



Reoperation Rates after Anterior Cervical Discectomy and Fusion Versus Posterior Cervical Foraminotomy: A Propensity Matched Analysis

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Introduction

Anterior cervical discectomy and fusion (ACDF) and posterior cervical foraminotomy (PCF) are both used to surgically treat patients with cervical radiculopathy, and have been shown to have similar outcomes. Nonetheless, ACDF has become increasingly more commonplace compared with PCF, in part because of a pervasive belief that PCF has a higher incidence of required reoperations.

Methods

- A retrospective review of the electronic medical records was performed to identify all patients that underwent ACDF and PCF for radiculopathy (excluding myelopathy indications) between January 2005 and December 2011.
- Revision surgery within 2 years, at the index level, was recorded.
- Propensity score analysis between the ACDF and PCF groups was utilized and matched the groups for age, gender, race, body mass index, tobacco use, median income and insurance status, primary surgeon, level of surgery, surgery duration, and length of hospital stay.

Results

790 patients met the inclusion/exclusion criteria, including 627 ACDF and 163 PCF. Prior to propensity matching, the PCF group was found to be significantly older, more likely to be male, and more likely to undergo surgery at C2 and C3.

After matching, there were no significant differences between groups for any baseline characteristics. Reoperation rate at the index level was 4.8% for the ACDF group and 6.4% for the PCF group (p=0.7), within 2 years of the initial surgery.

Using equivalence testing, based on an a priori null hypothesis that a clinically meaningful difference between the two groups would be =5%, we found that the absolute difference of 1.6% was significantly (p=0.01) less than our hypothesized difference.

Table 2			
	ACDF	PCF	p-value
N	188	140	
Age	53.3	52.9	0.7
BMI	28.9	28.5	0.4
Sex (male)	68%	69%	0.9
Surgery Duration	218 min	216 min	0.8
LOS	2.5d	2.6d	0.6
Smoking	23%	22%	0.8
Level			
C3	13%	23%	0.5
C4	32%	36%	0.5
C5	70%	70%	1.0
C6	88%	87%	1.0
C7	53%	56%	0.7
Post Propensity Matching			
Table 1			
	ACDF	PCF	p-value
N	627	163	
Age	51.2	53.6	0.02*
BMI	29.1	28.7	0.6
Sex (male)	53%	69%	0.0002*
Surgery Duration	211 min	217 min	0.2
LOS	2.3d	2.9d	0.4
Diabetes	14 (8%)	0 (0%)	1.0
Level			
C3	9%	20%	0.0002*
C4	33%	39%	0.2
C5	75%	71%	0.3
C6	87%	87%	1.0
C7	50%	56%	0.2
Current Smoker	27%	23%	0.6
Prior to Propensity Matching			

Conclusions

This study demonstrates that even after accounting for patient demographics, operative characteristics, and primary surgeon, there are no significant differences in 2 -year reoperation rates at the index level between ACDF and PCF. In fact, the reoperation rates are statistically equivalent.

Thus, spine surgeons can operate via the posterior approach to treat radiculopathy without putting patients at increased risk for revision surgery.

Learning Objectives

1. To understand the historical considerations for choosing ACDF versus PCF to surgically treat cervical radiculopathy
2. To learn about the true reoperation rates, 2 years after surgery at the index level, for ACDF and PCF
3. To understand that after propensity matching for demographic and operative characteristics, to ensure no confounding of data, that there are no significant differences in reoperation after the two procedures