Two-Level ACDF Versus Two-Level Cervical Disc Arthroplasty<br class="t-last-br">

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INTRODUCTION: Anterior cervical discectomy and fusion (ACDF) and cervical disc arthroplasty (CDA) are both treatment options for defined cervical spine pathologies. Relative to ACDF, CDA is a relatively novel treatment option. Limited research exists comparing outcomes between two-level CDA and two-level ACDF. This retrospective cohort study set out to compare the odds of postoperative adverse events, readmissions, five-year survival to reoperation, and total cost for two-level CDA relative to two-level ACDF.

METHODS: Patients undergoing two-level ACDF or two-level CDA were isolated from the PearlDiver M165Ortho database. Two-level ACDF and CDA patients were then matched 1:1 based on patient age, sex, and Elixhauser Comorbidity Index (ECI) scores. The incidence and odds of 90-day postoperative adverse events, including dysphagia, pulmonary embolism, deep vein thrombosis, surgical site infection, sepsis, pneumonia, urinary tract infection, and acute kidney injury, were compared between the two groups by univariate and multivariable analysis. Further, all-cause 90-day costs were compared and five-year survival to reoperation was assessed and compared.

RESULTS: In total, 118,514 (96.2%) two-level ACDF and 4,628 (3.8%) two-level CDA patients were identified in the database. Matching yielded 4,224 patients each for two-level ACDF and two-level CDA. After controlling for patient age, sex, and ECI on multivariable analysis, two-level CDA patients had significantly lower odds of experiencing 90-day dysphagia (OR 0.60, p<0.0001), readmission (OR 0.59, p=0.0002), and aggregate, any adverse event (OR 0.65, p<0.0001). Median 90-day cost of care was significantly greater for two-level ACDF compared to two-level CDA ($4,776.00 vs $3,191.00, p<0.0001). No significant difference in five-year survival to reoperation was identified between the two cohorts (p=0.7).

DISCUSSION AND CONCLUSION: Relative to two-level ACDF patients, two-level CDA patients had lower odds of relevant 90-day adverse events, lower overall 90-day costs, and no difference in five-year survival to reoperation. Currently, only a small proportion of patients undergo two-level CDA relative to two-level ACDF; this data suggests that it may be reasonable to consider CDA for more patients.