# Lumbar hemilaminectomy

## Complications

Lumbar laminectomy complications.

### Videos

<html><iframe width="560" height="315" src="https://www.youtube.com/embed/B4A6uR2dbbw" frameborder="0" allowfullscreen></iframe></html>

### Case series

#### 2017

A retrospective matched pair analysis, cohort study included a total of 144 patients who underwent surgery for bisegmental spinal stenosis at the levels L3-4 and L4-5 between 2008 and 2012. There were 72 matching pairs that corresponded in sex, year of birth, and width of the stenosed segments. The patients' impairments were reported before, immediately after, and 6 and 12 months after surgery using the Oswestry Disability Questionnaire (ODQ-D) and the EuroQol-5D (EQ-5D). The data were evaluated statistically.

The comparison of both surgical procedures (Bisegmental Fenestration versus Hemilaminectomy)regarding walking ability (walking a distance with and without a walking aid) revealed a significant difference. Patients who underwent hemilaminectomy had better postoperative results. The individual criteria of the ODQ-D and EQ-5D revealed no significant differences between 2-level fenestration and hemilaminectomy; however, there is always significant postoperative improvement in comparison with preoperative status. Age, sex, body mass index, comorbidities, smoking, and alcohol consumption had no influence on the surgical results. The reoperation rate was between 13% and 15% for both surgical techniques, not being significantly different.

Fenestration and hemilaminectomy are equivalent therapies for bisegmental lumbar spinal canal stenosis. Regarding walking, the study revealed better results for hemilaminectomy than for fenestration in this cohort of patients. Pain intensity, personal care, lifting and carrying of objects, sitting, social life, and travel all improved significantly postoperatively as compared with preoperatively. In both groups, health status as the decisive predictor improved considerably after surgery. We could show that both surgical methods result in significant postoperative improvement of all the individual criteria of the ODQ-D and the EQ-5D [1)].

#### 2015

A multicentre study was based on Spine Tango data. Inclusion criteria were LSS with a posterior decompression and pre- and postoperative COMI assessment between 3 and 24 months. 1,176 cases

were assigned to four groups: (1) laminotomy (n = 642), (2) hemilaminectomy (n = 196), (3) laminectomy (n = 230) and (4) laminectomy combined with an IF (n = 108). Clinical outcomes were achievement of minimum relevant change in COMI back and leg pain and COMI score (2.2 points), surgical and general complications, measures taken due to complications, and reintervention on the index level based on patient information. The inverse propensity score weighting method was used for adjustment.

Laminotomy, hemilaminectomy and laminectomy were significantly less beneficial than laminectomy in combination with IF regarding leg pain (ORs with 95% CI 0.52, 0.34-0.81; 0.25, 0.15-0.41; 0.44, 0.27-0.72, respectively) and COMI score improvement (ORs with 95% CI 0.51, 0.33-0.81; 0.30, 0.18-0.51; 0.48, 0.29-0.79, respectively). However, the sole decompressions caused significantly fewer surgical (ORs with 95% CI 0.42, 0.26-0.69; 0.33, 0.17-0.63; 0.39, 0.21-0.71, respectively) and general complications (ORs with 95% CI 0.11, 0.04-0.29; 0.03, 0.003-0.41; 0.25, 0.09-0.71, respectively) than laminectomy in combination with IF. Accordingly, the likelihood of required measures was also significantly lower after laminotomy (OR 0.28, 95% CI 0.17-0.46), hemilaminectomy (OR 0.28, 95% CI 0.15-0.53) and after laminectomy (OR 0.39, 95% CI 0.22-0.68) in comparison with laminectomy with IF. The likelihood of a reintervention was not significantly different between the treatment groups.

As already demonstrated in the literature, decompression in patients with LSS is a very effective treatment. Despite better patient outcomes after laminectomy in combination with IF, caution is advised due to higher rates of surgical and general complications and consequent required measures. Based on the current study, laminotomy or laminectomy, rather than hemilaminectomy, is recommendable for minimum relevant pain relief [2)].

**2013**

Fifty-four consecutive patients with lumbar stenosis undergoing multilevel hemilaminectomy through an MIS paramedian tubular approach (n=27) versus midline open approach (n=27) were included. Total back-related medical resource utilization, missed work, and health state values [quality adjusted life years (QALYs), calculated from EuroQuol-5D with US valuation] were assessed after 2-year follow-up. Two-year resource use was multiplied by unit costs based on Medicare national allowable payment amounts (direct cost) and work-day losses were multiplied by the self-reported gross-of-tax wage rate (indirect cost). Difference in mean total cost per QALY gained for MIS versus open hemilaminectomy was assessed as incremental cost-effectiveness ratio (ICER: COST(MIS)-COST(OPEN)/QALY(MIS)-QALY(OPEN)). RESULTS: MIS versus open cohorts were similar at baseline. MIS and open hemilaminectomy were associated with an equivalent cumulative gain of 0.72 QALYs 2 years after surgery. Mean direct medical costs, indirect societal costs, and total 2-year cost ($23,109 vs. $25,420; P=0.21) were similar between MIS and open hemilaminectomy. MIS versus open approach was associated with similar total costs and utility, making it a cost equivalent technology compared with the traditional open approach. CONCLUSIONS: MIS versus open multilevel hemilaminectomy was associated with similar cost over 2 years while providing equivalent improvement in QALYs. In our experience, MIS versus open multilevel hemilaminectomy is a cost equivalent technology for patients with lumbar stenosis-associated radicular pain [3)].

1)
Schüppel J, Weber F. Retrospective Matched-Pair Cohort Study on Effect of Bisegmental Fenestration versus Hemilaminectomy for Bisegmental Spinal Canal Stenosis at L3-L4 and L4-L5. J Neurol Surg A Cent Eur Neurosurg. 2017 Jan 9. doi: 10.1055/s-0036-1597617. [Epub ahead of print] PubMed PMID: 28068753.

2)
Munting E, Röder C, Sobottke R, Dietrich D, Aghayev E; Spine Tango Contributors.. Patient outcomes after laminotomy, hemilaminectomy, laminectomy and laminectomy with instrumented fusion for spinal canal stenosis: a propensity score-based study from the Spine Tango registry. Eur Spine J. 2015 Feb;24(2):358-68. doi: 10.1007/s00586-014-3349-0. PubMed PMID: 24840246.
3)
Parker SL, Adogwa O, Davis BJ, Fulchiero E, Aaronson O, Cheng J, Devin CJ, McGirt MJ. Cost-utility analysis of minimally invasive versus open multilevel hemilaminectomy for lumbar stenosis. J Spinal Disord Tech. 2013 Feb;26(1):42-7. doi: 10.1097/BSD.0b013e318232313d. PubMed PMID: 21959840.