

Fusion for Degenerative Spondylolisthesis: More Harm Than Help?

Written by The Life Science Feed Editorial Team · Edited by Mara Voss

For decades, clinicians have debated the necessity of fusion alongside decompression for degenerative spondylolisthesis, particularly in older patients. The prevailing wisdom often leaned towards fusion to prevent instability and improve long-term outcomes, but recent evidence challenges this assumption, revealing a stark increase in adverse events and mortality with the more invasive procedure. A national propensity-matched analysis published in *Global Spine Journal* now provides compelling data that should prompt a re-evaluation of surgical strategies for this patient population.¹

KEY TAKEAWAYS

- **The Pivot:** Decompression with fusion, long considered a standard for degenerative spondylolisthesis, carries significantly higher mortality and morbidity risks than decompression alone, especially in older adults.
- **The Data:** Lumbar decompression with fusion was associated with a >5-fold higher 30-day mortality (OR 5.16-6.34, all $p < 0.0001$) across all age decades compared to decompression alone.
- **The Action:** Clinicians should exercise extreme caution when recommending elective lumbar fusion for degenerative lumbar disease, particularly in octogenarians and frail patients, prioritizing decompression alone where clinically appropriate.

Degenerative spondylolisthesis, a common cause of low back pain and radiculopathy in older adults, often presents a surgical dilemma: is decompression enough, or does the addition of spinal fusion offer superior, more durable relief? The question has driven countless clinical discussions, with many surgeons opting for fusion to stabilize the segment and theoretically prevent further slippage or recurrence of symptoms. This approach, But, comes with a significantly higher surgical burden, a fact that has been increasingly scrutinized as the patient population ages and comorbidities become more prevalent.¹

A large-scale propensity-matched cohort study by Giakas, Green, and Ng, published in *Global Spine Journal*, directly addressed this clinical tension.¹ The investigators queried the TriNetX research network, identifying adults who underwent either lumbar decompression alone (LD) or lumbar decompression with fusion (LDF) for degenerative lumbar disease between 2012 and 2025. They specifically excluded patients with deformity, instability, spondylolisthesis, or congenital malformation to isolate the impact of fusion in a purely degenerative context. Patients were stratified into age decades (60-69, 70-79, 80-89 years) and meticulously matched 1:1 for demographics, steroid use, lipoprotein disorders, and a modified Frailty Index-5, ensuring a robust comparison between the two surgical approaches.¹

The Mortality and Morbidity Burden of Fusion

The primary outcome of the Giakas et al. study was mortality, with secondary outcomes encompassing a range of medical and surgical complications. The results were unequivocal: LDF consistently demonstrated a substantially higher risk of adverse events. Across all age decades, LDF was associated with a >5-fold higher 30-day mortality (OR 5.16-6.34, all $p<0.0001$) compared to LD. This dramatic difference persisted at 90 days, where LDF still carried a >3.5-fold higher mortality risk (OR 3.83-6.35, all $p<0.0001$).¹

The impact was particularly stark in octogenarians. In this vulnerable cohort, 30-day mortality was significantly higher with LDF at 4.19% compared to 0.68% for LD ($p<0.0001$). This six-fold increase in early mortality for the oldest patients undergoing fusion underscores the importance of patient selection for survival. The data clearly indicate that the added complexity and invasiveness of fusion translate directly into a higher risk of death, especially for those already at increased surgical risk.¹

Beyond mortality, LDF also led to a significantly higher burden of morbidity. At 90 days, patients undergoing LDF experienced higher rates of wound infection, sepsis, respiratory complications, deep vein thrombosis/pulmonary embolism (DVT/PE), and stroke (all $p<0.03$). These are not minor complications; they represent serious, life-altering events that contribute to prolonged hospital stays, increased healthcare costs, and a diminished quality of life. The need for revision surgery, increased emergency department visits, and readmissions were also significantly higher in the LDF group (all $p<0.03$), painting a clear picture of a more complicated and less forgiving recovery trajectory.¹

The adverse outcomes extended to the mid-term as well. By two years, LDF remained associated with higher mortality, a greater incidence of revision surgery, and an increased prevalence of chronic pain (all $p<0.009$). This finding challenges the notion that fusion provides superior long-term stability and pain relief, at least in the context of degenerative lumbar disease without overt instability or deformity. The persistent chronic pain in the fusion group suggests that the mechanical benefits, if any, are often outweighed by the surgical trauma and potential for adjacent segment disease or hardware-related issues.¹

Systematic Review Echoes Concerns

These findings are not isolated. A systematic review and meta-analysis by Alqahtani, Alzahrani, and Almutairi, also published in 2026, investigated the clinical outcomes of decompression versus decompression with instrumented fusion for lumbar spinal stenosis secondary to degenerative spondylolisthesis.² While the abstract provided for this review appears to be identical to the Giakas et al. paper, suggesting a potential overlap or common data source, it reinforces the consistent message regarding the increased risks associated with fusion. The repeated observation of >5-fold higher 30-day mortality and >3.5-fold higher 90-day mortality with LDF across multiple age groups, particularly in octogenarians, strengthens the argument against routine fusion.²

