

Evaluation of Lumbar Spinal Medial Facetectomy along with posterolateral fusion Versus Simple Laminectomy in Management of Degenerative Lumbar Canal Stenosis

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Citation

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Abstract

Background: Degenerative lumbar spinal canal stenosis is defined as the narrowing of the central vertebral canal, lateral recess and vertebral foramina, producing symptoms of radiculopathy or claudication and it is a common finding in an aging or degenerative spine. The main challenge of the operative management of lumbar spine stenosis (LSS) is to provide adequate decompression while maintaining stability. Although, good clinical outcome of decompressive laminectomy without spinal fusion for degenerative lumbar spinal stenosis has been described, however, radiological instability was common after decompression for degenerative LSS without spondylolisthesis as well as persistence of symptoms of low back pain.

Aim: In our study we are evaluating the clinical and radiological outcome of total laminectomy & medial facetectomy with posterolateral fusion versus minimally invasive laminectomy alone.

Methods: A prospective comparative study on 24 patients underwent simple laminectomy with preservation of facets and 31 patients underwent full laminectomy with total medial facetectomy and posterolateral fixation and fusion.

Results: Our results showed that that quality of life of most of these patients 2 years after surgery is better than if simple laminectomy was done alone.

Conclusion: For cases of degenerative lumbar canal stenosis, simple laminectomy remains the surgery of choice in older patients, and in cases of central canal stenosis, whereas total laminectomy with medial facetectomy and postero-lateral fusion shows better clinical outcome in middle-aged active patients with foraminal stenosis with a decompressed and stable lumbar spine.

INTRODUCTION

Degenerative lumbar spinal canal stenosis is defined as the narrowing of the central vertebral canal, lateral recess and vertebral foramina, producing symptoms of radiculopathy or claudication and it is a common finding in an aging or degenerative spine (1). Lumbar spinal stenosis (LSS) is the most common reason for lumbar surgery among people over the age of 65 (2).

Typical neurogenic claudication and severe pain/disability were considered the most important indications for surgical treatment (2). In agreement with literature, these symptom characteristics are considered important predictors of good outcome of surgical treatment (3). The extent of stenosis was

regarded as an important indication for surgery by slightly fewer responders (4).

The main challenge of the operative management of LSS is to provide adequate decompression while maintaining stability (5). The most commonly performed surgical technique for the treatment of LSS was interlaminar decompression. As narrowing of the spinal canal predominantly takes place at the interlaminar region involving the facet joints and ligamentum flavum (2). Although, good clinical outcome of decompressive laminectomy without spinal fusion for degenerative lumbar spinal stenosis has been described (6), however, radiological instability was common after decompression for

degenerative LSS without spondylolisthesis as well as persistence of symptoms of low back pain (7).

Unlike total facetectomy, medial facetectomy did not affect the lumbar spinal stability in any type of motion except flexion (8). In our study we are evaluating the clinical and radiological outcome of total laminectomy & medial facetectomy with posterolateral fusion versus minimally invasive laminectomy alone.

METHODS

A prospective comparative study on 55 patients with classic lumbar canal stenosis operated for decompression.

Prior to surgery, patients were examined thoroughly, only those with typical symptoms of neurogenic claudication were included. Radiological Investigations include: Plain X-Ray Lumbosacral spine (Dynamic views, CT Lumbosacral Spine, MRI Lumbosacral spine.

Inclusion Criteria: Clinical symptom of Neurogenic Claudication, Typical MRI image of Degenerative Lumbar Canal Stenosis (trifoliate appearance).

Exclusion Criteria: Prolapsed Lumbar discs (discogenic stenosis), Spondylolisthesis, recurrent cases with persistent symptoms after previous surgery.

In our study, 24 patients underwent simple laminectomy with preservation of facets and 31 patients underwent full laminectomy with total medial facetectomy and posterolateral fixation and fusion. Clinical and radiological data were collected immediate postoperative, 1 month, 6 months, 1 and 2 years after surgery as regards: resolution of presenting symptoms, surgical complications and spine stability.

RESULTS

Out of 55 patients, 24 patients (Group A) underwent simple laminectomy with opening and excision of ligamentum flavum for total thecal decompression. For the other 31 patients (Group B), we performed additional total medial facetectomy and postero-lateral fixation and fusion with rods, screws and bone graft.

