



Journal of Health and Medical Sciences

Alzahrani, A., Alhasani, M. A., & Jaaid, F. A. (2023), Study of Functional Outcome of Cervical Laminoplasty with Fixation Versus Cervical Laminoplasty without Fixation for Multiple Levels for Degenerative Cervical Spondylotic Myelopathy with Modified Japanese Orthopedic Association Score. *Journal of Health and Medical Sciences*, 6(1), 1-4.

ISSN 2622-7258

DOI: 10.31014/aior.1994.06.01.252

The online version of this article can be found at:
<https://www.asianinstituteofresearch.org/>

Published by:
The Asian Institute of Research

The *Journal of Health and Medical Sciences* is an Open Access publication. It may be read, copied, and distributed free of charge according to the conditions of the Creative Commons Attribution 4.0 International license.

The Asian Institute of Research *Journal of Health and Medical Sciences* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of Medicine and Public Health, including medicine, surgery, ophthalmology, gynecology and obstetrics, psychiatry, anesthesia, pediatrics, orthopedics, microbiology, pathology and laboratory medicine, medical education, research methodology, forensic medicine, medical ethics, community medicine, public health, community health, behavioral health, health policy, health service, health education, health economics, medical ethics, health protection, environmental health, and equity in health. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Journal of Health and Medical Sciences* aims to facilitate scholarly work on recent theoretical and practical aspects of Health and Medical Sciences.



ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

Study of Functional Outcome of Cervical Laminoplasty with Fixation Versus Cervical Laminoplasty without Fixation for Multiple Levels for Degenerative Cervical Spondylotic Myelopathy with Modified Japanese Orthopedic Association Score

Abdullah Alzahrani¹, Mohammad Abdullah Alhasani², Fahad Al Jeaid³

^{1,2,3} Orthopedic Surgeon, Taif University, Saudi Arabia

Correspondence: Abdullah Alzahrani. Email: abdullazahrani@tu.edu.sa

Abstract

Objective: To determine functional outcome of cervical laminoplasty with fixation versus without fixation for multiple levels of cervical spondylitis myelopathy. Cervical laminectomy is the standard operation for multiple cervical stenosis, which need decompressive surgery, however it is associated with significant number of recurrence and instability if it is not associated with posterior cervical fixation, usually the disease happens as a result go aging in old people mainly and most of the patients are old and fixation need times and expert, this makes the development of laminoplasty which lead to less instability which if it done in proper way it will not need fixation, in this study I review the outcome in patient have laminoplasty and fixation with patient who did not have associated fixation. **Materials and Methods:** 50 diagnosed cases of multiple level cervical myelopathy at king Abdulazaiz Hospital in Taif between 2012—2013 were retrospectively analyzed at, 1-year using MJOA. **Results:** 25 patients underwent 4 levels cervical laminoplasty with posterior lateral mass fixation compared to the same number of patients have 4 level cervical laminoplasty without fixation. The correlation between Duration of Symptoms to Preoperative and postoperative MJOA was statistically significant. We noted statistically significant improvement in symptoms of axial neck pain, radicular arm pain, and gait disturbances post operatively at one year in both groups. No difference between the group who had fixation with the group who did not regarding the improvement of symptoms and functional improvement. **Conclusion:** Functional outcomes in operated patients at 1-year follow up are the same after laminoplasty with or without fixation. But using fixation increases time of surgery. Symptoms of axial neck pain; radicular arm pain, clumsy hand and gait disturbances show significant improvement at one year follow up. While bladder and bowel involvement showed the least recovery. Significant improvement in function occurs 1 year postoperatively.

Keywords: Cervical Laminoplasty, Fixation, Degenerative Cervical Spondylotic Myelopathy, Orthopedic Association Score

1. Introduction

Cervical spondylotic myelopathy defined as clinical syndromes arising from a compression of neural structures due to disc herniation, hypertrophy of the facet joints and hypertrophy of ligaments, osteophyte formation. Most of the time it is treated conservatively, but if conservative treatment fails, surgical intervention is considered. The aim of surgery is to decompress, stabilize and to restore the alignment of the spine. LaRocca was one of the first to recommend early spinal cord decompression with or without stabilization to stop the progression of the disease for patients presenting with moderate functional disability. (LaRocca, 1988) most common surgical technique for multiple level stenosis includes laminectomy or laminoplasty with or without fixation, laminoplasty gives less instability and decompression.

