

Original Research Article

A CLINICAL STUDY OF ANTERIOR VERSUS POSTERIOR APPROACH FOR MANAGEMENT OF MULTILEVEL CERVICAL SPONDYLOTIC MYELOPATHY

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ABSTRACT

Background: Aim: To evaluate demographic data, clinical presentation in terms of functional disability, complications of multilevel (2 or more) cervical spondylotic myelopathy. Cervical spondylotic myelopathy is common cause of neurological dysfunction in old age little rare in younger age people which is diagnosed by clinico-radiological evaluation and surgery is the ideal treatment of choice whether to go through anterior or posterior surgical approach is still a matter of debating.

Materials and Methods: This is a prospective study done from August 2024 to March 2025 on patients with cervical spondylotic myelopathy by surgical decompression- anterior approach (anterior cervical discectomy with or without fusion with auto/allo graft (implants)), and posterior approach (cervical laminectomy with or without fusion with lateral mass fixation) in Department of Neurosurgery, Guntur General Hospital without randomizing the grouping were included for comparison. Clinical presentation, duration or surgery, blood loss and length of hospital stay were compared. Post operatively surgical complications were noted. Neurological improvements were evaluated by functional outcome scales (Nurick grading system and mJOA scores).

Results: The commonest age group of presentation is 51-60 years i.e. 31% of the study population with the mean age group of presentation is 50 years. Cervical spondylotic myelopathy was common in male gender with male to female ratio of 4:1. The commonest mode of presentation is motor dysfunction of extremities, graded sensory loss, disturbances in gait and balance with or without sphincter disturbances-depending on involvement patients categorised by two functional outcome scales- Nurick grading & mJOA scoring system. All the patients were investigated with x-ray c-spine (AP, Lateral, flexion, & extension views), CT c-spine, MRI c-spine were done. Most of the patients had 2-3 level (>70%) segmental spondylotic changes compared to 4 -5 level spondylotic changes. Of the patients included in the study, patients were assessed with Nurick grading and it was found that lower Nurick grades (1,2) had improvement in symptoms than for patients with higher Nurick grades (3,4) after 1 year of post surgery follow up. This difference was found to be statistically significant on chi square test. The mean amount of blood loss was less in anterior approach as compared to posterior approach. This difference was found to be statistically significant on unpaired t test (P value<0.05). Neck pain was more common in posterior approach than anterior approach. Complications like dysphagia was more common in anterior approach, CSF leak was more significantly common in posterior approach. The overall length of stay in hospital was more for posterior approach when compared to anterior approach.

Conclusion: Both anterior approach and posterior approaches were associated with betterment in postoperative neurological function for multilevel CSM. And there is no significant advantage in doing anterior approach in multilevel CSM. **Keywords:** CSM, Dysphagia, Nurick Grading, mJOA scoring, Anterior approach, MRI c-Spine

INTRODUCTION

Cervical spondylotic myelopathy (C.S.M.) is a common cause of neurological dysfunction. Its onset is marked mainly by acceptable motor dysfunction, decreased hand dexterity, and worsening gait and balance. Upper and lower extremity sensory and motor dysfunction and sphincter disturbance most commonly occur in a slow, stepwise pattern with disease progression. Although rare neurological decline occurs in a few cases, it is evident that the incidence increases with advancing age. C.S.M. constitutes the most common cause of spinal cord dysfunction in individuals older than 55 years.^[1]

It is a known fact that surgical decompression of the cervical spinal cord is an effective treatment option for C.S.M. It ceases symptom progression and suggests a meaningful functional recovery in a remarkable size among treated individuals.^[2,3] Spondylotic spinal cord compressions can appear from pathologies situated either anterior or posterior to the spinal canal. Surgical decompression can be done via either an anterior or a posterior surgical approach. The anterior surgical approach is usually anterior cervical discectomy and fusion or corpectomy, and posterior surgery typically involves laminoplasty or laminectomy and fixation. In the past, laminectomy without fusion was used widely for the treatment of C.S.M. The increase of postlaminectomy kyphotic deformities had resulted in a dramatic reduction in stand-alone laminectomy in the setting of CSM.^[4]

