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A Comparison of Unilateral and Bilateral Laminotomies for Decompression of L4-5 Spinal Stenosis

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Objectives: Laminotomy is known to be comparable to laminectomy in decompressive surgery of spinal stenosis. However, the comparison between unilateral and bilateral laminotomies is only available for short term follow-up. The object of this study is to compare clinical and radiological outcomes between unilateral and bilateral laminotomies for decompression of L4-5 degenerative lumbar spinal stenosis

Methods: 56 patients over a two-year period at one institution having decompressive surgery for L4-5 spinal stenosis were entered into this study. The patients were randomly assigned to the surgeons and each surgeon performed the surgery with only one method of unilateral or bilateral laminotomies. Clinical outcomes were assessed with Visual Analog Scale for back and leg pain and the Oswestry disability index. Radiographic measurements included were translational motion, angular motion, and epidural cross-sectional area. All the measurements were made from the radiographs of the immediate postoperative day and a minimum of three year follow-up.

Results: Demographics were not different among patient populations. The average age of the patients was 62.4 years (range: 31-82). Mean follow-up period was 49.3 months (range: 40-61). Clinical outcomes and complication rate were similar in both groups. Intraoperative bleeding and operation time were less in the unilateral laminotomy group. In radiographic measurement, Change of translational motion was significantly increased in the bilateral laminotomy group ($p=0.012$), but change of angular motion was not significantly different ($p=0.195$) between the two groups. Radiological instability was also more frequent in bilateral laminotomy group but not statistically significant.

Conclusions: Both unilateral and bilateral laminotomies provide sufficient decompression of spinal stenosis and excellent pain reduction. However, unilateral laminotomy can be done with shorter operation time and less bleeding. Radiologically, unilateral laminotomy has less translational motion increase after surgery, thus it may reduce the risk of later instability.