In the present study, we have analyzed post-operative functional recovery in patients undergoing early operation within 6 months from the symptoms and late after 6 months from the symptoms anterior cervical decompression and fusion surgery for degenerative cervical spondylotic myelopathy according to 'Modified Japanese Orthopaedic Association Scores' (MJOA).

2. Material and Methods

Studies have been on 50 patient's diagnoses between January 2012 to April 2013 with clinical and radiological of cervical spondylotic myelopathy of multiple levels were prospectively analyzed using Modified Japanese Orthopedic Association scoring (MJOA). All cases were operated on with laminoplasty C4 - C6 posterior approach. MJOA scoring was done pre-operatively and post-operatively for 1 year. Data was collected by direct observations. Radiographs of the cervical spine (Anteroposterior and Lateral) and MRI of the spine were done in all cases. Data were analyzed using – McNemar Test: For comparison between preoperative and post-operative symptoms of the two groups at 1 year follow up of axial neck pain, arm pain, gait disturbances and bowel and bladder symptom. For correlation between Duration of symptoms till surgery and Pre-operative MJO Correlation between Duration of symptoms till and postoperatively MJOA at 1 year, Chi-Square tests (Pearson Chi-Square, Continuity Correction, Fisher's Exact Test): -For association among the cases between- Number of levels Mann-Whitney test: - For comparison of blood loss and Anesthesia time by number of levels.

3. Results

The mean age in our study group one: was 50 years with (± 9.36 SD) range of 30 years to 70 years. Out of 25 patients enrolled 15 patients were male and 10 were female.

- Group two Out of 25 patients, 14 patients male and 11 female, the mean age was 50. (± 9.37 SD)
- all patients presented with signs and symptoms of myelopathy (30 MJOA 14 and above), 20 patients had moderate disability (MJOA 10 to 13),

At one year follow up, group 11 20 patients had mild disability (MJOA 14 and above), 5 patients had moderate disability (i.e. MJOA 10 to 13). Group 19 patients had mild disability (MJOA 14 and above) 6 patients had moderate disability (MJOA 10 to 13). The correlation between duration of symptoms (months) to post-operative MJOA scores was statistically nonsignificant both groups. This suggests that there was no significant difference after surgery if we do fixation or no fixation with laminoplasty

Table 1: One-year post-operative

| MU | ML | Su | BL | TOTAL |
|-----|-----|-----|-----|-------|
| 3/7 | 5/7 | 3/7 | 3/3 | 20 |
| 3/7 | 5/7 | 3/7 | 3/3 | 10 |
| 4/7 | 6/4 | 2/7 | 3/3 | 15 |
| 2/7 | 5/7 | 3/7 | 2/3 | 5 |

| MU | ML | SU | BL | TOTAL |
|-----|-----|-----|-----|-------|
| 4/7 | 5/7 | 3/7 | 3/7 | 20 |
| 4/7 | 5/7 | 3/7 | 2/7 | 10 |
| 4/7 | 5/7 | 3/7 | 4/7 | 15 |
| 3/7 | 6/7 | 3/7 | 5/7 | 5 |

JOA: Japanese Orthopaedic Association score, MU: motor function in the upper extremities, ML: motor function in the lower extremities, SU: sensory function in the upper extremities, BL: bladder function.

4. Discussion

The management of cervical spondylotic myelopathy continues to be debated due to the inadequacy of information available about natural history of this disorder (Bernard and Whitecloud, 1987). However, there is some agreement in literature that a shorter duration of symptoms and milder neurological deficit prior to surgery yields a better post-surgical outcome.

And this study supports that Successful surgical treatment of cervical myelopathy depend on identifying the specific pathology responsible for clinical syndrome. The surgical approach is then directed to deal with the factors causing the spinal cord compression.

In our study, 50 patients of cervical spondylotic myelopathy were treated by laminoplasty with or without lateral mass fixation. Majority (60%) of patients presented with symptoms of myelopathy and radiculopathy. C4-C5-C6-C7. The correlation between Duration of Symptoms to preoperative and post-operative MJOA scores was nonsignificant in both group of patients.

