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Predictors of Improved Pain, Quality of Life, and Physical Function after Surgical Treatment of Lumbar Spinal Stenosis

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PREDICTORS OF IMPROVED PAIN, QUALITY OF LIFE, AND PHYSICAL FUNCTION AFTER SURGICAL TREATMENT OF LUMBAR SPINAL STENOSIS

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Introduction: Degenerative lumbar stenosis is common in adults and is frequently managed by surgical intervention after non-operative measures fail to relieve pain. Limited evidence-based information regarding optimal selection of patients for surgery exists. Current reform in healthcare policy has sparked significant interest in comparative effectiveness research with the goal of optimizing treatment strategies for common conditions such as degenerative lumbar stenosis. The purpose of this study is to quantify the effectiveness of surgical treatment of lumbar stenosis and to identify patient predictors of greatest improvement using patient reported measures of pain, physical function and quality of life.

Methods: A retrospective study evaluated 229 adult patients who underwent decompression with or without posterior lumbar fusion for treatment of lumbar stenosis over a two year time period. Patient reported outcomes were measured using the SF36 health survey. 146 patients had 6 month follow-up and 106 patients had one year follow-up. Variations in scores of the SF36 pain, mental component summary (MCS), and physical component summary (PCS) subscales were analyzed by multivariate linear regression analysis.

Results: At 6-12 months post-surgery, patients reported an improvement of 8 points in average pain (32.3 to 40.4), physical function (28.6 to 36.9), and PCS (29.0 to 36.9) subscales of the SF36. There was a 6 point average improvement in MCS scores (41.8 to 48.10). Greater post-operative pain was significantly associated with smoking ($p<0.022$), diabetes ($p<0.035$), the presence of instrumentation ($p<0.004$), and re-operation within the 12 month time period ($p<0.021$). Patients who reported less pain pre-operatively continued to report less pain post-operatively ($p<0.002$). No significant correlation was observed between post-operative pain score and age, gender, BMI, mental health disorder, number of levels treated, revision surgery, or incidental durotomy.

In regards to improvements in quality of life, older age ($p<0.001$) and higher physical function scores at 12 months ($p<0.000$) were associated with better MCS scores. Revision surgery ($p<0.041$) and diagnosed mental health disorder ($p<0.000$) were associated with poorer MCS scores. Neither MCS nor

PCS were associated with gender, BMI, DM, smoking, number of levels, re-operation within 12 months, presence of instrumentation, or incidental durotomy.

Conclusion: In general, surgical treatment for lumbar stenosis improves patient pain, quality of life, and physical function as indicated by substantial improvement in all subscales of the SF36 health survey. Predictive factors associated with poor pain relief after surgery include smoking, diabetes, the presence of instrumentation, and re-operation within a 12 month time period. Higher MCS scores are seen in older patients and those with an increase in physical function post-operatively. Predictive factors for poor MCS scores include revision surgery and mental health diagnosis. No specific predictors of PCS score were identified, most likely due to the complicated nature of the patient population with lumbar spinal stenosis. Further work is necessary to determine the ideal surgical candidate.