Presently, it remains ambiguous whether multilevel spondylotic compression is well treated via an anterior or posterior surgical approach and whether one of these surgical approaches is superior in terms of patient outcomes and/or complication profile. Several reports using large administrative databases have endeavoured to explicate the safety and efficiency of the anterior versus posterior approach when treating Cervical Spondylotic Myelopathy. Unfortunately, in thestudy conducted by Shamji et al., no conclusion could be achieved regarding the effects and differences of anterior versus posterior surgery due to the lack of pathoanatomical patient data in this large database.^[5]

More recently, Fehling's et al,^[6] found that the posterior surgical group had a higher incidence of post-operative wound infection among patients with C.S.M., but overall complication rates, C5 motor palsy, and incidence of dysphagia were alike. Given this ongoing unreliability as to the optimal surgical treatment paradigm for multilevel spondylotic cervical cord compression, there is a supportive need

for a rational algorithm on how best is C.S.M. treated surgically.

Accordingly, our primary aims and objective of this report were to perform a systematic review by comparing both anterior cervical discectomy or corpectomy and posterior cervical laminectomy with or without fusion among the following clinical outcomes: post-operative neck pain, neurological outcomes, range of motion of the neck, and saggital alignment, as well as the post-operative complications. Ultimately, we look forward to answer the following key questions.

Aims and Objectives

The aim of our study is

- 1. To evaluate demographic data, clinical presentation in terms of functional disability, complications of multilevel (2 or more) cervical spondylotic myelopathy.
- 2. To compare the effectiveness of anterior versus posterior approaches for multi level cervical spondylotic myelopathy.

MATERIALS AND METHODS

This is a prospective study done from August 2024 to March 2025 on patients with cervical spondylotic myelopathy by surgical decompression- anterior approach (anterior cervical discectomy with or without fusion with auto/allo graft(implants)), and posterior approach (cervical laminectomy with or without fusion with lateral mass fixation) in department of Neurosurgery, Guntur General Hospital without randomizing the grouping were included for comparison. Clinical presentation, duration or surgery, blood loss and length of hospital stay were compared. Post operatively surgical complications were noted.

Neurological improvements were evaluated by functional outcome scales (Nurick grading system and mJOA scores)

Patients were evaluated with regards to age, sex, clinical radio logical presentation, before and after surgical treatment options and the prognostication. **Inclusion Criteria**

1. All the patients who were presented with symptoms of cervical radiculopathy and myelopathy in whom conventional diagnostic imaging studies shows futures of multilevel cervical (2 or more) spondylotic myelopathy in whom operating cases.

Exclusion Criteria

- 1. Single level CSM
- 2. CSM features due to trauma/ tumour
- 3. Patients who are unfit for surgery
- 4. Patients not given consent for study

Materials and Methods

The total patients admitted in Guntur general hospital with cervical spondylotic myelopathy under neurosurgery department are screened for eligibility criteria for this study, among which 60 patients were included in the study out of 60 patients,32 pts were selected for anterior approach and 28 pts selected for posterior approach non-randomizing with exclusion of patients having, tumour, trauma, single level compression those who are not fit for surgery and those who have not given consent surgery, from time period August 2024- March 2025)

The reason for using the anterior approach were spondylosis in 21 patients, ossification of posterior longitudinal ligament in 9 patients, degenerative kyphosis in 2 patients. The reasons for using posterior approach were OPLL in 16 patients and spondylosis in12 patients. All the patients were refractory to conservative treatment.

The decision to use the chosen procedure depended on 3 main factors: direction of spinal cord compression, pre-operative cervical alignment and the number of affected levels. Radiological examination included plain radiography, MR imaging and CT scan. Stability was assessed in the anterior and posterior groups.

The thirty two patients in the anterior group were treated using a corpectomy followed by placement of iliac bone graft (auto-graft) and cervical plates were added in all. In the posterior group 19 patients underwent laminectomy alone and nine patients underwent laminectomy followed by posterior instrumentation with lateral mass screws.

All patients of both groups examined distributed according to Nurick grading &mJOA scores and evaluated radiologically (AP view & lateral view xrays and MRI) before surgical intervention.

