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Original Research Article

Outcome of decompression, correction and fusion for cervical spondylotic myelopathy with kyphotic deformity

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ABSTRACT

Background: Cervical spondylotic myelopathy (CSM) with kyphotic deformity is a common degenerative spinal disorder that leads to progressive spinal cord compression and neurological deterioration. Objectives were to evaluate the outcome of decompression by laminectomy with correction by lateral mass fixation and fusion for CSM with kyphotic deformity.

Methods: Assessments were done pre-operatively and postoperatively at 1-, 2-, 3-, and 6-months using visual analogue score (VAS), modified Japanese orthopedic association (mJOA), Odom criteria, Nurick's grading, and cervical curvature index. Data were analyzed using standard statistical methods via the statistical package for social sciences (SPSS) version 25 (IBM®, Armonk, USA). A $p<0.05$ was considered statistically significant.

Results: The mean VAS score significantly improved from 6.27±1.75 to 0.73±0.59 at 6 months. The mean mJOA score increased from 11.27±0.80 preoperatively to 16.53±0.74 at the final follow-up, indicating substantial neurological improvement. According to the modified Odom criteria, 33.3% of patients had excellent outcomes, 60.0% had good outcomes, and 6.7% had fair outcomes. Functional status measured by Nurick's grading improved significantly, with 93.3% of patients in grade III preoperatively and 100% improving to either grade 0 or I by 6 months ($p<0.001$). The cervical curvature index showed marked radiological correction, improving from -8.24±2.59 preoperatively to 21.94±1.35 postoperatively ($p<0.001$).

Conclusions: Posterior decompression by laminectomy with lateral mass fixation and fusion is an effective and safe surgical technique for managing CSM with kyphotic deformity. It significantly improves neurological function, pain status, and cervical alignment.

Keywords: Cervical spondylotic myelopathy, Kyphotic deformity, Laminectomy, Lateral mass fixation, Posterior decompression

INTRODUCTION

Cervical myelopathy was first described by STOOKY in 1928. The most prevalent kind of spinal cord dysfunction in older people is CSM, which narrows the spinal canal and compresses the spinal cord and nerve roots, leaving adults with atraumatic quadriplegia.[1] Up to 5% of adults over 40 years of old are affected by this condition.[2] It frequently affects several spinal levels, which causes a steady decline in neurological function.[3]

Ossification of the posterior longitudinal ligament (OPLL), cervical stenotic myelopathy, and multi-segmental spinal cord compression due to CSM are the hallmarks of multilevel cervical degenerative myelopathy. Progressive degeneration of the facet joint and discs causes cervical kyphosis, which frequently results in the coexistence of OPLL with CSM and cervical stenotic myelopathy.[4]

Progressive subluxation of the apophyseal joints as a result of degenerative alterations in the facet joints and discs causes the kyphotic deformity linked to cervical spondylosis. The spinal cord moves to the anterior segment of the spinal canal and lean against the posterior portion of the vertebral bodies at the apex of the deformity in patients with kyphotic abnormalities. The anterior portion of the spinal cord experiences an increase in mechanical stress as kyphosis progresses especially in cervical flexion movement.[5]

Whether an anterior or a posterior approach is utilized, the primary goal of surgical intervention for patients with multilevel cervical myelopathy associated with cervical kyphosis is to decompress the spinal cord and restore the normal sagittal orientation. Nevertheless, multilevel anterior approach decompression has been linked to a higher risk of cord injury, cerebrospinal fluid leakage, graft failure, and pseudoarthrosis; additionally, if the segmental instability and kyphotic deformity were not addressed during the surgical procedure, the residual anterior compression following the posterior approach could impede neurological recovery.[4]

An anterior surgical technique is generally utilized for single-level CSM because it provides more stability while addressing compressing elments with less damage and loss of muscle.[6]

Given the higher risk of complications linked to anterior surgery, the posterior approach is more advantageous in CSM patients with three or more compromised spinal cord segments.[7] Laminectomy without fusion, laminectomy with instrumented fusion, and laminoplasty are the posterior alternatives. The position of the cord compression, number of levels involvement, sagittal alignment, instability, concomitant axial neck pain, and risk factors for pseudoarthrosis are all the aspects that should be taken into account while choosing the surgical technique. In terms of posterior surgical methods, laminectomy has traditionally been the treatment standard for CSM decompression.[8]

Subsequently posterior fusion was included alongside laminectomy to address the instability that resulted from the removal of posterior elements. This has decreased the rates of segmental instability and kyphosis.[9] In Bangladesh, there has been some isolated studies focusing on either of the surgical procedures for CSM.

