THE EFFECTS OF AGE ON CERVICAL MYELOPATHY

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ABSTRACT :

22 cases diagnosed with cervical magnetic resonance imaging (MRI) and operated due to myelopathy between 1990–1996 were evaluated in this study. These cases were divided into two groups as younger 60 (Group 1–10 cases) and over 60 (Group 2–12 cases) years of age. Clinical examinations and cervical MRIs were repeated by calling the patients to control in the late period (mean 8 months). Clinical grading was performed according to Nurrick and MRI grading Nagata classification. The aging effects were investigated by comparing the two groups.

As a result, neurological presentation in elder people shows differences from the young people as a regard clinical status before the operation, prolonged period of disease and the higher affected level. The urgent surgical intervention should be performed when the findings of myelopathy are realized. This will affect the surgical outcomes in a positive manner.

Key words: *Cervical myelopathy, Age*

INTRODUCTION

Alterations in the skeletal system occur as a result of aging. While disc hernias cause cervical myelopathy in young people, spondylotic changes are the main causes in old people. Although these both pathologies are treated surgically, there are significant differences between the both aged groups when the results considered.

In this study, our aim was to determine the effects of age on myelopathy by presenting 22 cases with cervical myelopathy. 10 of the cases are younger 60 and the other 12 over 60; all treated surgically.

MATERIAL and METHODS

In this study, between 1990–1996, surgically treated 22 cases with cervical myelopathy diagnosed by MRI were included. All cases were called to control at least 8^{th} months following surgical intervention and in all control MRIs were carried out. Cases were divided into 2 groups; as aged younger (Group 1) and over (Group 2) 60 years old. Clinical evaluation was performed according to Nurrick classifications (10), MRI evaluation was performed according to Nagata (9) classifications respectively. Both groups were examined accordingly with the duration of symptoms–diagnosis, the etiology of myelopathy, the level of the lesion, type of the operation, clinical and MRI findings before and after the surgical treatment. Statistical analysis was performed by Mann–Whitney U test for pathology, by Fischer exact test for the duration of the disease, again by Fischer exact test for the type of the operation and clinical and MRI findings. For the differences between lesion levels, Mendel Henzel chi–square test and for the evaluation of both levels individually chi–square test were used.

NURRICK CLASSIFICATION (10):

Grade 1: Signs of spinal cord disease but no difficulty in walking.

Grade 2: Slight difficulty in walking but does not prevent full–time employment.

Grade 3: Difficulty in walking that prevents full–time employment or ability to do all housework, but is not so severe as to require someone else's help to walk.

Grade 4: Ability to walk only with someone else's help or with the aid of a frame.

Grade 5: Chairbound or bedridden.

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NAGATA CLASSIFICATION (9):

Preoperative MRI:

Grade 1: Cord compressed slightly.

Grade 2: Cord width decreased by less than one third.

Grade 3: Cord width decreased at least one third.

Postoperative MRI:

Restoration

Improvement

Unchanged

Table 1. The two groups compared by age.

		Group 1	Group 2	
PATHOLOGY	Spondylosis	4	12	p<0.05
	Herniated Disc	9	4	p>0.05
DURATION of DISEASE		12.10±18.03 m.	36.42±28.43 m.	p<0.05
OPERATION	Anterior	9	7	p>0.05
	Posterior	1	5	p>0.05

Table 2. Correlation between age and the level of cord compression on MRI.

		CORD (+)	COMPRESSION (–)	
C 3–4	GROUP 1	–	10	p<0.05
	GROUP 2	7	5	
C 4–5	GROUP 1	2	8	p<0.05
	GROUP 2	9	3	
C 5–6	GROUP 1	8	2	
	GROUP 2	9	3	
C 6–7	GROUP 1	4	6	
	GROUP 2	4	8	

