



Surgical treatment for cervical spondylotic myelopathy in elderly patients: A retrospective study



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ABSTRACT

Objective: To analyze perioperative clinical features and outcomes of surgical treatment for cervical spondylotic myelopathy (CSM) in elderly patients.

Methods: From 2006 to 2013, we retrospectively reviewed 136 patients with CSM who underwent surgery. The patients were divided into two groups: 70 years or older (elderly group, 58 patients) and younger than 70 years (younger group, 78 patients). The course of disease, surgical outcome, morbidities, and postoperative complications were analyzed.

Results: In the elderly group, follow-up lasted 9–76 months (mean 39.6 months), the course of disease was 23.7 months (range 4–72 months). Anterior cervical decompression and fusions and posterior laminectomy and fixation were performed in 24 and 34 patients, respectively. The operative time averaged 103 min (range 48–210 min). In the younger group, follow-up lasted 10–71 months (mean 37.8 months), the course of disease was 12.6 months (range 2–58 months). Anterior cervical decompression and fusions and posterior laminectomy and fixation were performed in 75 and three patients, respectively. The prevalence of chronic diseases and postoperative complications were higher in the elderly group than the younger group. The recovery rates of JOA score were $40.82 \pm 11.20\%$ in the elderly group and $64.10 \pm 22.61\%$ in the younger group. The therapeutic effects of surgery were significantly better for the young patients than for the elderly.

Conclusion: Elderly patients with CSM present long period and serious symptoms, and the degeneration of multiple organs. Surgical decompression for CSM appears to be a beneficial and safe procedure for older patients if properly handled, although the recovery rate is poorer than that of younger patients.

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1. Introduction

With the trend of an aging society in China, age-related diseases are increasingly becoming the focus of study. Of these disorders, cervical spondylotic myelopathy (CSM) is a serious neurological disease that affects a broad range of people [1].

CSM is caused by cervical disk prolapse or by a bone crest causing spinal cord compression and often violating the pyramidal tract, and it clinically manifests as hand and foot weakness, unsteady gait, chest and abdominal discomfort [2,3]. Surgery is the main treatment for CSM [4–6]. Elderly patients often refuse to undergo surgery due to physiological and psychological factors in China. In addition, because of increased surgical risk in the elderly, postoperative complications and poor prognoses, many surgeons consider advanced age as a relative contraindication [7].

To analyze perioperative clinical features and outcomes of surgical treatment for CSM in elderly patients, we enrolled elderly patients with CSM who visited Shanghai Renji Hospital and compared them with young patients treated over the same period with cervical spine surgery.

2. Subjects and methods

2.1. Subjects

Total 136 patients treated for CSM at Shanghai Renji Hospital during 2006–2013 were followed up and retrospectively reviewed. The patients were divided into two groups according to their ages at the time of surgery. The elderly group (70 years old or older at the time of surgery) included 58 patients. The average age was 75.2 years old, with a range of 70–86. The younger group included 78 patients who were 69 years old or younger at the time of surgery. These patients ranged in age from 36 to 66 years old (average, 51.2 years). All of the patients presented with symptoms and

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Table 1
The clinical outcomes (JOA scale).

Group	Pre-OP	Post-OP	Follow-up	Recovery rate (%)
Elderly group	7.25 ± 2.59	9.87 ± 1.7	11.23 ± 2.5	40.82 ± 11.20
Young group	8.20 ± 2.7	10.14 ± 1.23	13.83 ± 1.14	63.98 ± 17.61

MRI findings consistent with myelopathy secondary to spinal cord compression. We excluded patients with myelopathy from other causes, such as ossified posterior longitudinal ligament, rheumatoid arthritis of the cervical spine, or trauma causing cord damage immediately after injury.

2.2. Surgical procedure

The surgical procedures included anterior cervical decompression and fusion (ACDF), posterior laminectomy and fixation, or both combined. ACDF included subtotal vertebrectomy, trapezoidal titanium mesh implantation, anterior cervical discectomy and fusion with the cage or both combined. Posterior laminectomy and fixation included simple surgical decompression laminectomy, decompression laminectomy and laminoplasty fixation (unilateral, bilateral).