So, this study was designed to observe the outcome of decompression, correction and fusion for CSM with kyphotic deformity.

METHODS

This prospective interventional study was carried out at the department of orthopaedic surgery at Bangladesh medical university (BMU), Shahbag, Dhaka, from July 2024 to June 2025. A total 30 patients who underwent posterior decompression, correction and fusion by ACBG. The patients were selected on the basis of the inclusion and exclusion criteria.

Inclusion criteria

Patient with age more than 45 years, both gender, patient with multi-level CSM, patient with failed conservative treatment, and with kyphotic deformity or instability were included.

Exclusion criteria

Patient with cervical spine injury like fracture or dislocation, inflammatory and autoimmune disorder like Ankylosing spondylitis, rheumatoid arthritis, patient with infection, patient with cervical tumour, patient with neuromuscular disorder, mentally and physically unfit patient were excluded.

After taking informed consent, detailed history and physical examination of each patient was performed. Plain radiographs and MRI of cervical spine were obtained in all patients. All necessary investigations for surgery were performed before operation.

Patients were selected by purposive non-randomized sampling method for the operative procedure. A structured case record form was used to interview and collect data. Patients were interviewed and case record form was filled up by the interviewer. Perioperative events were noted. Functional outcome was measured by using VAS for neck pain, Nurick grading for neurological status, modified Odom outcome criteria and mJOA for motor and sensory function of upper and lower extremities at 1st month, 2nd month, 3rd month and 6th month with a structured case record form. The analyses of different variables were done according to standard statistical analysis. Qualitative data was expressed as frequency and percentage and analyzed by chi-square test. Quantitative data was expressed as mean and standard deviation and analyzed by student t-test (parametric) and Mann-Whitney U test (non-parametric). Data was processed and analyzed using software SPSS version 25, IBM®, Armonk, USA. For all analyses, statistical significance was set at $p<0.05$ and confidence interval set at 95% level.

Surgical technique

All patients received detailed counseling regarding the surgical procedure, including the available treatment options along with their respective merits and demerits. Possible postoperative sequelae were also discussed thoroughly. Preoperative MRI, CT scan, and cervical Xrays (anterior-posterior and lateral views) were reviewed to confirm cord compression, kyphotic alignment.

The operative field was cleaned and shaved. All patients were catheterized preoperatively. Intravenous administration of prophylactic antibiotics was given. Under general anesthesia, patients were positioned prone on a radiolucent table with reverse Trendelenburg position. Chest pads and 60°-90° flexion at the knees were used to reduce epidural venous bleeding. The tong traction was applied to maintain alignment. A midline longitudinal skin incision was made over the posterior cervical spine from C2 to T1 or as per involved levels. Subperiosteal dissection exposed the spinous processes, laminae, and lateral masses bilaterally-typically from C3 to C7. Care was taken to avoid injury to the facet joint capsule. Lateral mass screws were inserted before decompression to preserve anatomical landmarks. The Magerl technique was commonly used, guided by anatomical landmarks and fluoroscopy. Tapping, probing, and screw insertion were performed from C3 to C6/C7 as required.

A posterior laminectomy was performed. The spinous processes with ligaments were resected. Fenestration was done by removing the ligamentum flavum between the laminae of the desired levels. Laminae were excised using a high-speed burr or Kerrison up-cut rongeur. All removed bone was preserved for later use as autologous graft material. If required, foraminotomy was performed to decompress the exiting nerve roots. Adrenaline-soaked cotton was applied over the dura and nerve roots to control bleeding. Any remaining disc material and cartilaginous endplates were removed, and the bony endplates were decorticated. Decortication of the lateral masses was performed. Autologous bone grafts obtained from the laminectomy were placed over the decorticated surfaces. Titanium rods were contoured and fixed to the lateral mass screws. After releasing tong traction, the construct was gently compressed to restore cervical lordosis and ensure graft stability. Position of the screw and lordosis was cheeked by fluoroscopy per-operatively. Hemostasis was achieved using unipolar, bipolar cautery and gel foam throughout the procedure.

RESULTS

A total of 30 patients diagnosed with CSM who met the predefined inclusion and exclusion criteria were enrolled in the study. Postoperative follow-up assessments were conducted at 1st, 2nd, 3rd and 6th month. All clinical and radiological data were systematically compiled, statistically analyzed, and presented in tabulated form to evaluate surgical outcomes and recovery.

