

# New clinical sign of cervical myelopathy: Wazir hand myelopathy sign

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## ABSTRACT

**Introduction:** Cervical spondylotic myelopathy (CSM) represents a spectrum of pathologies with progressive compression of the spinal cord. The clinical signs and symptoms play a key role in diagnosis. The characteristic hand myelopathy signs are of significant clinical importance. The aim of this descriptive study was to report a relatively easy to elicit new hand myelopathy sign. The basis for this is finger and wrist flexor disinhibition, which is used for the spinal specificity of cord compression at or above the C5/6 level.

**Methods:** The new clinical test was conducted in 68 patients with a mean age of 62 (range 54–68) years. The patients were divided into two groups according to their level of stenosis. Group 1 (n is 58) patients had stenosis at or above the C5/6 level, while Group 2 (n is 10) patients had stenosis at or below the C6/7 level. All these patients were clinically evaluated and their level of stenosis was confirmed using magnetic resonance imaging.

**Results:** The Wazir sign was observed and well reproducible in 54 (93%) patients (Group 1); the myelopathy signs of three patients were positive (Hoffman's sign, finger escape and ten-second test). In Group 2, the Wazir sign was not reproducible, but the myelopathy signs were also positive in three patients.

**Conclusion:** The Wazir hand myelopathy sign was found to be consistently present in our patients, in addition to the other hand myelopathy signs.

**Keywords:** cervical myelopathy, hand myelopathy signs

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## INTRODUCTION

Cervical spondylotic myelopathy (CSM) represents a spectrum of pathologies in which progressive compression of the cervical spinal cord occurs hand in hand with on-going degenerative changes. These changes



**Fig. 1** Photograph shows the author demonstrating the new hand myelopathy sign in a patient.

start with progressive degeneration of the disc, leading to instability at the posterior joints and spur formation. These changes are associated with hypertrophy of the ligamentum flavum, resulting in stenosis of the cervical canal circumferentially.<sup>(1)</sup>

The aetiology of CSM is multifactorial. Spinal factors contributing to its pathogenesis are congenital stenosis with an anteroposterior diameter  $\leq 12$  mm, progressive spondylosis, disc herniation, ossified posterior longitudinal ligament, hypertrophied ligamentum flavum, instability and impaired blood supply to the spinal cord. Differential diagnoses such as motor neuron disease, multiple sclerosis, spinal cord tumour and syringomyelia should be ruled out.

The clinical entity of CSM was well recognised in mid 1956 by Clark and Robinson, who specifically identified CSM arising from the spondylotic process rather than from any acute disc herniation.<sup>(2)</sup> In 1967, Brain and Wilkinson explained the progression of degenerative process in CSM, starting at the disc anteriorly and secondarily involving the surrounding structures with formation of osseous spurs. There is thickening and in-folding of the ligamentum flavum, leading to 360° stenosis<sup>(3)</sup> as well as producing symptoms of neck pain, an unsteady jerky broad-base gait and loss of dexterity in the hands.<sup>(4)</sup> Clinically, these patients typically have signs of upper motor neuron lesion below the level of cord compression and lower motor neuron findings at the level of stenosis.

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**Table 1. Summary of the results.**

Diagnosis/aetiology	No. of patients (%)						
	Total	Cervical spine involvement		Myelopathic hand sign		Wazir sign	
		Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Cervical spondylosis	52 (77)	48 (92)	5 (8)	48 (100)	0	46 (95)	0
OPLL	8 (12)	7 (87)	1 (12)	7 (100)	0	6 (85)	0
Disc protrusion	7 (10)	3 (50)	3 (50)	3 (100)	0	2 (66)	0
Congenital stenosis	1 (1)	0	1 (100)	0	0	0	0
Total	68	58 (85)	10 (15)	58 (100)	0	54 (93)	0

Group 1: patients with stenosis  $\geq$  C5/6 ; Group 2: patients with stenosis  $\leq$  C6/7

OPLL: ossification of the posterior longitudinal ligament

The characteristic hand myelopathy signs are of significant clinical importance. This descriptive study aimed to report a relatively easy to elicit new hand myelopathy sign, the basis of which is fingers and wrist flexor disinhibition, which can be used for the spinal specificity of cord compression  $\geq$  C5/6 level.

## METHODS

A descriptive study was conducted on 68 patients with an established diagnosis of cervical myelopathy. 54 male and 14 female patients with a mean age of 62 (range 54–68) years were included in the study. These cases were studied from Feb 2000 to Oct 2005 at three university hospitals, namely University Malaya Medical Centre, Kuala Lumpur, Duchess of Kent Children's Hospital, Hong Kong and Seremban General Hospital, Kuala Lumpur. Magnetic resonance (MR) imaging confirmed the patients' level of compression. During routine clinical follow-up of the patients, we found an interesting clinical hand myelopathy sign.

