Lumbar decompression surgery for spinal canal stenosis outcome

Lumbar laminectomy, represents the standard operative treatment for lumbar spinal stenosis, but this procedure is often combined with fusion surgery. It is still discussed whether minimal-invasive decompression procedures are sufficient and if they compromise spinal stability as well.

Decompression of lumbar spinal stenosis without fusion led to a significant and similar reduction of back pain and leg pain in a short-term and a long-term follow-up group. Patients without previous surgery benefited significantly better, whereas patients with previous decompression benefited regarding back pain, especially for long-term follow-up with a clear trend in favor of leg pain ¹⁾.

Currently, there is interest in minimally invasive surgery and various technical modifications of decompressive lumbar laminectomy without fusion.

Particularly, depression has been shown to be associated with less improvement following lumbar fusion surgery ^{2) 3) 4) 5) 6) 7) 8).}

Karp et al. ⁹⁾ reviewed 158 patients who underwent epidural spinal injections for low-back pain with or without radiculopathy. These investigators found that depression and sleep disturbance were prognostic of worse Patient-Reported Outcome Measurement Information System (PROMIS) outcomes following epidural spinal injections.

Hägg et al. ¹⁰ performed a randomized controlled trial of 264 patients with severe chronic low-back pain who underwent either surgical or nonsurgical treatment, and assessed the impact of underlying affective disorders. They found that baseline depression correlated with worse outcomes following both operative and nonoperative treatment.

Interestingly, they also observed that depressed patients tended to have better outcomes with nonoperativecare, whereas nondepressed patients tended to have better outcomes with fusion.

In the study of Lubelski et al. ¹¹⁾ found that worsening depression (as measured by the PHQ-9) independently significantly predicted worse EQ-5D index outcomes following conservative treatment for LSS (p = 0.0002). This effect was most evident when comparing patients with severe depression, who improve 0.14 points less than those with no depression. This difference exceeds the MCID and confirms that depression is a poor prognostic factor for QOL improvement following nonoperative treatment for LSS. Further investigation is needed to determine whether treatment of depression prior to conservative or surgical management of LSS will improve posttreatment QOL outcomes. There are several limitations that should be considered when interpreting the results. Multiple treating physicians were included, and factors such as participation in physical therapy, treatment with NSAIDs, opioid medications and other nonsurgical treatments varied by practitioner and patient; this increases the variability, but also improves the generalizability.

They adjusted for the increased variability by using the random effect in the regression models. Many patients were also lost to follow-up at the 4-month evaluation.

The cohorts were similar for most characteristics; however, there were statistically significant, albeit small differences for estimated percent below poverty threshold and median income by zip code. The analysis is only valid for patients who did follow-up assessments at these time points. Additionally,

this was a retrospective study with a relatively short follow-up period.

Prospectively designed studies with longer follow-up are needed to further validate the findings. Nonetheless, this is the largest study investigating the correlation between depression and QOL outcomes following conservative management of LSS.

Lubelski et al. have used the validated PHQ-9 measure of depression and have found a statistically and clinically significant impact on EQ-5D index outcomes.

The results of this study suggest that depressed patients with LSS have significantly less improvement following conservative management compared with nondepressed patients. Both physicians and surgeons who treat patients with LSS should consider using validated questionnaires such as the PHQ-9 for pretreatment evaluation of depression, to better assess the likelihood of success following treatment. Further investigation is needed to evaluate the effect of depression treatment prior to management of the spinal disorder. Future prospective studies with longer follow-up intervals may be useful in further evaluating the QOL outcomes in this patient population ¹².

In cases of lumbar spinal stenosis (LSS) treated with surgical decompression, a postoperative magnetic resonance imaging (MRI) is sometimes required. In the experience of a study, the obtained decompression observed on early postoperative MRI tends to be disappointing compared to the decompression achieved intraoperatively. This raises the question of whether the early postoperative MRI, performed after lumbar decompression, is a fair representation of the 'real' decompression. A study investigated the correlation between intraoperative and postoperative measurements of the lumbar spinal canal.

Surgical decompression of the spinal canal effectively decreases the compression of the dural sac. However, early postoperative MRI after lumbar decompression does not adequately represent the decompression achieved intraoperatively¹³.

Back pain improvement

Through the 1st postoperative year, patients with lumbar stenosis-without spondylolisthesis, scoliosis, or sagittal malalignment-and clinically significant back pain improved after decompression-only surgery ¹⁴.

The most common surgical method currently used is lumbar laminectomy, with complete decompression; this technique has a 5-year follow-up effective rate of 81.6%¹⁵⁾.

Complications

Apart from acute complications such as hematoma and infections, same-level recurrent lumbar stenosis and adjacent-segment disease (ASD) are factors that can occur after index lumbar spine surgery.

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While looking for predictors of revision surgery due to re-stenosis, instability or same/adjacent segment disease none of these were found. Within our cohort no significant differences concerning demographic, peri-operative and radiographic data of patients with or without revision wer noted. Patients, who needed revision surgery were older but slightly healthier while more likely to be male and smoking. Surprisingly, significant differences were noted regarding the distribution of intraoperative and early postoperative complications among the 6 main surgeons while these weren't obious within the intial index group of late revisions ¹⁶.

A systematic review was conducted using MEDLINE for literature published through December 2014. The first question focused on the effectiveness of lumbar spine surgery for symptomatic lumbar spinal stenosis in elderly patients. The second question focused on safety of surgical intervention on this elderly population with emphasis on perioperative complication rates.

Review of 11 studies reveals that the majority of elderly patients exhibit significant symptomatic improvement, with overall benefits observed for pain (change visual analog scale 4.4 points) and disability (change Oswestry Disability Index 23 points). Review of 11 studies reveals that perioperative complications were infrequent and acceptable with pooled estimates of mortality (0.5%), inadvertent durotomy (5%), and wound infection (2%). Outcomes seem less favorable with greater complication rates among patients with diabetes or obesity.

Based on largely low-quality, retrospective evidence, Shamji et al. recommend that elderly patients should not be excluded from surgical intervention for symptomatic lumbar spinal stenosis ¹⁷⁾.

Revision surgery

The possible risk factor of failed indirect decompression includes severe central canal stenosis (CCS), bony lateral recess stenosis]], uncontained disc herniation, locked facet, and severe hypertrophy of ligamentum flavum.

Fusion Is Not a Safeguard to Prevent Revision Surgery in Lumbar Spinal Stenosis¹⁸.

A cohort study showed no significant association between the type of index operation for Degenerative Lumbar Spinal Stenosis-decompression alone or fusion-and the need for revision surgery or the outcomes of pain, disability, and quality of life among patients after 3 years. Number of revision operations was associated with more pain and worse quality of life¹⁹.

Erectile function

Results suggest no significant improvement in overall erectile function postoperatively for patients with preoperative erectile dysfunction. This is important to address during patient counseling for decompression surgery candidates with cervical spinal stenosis and/or lumbar canal stenosis to manage expectations.²⁰

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