

2020 Dr. John Hanbery Award  
John Burke, MD, PhD  
Resident Physician  
Department of Neurological Surgery  
University of California, San Francisco

**INTRODUCTION:** Studies have demonstrated higher rates of perioperative complications and non-union in smokers undergoing spinal fusion surgery. Yet, few studies have investigated the impact of smoking on outcomes in patients undergoing surgery for degenerative lumbar spondylolisthesis. Here, we assess the impact of smoking on patient reported outcomes (PROs) and radiographic fusion in patients undergoing surgery for grade 1 degenerative lumbar spondylolisthesis.

**METHODS:** We analyzed patients undergoing single-segment surgery for grade 1 lumbar spondylolisthesis in the prospective Quality Outcomes Database (QOD) registry. Multivariable linear regression was performed to assess for associations between smoking status and PROs. Repeated measures ANOVA was performed to assess for differences in baseline and 24-month PRO scores. Binary logistic regression was performed to assess for association between smoking and Oswestry Disability Index Minimal Clinically Important Difference (ODI MCID) and radiographic fusion at 24 months, respectively. Radiographic fusion was assessed by an independent neuroradiologist.

**RESULTS:** This study included 531 non-smokers and 71 smokers. On univariate analysis, smokers and non-smokers significantly differed in age, gender and BMI ( $p < 0.05$ ). The two groups had significant differences in mean baseline ODI (non-smokers:  $45.53 \pm 16.99$  vs. smokers:  $56.82 \pm 15.17$ ,  $p < 0.001$ ). Both smoking and non-smoking groups demonstrated significant improvement in ODI from baseline ( $p < 0.00$ ). In multivariable analysis, non-smokers were more likely to achieve a minimum clinically important difference (MCID) in ODI (OR=7.30, 95%CI[2.32-12.28],  $p = 0.004$ ). There was no significant difference in radiographic fusion between the smoking and non-smoking groups (smokers: 100% fusion rate vs. non-smokers: 95.5%; adjusted OR=1.45, 95%CI[0.16-12.95],  $p = 0.74$ ).

**CONCLUSION:** Though both smokers and non-smokers benefit from surgery, non-smokers demonstrated greater improvement in disability. There was no negative association between smoking and radiographic fusion.

---

The John Hanbery award is presented each year to the author of the best clinical paper covering topics in neurosurgery.