



Does Obesity Correlate with Worse Patient-Reported Outcomes Following Cervical Surgery for Degenerative Conditions?

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Introduction

Numerous studies have investigated the impact of obesity in thoracolumbar surgery, however the effect of obesity on patient-reported outcomes (PROs) in cervical surgery has not been established. The purpose of this study was to investigate the possible correlation between obesity and patient-reported outcomes following surgery for degenerative cervical conditions.

Methods

Patients undergoing elective anterior cervical discectomy and fusion were evaluated. Follow up of at least 12 months was required. Patients were excluded for trauma, tumor, infection, urgent/emergent surgery, deformity, and pseudarthrosis. The EuroQol-5D (EQ-5D), Short Form-12 (SF-12), modified Japanese Orthopaedic Association (mJOAS) score, Neck Disability Index (NDI), and NASS patient satisfaction were utilized. Patients were defined as “obese” for BMI = 35 based on the World Health Organization definition of class II obesity. Chi-square tests assessed the association of obesity with disability, as well as percent achieving minimum clinically important difference (MCID) for NDI and satisfaction at 12 months.

Table 1: Patient-reported outcomes in obese versus non-obese

	Baseline			12-Months Postoperative		
	BMI < 35	BMI ≥ 35	P-Value	BMI < 35	BMI ≥ 35	P-Value
EQ-5D	0.6	0.6	0.92	0.77	0.72	0.08
NDI (%)	41.7	43.3	0.51	22.7	25.1	0.32
SF-12 PCS	31.9	28.7	0.02	42.3	38.9	0.05
SF-12 MCS	47	43.9	0.04	50.6	47.6	0.05
mJOA	12.2	10.7	0.01	14.4	13.6	0.74

Table 4: Change scores in obese vs. non-obese

	BMI < 35	BMI ≥ 35	P-Value
EQ-5D	0.17	0.12	0.12
NDI (%)	-19.1	-18.2	0.67
SF-12 PCS	10.4	10.2	0.92
SF-12 MCS	3.5	3.8	0.88
Neck Pain	-2.9	-2.5	0.24
Arm Pain			

Percent Achieving MCID at one year

	BMI < 35	BMI ≥ 35	P-Value
NDI	56%	52%	0.51
Neck Pain	57%	47%	0.11
Arm Pain	38%	47%	0.6
Satisfaction	85%	85%	0.85

Table 1: Demographic and surgical characteristics

Number of Patients	299		
Diagnosis			
Stenosis	112	(37%)	
Spondylolisthesis	44	(15%)	
Disc herniation	143	(48%)	
Myelopathy	121	(40%)	
Levels Involved	1.75 ± 0.81		
	BMI < 35	BMI ≥ 35	P-Value
Total	219	80	
Age	57.8 ± 10.3	51.3 ± 9.2	0.25
Male	124	36	
Female	95	44	
Smoker	119	45	0.89
Preoperative narcotic use	104	47	0.05
ASA ¹ > 2	106	63	< 0.001
Unemployed	90	33	0.52
Diabetes	48	31	0.03
ZD ² Sum Score	35.5 ± 9.8	37.6 ± 11	0.14
MSPQ Sum Score	7.7 ± 5.3	8.6 ± 5	0.2
¹ American Society of Anesthesiologists			
² Zung Depression Scale			
³ Modified Somatic Perception Questionnaire			

Results

A total of 299 patients were included, with 80 (27%) obese, and 219 (73%) non-obese. All PROs improved significantly after surgery in both groups. There was no difference in pre- to post-operative change scores for any PRO measure, including NDI (18.2 vs. 19.1, p = 0.67) and SF-12 PCS (10.2 vs. 10.4, p = 0.92). At 12 months there was no difference in percent of patients achieving MCID for NDI (52% vs 56%, p = 0.51), and no difference in patient satisfaction (85% vs. 85%, p = 0.85).

Conclusions

In this analysis of patients undergoing elective cervical surgery, BMI > 35 is associated with worse baseline and 12-month PROs, however no differences in change scores were observed across BMI groups for all PROs. There was no difference in percent of patients achieving MCID in NDI or satisfaction at 12 months. Obese patients may therefore achieve meaningful improvement following surgery for degenerative cervical conditions.

Key References

1. Buerba RA, Fu MC, Grauer JN. Anterior and posterior cervical fusion in patients with high body mass index are not associated with greater complications. Spine J. 2014;14(8):1643-1653.
2. Minhas SV, Chow I, Jenkins TJ, Dhingra B, Patel AA. Pre-operative Predictors of Increased Hospital Costs in Elective Anterior Cervical Fusions: A Single-Institution Analysis of 1082 Patients. Spine J. 2015.