Intraoperative assessment was designed to calculate the time of surgery, the amount of blood loss, levels of decompression, and post-operative complication and hospital stay.

All patients are followed up clinically and radiologically at outpatient department post operatively up to 1 year. The chi square test and t test were used for statistical analysis of data, results were considered significant at a p value of < 0.05.

RESULTS

A total of 60 patients were taken for my study who were admitted in the department of neurosurgery, Government General Hospital, Guntur. Patients were evaluated with clinical and radiological examination and subjected to surgical decompression procedures like anterior approach - anterior cervical discectomy with or without fusion, posterior approach like cervical laminectomy, with or without fusion are observed.

Table 1: Age Group	
AGE GROUP	NO OF PATIENTS (%)
<30 Yrs.	3 (5%)
31-40 Yrs.	8 (13.33%)
41-50 Yrs.	18 (30%)
51-60 Yrs.	19 (31.66%)
61-70 Yrs.	12 (20%)
TOTAL	60

In the present study out of 60 cases admitted, all the cases were categorised according to the different age groups from <30 years to 70 years as shown in figure. The commonest age group of presentation is 51-60 years i.e., 31% of the study population with the mean age group of presentation is 50 years.

Table 2: Treatment Groups	
PROCEDURE	NO OF PATIENTS
Anterior Approach	32 (53%)
Posterior Approach	28 (47%)

of the total patients admitted in GUNTUR General Hospital with CSM, 60 patients were selected basing on the inclusion and exclusion criteria. Among them, 32 (53%) patients underwent anterior cervical decompression and 28 (47%) patients underwent posterior cervical decompression with or without fusion.

Table 3: Segmental Levels Surgery-Anterior Approach	
NO. OF SEGMENTS	PATIENTS (%)
2	24 (75%)
3	8 (25%)

Among 32 patients who underwent anterior approach, 24 patients (75%) had undergone 2 segment level and 8 patients (25%) had undergone 3 segment level surgeries.

Table 4: Segmental Levels Surgery-Posterior Approach	
NO OF SEGMENTS	PATIENTS (%)
2-LEVEL	3 (11%)
3-LEVEL	1 (4%)

4-LEVEL	22 (78%)
5-LEVEL	2 (7%)

Among 28 patients who underwent poster	or approach, majority (78%)	had undergone 4 segment le	evel surgeries
followed by 2 segment level surgery (11%).		

Table 5: Anterio	r Approach I	Nurick Grading Dist	ribution (Patients)			
				TIME		
			PRE OP	POST OP	POST OP 1Yr	Total
	1	Count	3	10	10	23
	1	%	9.4%	31.3%	31.3%	24.0%
	2	Count	10	12	14	36
	2	%	31.3%	37.5%	43.8%	37.5%
NUDICK	2	Count	8	5	5	18
NUKICK	3	%	25.0%	15.6%	15.6%	18.8%
	4	Count	8	2	0	10
		%	25.0%	6.3%	0.0%	10.4%
	5	Count	3	3	3	9
	3	%	9.4%	9.4%	9.4%	9.4%
T-+-1		Count	32	32	32	96
Total		%	100.0%	100.0%	100.0%	100.0%
			Value	df	P VALUE	
Pearson Chi-Squa	ire		16.328	8	0.038 (S)	

As see in the above table, from pre op to post op 1 year recordings, proportion of cases having lower Nurick grades (1,2) were increasing and proportion of cases having higher Nurick grades (3,4) were decreasing in Anterior approach. This difference was found to be statistically significant on chi square test (P value <0.05).

Table 6: mJOA sco	re distribu	tion: (Anterior	approach)		
TIME	Ν	Mean	Std. Deviation	F	P VALUE
PRE OP	32	11.563	3.2621		
POST OP	32	13.969	3.3359	6 2 4 6	0.002 (S)
POST OP 1Yr	32	14.156	3.1429	0.540	0.005 (5)
Total	96	13.229	3.4258		

As seen in the above table, mean scores of MJOA have increased from pre op to post op 1 year recordings in anterior approach from 11.563 to 14.156. This change was found to be statistically significant on One way ANOVA test (P value <0.05).