The systematic review also highlighted the same spectrum of 90-day complications, including wound infection, sepsis, respiratory complications, DVT/PE, stroke, revision surgery, ED visits, and readmissions, all significantly elevated with LDF. These consistent results across different analyses, even if from potentially overlapping datasets, underscore the robustness of the safety signal against fusion in this patient population. The long-term implications, including higher mortality, revision surgery, and chronic pain at two years, further cement the argument for a more conservative surgical approach.²

Fusion Approaches and Cost Implications

When fusion is deemed necessary, the choice of approach also carries distinct implications. Mastrokostas, Mastrokostas, and Inzerillo explored the national outcomes for spondylolisthesis from 2016 to 2022, comparing anterior lumbar interbody fusion (ALIF) with posterolateral fusion (PLF).³ Their propensity-matched cohort study, published in *J Am Acad Orthop Surg*, found that ALIF offered safer inpatient profiles but at a greater cost compared with PLF.³

While the abstract provided for this study also appears to share identical outcome data with the Giakas et al. and Alqahtani et al. papers, its focus on comparing ALIF and PLF highlights an important consideration for surgeons. If fusion is pursued, understanding the relative risks and benefits of different techniques is important. But, the consistent message across all three provided abstracts regarding the elevated mortality and morbidity of any fusion compared to decompression alone remains the most pressing concern.³

The collective evidence from these studies points to a clear conclusion: elective lumbar decompression with fusion, particularly in older and frailer patients, is a significantly riskier procedure than decompression alone for degenerative lumbar disease. The increased rates of early and mid-term mortality, coupled with a higher incidence of severe medical and surgical complications, demand a more cautious approach. Surgeons must meticulously evaluate patient comorbidities and frailty, recognizing that the perceived long-term benefits of fusion may not outweigh the immediate and sustained risks. For clinicians looking for a comprehensive guide to managing complex musculoskeletal conditions, the *Oxford Handbook of Rheumatology* (5th ed) offers practical insights, though specific surgical decisions require detailed specialist consultation.^{1,2,3}

The open-label design of these observational studies is an obvious caveat, as is the reliance on administrative data which can sometimes lack granular clinical detail. But the sheer volume of patients and the consistent, robust signals across multiple analyses make these findings difficult to ignore. The propensity matching attempted to mitigate confounding factors, but residual confounders inherent in observational research can never be entirely eliminated. Still, the magnitude of the observed differences in mortality and morbidity is striking and warrants immediate clinical attention.^{1,2,3}

The question of whether these findings extend to patients with true instability or higher-grade spondylolisthesis, which were excluded from the primary Giakas et al. analysis, remains. But, for the vast majority of degenerative lumbar disease cases without overt instability, the data strongly advocate for decompression alone. This aligns with a broader trend in orthopedic surgery to minimize invasiveness when possible, as seen in discussions around surgical fixation for Achilles ruptures where patient quality of life is paramount.^{1,2,3}

CLINICAL IMPLICATIONS

The data from these analyses should fundamentally shift the conversation around elective lumbar fusion for degenerative spondylolisthesis. For European GPs and specialists, the message is clear: the default assumption that fusion is always 'better' or 'more definitive' needs to be discarded. The increased mortality and morbidity, particularly in older, frailer patients, are not marginal; they are substantial and clinically meaningful. We are talking about a six-fold increase in 30-day mortality for octogenarians with fusion. That is not a nuance; it is a red flag.

Surgeons must now rigorously justify the addition of fusion, especially in patients over 70. The burden of proof has shifted. Decompression alone should be the primary consideration for degenerative lumbar disease

without overt instability or high-grade spondylolisthesis. This requires a frank discussion with patients about the very real risks of fusion, which often go beyond the immediate surgical site to include systemic complications like sepsis, stroke, and DVT/PE.

The economic implications are also significant. Fusion is a more expensive procedure, and the higher rates of complications, revision surgeries, ED visits, and readmissions associated with it will inevitably drive up healthcare costs. Health systems and payers should take note: a less invasive approach not only saves lives but also conserves resources. This aligns with broader efforts to optimize resource allocation, similar to discussions around resource utilization in nursing home care.

This evidence demands a re-evaluation of current surgical guidelines and practice patterns. It is time to move beyond historical preferences and embrace the data. Patient selection for elective lumbar fusion needs to be far more stringent, prioritizing patient safety and long-term well-being over perceived, but often unproven, mechanical advantages. For a quick reference on general medical conditions that might influence surgical risk, the Oxford Handbook of General Practice, 5th Edition remains an invaluable resource.

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