.8	.007*
Proportion meeting MCID	60.3%	.003*
Reoperation	16.2%	.02*
Reoperation within 6 months	4.1%	.02*

Age represented by years. BMI, Body Mass Index; D, Dominant; MCID, Minimal Clinically Important Difference; N, number; PI, Pain Interference; PROMIS, Patient-Reported Outcomes Measurement Information System; UE, Upper Extremity.