			TIME	·		Total
			PRE OP	POST OP	POST OP 1Yr	
		Count	2	7	7	16
	1	%	7.1%	25.0%	25.0%	19.0%
		Count	6	13	14	33
	2	%	21.4%	46.4%	50.0%	39.3%
		Count	12	3	3	18
NURICK	3	%	42.9%	10.7%	10.7%	21.4%
		Count	7	2	1	10
	4	%	25.0%	7.1%	3.6%	11.9%
		Count	1	3	3	7
	5	%	3.6%	10.7%	10.7%	8.3%
Fotal		Count	28	28	28	84
		%	100.0%	100.0%	100.0%	100.0%
			Value	df	P VALUE	
Pearson Chi-	Square		22.922	8	0.003 (S)	

As seen in the above table, from pre op to post op 1 year recordings, proportion of cases having lower Nurick grades (1,2) were increasing and proportion of cases having higher Nurick grades (3,4) were decreasing in Posterior approach. This difference was found to be statistically significant on chi square test (P value < 0.05)

Table 8: mJOA score	distribution:	(posterior appro	ach)		
TIME	Ν	Mean	Std. Deviation	F	P VALUE
PRE OP	28	10.679	2.7896		
POST OP	28	12.821	3.3228		
POST OP1Yr	28	12.964	3.3498		

	Total	84	12.155	3.2984	4.584	0.013 (S)
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As seen in the above table, mean scores of MJOA have increased from pre op to post op 1 year recordings in posterior approach from 10.679 to 12.964. This change was found to be statistically significant on One way ANOVA test (P value <0.05)

					Type of Surgery		Total
					Anterior	Posterior	
			Count		3	2	5
	1		%		9.4%	7.1%	8.3%
			Count		10	6	16
Pre OP Nurick Grade	2		%		31.3%	21.4%	26.7%
			Count		8	12	20
	3		%		25.0%	42.9%	33.3%
			Count		8	7	15
	4		%		25.0%	25.0%	25.0%
			Count		3	1	4
5			%		9.4%	3.6%	6.7%
			Count		32	28	60
Total			%		100.0%	100.0%	100.0%
		Value		Df		P VALUE	
Pearson Chi-Square		2.813		4		0.590 (NS)	

As seen from the above table, during pre op recordings, even though proportion of cases having Nurick grade 1 and 2 are more in anterior approach as compared to posterior approach and Nurick grade were more in posterior than anterior approach, the difference in distribution was not found to be statistically significant on chi square test (P value >0.05).

Table 10: Post op Nuri	ck grading comp	oarision: (ant	erior versu	s posterior)		
	••	`		Type of Sur	gery	
				Anterior	Posterior	Total
			Count	10	7	17
	1		%	31.3%	25.0%	28.3%
			Count	12	13	25
	2		%	37.5%	46.4%	41.7%
Post op Nurick			Count	5	3	8
	3	3		15.6%	10.7%	13.3%
				2	2	4
	4		%	6.3%	7.1%	6.7%
			Count	3	3	6
	5		%	9.4%	10.7%	10.0%
			Count	32	28	60
Total			%	100.0%	100.0%	100.0%
		Value		Df	P VALUE	
Pearson Chi-Square .806		.806		4	0.938 (NS)	

As seen from the above table, during post op readings, proportion of cases with Nurick grade 4,5 are more in posterior approach as compared to anterior approach, the distribution was not found to be statistically significant on chi square test (P value >0.05).

			Type of Surg	gery	
			Anterior Posterior		Total
		Count	10	7	17
	1	%	31.3%	25.0%	28.3%
		Count	14	14	28
	2	%	43.8%	50.0%	46.7%
		Count	5	3	8
	3	%	15.6%	10.7%	13.3%
		Count	0	1	1
	4	%	0.0%	3.6%	1.7%
Destan Newisle 1Ve		Count	3	3	6
Post op Nurick I Yr	5	%	9.4%	10.7%	10.0%
		Count	32	28	60
Total		%	100.0%	100.0%	100.0%

	Value	Df	P VALUE
Pearson Chi-Square	1.771	4	0.778 (NS)

As seen from the above table, during post op readings at 1 year, proportion of cases with Nurick grade 4,5 are more in posterior approach as compared to anterior approach, the distribution was not found to be statistically significant on chi square test (P value >0.05).