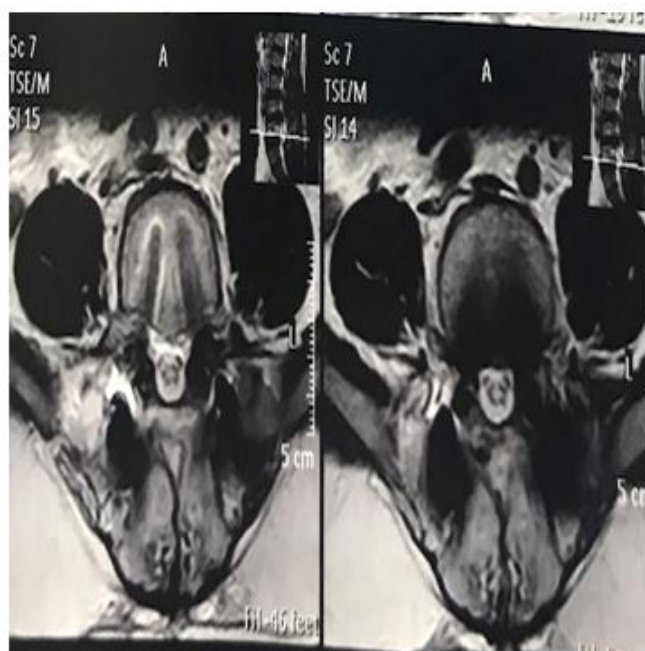
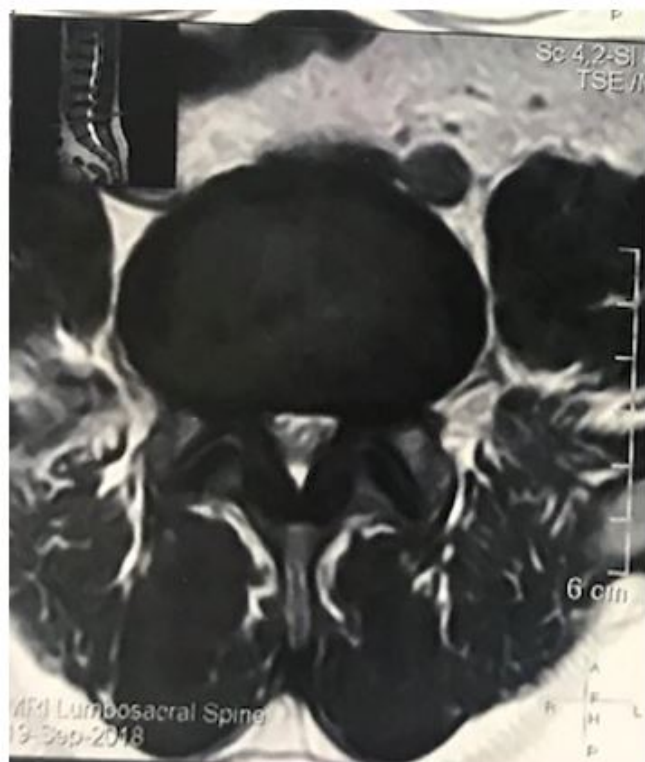
From Group A, 18 patients (75%) showed statistical significant post operative resolution of claudication pain in day 1 after surgery, by the end of the 1st month 20 patients (83%) were claudication free (P value 0.002), 4 patients (17%) did not improve clinically and showed persistent

claudication, 2 patients (8%) required redo surgery for a more aggressive decompression. Unintended dural tear was encountered in 2 patients (8 %) and was managed with muscle graft, duragen, gelfoam or fibrin glue with no postoperative leak in any patient (0%). 3 patients had immediate post-operative foot drop, 2 cases improved back to having intact motor power with IV steroids for 2 days after surgery, and only one patient had persistent weakness in unilateral foot dorsiflexion. Statistical significant back pain (P value 0.022) persisted up to 6 months in 11 patients (45%), and up to 1 year in 6 patients (25%). Radiologically, 21 cases (87.5%) showed statistical highly significant adequate decompression (P value <0.001) and 3 cases (12.5%) showed incomplete laminectomy, 8 cases showed evidence of aggressive bony decompression with partial medial facetectomy (33%), 6 cases (25%) showed significant radiological signs of instability (P value 0.043) 1-2 years after surgery.