The spinal factor distribution in the 68 patients was as follows: 52 (77%) patients had cervical spondylosis, eight (12%) had ossification of the posterior longitudinal ligament, seven (10%) had disc herniation, and one had congenital stenosis. Besides these findings in the upper limbs, 17 patients had pain and numbness in the C6–C8 dermatomes on both sides. 53 patients had a typical myelopathic gait, while all 68 had signs of upper motor neuron involvement in their lower limbs. In this series, six patients had incontinence with normal PR findings.

The 68 patients were divided into two groups according to their level of stenosis. Group 1 consisted of 58 patients who had stenosis  $\geq$  the C5/6 level, while Group 2 comprised ten patients with stenosis  $\leq$  the C6/7 level. All these patients were clinically evaluated and their level of stenosis was confirmed using MR imaging.

The patients' right wrist was rested in extension, supination and a relaxed position over the examiner's left distal forearm in mid-prone, either in a sitting or supine

position. The examiner ensured that the patient was relaxed by tapping with his middle finger or gently with a tendon hammer at the extended wrist around the palmaris longus tendon. Patients with cervical myelopathy would have an exaggerated response by flexing their fingers, thumb and wrist (Fig.1).

## RESULTS

Wazir sign was observed and well reproducible in 54 out of 58 patients (93%) in Group 1, with three patients having positive myelopathy signs (Hoffman's sign, finger escape and ten-second test). These patients showed moderate to severe stenosis  $\geq$  C5/6 on MR imaging. The remaining four (6%) patients in Group 1 did not demonstrate any Wazir sign apart from the absence of Hoffman's sign and ten-second test in two patients and finger escape sign in three patients. In Group 2, Wazir sign was not reproducible in the ten patients with stenosis  $\leq$  C6/7 apart from the three patients with myelopathy signs and whose level of stenosis was confirmed by MR imaging (Table 1).

## DISCUSSION

Clumsy hands and the wide-base jerky gait of elderly persons have been described throughout the ages. Likewise, neck and upper extremity pain is such a ubiquitous ailment of ageing that the phrase "pain in the neck" has become a widely used figure of speech. It was not until 1952, however, that it was recognised that myelopathy and radiculopathy from cervical spondylosis constituted clinical disorders, known to be the most common cause of cervical cord and root compression in patients older than 55 years of age.<sup>(5)</sup> The syndrome of "numb, clumsy hands" has been described in patients with high compressive myelopathy of C3–C6 level. The typical symptoms are a loss of manual dexterity with difficulties in writing, diffuse, nonspecific arm weakness as well as abnormal sensations.<sup>(6)</sup> Lesions at levels C6–C8 cause a syndrome of spasticity and a proprioceptive loss in the legs. Patients have difficulty in walking and

an unsteady feeling, and often lose their balance and fall. Urinary frequency and urgency are not uncommon. A complete loss of bowel and bladder function is an end-stage deficit that is rare and carries a poor prognosis.

The physical signs of cervical myelopathy can be summarised by a well-said phrase “uppers in the lowers and lowers in the uppers”. Upper motor neuron signs distal to compression in the upper and lower limbs as well as lower motor neuron findings in the upper extremities at the level of compression are observed. Characteristic dysfunction of the hand has been well reported in the literature as myelopathy hand sign, which appears to be due to reflex disinhibition and pyramidal tract involvement. Besides other upper motor neuron signs, these are observed in day-to-day clinical practice. There is a loss of power of adduction and extension of ulnar 2 or 3 fingers, coupled with an inability to grip and release rapidly with these fingers (normal grip and release is 20 times per 10 sec), termed as finger escape sign and ten-second test, respectively. These are generally accompanied by exaggerated tricep and bicep reflexes, positive Hoffmann’s signs, inverted radial reflex, Lhermitte’s sign and other long tract signs such as spastic gait and hyperreflexia in the lower limbs and a positive Babinski sign. No specific correlation has been found between hand myelopathy signs and the level of cervical cord involvement. However, these facts are well observed at the level of compression  $\geq$  C5/6 but rarely seen at  $\leq$  C6/7 level.<sup>(7)</sup>

The basis of this new hand myelopathy sign, which was named Wazir hand myelopathy sign after the family name of one of the authors, can be explained on the basis of disinhibition of tendon stretch reflex of the long flexor tendons of the fingers (root value of C7 and C8), wrist flexor (C6 and C7) and/or with the involvement of pyramidal tracts (which are the basis of other hand myelopathy signs). Some of our patients were operated

on due to their worsening symptoms. However, we could not determine whether there was any improvement in their Wazir sign or other myelopathy signs, as the follow-up period was too short.

The evolution of new clinical signs over time will help clinicians in the diagnosis and understanding of diseases. This study provided evidence for a new clinical sign for CSM that is based on the examination of finger and wrist flexor muscle disinhibition. Future long-term studies with a larger sample are required to support our findings as well as determine its correlation to specific level of cord involvement and its recovery besides other myelopathy hand signs postoperatively.

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