

# Greater odds of overall satisfaction three months after lumbar fusion when surgery is minimally invasive

December 14 2021

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Researchers compared outcomes in two groups of patients surgically treated with lumbar fusion for degenerative spine disease. One group had undergone minimally invasive surgery (MIS) and the other open surgery. The researchers found that MIS procedures were associated with significantly greater odds of patient satisfaction 3 months postoperatively but not 12 months postoperatively. MIS was also associated with less disability and pain at both time points. For more details, see the article "Minimally invasive versus open lumbar spinal fusion: a matched study investigating patient-reported and surgical outcomes" by James Mooney, MD, and colleagues, published today in the *Journal of Neurosurgery: Spine*.

The minimally invasive approach to [surgery](#) is quite popular. That's no surprise: compared to open surgeries in general, minimally invasive surgical approaches produce less physical damage to the patient, result in fewer complications and less postoperative pain, and tend to save patients from prolonged stays in the hospital.

Given the popularity of MIS, it is best to have large-scale studies confirm or deny its benefits over [open surgery](#). This is what the present study set out to do for lumbar spine surgery. Fourteen researchers from ten medical centers investigated data from the Quality Outcomes Database (QOD) on patients who had undergone elective [lumbar fusion](#) for degenerative spine disease. The lumbar surgery module of the QOD

is the largest of its kind in the United States. Both subjective (patient-reported) and objective outcomes in patients who underwent MIS or open surgery for lumbar fusion were examined and analyzed.

To make a sound comparison between outcomes in the two patient groups, the researchers first performed optimal matching (1:2 [a ratio of 1483 patients who underwent MIS to 2966 patients who underwent open surgery]) with regard to thirty-three variables covering demographics, symptoms, comorbidities, indications for surgery, operative details, and patient-reported scores on various scales. This made the groups highly homogeneous and easier to compare more precisely.

Outcomes at 3 and 12 months were examined. Overall satisfaction (score 1 or 2 on the North American Spine Society scale), decreases in disability (scored by the Oswestry Disability Index) and back and leg pain (scored using a visual analog scale), duration of surgery, length of hospital stay, reoperations, and incidental durotomy rate (unintended tears or puncture of the dura mater) were foci of particular interest.

Three months postoperatively, patients who underwent MIS for lumbar fusion had greater odds of achieving overall satisfaction than patients who underwent open surgery. The difference in satisfaction was significant for male patients, White patients, obese patients, and patients younger than 58 years of age. Also associated with greater odds of achieving satisfaction 3 months after MIS were absence of grade I spondylolisthesis (slipped vertebra), presence of lumbar stenosis (narrowing of the spinal canal), single-level fusion, and primary surgery. There was no difference in overall satisfaction between the two patient groups at 12 months.

Patients who underwent MIS had lower disability scores at 3 months and 12 months postoperatively than patients who underwent open surgery. The proportion of patients who reached an optimal disability score (ODI

less than 20) at both 3 months and 12 months was significantly greater in the MIS group.

Compared with patients who underwent open lumbar surgery, patients who underwent MIS had a greater decrease in back and leg pain at both 3 months and 12 months postoperatively. A higher proportion of MIS patients attained minimal back pain (score of 2 or less on the visual analog scale) at both 3 months and 12 months as well as minimal leg pain at 12 months.

Length of stay in the hospital was significantly shorter among patients who underwent MIS. Revision surgery within 12 months was performed at a greater rate among patients who underwent open surgery. There was no significant difference between patient groups with respect to length of surgery or incidental durotomy rates.

The authors state that their investigation is "the largest multicenter database study to examine patient outcomes after MIS versus those after open lumbar spinal fusion by utilizing the lumbar spine surgery module of the QOD." Three months after surgery, overall satisfaction was greater in patients who underwent MIS. Twelve [months](#) after surgery, overall satisfaction continued, although there was no significant difference between groups. Lower levels of disability and pain were noted at both time points in the MIS group.

When asked about the findings of this study, Dr. Mohamad Bydon responded, "This study demonstrates the value of minimally [invasive surgery](#) for patients in select cases. Prospective registries like the Quality Outcomes Database can help us evaluate surgical techniques and methodologies and expand options for patients."

**More information:** Mooney J, Michalopoulos GD, Alvi MA, Zeitouni D, Chan AK, Mummaneni PV, Bisson EF, Sherrod BA, Haid RW,

Knightly JJ, Devin CJ, Pennicooke B, Asher AL, Bydon M: Minimally invasive versus open lumbar spinal fusion: a matched study investigating patient-reported and surgical outcome. *Journal of Neurosurgery: Spine*, published ahead of print December 14, 2021. [DOI: 10.3171/2021.10.SPINE211128](https://doi.org/10.3171/2021.10.SPINE211128)

Provided by Journal of Neurosurgery

Citation: Greater odds of overall satisfaction three months after lumbar fusion when surgery is minimally invasive (2021, December 14) retrieved 25 April 2024 from <https://medicalxpress.com/news/2021-12-greater-odds-satisfaction-months-lumbar.html>

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