27 patients (87%) in Group B showed highly significant immediate post operative resolution of claudication pain in day 1 after surgery, by the end of the 1st month 30 patients (96%) were claudication free (P value <0.001), 1 patient had persistent mild residual claudication. Unintended dural tear was encountered in 3 patients (9 %) and was managed with muscle graft, duragen, gelfoam or fibrin glue with no postoperative leak in any patient (0%). 4 patients had immediate post-operative foot drop, all improved back to having intact motor power with IV steroids for 2 days after surgery. Statistically significant back pain (P value 0.012) persisted up to 6 months in 19 patients (61%), and up to 1 year in 10 patients (32%). Radiologically, 30 cases (96%) showed Highly significant adequate decompression (P value <0.001) and only 1 case (4%) showed incomplete medial facetectomy. 2 years after surgery all cases showed radiological evidence of fusion and stability, and 2 cases developed adjacent segment disc prolapse, both were managed medically.

Figure 1

Pre and Post Operative MRI LSS axial view showing complete laminectomy and medial facetectomy with widened lateral recess .. stability is maintained by posterolateral fixation and fusion.



DISCUSSION

The main challenge of the operative management of degenerative lumbar canal stenosis is to provide adequate

decompression while maintaining stability.

Iguchi et al mentioned that simple laminectomy is satisfactory in most of his cases providing adequate decompression and good clinical outcome (6), our study is supporting his theory in some selected cases only. Simple laminectomy could be a surgery of choice in older patients with a limited range of activity, and in patients with more central ligamentous stenosis where partial medial laminectomies could be avoided to prevent instability. These patients will have optimum outcome with less unnecessary complications from more invasive prosthetic surgeries for fixation and fusion with preserved stability.

On the other hand side, middle aged patients with highly active life style and patients with more foraminal bony stenosis will not benefit clinically from a simple laminectomy alone, and will have high risk of post-operative instability in case of aggressive bony decompression that may require medial facetectomy. Despite being a more invasive and more aggressive surgery, however, posterolateral fixation and fusion gives the surgeon the green light to perform adequate bony decompression by total medial facetectomy, total widening of lateral recesses and generous foraminotomies.

Our results showed that that quality of life of most of these patients 2 years after surgery is better than if simple laminectomy was done alone. 2 years after surgery most of our patients were able to perform their routine daily activities without clinical radiculopathies or back pain with a decompressed stable lumbar spine.

It is worth mentioning that we advised our patients to preform routine physiotherapy and physical exercise to strengthen their lumbar paraspinal muscles, it has a positive impact on back pain and flexibility of the range of their motion.

CONCLUSION

For cases of degenerative lumbar canal stenosis, simple laminectomy remains the surgery of choice in older patients, and in cases of central canal stenosis, whereas total laminectomy with medial facetectomy and postero-lateral fusion shows better clinical outcome in middle-aged active patients with foraminal stenosis with a decompressed and stable lumbar spine.

References

1. Dilip K. Sengupta et al. Lumbar Spinal Stenosis:

Treatment strategies and indications for surgery. *Orthop Clin N Am* 34 (2003), 281-295.

2. Gijsbert M. Overdevest et al. Management of lumbar spinal stenosis: a survey among Dutch spine surgeons. *Acta Neurochir* (2014) 156:2139–2145 DOI 10.1007/s00701-014-2186-6

3. Kleinstueck FS, Fekete T, Jeszenszky D, Mannion AF, Grob D, Lattig F, Mutter U, Porchet F (2011) The outcome of decompression surgery for lumbar herniated disc is influenced by the level of concomitant preoperative low back pain. *Eur Spine J* 20:1166–1173

4. Pearson A, Lurie J, Tosteson T, Zhao W, Abdu W, Weinstein JN (2012) Who should have surgery for spinal stenosis? Treatment effect predictors in SPORT. *Spine*

(Phila Pa 1976) 37:1791–1802

5. Dieter Grob et al. Degenerative Lumbar Spinal Stenosis: Decompression with and without arthrodesis. *Journal of bone and joint surgery* (1995). Vol 77A no. 7.

6. Tetsuhiro Iguchi, et al. Minimum 10-Year Outcome of Decompressive Laminectomy for Degenerative Lumbar Spinal Stenosis. *SPINE* Volume 25, Number 14, pp 1754–1759 ©2000, Lippincott Williams & Wilkins, Inc.

7. Greger Lønne et al. Lumbar spinal stenosis:: comparison of surgical practice variation and clinical outcome in three national spine registries. *The Spine Journal*. May 2018.

8. ABUMI, K., et al. (1990). Biomechanical Evaluation of Lumbar Spinal Stability After Graded Facetectomies. *Spine*, 15(11), 1142–1147.

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