Table 1 provides a summary of the age distribution among the study participants. Most patients (60%) fell within the 51-60 years' age group, followed by 26.66% in the 61-70 years' group. The smallest proportion, 13.33%, belonged to the 41-50 years range. The average age of the study population was 57.13 years, with a standard deviation of 6.14, and the ages ranged from 48 to 63 years, reflecting that the participants were predominantly in the late middle-aged to early elderly category.

Figure 1 illustrates the distribution of the study patients by gender (n=34). The majority of participants were male, accounting for 73% (11 patients), while 27% (4 patients) were female. This indicates a male predominance in the study population. Table 2 summarizes the clinical features observed among the study participants. The most frequently reported findings were numbness and clumsiness of the hand, plantar reflex bilaterally extensor, and positive long tract signs, each present in 100% of patients. Other common features included positive root tension signs (86.7%), neck pain (80.0%), sensory involvement (80.0%), and exaggerated knee and ankle reflexes (80.0%). Motor involvement was noted in 60.0% of cases, while gait instability was present in 53.3%. A smaller subset (20.0%) had weakness in both lower limbs.

Table 3 presents the frequency of cervical spinal level involvement among the patients. The C5-C6 level was involved in 100% of cases, making it the most commonly affected segment. This was followed by C6-C7 in 66.7%, C4-C5 in 60.0%, and C3-C4 in 33.3% of patients. Table 4 shows the distribution of postoperative complications among the study patients. The majority of patients (66.7%) experienced no complications. Nerve root injury was done in only 2 patients (6.7%), Dural tear only 3 patients (10%) and Seroma formation observed in 5 patients (16.66%).

Table 5 shows changes in VAS scores for neck pain among study patients over time. Mean preoperative VAS score was 6.27±1.75, which steadily decreased postoperatively, reaching 0.73±0.59 at 12 months. Reduction in pain was found to be statistically significant (p<0.001).

mJOA scores of the study patients at different time points. The mean preoperative mJOA score was 11.27±0.80, which showed progressive improvement after surgery, reaching 16.53±0.74 at the 12-month follow-up. This increase in scores indicates significant neurological recovery over time. Difference between the preoperative and 12-month postoperative scores was statistically significant (p<0.001), as determined by a paired t-test.

cervical curvature index among the study patients to evaluate correction of kyphotic deformity. The mean preoperative curvature was 8.594±3.94, indicating kyphosis. Significant postoperative improvement was observed, with the index rising to 21.15±2.539 at 12 months. The change from preoperative to 12-month postoperative values was statistically significant (p<0.001). Table 6 summarizes the changes in Nurick's grading for CSM before and after surgery. Preoperatively, the majority of patients were graded as grade III (93.3%), and one patient was in grade IV (6.7%). By the 12-month follow-up, 60.0% had improved to grade 0, and 40.0% to grade I, indicating marked functional recovery. The improvement was statistically significant (p<0.001).

The postoperative functional outcomes of patients based on the modified Odom criteria. The majority of patients 9 (60.0%) reported a good outcome, while 5 (33.3%) experienced an excellent recovery. Only one patient 1(6.7%) was classified as having a fair outcome, and no patients were rated as poor.

Table 1: Distribution of the study patients according to age, (n=30).

Age (in years)	N	Percentage (%)
41-50	4	13.33
51-60	18	60.0
61-70	8	26.66
Total	30	100
Mean±SD and range	57.13±0.14, 48-63	

Table 2: Distribution of the study patients according to clinical features, (n=30).

Clinical feature*	N	Percentage (%)
Neck pain	24	80.0
Numbness and clumsiness of hand	30	100.0
Gait instability	16	53.3
Root tension signs positive	26	86.7
Sensory involvement	24	80.0
Motor involvement	18	60.0
Both lower limb weakness	6	20.0
Knee and ankle jerk exaggerated	24	80.0
Plantar reflex bilaterally extensor	30	100.0
Long tract signs positive	30	100.0

*Multiple answers.

Table 3: Distribution of the study patients according to cervical level of involvement, (n=30).

Levels*	N	Percentage (%)
C3-C4	10	33.3
C4-C5	18	60.0
C5-C6	30	100.0
C6-C7	20	66.7

*Multiple answers.

Table 4: Distribution of study patients according to complications, (n=30).

Complication	N	Percentage (%)
None	20	66.66
Seroma	5	16.66
Dural tear	3	10
Nerve root injury	2	6.66
Total	30	100

Table 5: Distribution of the patients according to VAS score, mJOA score and cervical curvature index for kyphotic deformity for neck pain, (n=30).