Fable 12: mJOA score comparison: (ANTERIOR VERSUS POSTERIOR)									
TIME	SITE	Ν	Mean	Std. Deviation	T TEST	P VALUE			
Bro OB m IO A	ANTERIOR	32	11.563	3.2621		0.268 (NS)			
Pre OP mJOA	POSTERIOR	28	10.679	2.7896	1.119	0.208 (113)			
Post op mJOA	ANTERIOR	32	13.969	3.3359		0.100 (MIC)			
	POSTERIOR	28	12.821	3.3228	1.332	0.166 (115)			
Post op mJOA 1Yr	ANTERIOR	32	14.156	3.1429	1 421	0.161 (MS)			
	POSTERIOR	28	12.964	3.3498	1.421	0.101 (NS)			

As seen from the above table, even though the mean scores of MJOA were more in anterior approach as compared to posterior approach at pre op, immediate post op and post op at 1 year, the difference was not found to statistically significant on unpaired t test (P value >0.05).

Table 13: Time of surgery comparison: (ANTERIOR VERSUS POSTERIOR)									
	SITE	Ν	Mean	td. Deviatio	T TEST	P VALUE			
Time of Surgery (mins)	ANTERIOR	32	96.563	12.6004	4 815	<0.001 (S)			
	POSTERIOR	28	120.000	24.0370	-4.015	<0.001 (S)			

The mean time for surgery in minutes was less in anterior approach (96.53 mins) as compared to posterior approach (120 mins). This difference was found to be statistically significant on unpaired t test (P value <0.05).

Table 14: Median blood loss comparision: (ANTERIOR VERSUS POSTERIOR)									
	SITE	Ν	Mean	Std. Deviation	T TEST	P VALUE			
	ANTERIOR	32	120.938	21.3057					
Bleeding (ml)	POSTERIOR	28	189.286	32.7650	-9.694	<0.001 (S)			

The mean amount of blood loss was less in anterior approach (120.938 ml) as compared to posterior approach (189.286 ml). This difference was found to be statistically significant on unpaired t test (P value <0.05).

Table 15: NRS Neck Pain Co	mparison: (AN	ΓERI	OR VERSUS P	OSTEF	RIOR)			
					Type of	Total		
					Anterior	Posterior	Total	
	NO		Count		30	18	48	
NDS Mostr Dain	NO		%		93.8%	64.3%	80.0%	
INKS Neck Pain	PRESENT		Count		2	10	12	
			%		6.3%	35.7%	20.0%	
Total			Count		32	28	60	
10121		%		100.0%	100.0%	100.0%		
			Value		df	P VA	LUE	
Pearson Chi-Square		8.103		1	0.00	4 (S)		

NRS neck pain was more common in posterior approach (35.7%) as compared to anterior approach (6.3%). As per above results this study is statistically significant (P-value <0.05).

Table 16: CSF Lo	eak comparis	on: (ANTERIO	R VERSUS POSTI	ERIOR)			
				Type of	Type of Surgery		
				Anterior	Anterior Posterior		
	NO	(Count	32	24	56	
	NO		%	100.0%	85.7%	93.3%	
CSF Leak	CSF Leak		Count	0	4	4	
	YES		%		14.3%	6.7%	
T- 4-1	T (1		Count	32	28	60	
Total			%	100.0%	100.0%	100.0%	
			Value	Df	P VALUE		
Pearson Chi-Square		e	4.898	1	0.027 (S)		

CSF leak was more common in posterior approach (14.3%) as compared to anterior approach (0%). As per chi square test among this study group the results are statistically significant (P value <0.05).

Table 17: Dyspha	gia: (ANTERIOR VE	RSUS POSTER	RIOR)				
					Type of	Total	
				Anterior Posterior			Total
	NO	Cou	nt		28	28	56
	NO	%			37.5%	100.0%	93.3%
Dyspitagia	DDECENT	Count			4	0	4
	PKESENI	%		1	2.5%	0.0%	6.7%
т	Total		Count		32	28	60
10				1	00.0%	100.0%	100.0%
			Value		Df	P VA	LUE
	Pearson Chi-Square		3.750	1 0.05 (5		5 (S)	

Dysphagia was more common in anterior approach (12.5%) as compared to posterior approach (0%). This difference was found to be statistically significant on chi square test (P value <0.05).

