

Factors Which Predict Adverse Outcomes in Anterior Cervical Discectomy and Fusion Procedures in the Nonelderly Adult Population

Adrian J Rodrigues, Rayyan Jokhai, Kunal Varshneya, Martin N. Stienen & Anand Veeravagu

STUDY DESIGN

Retrospective cohort.

OBJECTIVE

The largest published cohort of anterior cervical discectomy and fusion (ACDF) patients was queried to better characterize demographic and operative factors that predict 90-day complication and 2-year reoperation risk.

SUMMARY OF BACKGROUND DATA

The MarketScan Database was queried from 2007 to 2016 to identify adult patients until 65 years, who underwent an ACDF procedure using International Classification of Diseases 9th Version (ICD-9) and Current Procedural Terminology (CPT) codes. MarketScan is a national insurance claims database that contains millions of patient records across all 50 states.

METHODS

Multivariate logistic regression was used to identify factors associated with complications until 90 days and reoperations until 2 years.

RESULTS

Of 138,839 ACDF procedures, 8500 patients (6.1%) experienced a complication within 90 days of the ACDF, and 7433 (5.4%) underwent surgical revision by 2 years. While the use of anterior cervical plating did not predict 2-year reoperation, it was associated with dramatically reduced 90-day complication risk (adjusted odds ratio [aOR]: 0.32; 95% confidence interval [CI]: 0.30-0.34; $P < 0.001$). Upon multivariate analysis, female sex (aOR: 0.83; 95% CI: 0.79-0.87; $P < 0.001$) was associated with decreased risk of 2-year reoperation, while depression predicted a 50% increase in reoperation risk (aOR: 1.51; 95% CI: 1.43-1.59; $P < 0.001$). The single largest factor associated with reoperation risk, however, was the presence of a 90-day postoperative complication (aOR: 1.79; 95% CI: 1.66-1.94; $P < 0.001$).

CONCLUSION

Increased patient comorbidities and the use of bone morphogenic protein were found to increase the risk for postoperative complications, while cervical plating was associated with a strong decline in this risk. In addition, poor patient mental health outweighed the adverse of impact of other comorbidities on 2-year revision risk. The presence of a postoperative complication was the key modifiable risk factor associated with reoperation risk. Conclusions from this study may help surgeons better identify high-risk ACDF patients for more careful patient selection, counseling, informed consent, and management.

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