Index with mean±SD (min-max)	Pre operative	1st month	2nd month	3rd month	6th month	P value
VAS (Neck pain)	6.27±1.75 (3.00-8.00)	3.20±0.77 (2.00-4.00)	2.13±0.64 (1.00-3.00)	1.07±0.26 (1.00-2.00)	0.73±0.59 (0.00-2.00)	<0.001*
mJOA score	11.27±0.80 (10.00-12.00)	14.00±0.85 (13.0-16.0)	15.00±0.84 (14.0-16.0)	15.93±0.70 (15.0-17.0)	16.53±0.74 (16.0-18.0)	<0.001*
Cervical curvature index for kyphotic deformity	-8.24±2.59 (-11.56 to -3.55)	21.70±1.43 (19.50 to 24.55)	21.82±1.35 (19.70 to 24.57)	21.89±1.35 (20.00 to 24.80)	21.94±1.35 (20.00 to 24.80)	<0.001*

*Paired t Test (preoperative vs post-operative at 6 months follow up).

Table 6: Distribution of patients according to modified Odom criteria and Nurick's grading system for CSM, (n=30).

Modified Odom criteria	Excellent	Good	Fair	Poor	Total
Frequency	10	18	2	0	30
Percentage	33.3%	60%	6.7%	0	100%
Nurick's grade	**0**	**I**	**III**	**IV**	**P value**
Preoperative	0 (0.0%)	0 (0.0%)	28 (93.3%)	2 (6.7%)	<0.001*
At 6 month postoperative	18 (60.0%)	12 (40.0%)	0 (0.0%)	0 (0.0%)	<0.001*

*Wilcoxon signed rank test (preoperative vs post-operative at 6 months follow up).

Figure 1 (A-C): X-ray, MRI and CT scan of CSM.

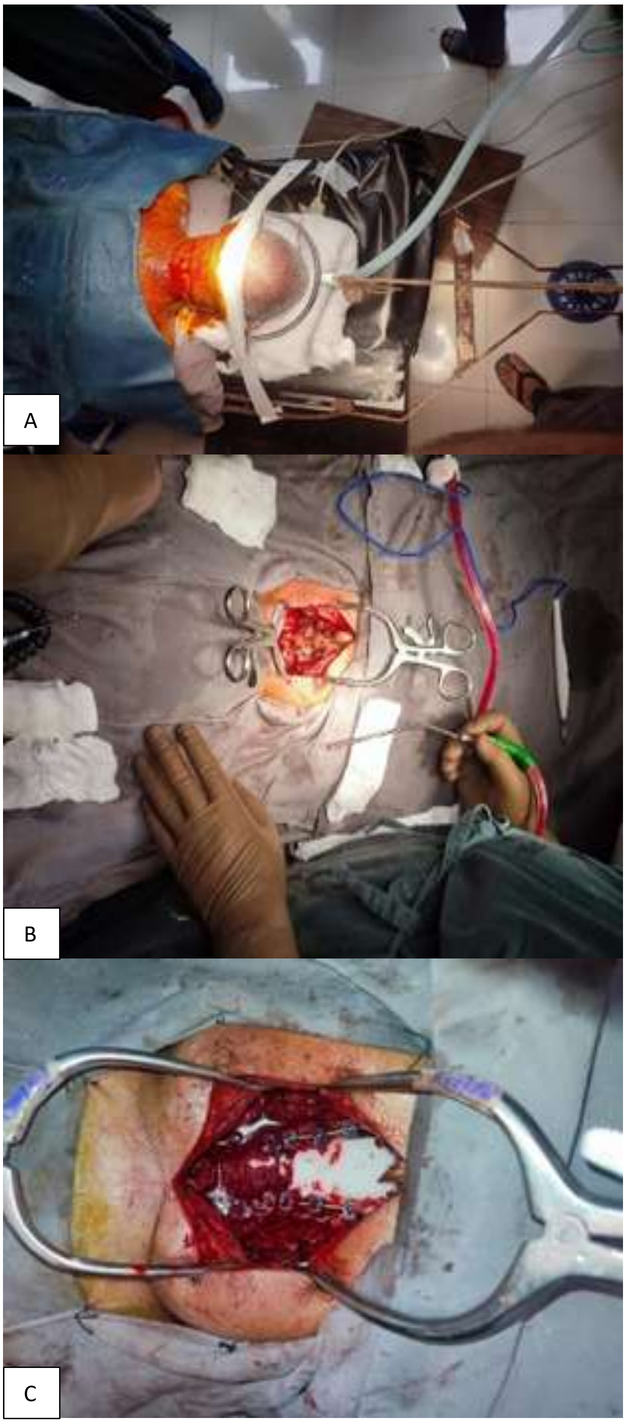

Figure 2 (A-C): Positioning, incision and exposure and lateral mass screw insertion.

