Section: Orthopaedic

Original Research Article

CLINICAL AND FUNCTIONAL OUTCOMES OF DECOMPRESSIVE LAMINECTOMY IN LUMBAR CANAL STENOSIS: A PROSPECTIVE STUDY OF 30 PATIENTS

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ABSTRACT

Background: Lumbar canal stenosis is a common degenerative spinal disorder causing back pain, radiculopathy, neurogenic claudication, and disability. Surgical decompression remains the treatment of choice in patients who fail conservative management. The objective is to evaluate the clinical and functional outcomes of decompressive laminectomy in patients with lumbar canal stenosis.

Materials and Methods: A prospective study was conducted on 30 patients with symptomatic lumbar canal stenosis treated with decompressive laminectomy between Jan 2025 and April 2026. Clinical and functional outcomes were assessed using Visual Analog Scale (VAS) scores for back pain and leg pain and the Revised Oswestry Disability Index (RODI). Assessments were performed preoperatively, immediately postoperatively, and at 1-, 3-, and 6-month follow-up. Statistical analysis was performed using paired t-test, ANOVA, Wilcoxon signed-rank test, and Mann–Whitney U test.

Results: The mean age was 52.5 years. Females constituted 56.6% of the study population. Back pain was present in all patients, leg pain in 80%, neurogenic claudication in 76.6%, and neurological deficit in 30%. Mean VAS back pain improved significantly from 7.83 preoperatively to 0.70 at 6 months ($p<0.001$). Mean VAS leg pain improved from 5.53 to 0.83 ($p<0.001$). Mean RODI improved from 65.10 preoperatively to 18.77 at final follow-up ($p<0.001$). Improvement was observed throughout the follow-up period.

Conclusion: Decompressive laminectomy provides significant clinical and functional improvement in patients with lumbar canal stenosis, resulting in marked reduction in pain and disability at six months after surgery.

Keywords: Lumbar canal stenosis, decompressive laminectomy, lumbar decompression, neurogenic claudication, Oswestry Disability Index, VAS.

INTRODUCTION

Lumbar canal stenosis is one of the most common degenerative spinal disorders affecting middle-aged and elderly individuals. Progressive narrowing of the spinal canal results in compression of neural elements, producing symptoms such as low back pain, radiculopathy, neurogenic claudication, and functional disability. Conservative treatment may provide temporary relief; however, surgical intervention becomes necessary in patients with persistent symptoms and significant impairment of daily activities.

Decompressive laminectomy remains the standard surgical procedure for symptomatic lumbar canal stenosis without instability. Despite widespread use, outcome data from prospective Indian studies remain limited. Therefore, this study was undertaken to evaluate the clinical and functional outcomes following decompressive laminectomy.

MATERIALS AND METHODS

Study Design: Prospective observational study.
Study Period: Jan 2025toApril2026
Study Center: Department of Orthopaedics, NAMO medical education and research institute silvassa, DNH
Sample Size: Thirty patients.
Inclusion Criteria
- Symptomatic lumbar canal stenosis.
- MRI-confirmed diagnosis.
- Failure of conservative management.
- Willingness to participate and complete follow-up.

Exclusion Criteria
- Cauda equina syndrome.
- Ankylosing spondylitis.
- Neoplasms.
- Metabolic disorders.
- Diabetic neuropathy.
- Psychiatric illness.
- Medically unstable patients.

Outcome Measures
1. Visual Analog Scale (VAS) for back pain.
2. Visual Analog Scale (VAS) for leg pain.
3. Revised Oswestry Disability Index (RODI).

Surgical Technique: All patients underwent decompressive lumbar laminectomy performed by a senior spine surgeon under general anesthesia.
Follow-Up
Patients were evaluated:
- Immediate postoperative period
- 1 month
- 3 months
- 6 months postoperatively.

Statistical Analysis
Data were analyzed using paired t-test, ANOVA, Wilcoxon signed-rank test, and Mann–Whitney U test. Statistical significance was defined as $p<0.05$.

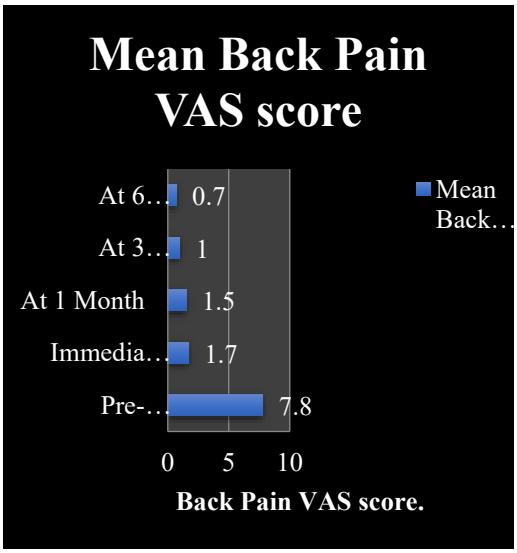
RESULTS

Demographic Characteristics
Mean age was 52.5 years.

