

Effectiveness of Posterior Laminoforaminotomy in the Management of Lateral Cervical Soft Disc Herniation

Laminoforaminotomy
in the Management of
Lateral Cervical Soft
Disc Herniation

Mohammad Nasir and Fayyaz Ahmad

ABSTRACT

Objective: The outcome of this study will therefore determine the suitability of posterior laminoforaminotomy in the treatment of lateral cervical soft disc herniation.

Study Design: observational study

Place and Duration of Study: This study was conducted at the Department of Neurosurgery MTI HMC Peshawar from July 2022 to June 2023.

Methods: A total of fifty four patients were included in this study for the surgical management of lateral cervical soft disc herniation with laminoforaminotomy. The measure of effectiveness was done using Odom's criteria. All the analysis of the data was done employing SPSS.

Results: The patients' mean age was 42. 04±11, 57 years. The Odom's criteria to determine the efficacy were excellent in 39 (72. 2%) patients, good 10 (18. 5%), fair 3 (5. 6%) and poor 2 (3. 7%).

Conclusion: Posterior laminoforaminotomy can be recommended as an effective method of surgical treatment for lateral cervical soft disc herniation.

Key Words: Soft disc; Spine surgery; cervical foraminotomy; spondylosis

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INTRODUCTION

Cervical spine soft disc herniation is defined as the bulging of intervertebral disc beyond its normal margins and compressing the adjacent neural tissue^{1,2}. Lateral herniation is the extrusion of disc material into the outside of the spinal canal and could possibly impinge on nerve roots as they exit the neural foramen³. This condition often manifests as radiculopathy, a condition characterised by pain, numbness and muscle weakness in the area served by the affected nerve. At times, conventional treatments such as conservations and physical therapies can help alleviate the problems. However, if the symptoms persist or worsen, then the surgical surgery may be needed⁴⁻⁶.

Lateral cervical soft disc herniation is a major clinical challenge in the sphere of spinal disorders; it often causes severe pain and neurological deficits⁷. What is more, the posterior laminoforaminotomy (PLF) is now one of the most significant surgical ways of treatment for this specific disease.

This is an operation that is less invasive and which is carried out on the posterior cervical region. It focuses on the neural foramen which is a critical region where nerve root entrapment occurs due to herniated disc fragments^{8,9}.

PLF is derived from the principles of decompression with the aim of alleviating the neural compression and return the nerve roots to their normal state of functioning of the affected nerves¹⁰. Unlike the conventional open operations, PLF is characterized by minimal access and requires small incisions and special instruments to get to the intended area through the back part of the spine¹¹. Therefore, the effectiveness of posterior laminoforaminotomy depends on the ability of giving a direct and selective approach to the neural foramen to give the surgeon a view of the herniated disc and treat it correspondingly. This is because accessing the procedure through the back side minimizes the handling of the spinal cord; hence the possibility of experiencing challenges associated with the more invasive methods^{12,13}.

The rationale for posterior laminoforaminotomy in the treatment of lateral cervical soft disc herniation is that it is a selective procedure that is less traumatic and capable of providing adequate decompression of neural elements. Due to the constant advancements in both technology and process, this surgical method can be a more useful option in assisting patients who wish to have the troublesome symptoms of lateral cervical disc herniation relieved. Further clarification of the specificities and outcomes associated with this still-evolving component of spinal surgery will be obtained

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from the further analysis of clinical studies and cases. The objective of the study is to evaluate the role of posterior laminoforaminotomy in treating patients with lateral cervical soft disc herniation.

METHODS

This observational study was carried out in the MTI HMC Neurosurgery department, Peshawar from the months of July 2022 to June 2023. Posterior cervical laminoforaminotomy was performed in fifty four patients for the management of lateral cervical soft disc herniation and this did not exclude any patient based on the age or gender. This investigation also did not include patients who had a prior cervical anterior or posterior fusion or those who had undergone laminectomy or multi-segment, or bilateral posterior cervical fusion at the same time.

Patients or their families were offered informed consent after the research proposal was approved by the hospital’s ethics council. The reviewed patients’ records included their age, gender, handedness, previous conditions, current diagnosis, neuroimaging findings, treatment details, and outcomes with focus on the symptoms that improved or worsened and their aftermaths. Cervical radiculopathy was confirmed using magnetic resonance imaging for diagnosis while computed tomography was used to establish the cause of the cervical radiculopathy such as foraminal stenosis, osteophyte or lateral disc herniation. X-rays were used for assessing the straightening of the spine, height of disc, and kyphotic deformity. NCS and EMG were done in some cases where multiple levels were affected to determine which level was involved. Odom’s criteria were used to assess the Effectiveness of the procedure. Sample size was determined by openepi, previous proportion of fair outcome 3. 6%, margin of error 5% and confidence interval of 95%. Data entry was done using a form developed from the study tool while the analysis of the patients’ data was done using Statistical Package for Social Sciences (SPSS) version 21.

RESULTS

The present study was under taken on 54 patients having mean age of 42. 04 ± 11. 57 years. The male

patients were 35 of them while the female patients were 19 in number. The symptoms upon presentation was which included pain in the arms 29 (53. 7%), pain in the neck 12 (22. 2%), motor weakness 7 (13%) and tingling with numbness was seen in 6 (11. 1%) patients. The levels of cervical discs involved are indicated in table 2. The outcome based on the Odom’s criteria was excellent in 39, good in 10, fair in 3 and poor in 2 patients. Two patients developed infection in the post-procedure period, one underwent reoperation and one patient had CSF leak.