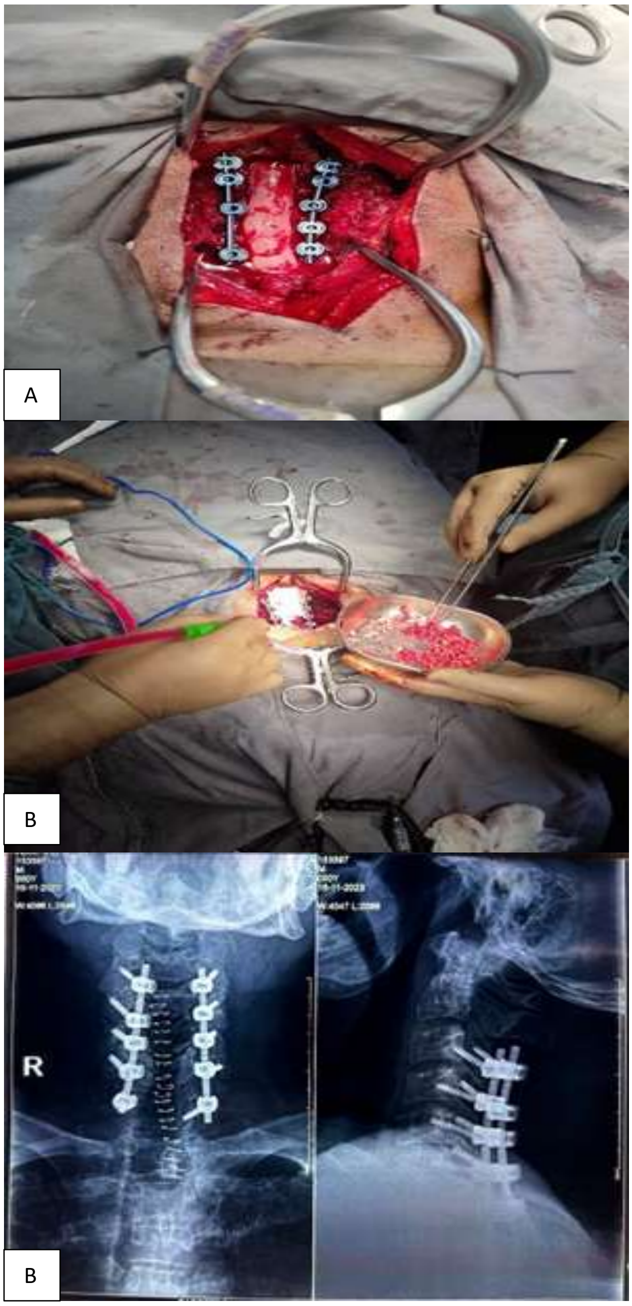

Figure 3 (A-C): Decompression by laminectomy, and fusion by bone graft.

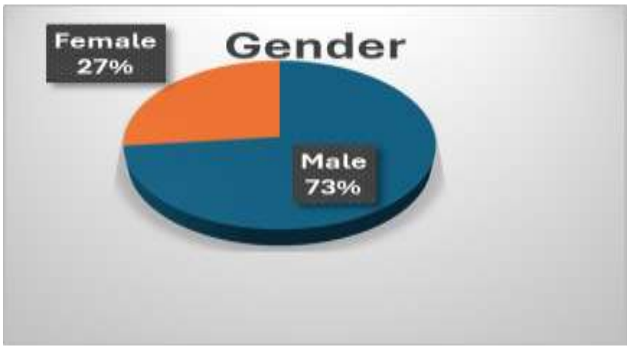

Figure 4: Distribution of the study patient by gender, (n=30).

DISCUSSION

The age distribution among the study participants showed that the majority (60%) were between 51 and 60 years old, followed by 26.66% in the 61-70 age group, while the smallest portion (13.33%) fell within the 41-50 range. The average age was 57.13 years with a standard deviation of 6.14, and participant ages ranged from 48 to 63 years, indicating that most individuals were in the late middle-aged to early elderly category. This demographic trend suggests that the condition, under study predominantly affects individuals in their sixth and seventh decades of life, possibly reflecting age-related physiological changes or cumulative exposure to risk factors. Comparable patterns are observed in other studies reported ages ranging from 52 to 68 years with a mean of 58±7.8, and another study included 59 patients with a mean age of 61.14±7.17, ranging from 47 to 75 years.[11,13] These consistent findings across various studies underscore a clear age-related trend.

