

## Paper #11

# Does Smoking Affect Treatment Allocation and Outcomes in Patients with Rotator Cuff Tears?

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### Summary:

Smokers with known rotator cuff tears reported worse pain and function scores at baseline and over the course of one year when compared to non-smokers, regardless of whether they received surgical or nonsurgical management. Smoking was not a significant predictor of treatment allocation in this prospective cohort study.

### Abstract:

#### INTRODUCTION

The effect of smoking on clinical outcomes in patients with rotator cuff tears (RCTs) has not been fully elucidated. The objectives of this study were (1) to assess the influence of smoking status on treatment allocation (surgical versus non-surgical management) and (2) to compare the short-term functional outcomes of surgical and non-surgical treatment of rotator cuff tears between smokers and non-smokers.

#### METHODS

In the context of a prospective pragmatic cohort study we included 196 subjects with known full-thickness rotator cuff tears who were followed prospectively for one year. The Western Ontario Rotator Cuff Index (WORC), American Shoulder and Elbow Surgeons (ASES) score and visual analogue pain scores were collected at baseline, 4, 8, 16, and 32 weeks and at one year. Multivariate logistic regression was used to determine predictors of treatment allocation. Generalized linear models and t-tests were used to assess the effect of smoking on outcome measures at baseline. Mixed-effects repeated measures regression models were used to assess the effect of smoking on the outcomes after surgical and non-surgical management of rotator cuff tears.

#### RESULTS

The smoking group was younger than the non-smoking group (54.2 vs. 61.4 years,  $p=0.0004$ ). 22% of the surgical group and 12% of the non-surgical group were smokers. There was no significant difference between smokers and non-smokers in regards to the proportion of patients who were obese, had diabetes, had experienced rotator cuff tear symptoms for more than a year, had utilized physical therapy, had a large RCT, or who had received workers compensation. Smoking status was not significantly associated with allocation to surgical versus non-surgical treatment (OR=0.85,  $p=0.762$ ). After adjustment for covariates, subjects who smoked reported less favorable baseline adjusted WORC scores (40.9 vs. 54.5,  $p=0.0008$ ), lower ASES scores (43.0 vs. 59.9,  $p=0.0001$ ), as well as worse pain scores (59.5 vs. 42.9,  $p=0.0001$ ). Within the non-surgical management group, smokers reported significantly lower adjusted WORC scores (38.0 vs. 56.8,  $p=0.0127$ ), lower ASES scores (39.2 vs. 61.6,  $p=0.0872$ ), and worse pain (61.9 vs. 42.1,  $p=0.0176$ ) over one year. Similarly, in patients who underwent rotator cuff repair, smokers reported significantly lower adjusted WORC scores (31.1 vs. 40.4,  $p=0.0352$ ), lower ASES scores (37.7 vs. 50.0,  $p=0.0143$ ), and worse pain scores (63.2 vs. 51.5,  $p=0.0408$ ) over the follow-up period.

#### CONCLUSIONS

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Subjects who smoked reported worse pain and function scores at baseline and over the course of one year, regardless of whether they received surgical or nonsurgical management. Smoking was not a significant predictor of treatment allocation in this cohort. The disparity in reported function and pain in smokers was less pronounced in those who underwent surgical repair than those who received non-surgical management. Further follow-up is needed to more clearly elucidate the influence of smoking on the management and outcome of rotator cuff tears.