Impact of Smoking Status on Early and Late Outcomes after Adult Spinal Deformity Surgery

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INTRODUCTION: There is limited data on the impact of smoking status on both short- and long-term outcomes after adult spinal deformity (ASD) surgery. We sought to analyze a large single center cohort to add more to our understanding of the effect of smoking on outcomes and postoperative complications.

METHODS: A total of 1,013 ASD patients (Age: 46 ± 23 years; mFI: 0.44 ± 0.70; Levels: 10.1 ± 4.2) were stratified based on smoking status into three groups. Current smokers (n = 72) included all patients who were active smokers. Former smokers (n = 265) included all patients who quit smoking more than 4 weeks before surgery. Nonsmokers (n = 676) included all patients who had never smoked. Outcome measures studied included perioperative complicat and revision surgery rates.

RESULTS: The readmission rate at 90 days was significantly higher in current (12.7%) and former smokers (12.0%), compared with nonsmokers (6.1%) (p=0.007). There was a significantly higher rate of postoperative epidural hematoma in smokers (5%), compared to former and nonsmokers (0%) (p<0.001). There was a higher rate of postoperative pneumonia in smokers (4.5%) compared to former smokers (1.4%) and nonsmokers (0.07%) (p=0.038). There was no significant difference in length of stay between the groups. At minimum one-year follow up, there was a significantly higher rate of pseudarthrosis (smokers: 15.6%, former: 6.7%, non: 4.5%, p=0.041) with no significant difference in rate of revision surgery for pseudarthrosis. Smokers had a significantly higher rate of neurologic complications (29% versus 18.5%, p=0.001) compared to nonsmokers. Smokers who did not experience any resolution of the neurologic injury had greater pack year history (28.5 ± 22 pack year) versus smokers who experienced complete resolution of the motor and/or sensory deficit (21.2 ± 19.3 pack year) (p=0.02).

DISCUSSION AND CONCLUSION: Smoking is associated with higher 90-day readmission rate, and higher rates of epidural hematoma, neurologic complications, and postoperative pneumonia after ASD surgery. At one year, smokers have a higher rate of pseudarthrosis. Patients with greater pack year history were less likely to experience resolution of a neurologic injury sustained at the index surgery.