The gender distribution among the study participants (n=30) revealed a clear male predominance, with 73% (22 patients) male and only 27% (8 patients) female. This pattern aligns with findings from several other studies, suggesting a consistent trend. For instance, 22 males and just 2 females out of 24 patients, similarly, 14 men and 6 women among 20 participants.[12,13] These consistent observations across multiple studies highlight a recurring male predominance in this clinical context.

The clinical features observed among the study participants revealed a consistent pattern of neurological impairment. The most universally reported symptoms were numbness and clumsiness of the hand, bilaterally extensor plantar reflexes, and positive long tract signs-all present in 100% of patients. Other commonly noted findings included positive root tension signs (86.7%), neck pain (80.0%), sensory disturbances (80.0%), and exaggerated knee and ankle reflexes (80.0%). Motor involvement was documented in 60.0% of cases, while gait instability affected 53.3% of patients. A smaller proportion (20.0%) experienced bilateral lower limb weakness. These clinical findings suggest a predominance of cervical myelopathy and radiculopathy-related symptoms in the study cohort. Similar trends were reported, where all 40 patients exhibited gait difficulty and myelopathic signs, while 34 reported sensory changes and 36 had motor weakness in both upper and lower limbs. Neck pain ranged from mild (n=35) to moderate (n=5), and a subset experienced radiculopathy (n=8) and bowel or bladder involvement (n=4).[13] Another study described presenting features such as upper extremity weakness (n=31), lower extremity weakness (n=23), extremity hypesthesia (n=29), gait instability (n=24), hyperreflexia (n=33), Hoffmann sign (n=21), Babinski sign (n=13), and clonus (n=8).[4] The consistency across studies underscores the importance of a thorough neurological examination for timely diagnosis and appropriate management of cervical spinal pathology.

The frequency of cervical spinal level involvement among the study participants showed that the C5-C6 segment was the most commonly affected, observed in 100% of cases. This was followed by involvement of C6-C7 in 66.7% of patients, C4-C5 in 60.0%, and C3-C4 in 33.3%, indicating a predominance of mid to lower cervical spine pathology. These findings are consistent with patterns observed in other studies. Similarly found involvement at C3-C5 (n=12), C4-C6 (n=6), and C3-C6 (n=2), reinforcing the frequent implication of adjacent cervical segments.[13] Another study reported surgical foraminotomies at C4/5 in 12 cases, C5/6 in 16 cases, and C6/7 in only 1 case, with multiple level involvement noted in several patients (e.g., C4/5 and C5/6 in 9 cases, C5/6 and C6/7 in 4 cases).[14] Collectively, these data highlight C5-C6 as a critical segment in cervical spine pathology, likely due to its biomechanical vulnerability and frequent exposure to degenerative changes.

The distribution of postoperative complications among the study patients indicated that the majority (66.7%) experienced no adverse events, reflecting a favorable surgical outcome. The complications recorded was seroma formation in 5 patients (16.66%), Dural tear in 3 patients (10%), and Nerve root injury in 2 patients (6.66%). This low complication rate reported cord or nerve root injury, dural tears, or thrombosis, with only one case of transient urinary retention and two cases of superficial wound infections in diabetic patients.[15] In contrast, other studies documented a wider range of complications. In a larger cohort of 100 patients, observed 3 cases each of superficial wound infection and C5 root pain, along with 2 dural tears and 2 postoperative neurological deficits.[1] Another study noted that 4 of 43 patients (9.3%) experienced axial symptoms, and only two patients failed to achieve full recovery due to disease severity.[4] Overall, while minor complications are not uncommon across various studies.

The VAS scores for neck pain among the study patients showed a significant improvement over time. The mean preoperative VAS score was 6.27±1.75, which steadily decreased to 0.73±0.59 at 6 months postoperatively, indicating a substantial reduction in pain ($p<0.001$). This trend is supported by similar findings in other studies reported a preoperative mean VAS of 7±0.82 that decreased to 0.7±0.68 at 12 months, also statistically significant ($p<0.001$).[13] A significant reduction in VAS scores from 5.52±1.03 preoperatively to 2.97±1.93 at a 2-year follow-up ($p<0.001$).[15] Another study reported a marked decrease in axial neck and shoulder pain, with postoperative VAS scores dropping to 10.6±5.3 from 37.4±12.1 preoperatively ($p<0.001$).[4] Collectively, these consistent findings across multiple studies confirm the effectiveness of the surgical interventions.