RESULTS

22 cases were operated because of cervical myelopathy; 12 older 60 and 10 younger 60 years of old age with mean age being 68 in the first and 38 in the second group respectively. Spondylosis was present in all of the older aged group and in 7 cases disc hernia were also associated with spondylosis. Mean duration of the symptoms was approximately 12 months in Group 1 and 36 months in Group 2 respectively (Table 1). The most affected levels were C5–6 in Group 1 and C4–5 in Group 2. However; C3–4 and C4–5 levels were found to be more affected in elder group than young group ($p<0.05$)(Table 2). Anterior cervical discectomy followed by anterior fusion was the type of surgical intervention 90% in the young and 58% in the elder group; on the other hand posterior cervical decompression was carried out 10% in the first and 42% in the second group respectively. Neurological improvements were observed in both groups, but there were significant differences in regarding complete improvements in both groups when compared to each other ($p<0.05$) (Table 3). Preoperative MRI examinations showed the presence of Grade 1–2 compression of 25% in the old patients and 50% in the young patients and Grade 3 compression of 75% in the first and 50% in the second groups respectively. No statistical differences were present in postoperative MRI examinations of the both groups ($p>0.05$) (Table 4). However, on the other hand, clinical improvement rate was 80% in youngs and 50% in the olds.

Table 3. Comparing of groups according to Nurrick Classification

	Grade 0		Grade 1		Grade 2	Grade 3		
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Grade 1	5							
Grade 2	2		1	5				
Grade 3			2	3		3		
Grade 4								1
Grade 5								

Table 3. Comparing of groups according to Nagata Classification

	Restoration		Improvement		Unchanged	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Grade 1	1					
Grade 2	4	3				
Grade 3	3	3	2	6		

DISCUSSION

Spondylotic changes related to the aging are the most common causes in the etiology of cervical myelopathy. In the literature, it has been reported that clinical improvements were only seen in 35% (22–45%), worsening in 30% (22–48%) and no change in 35% of the conservatively treated cases with cervical myelopathy (8). Therefore these data indicate that surgical intervention shouldn't be disregarded in cases with cervical myelopathy.

According to Taylor (14) walking disorders are generally condemned because of the increasing age, thus patients with myelopathy go to the doctors at very late stages. Late diagnosis comes together with the worsening of the clinical presentation (8). Some authors relate it to the insufficient surgical results due to the severe clinical presentation (3, 4, 5, 6, 12, 13). The relations between prolonged duration of the disease, severe clinical presentation and surgical results are remarkable. In our cases, mean duration of the disease was 12.10 months and 36.42 months in the young and old groups respectively ($p<0.05$). While 31.08% of the elder patients were in severe clinical grades on admission (grade 3 and 4), in young patients it was 9.09%. Postoperatively, complete clinical improvements (Grade 0) were obtained 31.8% in Group 1 but in Group 2 no complete clinical improvement could be obtained ($p<0.05$). On the basis of our results, one shouldn't be conclude that old cases do not benefit from surgical interventions. Yamamoto (14), who quantitatively analyzed neurons and arteries of the spinal cord, has reported that although increases in number of the ν–motor neurons occur but no changes in α–motor neurons with age. Atherosclerotic alterations are also mild (8). These findings suggest that an improvement can be observed in elder cases with cervical myelopathy. Our postoperative findings also support this concept although complete clinical improvements in olds can not be realized at the required grade levels.

Another factor affecting the surgical reslts is the type of the lesion (1). In young patients disc hernias are more common and generally seen at one level; on the other hand, in old patients spondylotic alterations at multiple levels are dominant. These significant differences in both groups are also reported in Nagata's series (8). In our series we have seen more spondylosis in old patients when compared to the young patients ($p<0.05$). Myelopathy is more prone to develop at the affected upper cervical levels (C3–4, C4–5) than lower ones in olds as identified by Nagata et al. (8), like in our cases. Nagata (8) has also reported that clinical symptoms show more rapid progress in old cases with myelopathy because of upper cervical levels (C3–4, C4–5).

With introduction of MRI, diagnosis of the cervical myelopathies has become more accurate. A relationship between the severity of disease and spinal cord deformity has been observed by MRI in many reported series (3, 9, 11). Improvements in spinal cord deformities seen on postoperative MRI may also be a good sign of clinical status (3, 9, 11). In the cases with mild cervical cord compression, restoration are more obvious than serious ones (2, 7, 8). We have also observed similar findings in our cases. Complete improvements were obtained in 80% of young patients but it was 50% in old patients.

As a conclusion; postoperative neurological improvements in elder patients with cervical myelopathy show differences than youngs, because of the preoperative clinical status, prolonged period of the disease and the higher affected level. There was no systemic complications relating to age. Therefore surgical interventions should be carried out immediately when the findings of myelopathy are realized.

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