

# □ Lumbar Spinal Stenosis Surgery Complications

- [Percutaneous Endoscopic Decompression for Lumbar Central and Lateral Recess Spinal Stenosis: A Combined Uni-Portal and Bi-Portal Approach](#)
- [Acute Pancreatitis after Major Spine Surgery: A Case Study](#)
- [Unilateral biportal endoscopic lumbar interbody fusion vs. posterior lumbar interbody fusion for the treatment of bilateral lumbar spinal stenosis](#)
- [Biomechanical analysis of trivergent, a new posterior lumbar spinal fixation system](#)
- [Characterizing Spinal Decompression for Foot Drop Caused by Lumbar Degenerative Disease: A Systematic Review and Meta-Analysis of Cohorts](#)
- [Rates, Causes, and Predictive Factors of Hospital Readmissions After Spine Surgery for Lumbar Spinal Stenosis: A Nationwide Retrospective Cohort Study](#)
- [Biportal Endoscopic Decompression for Degenerative Lumbar Spondylolisthesis With Stenosis](#)
- [Readmission rates and hospital charges: a comparative study of surgical interventions in degenerative spondylolisthesis and spinal canal stenosis](#)

see [Lumbar laminectomy complications](#)

Surgery for [lumbar spinal canal stenosis](#) (usually decompressive [lumbar laminectomy](#) ± [fusion](#)) is generally effective, but carries potential complications. Below is a structured summary.

## □ Neurological Complications

Complication	Description
<a href="#">Incidental durotomy</a>	Intraoperative dural tear causing CSF leak. May result in postural headache or pseudomeningocele. Usually no long-term impact (e.g., SPORT trial).
<a href="#">Nerve root injury</a>	Rare (<1%). May lead to radiculopathy or motor weakness. Higher risk in revisions or severe stenosis.
<a href="#">Spinal cord injury</a>	Exceptionally rare in lumbar surgery. Catastrophic if it occurs. More likely in high lumbar or anomalous anatomy.

## □ Infectious Complications

Complication	Description
<a href="#">Surgical site infection (SSI)</a>	Ranges from superficial to deep infection. Higher risk with instrumentation, diabetes, or long procedures.
<a href="#">Epidural abscess</a>	May occur days-weeks later. Presents with pain, fever, and neurological symptoms. Requires prompt drainage.
<a href="#">Urinary tract infection (UTI)</a>	Often related to catheter use. More frequent in elderly or immobilized patients.

## □ Vascular and Hematologic Complications

Complication	Description
<b>Spinal Epidural hematoma</b>	May cause acute neurological decline. Surgical emergency.
<b>Deep vein thrombosis (DVT) / Pulmonary embolism (PE)</b>	Risk increases with immobility, age, or comorbidities. Prophylaxis recommended.
<b>Intraoperative bleeding</b>	Can be significant in patients on anticoagulants or with venous engorgement.

## □ Mechanical and Surgical Complications

Complication	Description
<b>Failed back surgery syndrome (FBSS)</b>	Persistent or recurrent pain despite technically correct surgery. Multifactorial origin.
<b>Recurrent stenosis</b>	Can result from scar tissue or ongoing degeneration.
<b>Adjacent segment disease</b>	Degeneration of levels above/below a fused segment over time.

## □ General Medical Complications

Complication	Description
<b>Cardiac or pulmonary events</b>	Perioperative risk in elderly or high-risk patients.
<b>Postoperative delirium</b>	Common in older adults. Related to anesthesia, pain meds, or metabolic imbalance.
<b>Anesthesia-related complications</b>	Hypotension, allergic reactions, respiratory issues.

## □ Reoperation Risk

- 5–15% of patients may require reoperation within 5 years.
- Higher rates in fusion vs decompression alone.
- Reasons include infection, hardware failure, recurrent stenosis, or adjacent segment disease.

## □ Notes from Clinical Trials

- **SPORT trial:** Incidental durotomy did not worsen long-term outcomes.
- **Swedish Spinal Stenosis Study:** Both surgery and conservative treatment show benefit; surgery has faster relief.
- **NORDSTEN trial:** Fusion not superior to decompression alone in many cases.

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.

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 were 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 obvious within the initial index group of late revisions <sup>1)</sup>.

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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 <sup>2)</sup>.

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## SPORT: Does incidental durotomy affect long-term outcomes in cases of spinal stenosis?

In a [prospective cohort study](#) from a [randomized clinical trial](#) database (SPORT) Atman Desai \*et al.\* from the Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire published in the [\\*Neurosurgery Journal\\*](#) to assess whether incidental durotomy during first-time open decompressive [laminectomy](#) for [lumbar spinal stenosis](#) impacts long-term outcomes. Incidental durotomy was associated with longer [operative times](#), greater [blood loss](#), and longer [hospital stays](#) but did **not** impact long-term [functional outcomes](#) (up to 4 years) such as [pain](#), physical function, or [disability](#) scores <sup>3)</sup>

### Critical Review

This study leverages the robust SPORT dataset, focusing on a sub-cohort of 409 patients with lumbar spinal stenosis undergoing first-time laminectomy. The reported 9% incidence of [durotomy](#) aligns with existing literature. Its main strength lies in the long-term follow-up (mean 43.8 months) and standardized outcome measures, including SF-36 and ODI.

However, there are several concerns:

- **Selection Bias:** Despite prospective data collection, the analysis was retrospective, increasing the risk of bias.
- **Confounding:** While baseline characteristics were well-matched, unmeasured surgeon-related factors (e.g., skill, experience) could influence both durotomy occurrence and outcomes.
- **Underpowered for Rare Events:** With only 37 durotomy cases, the study may lack statistical power to detect subtle differences in outcomes or rare complications.
- **Blinding:** There is no mention of blinding in outcome assessments, a nontrivial issue when dealing with subjective measures such as patient-reported outcomes.

## Final Verdict

### Takeaway for the Practicing Neurosurgeon:

Incidental durotomy, while increasing perioperative morbidity, does not necessarily translate to worse long-term outcomes—providing some reassurance in clinical practice. Nonetheless, its occurrence still warrants prevention efforts due to short-term burden.

### Bottom Line:

Durotomy is not a prognostic determinant for long-term recovery following first-time laminectomy for stenosis.

**Score:** 6.5 / 10

1)

Melcher C, Paulus AC, Roßbach BP, Gülecyüz MF, Birkenmaier C, Schulze-Pellengahr CV, Teske W, Wegener B. Lumbar spinal stenosis - surgical outcome and the odds of revision-surgery: Is it all due to the surgeon? Technol Health Care. 2022 Jun 10. doi: 10.3233/THC-223389. Epub ahead of print. PMID: 35754243.

2)

Shamji MF, Mroz T, Hsu W, Chutkan N. Management of Degenerative Lumbar Spinal Stenosis in the Elderly. Neurosurgery. 2015 Oct;77 Suppl 4:S68-74. doi: 10.1227/NEU.0000000000000943. PubMed PMID: 26378360.

3)

Desai A, Ball PA, Bekelis K, Lurie J, Mirza SK, Tosteson TD, Weinstein JN. SPORT: Does incidental durotomy affect longterm outcomes in cases of [spinal stenosis](#)? Neurosurgery. 2015 Mar;76 Suppl 1(0 1):S57-63; discussion S63. doi: 10.1227/01.neu.0000462078.58454.f4. PMID: 25692369; PMCID: PMC4517439.

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