

Prior Bariatric Surgery Lowers Complication Rates Following Adult Spinal Deformity Surgery in Morbid Obese Patients

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INTRODUCTION: Bariatric surgery (BS) is a treatment for morbid obesity that has the potential to influence bone and mineral metabolism. The influence of prior BS on the surgical outcomes of adult spinal deformity (ASD) is not well established. The purpose of this study was to compare the rates of postoperative complications between patients with and without a history of BS within 2 years before their ASD surgery.

METHODS:

The Mariner database was utilized to identify patients with morbid obesity age 18 and older who had been treated with posterolateral fusion for ASD, using International Classification of Diseases, 9th Revision (ICD-9), 10th Revision (ICD-10), and current procedural terminology (CPT) codes. Two main cohorts were created, those who had prior bariatric surgery within 2 years but were considered to be obese before their ASD surgery and those who had obesity but did not undergo BS. Primary outcome measures assessed included major and minor complications, dysphasia, intubation, aspiration, dysphagia, surgical site infections, readmissions, and ED-visits within 90 days of surgery. Additionally, one- and two-year revision, pseudarthrosis and instrument failure within 2 years were assessed. Multivariate logistic regression was used to adjust for demographic variables and comorbidities.

RESULTS: ASD patients who had undergone prior BS are at an decreased risk of developing major complications (6.3% vs 13.3%, OR 0.40, 95% CI 0.32-0.52, p < 0.001), minor complications (18.3% vs 29.1%, OR 0.50, 95% CI 0.42-0.69, p < 0.001), emergency intubation (0.2% vs 1.3%, OR 0.14, 95% CI 0.03-0.42), pulmonary embolism (1.2% vs 3.3%, OR 0.35, 95% CI 0.20-0.59, p < 0.001), pneumonia (2.5% vs 5.2%, OR 0.44, 95% CI 0.29-0.66, p < 0.001), cerebrovascular accident (1.2% vs 2.3%, OR 0.46, 95% CI 0.25-0.82, p = 0.009), transfusion (2.4% vs 3.9%, OR 0.57, 95% CI 0.37-0.87, p = 0.010), acute kidney injury (4.1% vs 8.0%, OR 0.46, 95% CI 0.33-0.64, p < 0.001), urinary tract infection (8.5% vs 14.4%, OR 0.51, 95% CI 0.43-0.65, p < 0.001), wound complications (5.8% vs 10.0%, OR 0.52, 95% CI 0.39-0.69, p < 0.001), sepsis (1.7% vs 3.9%, OR 0.39, 95% CI 0.24-0.63, p < 0.001), surgical site infection (5.5% vs 12.4%, OR 0.39, 95% CI 0.29-0.51, p < 0.001), myocardial infarction (1.0% vs 2.3%, OR 0.40, 95% CI 0.46-0.54, p = 0.004), pseudarthrosis (22.3% vs 27.3%, OR 0.76, 95% CI 0.64-0.90, p = 0.001), instrument failure (26.7% vs 31.3%, OR 0.73, 95% CI 0.63-0.89, p = 0.001), revision within 1 year (26.7% vs 31.3%, OR 0.76, 95% CI 0.64-0.90, p = 0.001), and ED-visits within 90 days (26.7% vs 31.3%, OR 0.75, 95% CI 0.63-0.89, p = 0.001).

DISCUSSION AND CONCLUSION:

BS is associated with decreased postoperative complications in ASD patients for both short-term and long-term outcomes. This study may help spine surgeons in the future when advising patients with morbid obesity on the best course of action for treatment of ASD.

	BS n = 1,544		MC n = 1,544		p-value
Age Range	<34	70 4.5%	70 4.5%	1.00	
	35-44	233 15.1%	233 15.1%	1.00	
	45-54	479 31.0%	479 31.0%	1.00	
	55-64	499 32.3%	499 32.3%	1.00	
	>65	263 17.0%	263 17.0%	1.00	
Gender (Female)	1111 72.0%	1111 72.0%	1.00		
Comorbidities					
Chronic Obstructive Pulmonary Disease	135 8.7%	135 8.7%	1.00		
Diabetes Mellitus	279 18.1%	279 18.1%	1.00		
Coronary Artery Disease	643 41.6%	643 41.6%	1.00		
Tobacco	326 21.1%	326 21.1%	1.00		
Congestive Heart Failure	385 24.9%	385 24.9%	1.00		
Hyperlipidemia	125 8.1%	125 8.1%	1.00		
Peripheral Vascular Disease	884 57.3%	884 57.3%	1.00		
Hypertension	172 11.1%	172 11.1%	1.00		
Depression	1034 67.0%	1034 67.0%	1.00		
Chronic Obstructive Pulmonary Disease	651 42.2%	651 42.2%	1.00		

	BS n = 1,544		MC n = 1,544		Adjusted OR (95% CI)	p-value
Major Complications	97	6.3%	205	13.3%	0.40 (0.32-0.52)	<0.001*
Minor Complications	283	18.3%	449	29.1%	0.50 (0.42-0.60)	<0.001*
Intubation	3	0.2%	20	1.3%	0.14 (0.03-0.42)	0.001*
Aspiration	6	0.4%	9	0.6%	0.65 (0.21-1.82)	0.418
Dysphagia	114	7.4%	103	6.7%	1.11 (0.94-1.27)	0.444
PE	19	1.2%	51	3.3%	0.35 (0.20-0.59)	<0.001*
PNA	38	2.5%	80	5.2%	0.44 (0.29-0.66)	<0.001*
CVA	18	1.2%	36	2.3%	0.46 (0.25-0.82)	0.009*
DVT	34	2.2%	45	2.9%	0.73 (0.46-1.15)	0.186
Transfusion	37	2.4%	60	3.9%	0.57 (0.37-0.87)	0.010*
AKI	64	4.1%	124	8.0%	0.46 (0.33-0.64)	<0.001*
UTI	131	8.5%	222	14.4%	0.51 (0.43-0.65)	<0.001*
Wound Complications	89	5.8%	154	10.0%	0.52 (0.39-0.69)	<0.001*
Sepsis	26	1.7%	60	3.9%	0.39 (0.24-0.63)	<0.001*
Readmission	210	13.6%	190	12.3%	1.11 (0.90-1.38)	0.307
Surgical Site Infection	85	5.5%	192	12.4%	0.39 (0.29-0.51)	<0.001*
MI	16	1.0%	35	2.3%	0.40 (0.46-0.54)	0.004*
Pseudarthrosis 2 Year	345	22.3%	422	27.3%	0.76 (0.64-0.90)	0.001*
Dural Tear	581	37.6%	562	36.4%	1.05 (0.91-1.22)	0.47
Instrument Failure 2 Year	412	26.7%	484	31.3%	0.75 (0.63-0.89)	0.001*
Reoperation within 1 Year	345	22.3%	422	27.3%	0.76 (0.64-0.90)	0.001*
Reoperation within 2 Years	581	37.6%	562	36.4%	1.05 (0.91-1.22)	0.47
ED-Visit	412	26.7%	484	31.3%	0.75 (0.63-0.89)	0.001*

PE, Pulmonary embolism; PNA, pneumonia; CVA, Cerebrovascular accident; DVT, deep vein thrombosis; AKI, acute kidney injury; UTI, urinary tract infection; MI, myocardial infarction. Bolded variables indicate statistical significance with P < 0.05