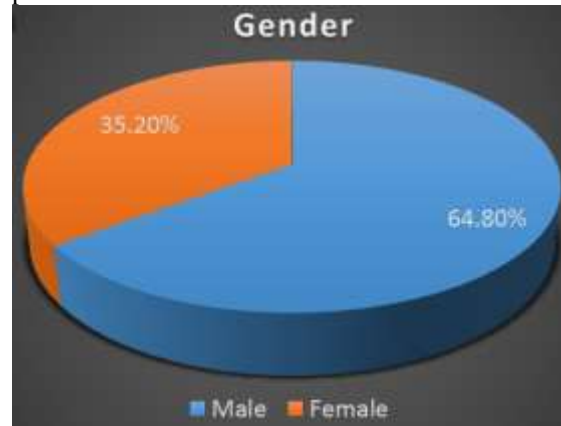


Figure No. 1: Gender distribution

Table No. 1: Cervical discs levels

Cervical discs levels	Frequency	Percent
C3-4	3	5.6
C4-5	4	7.4
C5-6	16	29.6
C6-7	31	57.4
Total	54	100.0

Table No. 2: Efficacy of the treatment

Efficacy of the treatment	Frequency	Percent
Excellent	39	72.2
Good	10	18.5
Fair	3	5.6
Poor	2	3.7
Total	54	100.0

Table 3: Association of the efficacy of the treatment with gender

		Gender		Total	P value
		Male	Female		
Efficacy	Excellent	26	13	39	0.64
		66.7%	33.3%	100.0%	
	Good	7	3	10	
		70.0%	30.0%	100.0%	
	Fair	1	2	3	
		33.3%	66.7%	100.0%	
	Poor	1	1	2	
		50.0%	50.0%	100.0%	
Total		35	19	54	
		64.8%	35.2%	100.0%	

DISCUSSION

The utilization of the posterior cervical approach is less common in comparison to its anterior counterpart. Anterior surgery and corpectomy for cervical disc hernia and cervical spondylotic myelopathy have many drawbacks, usually necessitating strong bone grafts. The fusion rates decrease in older individuals, those with diabetes, and smokers, and are often accompanied by neighboring segment illness and difficulties with the graft. As a result, posterior surgery remains popular due to its wide range of surgical purposes.¹⁵

Various studies have suggested that degenerative alterations in the spine are more common in men of middle to old age. A study of 34 instances revealed a male predominance, with 26 males and 8 females. The age range of the participants was between 36 and 68 years, with an average age of 53.6 years¹⁶. A separate study emphasized the significant occurrence of cervical degenerative radiculopathy in males (54.3%) aged between 34 and 66 years¹⁷. Consistent with these findings, our study discovered that 64.8% of the participants were male, with an average age of 42.04 years.

The most frequent occurrence of cervical radiculopathy is at the C6-7 level, with the C5-6 level being the second most prevalent. An analysis of 35 instances revealed that the C6-7 level was the most prevalent (51.4%), followed by C5-6 (28.8%)¹⁷. The results we obtained exhibit a similar trend, with C6-7 accounting for 57.4% and C5-6 accounting for 29.6%.

The clinical outcomes of the cervical posterior foraminotomy have been consistently described as highly favorable, with a success rate above 90% in a significant proportion of cases¹⁷. Another study involving 736 individuals indicated a 96% rate of pain alleviation and a 98% rate of recovery of motor impairments. A study involving 89 cases examined the outcomes of cervical posterior foraminotomy. The patients were monitored for a duration of 8.6 months, and the rates of favorable and outstanding results were determined to be 95% based on Odom's criteria. A study¹⁸ involving 162 cases found that 95% of patients experienced a complete resolution of preoperative symptoms. Postoperative follow-up was conducted for a duration of 77 months, and it was highlighted that foraminotomy did not contribute to an increased likelihood of kyphosis. Within a study encompassing 84 patients, it was observed that among those patients who were monitored for an average duration of 8 years, a remarkable 96% achieved outcomes that were classified as either very good or good¹⁹. The current study, involving 54 patients, found that 72.2% of patients achieved excellent postoperative results, while 18.5% of patients achieved good results. In our study 90.7% recovery rate was recorded in preoperative symptoms.

Concerning laminoforaminotomy, a study reported a 2.2% or higher intraoperative complication rate.²¹. However, our study of 54 patients showed no major complications, with infection observed in 3.7% of patients, reoperation in 1.9%, and CSF leak in 1.9%.

CONCLUSION

From our study we conclude that posterior laminoforaminotomy is an effective procedure for the management of lateral cervical soft disc herniation with overall 90.7% success rate and 7.5% complications rate.

Author's Contribution:

Concept & Design of Study: Mohammad Nasir
 Drafting: Fayyaz Ahmad
 Data Analysis: Fayyaz Ahmad
 Revisiting Critically: Mohammad Nasir
 Final Approval of version: Mohammad Nasir

Conflict of Interest: The study has no conflict of interest to declare by any author.

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