5. Conclusion

Laminoplasty of cervical vertebrae from c4 to c7 show no difference in one year out come with or without fixation. We recommend not to do lateral mass fixation if proper laminoplasty for cervical spine done. Functional outcomes in operated patients at 1-year follow up are with no difference if laminoplasty with fixation or without fixation. Symptoms of axial neck pain radicular arm pain, clumsy hand and gait disturbances show significant improvement at one year follow up following surgery compared to bladder and bowel involvement which showed the least recovery. JOA: Japanese Orthopedic Association score, MU: motor function in the upper extremities, ML: motor function in the lower extremities, SU: sensory function in the upper extremities, BL: bladder function.

References

- Basu S, Sreeramalingam R 2012 Adjacent level spondylodiscitis after anterior cervical decompression and fusion. *Indian J Orthop.*, 46: 360-363.
- Bernard TN Jr, Whitecloud TS 3rd 1987 Cervical spondylotic myelopathy and myeloradiculopathy. Anterior decompression and stabilization with autogenous fibula strut graft. *ClinOrthopRelatRes.*, 149-160.

- Burkhardt JK, Mannion AF, Marbacher S, Dolp PA, Fekete TF, *et al.* 2013. A comparative effectiveness study of patient-rated and radiographic outcome after 2 types of decompression with fusion for spondylotic myelopathy: anterior cervical discectomy versus corpectomy. *Neurosurg Focus*, 35: E4.
- Burkhardt JK, Mannion AF, Marbacher S, Dolp PA, Fekete TF, *et al.* 2013 A comparative effectiveness study of patient-rated and radiographic outcome after 2 types of decompression with fusion for spondylotic myelopathy: anterior cervical discectomy versus corpectomy. *Neurosurg Focus.*, 35: E4.
- Chagas H, Domingues F, Aversa A, Vidal Fonseca AL, de Souza JM 2005. Cervical spondylotic myelopathy: 10 years of prospective outcome analysis of anterior decompression and fusion. *SurgNeurol.*, 64 Suppl 1: S1:30-35.
- Ding C, Hong Y, Liu H, and Shi R, Song Y, *et al.* 2013. Comparison of cervical disc arthroplasty with anterior cervical discectomy and fusion for the treatment of cervical spondylotic myelopathy. *ActaOrthopBelg.*, 79: 338-346.
- Ebersold MJ, Pare MC, Quast LM 1995. Surgical treatment for cervical spondylitic myelopathy. *J Neurosurg.*, 82: 745-751.
- G Hukuda S, Mochizuki T, Ogata M, Shichikawa K, Shimomura Y. 1985. Operations for cervical spondylotic myelopathy. A comparison of the results of anterior and posterior procedures. *J Bone Joint Surg Br.*, 67: 609-615.
- LaRocca H. 1988. Cervical spondylotic myelopathy: *natural history*. *Spine Phila Pa.*, 1976 13: 854-855.
- Lin Q, Zhou X, Wang X, Cao P, Tsai N, *et al.* 2012 A comparison of anterior cervical discectomy and corpectomy in patients with multilevel cervical spondylotic myelopathy. *Eur Spine J.*, 21: 474-481.
- Liu X, Min S, Zhang H, Zhou Z, Wang H, *et al.* 2014. Anterior corpectomy versus posterior laminoplasty for multilevel cervical myelopathy: a systematic review and meta-analysis. *Eur Spine J.*, 23: 362-372.
- Song KJ, Lee KB, Song JH 2012 Efficacy of multilevel anterior cervical discectomy and fusion versus corpectomy and fusion for multilevel cervical spondylotic myelopathy: a minimum 5-year follow-up study. *Eur Spine J.*, 21: 1551-1557.
- Wen ZQ, Du JY, Ling ZH, Xu HD, Lin XJ 2015. Anterior cervical discectomy and fusion versus anterior cervical corpectomy and fusion in the treatment of multilevel cervical spondylotic myelopathy: systematic review and a meta-analysis. *Ther Clin Risk Manag.*, 11:161-170.
- Yan D, Wang Z, Deng S, Li J, Soo C 2011 Anterior corpectomy and reconstruction with titanium mesh cage and dynamic cervical plate for cervical spondylotic myelopathy in elderly osteoporosis patients. *Arch Orthop Trauma Surg.*, 131:1369-1374.