

Study of the Outcome of Surgical Versus Nonsurgical Treatment for the Treatment of Unstable Traumatic Lesions of the Lower Cervical Spine Amgad El-Said Matter MD PhD

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Introduction

Spinal column injury, especially at the level of the cervical spine, is one of the common causes of death due to trauma and significant morbidity, so, timely diagnosis and management of these patients can significantly decrease the associated mortality and morbidity. Surgical and nonsurgical methods, or a combination, have been used for almost a century in patients with unstable cervical spine lesions. The purpose of this study was to compare the success rate and capacities of the nonsurgical versus surgical approach in the management of unstable lower cervical spine lesions and their sequels.

Methods

All patients presented with unstable lower cervical spine injury (from C3 to C7) in the period from May 2010 and May 2015 were included in this study. Patients included in this study if they had a subluxation of 3.5 mm or more and/or an angulation of 11° or more in their primary radiograph of the lower cervical spine. We included fourty patients. There were 26 males and 14 females. Age ranged between 19 to 43 years with a mean age of 25 years. All patients initially underwent cervical traction (5lbs per vertebral level) for re-alignment of the vertebral column. Afterwards, 20 of them were randomly selected for halo vest treatment (halo group) and the rest for surgical approach (surgery group)

Results The level of injury among both

groups was shown in the Table. The average amount of subluxation was 25.75% and the average angulation was 14.5°. In the surgery group, the largest number of patients had injury at C4-C5 level. The average amount of subluxation was 26.5% and the mean angulation was 14.5°. Five patients in the halo group belonged to category 1. The average subluxation at time of admission was 26%, and the average angulation was 14.8°, which changed to 3% and 5.4° 6 months later (3 months after removal of the halo cast). Seven patients in the surgery group belonged to category 1. The average subluxation at the time of admission was 27.1%, and that for angulation was 14.4°; these values changed to 0% and 2.1°. Within each group, the degree of angulation was significant before and after treatment. Comparing the results of treatment between the 2 groups, it was statistically found that although no significance was present regarding the subluxation (p-value=0.202); the decrease in the degree of angulation was significantly different (pvalue=0.010). Category 2 included 5 patients from the halo group. Comparing the results of treatment between the 2 groups,

evel of injury among the halo vest and surgery group.		
Level of injury	Number of patients	
	Halo group	Surgery group
C3-C4	10	3
C4-C5	2	8
C5-C6	4	6
C6-C7	3	3
C7-T1	1	0

it was statistically found that although no significance was present regarding the subluxation (p-value=0.202); the decrease in the degree of angulation was significantly different (pvalue=0.010). Category 2 included 5 patients from the halo group. One of these, one patient had a relapse of locked facet after treatment with halo, so surgery was performed to stabilize the vertebra. The other 4 cases had a change in subluxation from 26% to 2.5% and in angulation from 15.5° to 2.5°. Seven patients from the surgery group belonged to category 2, 6 of which underwent the anterior approach, and one the posterior. In these cases, the average angulation decreased from 14.4° to 2° and the average subluxation from 27.8% to 1.7%. No statically significant difference was observed in the treatment results between the 2 groups (p-value of 0.755 for both angulation and subluxation). Ten patients in the halo group belonged to category 3. One of these patients experienced a relapse of the subluxation/angulation after the removal of halo cast. In the other 9 cases, the average subluxation to changed from 25.5% to 5.8% and the angulation from 14° to 5.6°. In the surgery group, 6 patients belonged to category 3. In these cases, the change in the average subluxation was from 24.1% to 3.3%, and that in the average subluxation was from 24.1% to 3.3%. Statistical analysis of improvements in the angulation values showed that there was a significant difference between surgeries versus the halo group (pvalue=0.000). The improvement in subluxation was not significantly different between the 2 groups (pvalue=0.428).



 A) Plain X-ray showed unstable
C3 oblique body fracture with subluxation



C) MRI T2 weighted image shows central cord high density. (full neurologic recovery)



B) Plain X-ray after skull cervical traction shows re-alignment of the vertebral column. Halo vest was used for three months

Learning Objectives

To compare the success rate and capacities of nonsurgical versus surgical management of lower cervical spine injury

Conclusions

The nonsurgical approach can be an acceptable alternative to surgical correction in selected patients with various lower cervical spine injuries and yielded comparable results; however, a large sample size and longer follow-up may be necessary for verifications