Table 18: Length of hospital stay: (ANTERIOR VERSUS POSTERIOR)									
	SITE	Ν	Mean	d. Deviatio	T TEST	P VALUE			
of hospital stay	ANTERIOR	32	5.438	.7594	-11.952	<0.001 (S)			
	POSTERIOR	28	7.893	.8317					

The mean length of hospital stay in days was less in anterior approach (5.438 days) as compared to posterior approach (7.893 days). This difference was found to be statistically significant on unpaired t test (P value < 0.05).



Figure 1: X-ray Cervical spine AP View & Lateral View Flexion and Extension

DISCUSSION

In the present study out of 60 cases admitted, all the cases were categorised according to the different age groups from <30 years to 70 years. The commonest age group of presentation is 51-60 years i.e., 31% of the study population with the mean age group of presentation is 50 years.

Anthony L. Asher et al. in study reported median age of 61 years in anterior group and 66 years in posterior group.7Ziad A Audat et al. in a study reported mean age of 61 ± 12.06 .^[8]

There were 48 (80%) male patients and 12 (20%) female patients with male to female ratio of 4:1 as shown in figure. The present study has a little male preponderance.

Anthony L. Asher, et al. reported 76 % males in his study7. Zoher Ghogawala et al. reported 57 % male and 43 % females in a study.^[9]

Of the total patients admitted in Government General Hospital, Guntur with CSM, 60 patients were selected for this study basing on the inclusion and exclusion criteria. Among them, 32(53%) patients

underwent anterior cervical decompression (ACDF with or without implants) and 28(47%) patients underwent posterior cervical decompression with or without fusion(Laminectomy with or without Lateral Mass Fixation).

Among 32 patients who underwent anterior approach, 24 patients (75%) had undergone 2 segment level and 8 patients (25%) had undergone 3 segment level surgeries.

Among 28 patients who underwent posterior approach, two-segment level to multi (5) segmental level among which majority had undergone 4 segment level surgery that is (78%) followed by 2 segment level surgery (11%).

In the present study from pre op to post op 1 year recordings, proportion of cases having lower Nurick grades (2,3) were improving to Nurick grades (1,2) and proportion of cases having higher Nurick grades (4,5) were static or further deteriorating in Anterior approach. This difference was found to be statistically significant on chi square test (P value <0.05) with mean improvement from 2.9 to 2.0 pre-op to post-operative after 1 year of follow up.

In the present study from pre op to post op 1 year recordings, proportion of cases having lower Nurick grades (2,3) were improving to Nurick grades (1,2) and proportion of cases having higher Nurick grades (4,5) were static or further deteriorating even in Posteriorapproach. This difference was found to be statistically significant on chi square test (P value <0.05) with mean improvement from 2.9 to 2.2. In the present study during pre op recordings, even though proportion of cases having Nurick grade 1 and 2 are more in anterior approach as compared to posterior approach and Nurick grade 3 were more in posterior than anterior approach, the difference in distribution was not found to be statistically significant on chi square test (P value >0.05).

In the present study during post op readings, proportion of cases with Nurick grade 4,5 are more in posterior approach as compared to anterior approach, the distribution was not found to be statistically significant on chi square test (P value >0.05) (mean 2.2, 2.3 anterior and posterior groups respectively).

In the present study during post op readings at 1 year, proportion of cases with Nurick grade 4 & 5 are more in posterior approach as compared to anterior approach, the distribution was not found to be statistically significant on chi square test (P value >0.05) (mean improvement 2.0 to 2.25 anterior and posterior respectively).

