

Trimming the Risks: Weight Loss and its Effect on Obesity-Related Complications in Spine Fusion Surgery

Camryn Patz Myers¹, Abel De Varona Cocero², Fares Ani, Constance Maglaras, Tina Raman³, Themistocles Stavros Protopsaltis⁴

¹NYU Langone Health, ²NYU Langone Health Orthopedic Surgery, ³NYU Langone Orthopedic Hospital, ⁴NYU Hospital For Joint Disorders

INTRODUCTION:

Benefits of weight reduction have been shown to improve patient health and satisfaction. ASA grading is directly related to BMI as well as other comorbid conditions. What remains unclear is the effect of preoperative weight loss on complications and outcomes after lumbar spinal fusion. This study evaluated the association of postoperative complications and return to the operating room after lumbar fusion in patients who lost weight, those with a normal BMI, and those who remained morbidly obese.

METHODS: A single-center retrospective chart review for 1-4 level lumbar fusions 2017-2020 was performed for demographics, surgical characteristics, postoperative complications, BMI readings, and nutrition/bariatric consultations. Three cohorts were developed Patients with normal BMI ranging from 18.5 to 25 were designated as normal. Patients who maintained severe to morbid obesity (35-45) were designated as obese. Patients who preoperatively reduced their BMI from severe/morbidly obese (30-35) to Overweight/Normal (25-30) were designated as weight loss. One-way ANOVAs and chi-square analysis compared intraoperative/postoperative outcomes. Post-hoc analyses were conducted to determine the significant differences between the patient groups.

RESULTS:

A total of 703 patients were included (n=362 normal, n=204 obese, and n=136 weight loss). The weight loss patients dropped an average of 4.63 BMI points preoperatively, with an average weight loss duration of 1,896 days. Demographics demonstrated a significantly higher number of females in the normal group (66.7% vs. 59.40% vs. 48.10%; p<.001) compared to the obese and weight loss group. Patients in the normal and weight loss group had significantly lower operative time, blood loss, and length of stay compared to obese patients. Post-hoc analysis revealed significant differences in operative time between the normal group and both the obese and weight loss group (p=0.002, p<0.001). Estimated blood loss was greater in the obese group compared to normal but there were no significant differences between the severely obese and weight loss groups. Deep surgical infections were found to be significantly lower in the weight loss group compared to the obese group (0.0% vs. 3.45%; p=.027).

DISCUSSION AND CONCLUSION:

Obese patients who lost weight preoperatively had shorter operative time, blood loss, and length of stay. Though their metrics did not improve to the level of normal BMI patients, weight loss patients had significantly fewer postoperative complications including deep wound infections compared to obese patients.

	Normal BMI (N=362)	Severe- Morbidly Obese (n=204)	Weight Loss (n=136)	p-value
Demographics:				
Age (years)	60.24 ± 13.85	57.39 ± 11.60	60.64 ± 12.633	0.023
Gender (% Female)	66.70%	59.40%	48.10%	<0.001
CCI	2.47 ± 2.06	2.73 ± 1.90	3.24 ± 2.14	0.001
Smoking	6.90%	6.90%	11.80%	0.165
Surgical Characteristics:				
Pre-op Radiculopathy	49.20%	51.00%	42.20%	0.26
Open vs. MIS	89.8% vs. 10.2%	88.2% vs. 11.8%	94.1% vs. 5.9%	0.191
Levels Fused	1.76 ± 0.969	1.83 ± 0.896	1.90 ± 1.04	0.307
Operative Time (min)	219.77 ± 5.085	267.09 ± 7.935	257.00 ± 10.49	<0.001
Estimated Blood Loss (mL)	247.21 ± 14.860	385.50 ± 38.506	335.04 ± 41.017	<0.001
Length of Stay (days)	3.01 ± 0.108	4.12 ± 0.235	3.82 ± 0.266	<0.001
Intraoperative				
Neuromonitoring	2.80%	2.90%	3.70%	0.866
Durotomy	5.00%	4.40%	2.20%	0.394
Postoperative Outcomes:				
Cardiac	5.50%	5.90%	4.40%	0.342
Neurological Deficit	4.20%	4.90%	3.00%	0.786
Superficial Surgical Site	0.30%	2.90%	1.50%	0.025
Deep Surgical Infection	0.00%	3.45%	0.00%	0.007
Reoperation				
Return to OR in 30 Days	1.90%	3.40%	2.20%	0.529
Return to OR within 90 Days	3.30%	2.90%	2.90%	0.96
Instrumentation Revision	0.30%	1.50%	0.70%	0.268
Adjacent Segment Disease	0.60%	2.90%	3.70%	0.028
Pseudarthrosis	1.40%	2.00%	3.70%	0.264