Table 1: ?

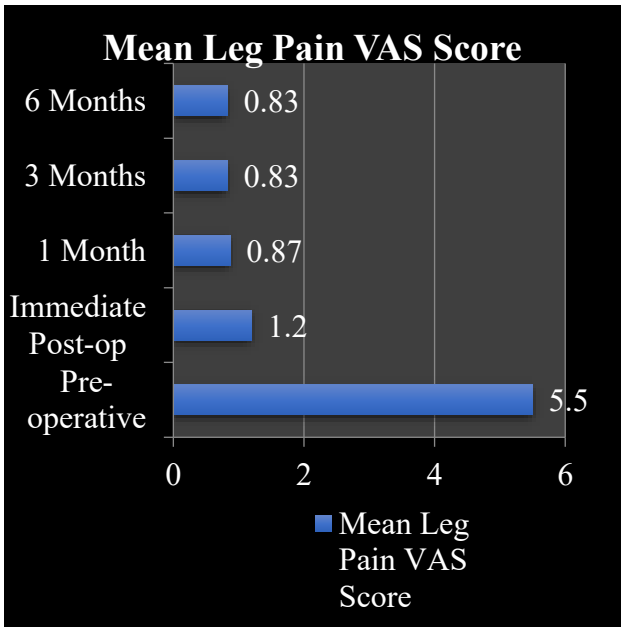
Variable	Value
Male	13 (43.3%)
Female	17 (56.7%)
Back pain	30 (100%)
Leg pain	24 (80%)
Neurogenic claudication	23 (76.6%)
Nerve root tension signs	11 (36.7%)
Neurological deficit	9 (30%)

Clinical Outcomes
Mean VAS Back Pain:
- Preoperative: 7.83
- 6 months: 0.70
- $p<0.001$



Mean VAS Leg Pain:
- Preoperative: 5.53
- 6 months: 0.83
- $p<0.001$

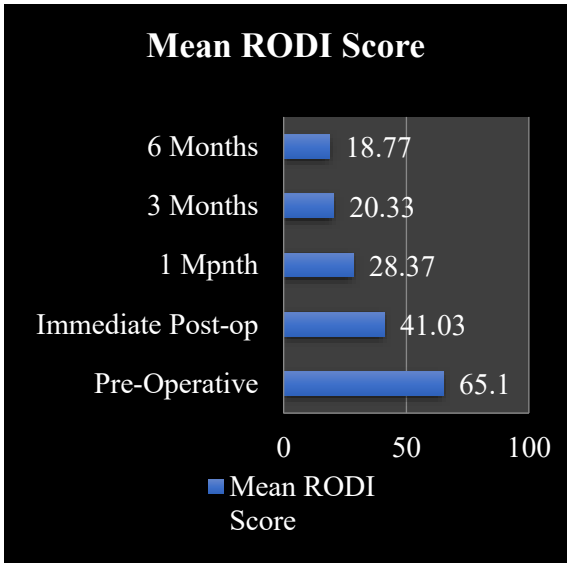
Mean RODI:
- Preoperative: 65.10



- 6 months: 18.77

• $p<0.001$

Significant improvement was observed at every follow-up interval.



DISCUSSION

The present study demonstrated significant improvement in pain and disability following decompressive laminectomy for lumbar canal stenosis. The mean age of patients was 52.5 years, consistent with the reports of Herno et al. and RajendraNath et al. The mean VAS score for back pain improved from 7.83 to 0.70 and leg pain improved from 5.53 to 0.83 at six months, indicating substantial symptomatic relief. Similarly, mean RODI improved from 65.10 to 18.77, demonstrating marked functional recovery. These findings support the role of decompressive laminectomy as an effective treatment modality in patients with lumbar canal stenosis who fail conservative management. Comparable improvements have been reported by Kwon et al., Iguchi et al., and Atlas et al. The study is limited by its small sample size, single-center design, and relatively short follow-up period of six months. Future multicenter studies with longer follow-up are warranted.

CONCLUSION

Decompressive laminectomy provides significant improvement in pain relief and functional outcomes in patients with lumbar canal stenosis. Significant reductions in VAS scores for back and leg pain and improvement in RODI scores were observed throughout the six-month follow-up period. Decompressive laminectomy remains an effective surgical option for appropriately selected patients with lumbar canal stenosis.

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