



# Multisegmental lumbar spinal stenosis—simple decompression is better?

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Comment on: Ulrich NH, Burgstaller JM, Held U, *et al.* The Influence of Single-level Versus Multilevel Decompression on the Outcome in Multisegmental Lumbar Spinal Stenosis: Analysis of the Lumbar Spinal Outcome Study (LSOS) Data. *Clin Spine Surg* 2017. [Epub ahead of print].

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Lumbar spinal stenosis (LS) is probably one of the most prevalent symptomatic spinal disease in older patients, with most of them requiring surgical treatment to relief their symptoms (1-3). Surgery objective is to decompress the nerve roots and, sometimes, stabilize the spine and/or restore the normal or near normal alignment (1-4). Additionally, there are some good evidences that surgery is better than conservative treatment to relief moderate and severe symptoms due to stenosis (5-8). Despite the trends in increasing the use of implants and reconstructive surgery, the vast majority of patients will have clinical improvement with simple nerve roots decompression (5-8).

However, many patients are older, with comorbidities and presenting with many levels of LS, which may require more extensive procedures. In this context, Ulrich *et al.* performed a prospective multicenter cohort study comparing patients with multisegmental LSS (at least three levels of stenosis, moderate or severe) treated using a single-level decompression versus a multilevel decompression (at least two levels) (9). The decision of the procedure was made at the discretion of the treating surgeon. Surgical treatment consisted in an open lumbar laminotomy without instrumentation, with lateral recess decompression performed when necessary. Outcome was mainly assessed with the Spinal Stenosis Measure (SSM) symptoms and function score at base line, 6, 12 and 24 months after surgery. A total of 141 patients had 12 months of follow-up (from a total of 684 who had surgery without previous spine surgery). A total of 33 patients (23%) had single level versus 108 (77%) had multilevel surgery. They reported that multilevel surgery was associated with a less favorable

SMM symptoms and function score compared with those patients who had single level surgery, although both groups improved over time, with similar complication rate. This study suggested that single level decompression might be better than multilevel laminectomy to improve patient's symptoms. Of note, patients' characteristics at baseline (age, gender, comorbidities, outcome measurements, etc.) were very similar, without statistical differences—with a trend to multilevel patients to have a longer duration of the symptoms compared with single level patients. About 50% of both groups had also spondylolisthesis diagnosed in MRI scans.

This paper needs some additional comments:

- (I) Although the results favor single level decompression, the patients were not randomized: this may lead to a bias selection. The number of severe levels per patients, as stated in *Table 2* of the manuscript, demonstrated that there were a trend to a higher number of severe compression in the multilevel group ( $P=0.06$ ). Patients with multilevel surgery had also a trend to a longer duration of preoperative symptoms than in single level surgery.
- (II) No patient in the single level decompression had a decompression at L5S1 level, compared with 20 (18.5%) in the multilevel group ( $P=0.02$ ), which may potentially lead to more severe low back symptoms once this region is a transitional area with important muscular attachments.
- (III) The higher rate of patients in both groups with spondylolisthesis is the most important factor, in our humble opinion, to be considered in this study—this may explain why patients with single

level may have similar or even better outcomes than multilevel, once the spondylolisthesis level is generally the most symptomatic and single level decompression may lead to a lesser degree of postoperative instability and, consequently, to better functional and physical outcome, since any patient in this study received an instrumented fusion. In a randomized controlled trial including patients with stenosis exclusively due to spondylolisthesis, Ghogawala had demonstrated that patients with stenosis secondary to lumbar degenerative spondylolisthesis may do slightly better than those patients that received only a decompressive procedure (10).

- (IV) Although there were no statistical differences ( $P=0.06$ ), multilevel surgery group had 67.3% of duration of symptoms >12 months, compared with only 48.5% in the single level group. This small difference may also be related to a worse outcome in the multilevel group. It is a selection bias that must be considered.
- (V) Finally, multilevel surgery may lead to a higher degree of muscle fibrosis, which may also affect the final outcome. However, patients with single level decompression may need an additional surgery after a longer follow-up, where symptomatic adjacent level disease may occur. It means that the differences obtained in favor of single level may disappear with a longer follow-up.

Authors must be congratulated for this outstanding paper, which must be commended for all spine surgeons. A randomized controlled trial should be designed to clarify all the raised issues, potentially excluding patients with spondylolisthesis.

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## Footnote

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*Ethical Statement:* The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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