Surgical Trends in Use of Cervical Disc Arthroplasty versus Anterior Cervical Discectomy and Fusion from 2016 to 2021

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INTRODUCTION:
Anterior cervical discectomy and fusion (ACDF) has been the most common procedure to treat degenerative cervical conditions, but recently cervical disc arthroplasty (CDA) has arisen as a motion-preserving operation to decrease risk of adjacent segment disease. The objective of this study was to determine surgical trends between CDA versus ACDF over the past 5 years, quantifying surgical volume over time, comparing baseline patient demographics and resultant postoperative complications.
METHODS:
A total of 69,287 patients were identified from a nationwide database who underwent either ACDF (n=44,652) or CDA (n=24,635) from 2016 to 2021. The percentage of patients managed by each operative procedure was calculated overall and subdivided by year. Baseline patient demographics were compared between operative groups, comparing resultant postoperative readmission rates and 2-year revision rates. Linear regression modelling was performed to evaluate trends/differences in procedural volume by year.
RESULTS:
From 2016-2021, CDA constitute 35.6% of procedures, although the number/proportion of CDA procedures has significantly risen relative to ACDF (23.3% in 2016 to 43.2% in 2021, $p<0.001$). Patients undergoing CDA were younger and less likely to have diabetes, rheumatoid arthritis, obesity, or tobacco use disorder relative to ACDF ($p<0.0001$ for all). Patients undergoing CDA had lower rates of readmission (1.7 vs. 8.2%, $p<0.0001$) but higher 2-year revision rates (1.23 vs. 0.84%, $p<0.0001$).
DISCUSSION AND CONCLUSION:
Our findings quantify the increased surgical volume of CDA, both absolutely and relative to ACDF over the past 5 years. Of note, patients undergoing CDA have fewer baseline demographic comorbidities, highlighting patient selection measures may be in place. This in turn has led to decreased readmission rates for patients undergoing CDA, although both surgeons and patients should be aware of the increased 2-year revision risk of CDA relative to ACDF. Additional long-term studies evaluating patient-reported outcomes and potential long-term complications of CDA are still required.