

## Obesity Worsens Patient Reported Outcomes Following Surgery for Degenerative Lumbar

### Spondylolisthesis: An Analysis of the Quality Outcomes Database

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#### Introduction

Two conflicting randomized trials on surgery for degenerative lumbar spondylolisthesis (DLS) call for identification of patients who may benefit most from surgery. This study investigates the impact of obesity on patient reported outcomes (PROs) following surgery for DLS.

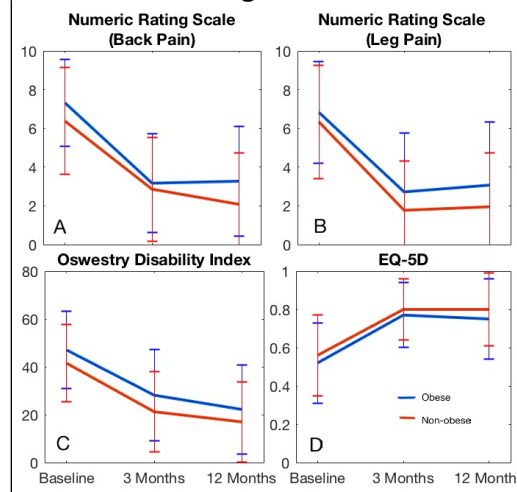
#### Methods

This was an analysis of 477 patients who underwent surgery for grade 1 DLS in a prospectively-collected national spine registry. For univariate comparisons, patients were stratified by BMI  $\geq$  30 kg/m<sup>2</sup> (obese) and  $<$  30 kg/m<sup>2</sup> (non-obese). Baseline and one year follow-up parameters were collected. PROs included the North American Spine Society (NASS) satisfaction questionnaire, numeric rating scale (NRS) back pain, NRS leg pain, Oswestry Disability Index (ODI), and EuroQoL-5D (EQ-5D).

#### Results

We identified 224 obese (47.0%) and 253 non-obese patients (53.0%). Obese patients were younger (60.0 vs 63.3 years,  $p < 0.01$ ), more often had diabetes mellitus (25.4% vs 10.7%,  $p < 0.01$ ), and had higher ASA grades (56.3% vs 32.8% with ASA grades 3 or 4,  $p < 0.01$ ). Obese patients more often presented with sensory predominant symptoms (46.4% vs 38.9%,  $p = 0.02$ ) and were less independently ambulatory (82.5% vs. 93.7%,  $p < 0.01$ ). Obese patients more often underwent fusion surgery (87.9% vs 78.3%,  $p < 0.01$ ), had higher estimated blood loss ( $302.9 \pm 327.5$  vs  $213.3 \pm 227.0$  ml,  $p < 0.01$ ), longer operative times ( $212.7 \pm 95.2$  vs  $177.2 \pm 80.4$  min,  $p < 0.01$ ), and longer hospitalizations ( $3.3 \pm 1.6$  vs  $2.9 \pm 2.0$  days,  $p < 0.01$ ). At baseline, obese patients had worse NRS back pain, ODI, and EQ-5D scores ( $p < 0.05$ ). Both cohorts improved significantly from baseline for back and leg pain, ODI, and EQ-5D at 12 months ( $p < 0.01$ ) (Figure 1). At 12 months, fewer obese patients responded that surgery met their expectations (64.4% vs. 70.1%,  $p < 0.01$ ). In adjusted multivariate analyses, increasing BMI was associated with worse NRS leg pain, ODI, and EQ-5D at 12 months ( $p < 0.05$ ).

Figure 1.



#### Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Understand the negative impact of obesity on outcomes following surgery for grade 1 degenerative lumbar spondylolisthesis
- 2) Understand that despite the negative impact, patients with obesity still benefit significantly from surgery for grade 1 degenerative lumbar spondylolisthesis

#### Conclusions

Obesity was associated with worse pain, disability, and quality of life 12-months postoperatively. Preoperative weight loss may be considered to optimize outcomes.

(A) Average NRS back pain scores at baseline, 3 months, and 12 months following surgery by cohort. (B) Average NRS leg pain scores at baseline, 3 months, and 12 months following surgery by cohort. (C) Average ODI at baseline, 3 months, and 12 months following surgery by cohort. (D) Average EQ-5D at baseline, 3 months, and 12 months following surgery by cohort. The error bars represent one standard deviation. For both cohorts, there were statistically significant improvements at 3- and 12-month follow up, relative to baseline, for NRS back and leg pain, ODI, and EQ-5D ( $p < 0.01$ , all comparisons). At baseline, the obese cohort had significantly worse NRS back pain ( $p < 0.001$ ), ODI ( $p < 0.001$ ), and EQ-5D ( $p = 0.04$ ) without significant differences in NRS leg pain. The obese cohort had significantly worse NRS leg pain ( $p < 0.001$ ), ODI ( $p < 0.001$ ), and EQ-5D ( $p = 0.01$ ) at 3 months. The obese cohort had significantly worse NRS leg pain ( $p < 0.001$ ), ODI ( $p < 0.01$ ), and EQ-5D ( $p < 0.01$ ) at 12 months. There were no significant between-group differences with regards NRS back pain at 3 months and 12 months.