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Surgery outcomes and functionality in patients with cervical spondylotic myelopathy

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ABSTRACT

Purpose: This study investigated functionality statues and surgical outcome of patients with cervical spondylotic myelopathy (CSM) contains cervical herniated disc (CHD) and cervical spinal stenosis (CSS) based on the Japanese Orthopedic Association Cervical Myelopathy Evaluation Questionnaire (JOACMEQ).
Methods: This was a prospective clinical study a sample of cases with CSM. Patient's functionality statues and surgical outcome were evaluated based on JOACMEQ scores at two points in time: pre- and postoperative assessments.
Results: In all 87 patients were completed the JOACMEQ measure. The mean age of patients was 50.3 (SD=10.2) years. The mean clinical follow-up was 12 months (range 7-37 months). Statistically difference between was observed pre- and postoperative indicating improvements on the outcomes and functionality in all subscales ($P < 0.001$). However, there was no significant difference between patients with CSM and CHD.
Conclusion: The findings suggest that surgery is an efficacious procedure for the treatment of CSM and the functionality statues as measured by the JOACMEQ are higher than prior to surgery.

Keywords: JOACMEQ; Surgery outcomes and functionality; Cervical spondylotic myelopathy

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INTRODUCTION

Cervical spondylotic myelopathy (CSM) contains cervical herniated disc (CHD) and cervical spinal stenosis (CSS) is the most common degenerative disease. It is usually a chronic and progressive disease. The prevalence of patients with CSM increases as they grow older[1]. Thus, assessment of treatment outcome and functionality in those who suffer from the disease is an important part of clinical practice. As such the Japanese Orthopedic Association Cervical Myelopathy Evaluation Questionnaire (JOACMEQ) is a well-known instrument to assess outcome and functionality in this population[2]. The JOACMEQ) has been validated as an outcome measure in this patient[2].

Thus, the aim of this study was to evaluate surgery outcomes and functionality in patients with CSM diseases based on JOACMEQ.

MATERIAL AND METHODS

Patients and data collection

This was a cross sectional study and included consecutive patients who were referred to a convenient sample of newly diagnosed CSM patients attending the neurosurgery clinic of a large teaching hospital in Tehran, Iran during May 2008 to November 2011. The diagnosis of CSM was made based on clinical symptoms,

neurological examinations, and imaging including plain radiography, computed tomography (CT) and magnetic resonance imaging (MRI) of the cervical and spine. All patients had the typical symptoms of CSM. The stenotic level(s) were localized on the MRI or CT images. There were no restrictions on patient selection with regard to types of CSM, age or other characteristics. The exclusion criteria were prior cervical spine surgery and spinal anomalies. Patients were assessed at two points in time: pre-operative and post-operative based on JOACMEQ. Standard surgery technique was used. Patients were undertaken laminectomy with or without fusion procedure for CSS and posterior discectomy approach for CHD[3].

The JOACMEQ score

The Japanese Orthopedic Association Cervical Myelopathy Evaluation Questionnaire (JOACMEQ) is a revised version of the Japanese Orthopedic Association score (JOA). It was developed for the purpose of evaluating cervical myelopathy disorders[2]. It is a tool and contains 24 items tapping into five subscales: lower extremity function (5 items), quality of life (8 items), cervical spine function (4 items), bladder function (4 items), and upper extremity function (5 items). The score for each subscale ranges from 0 to 100 and higher scores indicate better conditions[2]. Pre- and post-operative scores was compared using the paired t-test in order to assess of surgical outcomes and functionality based on JOACMEQ.

Statistical analysis

All statistical analyses were performed using the PASW Statistics 18 Version 18 (SPSS, Inc., 2009, Chicago, IL, USA). The t-test was used for comparison. P value lea than 0.05 was considered statistically significant.

Ethics

The Ethics Committee of Shahid Beheshti University of Medical Sciences approved the study.

RESULTS

In all 96 patients were approached. Of these 87 patients completed the questionnaire and nine patients were excluded due to prior cervical spine surgery or spinal anomalies. The characteristics of the CSM patients and their scores on the JOACMEQ are shown in Table 1. The mean age of patients was 50.3 (SD=10.2) years. The mean clinical follow-up was 12 months (range 7-37 months). Most patients with CSM had a developmental narrow spinal canal, and decompressive laminae were distributed from C2 to T1 levels. The number of decompressed lamina was 3.3 (SD=1.1). Meanwhile, most patients with CHD had a one- or two level discectomy and were distributed from C2 to C7 levels.

Table 1. The characteristics of the study sample (n =87).

	Number* (%)
Age groups (Year)	50.3 (10.2%)
Range	24-79
Gender	
Male	39 (44.8%)
Female	48 (55.2%)
Type of disease	
Cervical herniated disc	50 (57.5%)
Cervical spinal stenosis	37 (42.5%)

*Values are mean (SD) or number and percent.

Table 2. Responsiveness to change as measured by the JOACMEQ.

	Preoperative Mean (SD)	Postoperative Mean (SD)	*P* value*
Lower extremity function	41.3 (24.3)	69.7 (11.2)	< 0.001
Quality of life	32.4 (25.6)	56.1 (7.6)	< 0.001
Cervical spine function	51.1 (29.3)	76.9 (9.3)	< 0.001
Bladder function	61.3 (19.3)	79.3 (7.3)	< 0.001
Upper extremity function	48.4 (15.4)	59.1 (12.4)	< 0.001

*Derived from paired samples t-test

Overall 90.8% of patients improved with surgery (n=9) and the remaining 9.1% of patients had no change in their JOACMEQ score after surgery (n=8). Statistically difference between was observed pre- and postoperative indicating improvements on the outcomes and functionality in all subscales (P<0.001).The results are shown in Table 2. However, there was no significant difference between patients with CSM and CHD. The most common complications were C5 nerve palsies which occurred in 5.7% of the cohort (n=5); all completely resolved. Re-operation was not required at final follow-up.

DISCUSSION

The findings from this study suggest that a statistically significant difference exists between pre- and postoperative functionality statues in patients with CSM based on JOACMEQ score.

In many previous studies, surgical outcomes of patients with CSM were evaluated based on variety of measures and good results have been reported. Meanwhile, all authors identified that cervical decompression has enough effectiveness for the patients with CSM[4], which is in line our findings. However, to our knowledge, the present study is first report about assessment of functionality

statues and surgical outcome of patients with CHD and CSS according to JOACMEQ in literature.

The JOACMEQ simultaneously considers a five subscale as lower extremity function, quality of life, cervical spine function, bladder function and upper extremity function in cases with CSM, so this measure may be more useful for assess these patients. There is a variety of measurements in the literature for patients with CSM. However, the JOACMEQ offers an effective method of evaluation of quality of life[5], and as suggested it is possible that the JOACMEQ will succeed and become a global standard to evaluate outcomes in patients with cervical myelopathy[6].

The limitations of this study were: first, we cannot outcomes analysis based on type of disease. second, we set up 12 months (range 7-37 months) follow up as the point of times for evaluating clinical outcomes. However, these data are just short-term follow up data, so there is a possibility that these data don't reflect on the natural course of postoperative functionality. Then, it is essential that long-term follow up analysis should be reinforced for further work-up.

CONCLUSION

The findings suggest that surgery is an efficacious procedure for the treatment of CSM and the functionality statues as measured by the JOACMEQ are higher than prior to surgery.

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FINANCIAL DISCLOSURE

None to declare

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