Surgeon Specialty is Not associated with Differences in medical complications, emergency department (ED) visits, readmissions, and hospital lengths of stay For patients undergoing Cervical disc arthroplasty (CDA)

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INTRODUCTION:

Cervical disc arthroplasty (CDA) is a motion-preserving alternative to anterior cervical discectomy and fusion (ACDF) for treating cervical degenerative disease. Both neurosurgery and orthopaedic spine surgeons perform CDA, yet differences in medical complications, emergency department (ED) visits, readmissions, and hospital lengths of stay between these specialties remain unclear. This study compares these factors following single-level CDA.

METHODS:

A retrospective cohort study was conducted using a large national database, including patients undergoing single-level CDA with neurosurgery and orthopaedic spine surgeons. Patient demographics, comorbidities, and 90-day postoperative medical complications, ED visits, readmissions, and lengths of stay were analyzed. The prevalence of individual comorbidities and the overall comorbidity burden, assessed using the Elixhauser Comorbidity Index (ECI), were compared between groups. Multivariable logistic regression was used to evaluate differences in complication rates, ED visits, readmissions, and lengths of stay while controlling for comorbidities and ECI. Statistical significance was defined as $P < 0.001$.

RESULTS:

Patients undergoing CDA with neurosurgery spine surgeons had similar rates and odds of medical complications compared to those treated by orthopaedic spine surgeons. The incidence of acute kidney injuries did not differ significantly between groups (0.35% vs. 0.14%, OR: 2.50, 95% CI: 0.99–6.32, P = 0.066). Similarly, pneumonia rates were comparable (0.60% vs. 0.57%, OR: 1.06, 95% CI: 0.64–1.74, P = 0.920), as were surgical site infections (0.29% vs. 0.23%, OR: 1.27, 95% CI: 0.58–2.74, P = 0.662). Patients undergoing surgery with neurosurgeons had similar odds of deep venous thrombosis (0.21% vs. 0.03%, OR: 7.27, 95% CI: 0.99–53.69, P = 0.040). The rates of cerebrovascular accidents (0.12% vs. 0.06%, OR: 2.17, 95% CI: 0.49–9.53, P = 0.053) and respiratory failure (0.12% vs. 0.06%, OR: 2.17, 95% CI: 0.49–9.53, P = 0.053) were also similar between groups. There were no differences in lengths of stay between patients who underwent CDA by neurosurgery versus orthopaedic spine surgeons (2.93 vs. 2.83 days; P = 0.044). Patients who underwent surgery with neurosurgery spine surgeons had no difference in rates and odds of ED visits (2.16% vs. 2.80%, OR: 0.76, 95% CI: 0.61–0.97, P = 0.030) or readmissions (1.51% vs. 1.47%, OR: 1.03, 95% CI: 0.75–1.40, P = 0.920) within 90 days of surgery.

DISCUSSION AND CONCLUSION:

Patients undergoing single-level CDA with neurosurgery and orthopaedic spine surgeons experienced comparable rates of medical complications, ED visits, readmissions, and lengths of stay. These findings suggest that surgeon specialty does not significantly impact postoperative medical outcomes following CDA.

	Neurosurgery		Orthopaedic Surgery		
Demographics	N	%	N	%	*P*-value
	12,138		5,331		
Age (Years)					0.777
<25	81	0.5	16	0.45	
25-29	260	2.3	101	2.86	
30-34	951	7	261	7.39	
35-39	1702	14	469	13.28	
40-44	2211	18.19	633	17.93	
45-49	2454	20.02	714	20.22	
50-54	1926	15.84	583	16.51	
55-59	1334	10.97	370	10.48	
60-64	796	6.55	215	6.09	
65-69	347	2.85	107	3.03	
70-74	139	1.14	43	1.22	
75-79	66	0.54	16	0.45	
80+	11	0.09	3	0.08	
Sex					0.093
Female	6831	56.19	1927	54.57	
Male	5327	43.81	1604	45.43	
Region					**<0.001**
Midwest	3033	24.95	921	26.08	
Northeast	1677	13.79	708	20.05	
South	4697	37.05	1276	36.14	
Unknown	56	0.46	15	0.42	
West	2785	22.91	611	17.3	
Comorbidities					
Alcohol Use Disorder	914	7.52	248	7.02	0.341
Asthma	2174	17.88	657	18.61	0.136
Blood Loss Anemia	254	2.09	73	2.07	0.989
COPD	2918	24.00	830	23.51	0.559
Cancer	805	6.62	246	6.97	0.493
Cardiac Arrhythmias	1680	13.82	489	13.85	0.985
Cerebrovascular Disease	1320	10.86	349	9.88	0.105
Chronic Kidney Disease	590	4.85	136	3.85	0.014
Coagulopathy	601	4.94	183	5.18	0.595
Congestive Heart Failure	213	1.75	68	1.93	0.559
Coronary Artery Disease	1412	11.61	399	11.3	0.628
Depression	5389	45.97	1598	45.26	0.465
Diabetes	2810	23.93	795	22.51	0.084
Drug Abuse	1640	13.49	410	11.61	0.003
HIV	58	0.48	24	0.68	0.181
Hypertension	6075	49.97	1695	48	0.041
Hypothyroidism	2516	20.69	780	22.09	0.076
Ischemic Heart Disease	904	7.44	244	6.91	0.305
Iron Deficiency Anemia	1231	10.13	356	10.08	0.965
Liver Disease	1807	14.86	524	14.84	0.994
Obesity	4279	36.02	1254	35.51	0.596
Peripheral Vascular Disease	931	7.66	274	7.76	0.868
Peptic Ulcer Disease	534	4.39	138	3.91	0.229
Tobacco Use	5320	43.81	1865	52.8	**<0.001**
Valvular Disease	1177	9.68	332	9.4	0.644
Weight Loss	948	7.80	267	7.56	0.670
ECI	2.93		2.83		0.040

Table 1. Comparison of Baseline Demographics Among Patients undergoing Single Level CDA by Specialty

	Neurosurgery (%)	Orthopaedic Surgery (%)	OR	95% CI	*P*-value
Acute Kidney Injuries	0.35	0.14	2.50	0.99-6.32	0.066
Pneumoniae	0.60	0.57	1.06	0.64-1.74	0.920
Surgical Site Infections	0.29	0.23	1.27	0.58-2.74	0.662
Deep Venous Thrombosis	0.21	0.03	7.27	0.99-53.69	0.040
Cerebrovascular Accidents	0.12	0.06	2.17	0.49-9.53	0.053
Respiratory Failures	0.12	0.06	2.17	0.49-9.53	0.053

Table 2. Comparison of Incidence and Odds of Ninety-Day Medical Complications of Patients undergoing Single Level CDA by Surgeon Specialty.

OR = Odds-Ratio; 95% CI = 95% Confidence Interval

Orthopaedic spine surgeons were the reference group.