

Beyond Experience: Surgeon Tenure Does Not Predict Anterior Cervical Discectomy and Fusion Outcomes

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INTRODUCTION:

Surgeon experience is commonly thought to play a key role in surgery outcomes. Complex spinal procedures, such as adolescent idiopathic scoliosis corrections, have been shown to have better complication profiles in the presence of a longer-tenured attending surgeon. Outcomes of anterior cervical discectomy and fusions (ACDF), a common surgery, are affected by surgeon-specific factors, such as increased case volume. While an increased case volume has been shown to improve ACDF outcomes, it remains to be seen whether a longer tenure alone can have an impact. 137,000 ACDF procedures are carried out each year in the US, which warrants further investigation into outcome optimization. Prior research into the impacts of tenure has focused on the results of a sole surgeon or the impacts of specialty training, which limits generalizability. This study evaluated the relationship between surgeon experience and the incidence of complications following ACDF procedures in a large, multi-surgeon, multi-site cohort. It was hypothesized that a longer tenure would reduce the incidence of long-term complications.

METHODS:

Patients who underwent anterior cervical discectomy and fusion (ACDF) between 2003 and 2022 at a multisite academic center were included in this study. Surgeon experience was defined as the number of days from residency graduation to the surgery date. Multivariate generalized logistic regressions assessed the impact of surgeon experience on odds of 30- or 90-day readmissions, 90-day sepsis, surgical site infection, wound dehiscence, and long-term complications. Some outcomes with low event rates were omitted. Covariates included BMI, age, sex, race, scoliosis, stenosis, intracranial hypertension, primary surgeon, surgery length, and Elixhauser comorbidity count. Long-term complications encompassed new diagnoses within 90 days such as pseudoarthrosis, proximal junctional kyphosis/adjacent segment disease, fracture post-implant, postural kyphosis, or unspecified kyphosis. Forest plots were generated to visualize the effects of surgeon tenure on these outcomes.

RESULTS: Data from patients who had undergone an ACDF procedure were analyzed. The cohort consisted of 1,567 patients (mean age 54.86 years, mean BMI 29.13 kg/m², 45.8% female). Two subcohorts were analyzed: 790 single-level ACDF patients (mean age 52.81 years, BMI 28.68 kg/m², 46.1% female) and 777 multilevel ACDF patients (mean age 56.94 years, BMI 29.58 kg/m², 45.4% female). No statistically significant associations were observed between surgeon experience and 30- or 90-day postoperative readmissions, or collective long-term complications in the full, single-level, or multilevel cohorts. No statistically significant associations were observed between surgeon experience and 30- or 90-day post-discharge in the full or single-level cohorts.

DISCUSSION AND CONCLUSION: Surgeon years of experience had no statistically significant impact on ACDF outcomes in any cohort. Although prior studies have suggested that higher case volumes are associated with reduced complication rates, these findings indicate that time since residency alone may not influence outcomes. This information can help guide physicians and educators in allocating cervical spine cases across varying experience levels to optimize patient care. Further research is needed to better inform patients and providers during surgical planning and procedure selection.