2.3. Evaluation of clinical outcomes after surgery

The clinical evaluation was graded according to the Japanese Orthopedic Association (JOA score), with the high score being 17 [8]. The recovery rate, which indicated the degree of normalization after surgery, was calculated using the following formula: (postoperative score – preoperative score)/(17 – preoperative score) × 100%. Operating time, surgical blood loss, and the length of hospital stay were also recorded.

2.4. Statistical analysis

SPSS statistical software (version 13.0) was used for statistical analysis. Differences in the course of disease, lesion section, the selection of operation, hospital stay, comorbidities and postoperative complications between the two groups were analyzed using the chi-square test. Student's *t* test was used for the analysis of the differences in the mean values of pre- and post-operative scores between the two groups. $P < 0.05$ was considered to be statistically significant.

3. Results

3.1. Follow-up

In the elderly group, follow-up was performed in 58 cases, and the follow-up period lasted 9–76 months with a mean of 39.6 months. The mean JOA score was 7.25 ± 2.59 preoperatively, 9.87 ± 1.7 postoperatively, and 11.23 ± 2.5 on the final follow-up in the elderly group. Among 58 patients followed up, 53 patients (91.4%) would have been willing to undergo surgery if they had to reselect the treatment method.

In the younger group, follow-up lasted 10–71 months (a mean of 37.8 months). Compared to the elderly group, the average JOA score was 8.20 ± 2.7 preoperatively, 10.14 ± 1.23 postoperatively, and 13.83 ± 1.14 on the final follow-up in the younger group (Table 1). The recovery rates of JOA score were 40.82 ± 11.20% in the elderly group and 64.10 ± 22.61% in the younger group.

The therapeutic effects of surgery were significantly better for the young patients than for the elderly ($P < 0.01$).

3.2. The course of disease

The course of disease was significantly longer in the elderly group (23.7 months with a range of 4–72 months) than in the younger group (12.6 months with a range of 2–58 months) ($P < 0.05$).

In the elderly group, two patients (3.4%) had one level of compression, 11 patients (19.0%) had two compressed levels, 23 patients (39.7%) had three compressed levels, and 22 patients (37.9%) had four compressed levels or more.

In the young group, 21 patients (26.9%) had one level of compression, 48 patients (61.5%) had two compressed levels, eight patients (10.3%) had three compressed levels, and one patient (1.3%) had four compressed levels or more.

3.3. Preoperative comorbidities

Forty-one (70.7%) patients had chronic diseases in the elderly group. Thirteen patients had one chronic disease, 20 patients had two chronic diseases, and eight patients had three or more chronic diseases. Seventeen (21.8%) patients had chronic diseases in the young group (Table 2). The prevalence of chronic diseases in the elderly group was significantly greater than in the younger group ($P < 0.01$).

3.4. Hospital stay

The patients in the elderly group were hospitalized for 8–15 days, with a mean of 13.5 days: 9.5 days for those undergoing surgery through the anterior approach and 15.4 days for those receiving surgery through the posterior approach. The hospital stay of the younger group was 7–14 days with a mean of 9.1 days.

3.5. Selection of operation

In the elderly group, 24 patients (41.4%) underwent ACDF, including subtotal vertebrectomy trapezoidal titanium mesh implantation, anterior cervical discectomy and fusion with the cage, or both combined. Thirty-four patients (58.6%) received posterior laminectomy and fixation, including simple surgical

Table 2
Preoperative comorbidities of the patients.

	Elderly group (cases)	Young group (case)
Hypertension	25	9
Diabetes	12	3
Coronary heart disease	10	2
Upper gastrointestinal ulcers or chronic gastritis	6	3
Chronic bronchitis	7	0
History cerebral embolism	5	2
Arrhythmias	4	1
Chronic anemia	5	1
Asthma	2	0
Parkinson's disease	2	0
Chronic renal insufficiency	2	0

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