The mean mJOA scores among the study patients demonstrated significant neurological improvement over time following surgery. The preoperative mean mJOA score was 11.27±0.80, which progressively increased postoperatively, reaching 16.53±0.74 at the 6-month follow-up. Similar improvements have been reported across various studies observed an increase from a preoperative mean of 7.3±3.34 to 11.5±4.25 at 12 months ($p<0.001$).[13] An improvement from 13.13 to 16.14 ($p=0.001$), while Jain et al reported a rise from 10.21 preoperatively to 14.4 postoperatively.[12] Another study documented mean mJOA scores improving from 8.2±2.1 to 12.7±2.8 and an increase from 8.86±1.21 preoperatively to 14.66±1.18 postoperatively ($p<0.001$).[1,11] So, these findings reinforce that surgical intervention leads to marked and statistically significant neurological recovery as measured by mJOA scores.

The postoperative functional outcomes based on the Modified Odom Criteria showed that the majority of patients experienced favorable recoveries. Specifically, 50.0% of patients reported a good outcome, while 33.3% had an excellent recovery, 3 patients (10.0%) were having a fair outcome and only 2 patients were rated as poor, indicating generally positive surgical results. Comparable findings were observed in other studies reported 50.0% of patients with excellent outcomes, 30% with good recovery, 10% fair, and 10% poor outcomes.[13] Another study found 27% excellent, 54% good, 19% fair, and no poor outcomes.[8] Overall, these data suggest that most patients undergoing the procedure achieve good to excellent postoperative status according to the modified Odom criteria.

The changes in Nurick's grading before and after surgery demonstrated significant functional improvement among the patients. Preoperatively, most patients were classified as grade III (93.3%), with 2 patients at grade IV (6.7%). At the 6-month follow-up, 60.0% of patients improved to grade 0, and 40.0% improved to grade I, indicating substantial recovery ($p<0.001$). Similar positive outcomes were reported 84% of patients improved by at least one Nurick grade, and none showed deterioration.[10] All patients initially at grades III and IV improving to grades I and II, respectively, with those in grade V showing notable postoperative improvements as well.[13] Another study found an average 1-point improvement in Nurick grades ($p=0.001$).[12] Collectively, these findings underscore the effectiveness of surgical intervention in significantly enhancing neurological function.

The progression of the cervical curvature index among the study patients showed a significant correction of kyphotic deformity following surgery. The mean preoperative curvature was 7.24±2.59°, indicating kyphosis, which improved markedly to 19.94±1.35° at 6 months postoperatively. This change was statistically significant ($p<0.001$), reflecting successful restoration of cervical lordosis. Comparable findings were reported a significant increase in curvature index from 8.4±2.5% preoperatively to 19.3±2.1% postoperatively ($p<0.001$).[4] Similarly reported significant curvature correction, improving 10.7±4.2° postoperatively than preoperatively.[14] Overall, these results indicate that surgical intervention effectively improves kyphotic cervical deformities initially, though some degree of correction loss may occur over time, emphasizing the importance of long-term follow-up in assessing surgical outcomes.

Limitations

This study was conducted at a single facility-based hospital, so the study population may not represent the whole community. There were no comparison groups to compare the outcome with different extramedullary and intramedullary operative techniques. Long-term outcome couldn't be assessed due to the short follow-up duration. Fusion was assessed by plain radiographs only, which may not detect pseudarthrosis accurately.

CONCLUSION

The present study demonstrates that decompression by laminectomy with lateral mass fixation and fusion is an effective surgical intervention for CSM associated with kyphotic deformity. Patients exhibited significant neurological recovery as evidenced by improvements in mJOA scores and Nurick's grading. Additionally, substantial pain relief was observed through a marked reduction in VAS scores. Postoperative restoration of cervical alignment by cervical curvature index. Functional outcomes assessed by the Modified Odom Criteria also indicate high rates of good to excellent recovery, with minimal complication rates and relatively short hospital stays.

Recommendations

Conduct large-scale, multicenter studies to increase external validity and reduce selection bias. Extend follow-up beyond 6 months to evaluate long-term maintenance of alignment, neurological recovery, and late-onset complications. Include comparative groups undergoing different surgical approaches for more robust outcome assessment.