Edwards et al. in one study reported that study there is significant improvement in anterior approach than posterior approach surgeries as mean pre-op Nurick grade (1.9,2.3-anterior & posterior respectively) and post-op Nurick grade (1.0,0.8-anterior &posterior).^[10]

Kristof et al. in one study reported that study there is no significant difference between anterior and posterior approach surgeries as mean pre-op Nurick grade (3,3-anterior & posterior respectively) and post-op Nurickgrade (2,2.5-anterior & posterior).^[11]

In the present study mean scores of mJOA have increased from pre op to post op 1 year recordings in anterior approach from 11.563 to 14.156 with SD 3.42. This change was found to be statistically significant on One-way ANOVA test (P value <0.05). In the present study mean scores of mJOA have increased from pre op to post op 1 year recordings in posterior approach from 10.679 to 12.964 with SD 3.29. This change was found to be statistically significant on One-way ANOVA test (P value <0.05). In present study even though the mean scores of mJOA were more in anterior approach as compared to posterior approach at pre op, immediate post op and post op at one year this was not statistically significant.

Michael G. Fehlings et al. reported in one study that improvement in the mJOA was significantly lower in the anterior group when compared to posterior group (2.47 vs. 3.62, respectively, P <0.01), although the groups started at different levels of baseline impairment.^[12]

In the present study NRS (numerical rating scale) neck pain (post-operative axial pain scores) was more common in posterior approach (35.7%) as compared to anterior approach (6.3%). This difference was found to be statistically significant on chi square test (P value<0.05). This evaluating risk differences among anterior versus posterior approach.

Liu et al,^[13] and Hosono et al,^[14] studies favouring anterior approach having lesser chances of postoperative neck pain with significant risk differences 3.7%(p=0.34),28%(p=0.04) respectively.

In the present study CSF leak was more common in posterior approach (14.3%) as compared to anterior approach (0%). This difference was found to be statistically significant on chi square test (P value <0.05).

Christopher D. Witiw, et al. reported in a study that cutaneous cerebro spinal fluid (CSF) leak is significantly higher in patients undergoing ACDF.^[15] In present study the mean time for surgery in minutes was less in anterior approach (90-120 mins ~ 96.53

mins) as compared to posterior approach (90-150 mins \sim 120 mins). On unpaired T test this study was significant with (P value <0.05).

Anthony L. Asher et al. in one study reportedOperative time in min as 166 mins for anterior and 143 mins for posterior.^[7]

In the present study the mean amount of blood loss was less in anterior approach (90-160ml \sim 120.938 ml) as compared to posterior approach (150-250ml \sim 189.286 ml). This difference were statistically significant with unpaired T test (P value <0.05).

Christopher D. Witiw, et al,^[15] Liu et al,^[13] reported in a study that bleeding is lesscommon in anterior surgery group. Hirai et al., Edwards et al. reported in a study that bleeding more common in anterior.

When the patients has three or more segments affected there has been reports of higher no-union rates, for which posterior approach is preferred. Posterior decompression is indicated when three or more segments are affected or when the posterior longitudinal ligament is ossified, in these cases the recommendation is to realize laminectomy, it should always be accompanied by instrumentation and fusion because of high risk of kyphosis after laminectomy is performed. Both techniques offer similar functional results.

Anterior pathologies that involve only 2 or 3 vertebral level usually proceed using anterior approach, while in cases of more than 3 levels the posterior approach appears to be more suitable due to swallowing difficulty and construct failure. Treatment has to be individualized with every patient, taking to account the imagery, number of segments affected, according to the radiological characteristics of the lesion, cervical saggital balance and the surgeons surgical knowledge.

An adequate decompression of neurological elements offers suitable functional results in both approaches, which was observed in the present study. The patients were not randomized to the surgical procedure they underwent. The type of surgical procedure to be performed was surgeon dependent. The number of levels compared was different as anteriorsurgery involved slightly fewer levels when compared with posterior approach surgery.

CONCLUSION

Our results demonstrated that patients with multilevel cervical myelopathy when treated with posterior approach do well and compare favorably with patients treated with an anterior approach at the midterm follow-up of 1.4 years. The main objective of the CSM treatment is the decompression of neurological structures. Although both approaches, offer adequate functional results; it has been proved that in patients with CSM, the posterior decompression offers better results compared with the anterior approach, both in mJAO as in Nurick scales. An adequate decompression of neurological elements offers suitable functional results in both approaches, which was observed in the present study. **Conflict of Interest:** None **Funding Support:** Nil

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