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REFERENCES

1. Singh DK, Kumar V, Yadav K, Mohammad K, Sharma PK. Comparative outcome analysis of lateral mass fixation and trans-facet fixation with posterior decompression in the management of cervical spondylotic myelopathy: An institutional experience. J Craniovert Junct Spine. 2022;13(3):357-63.
2. Adnan M, Khan MJ, Rehman AUR, Shams S, Zahid H, Mumtaz S. Comparison of Laminoplasty with Laminectomy and Fusion in the management of Multilevel Cervical Spondylotic Myelopathy. Pak J Med Health Sci. 2020;14(1):5-8.
3. Guan L, Hai Y, Yang JC, Zhou LJ, Chen XL. Anterior cervical discectomy and fusion may be more effective than anterior cervical corpectomy and fusion for the treatment of cervical spondylotic myelopathy. BMC Musculosk Dis 2015;16(1):1-9.
4. Du W, Zhang P, Shen Y, Zhang Y, Ding W, Ren L. Enlarged laminectomy and lateral mass screw fixation for multilevel cervical degenerative myelopathy associated with kyphosis. Spine J. 2014;14(1):57-64.
5. Uchida K, Nakajima H, Sato R. Cervical Spondylotic Myelopathy Associated with Kyphosis or Sagittal Sigmoid Alignment: Outcome after Anterior or Posterior Decompression. J Neurosurg. 2009;11:521-8.
6. Kawakami M, Tamaki T, Iwasaki H, Yoshida M, Ando M, Yamada H. A Comparative Study of Surgical Approaches for Cervical Compressive Myelopathy. Clin Orthopaed Rel Res. 2000;381:129-36.
7. Rhee JM, Basra S. Posterior Surgery for Cervical Myelopathy: Laminectomy, Laminectomy with Fusion, and Laminoplasty. Asian Spine J. 2008;2(2):114.
8. Highsmith JM, Dhall SS, Haid RW, Rodts GE, Mummaneni PV. Treatment of cervical stenotic myelopathy: A cost and outcome comparison of laminoplasty versus laminectomy and lateral mass fusion-Clinical article. J Neurosurg Spine. 2011;14(5):619-25.
9. Chen Y, Guo Y, Chen D, Wang X, Lu X, Yuan W. Long-term outcome of laminectomy and instrumented fusion for cervical ossification of the posterior longitudinal ligament. Int Orthopaed. 2009;33(4):1075-80.
10. Arab AA, Eltantawy MH, Elawady MA. Lateral Mass Screw Fixation in Sub-Axial Cervical Spine Combined with Decompression Laminectomy in Multi-Level Cervical Spondylotic Myelopathy; Safety and Clinical Outcome. Zagazig University Med J. 2023;29(2):505-11.
11. Du W, Wang HX, Zhang JT, Wang F, Zhang X, Shen Y, et al. Cervical alignment and clinical outcome of anterior decompression with fusion vs. posterior decompression with fixation in kyphotic cervical spondylotic myelopathy. Front Neurosci. 2022;16:1029327.
12. Sarathy RP, Bansal S, Sekar A, Patnaik A, Sahu RN. An Observational Study Comparing Laminoplasty versus Lateral Mass Screw Fixation in Multilevel Cervical Compressive Myelopathy. J Spinal Surg. 2024;11(4):134-41.
13. Ahsan MK, Islam SS, Joshi SR. Laminoplasty versus Laminectomy for Multilevel Cervical Spondylotic Myelopathy-A Prospective Study in a Tertiary Level Hospital. Int J Ortho Res and Tram. 2022;01:01.
14. Fang Z, Li Y, Huang Z, Luo G, Yang H, Cheng H, et al. Evaluation of enlarged laminectomy with lateral mass screw fixation in relieving nerve root symptoms and correcting kyphosis for cervical myelopathy and radiculopathy. Front Surg. 2023;10:1103804.

15. Hussein M, Abdelrazek MA, Eladawy A. Decompressive Cervical Laminectomy and Lateral Mass Screw-Rod Fusion for Multisegmental Cervical Spondylotic Myelopathy with Flexible Sagittal Cervical Alignment. Adv Spine J. 2022;41(2):81-91.
16. Tracy JA, Bartleson BJ. Cervical spondylotic myelopathy. Neurologist. 2010;16(3):176-87.
17. Ahsan MK, Awwal MA, Khan SI, Zaman N, Haque MH, Zahangiri Z. Open-door Laminoplasty for Multilevel Cervical Spondylotic Myelopathy and Ossification of the Posterior Longitudinal Ligament (OPLL) using Titanium Reconstruction Miniplate and Screws. Mymensingh Med J. 2017;26(3):558-68.
18. Jain A, Rustagi T, Prasad G, Deore T, Bhojraj SY. Does Segmental Kyphosis Affect Surgical Outcome after a Posterior Decompressive Laminectomy in Multisegmental Cervical Spondylotic Myelopathy? Asian Spine J. 2017;11(1):24-30.

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