Case report

**Misdiagnosis in cervical spondylosis myelopathy.**

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Received October 2016. Accepted following peer review Jan 2017. Published May 2017

**JISHANT 2017:2**

**Abstract**

Cervical spondylotic myelopathy is a neck condition that arises when the spinal cord becomes compressed due to the wear-and-tear changes that occur in the spine as we age. The condition commonly occurs in patients over the age of 50. This can lead to compression of the spinal cord and symptomatic myelopathy. Symptoms of myelopathy can be subdivided on the basis of upper or lower motor neurone injury. The usual complaints are unsteady/clumsy gait, altered sensation, bowel and bladder dysfunction (in the late stages), lower extremity spasticity and diffuse hyperreflexia with the possible presence of the Babinski, sign, Hoffman reflexes, or any combination of these reflexes. These are due to compression of upper motor neurons. Hypotonia and hyporreflexia with some changes in sensation may also occur if there is compression of lower motor neurons. The deterioration in gait is generally the result of the overall lower extremity spasticity rather than weakness. Roentgenography, computed tomography, magnetic resonance imaging, and neurophysiologic studies are the main studies used to diagnosis this disease. We report a 67 year old woman, whose gait disturbance was misdiagnosed. We found several sensory disturbances, hyperreflexia in her legs and arms, right ankle clonus, right Babinski, bilateral Hoffman sign, muscle atrophy and spastic quadraparesis. MRI revealed three levels of compression over the cervical cord. Anterior cervical disectomy, corpectomy and bone graft were performed. Her outcome was satisfactory, with improvements in her sensory disturbance and muscle weakness.

**KEYWORDS:** Cervical; Spondylosis; Myelopathy; Trauma
Introduction

Cervical spondylotic myelopathy (CSM) is a neck condition that arises when the spinal cord becomes compressed—or squeezed—due to the wear-and-tear changes that occur in the spine as we age. The condition commonly occurs in patients over the age of 50.\(^1\) The name refers to impaired function of the spinal cord caused by degenerative changes of the discs and facet joints in the cervical spine.\(^2\)

CSM is characterized by slow impairment, with deterioration of gait, weakness, sensory disturbances and radicular pain, commonly seen.\(^3\)

This type of spinal cord injury is one of the most frequent cause of spastic paraparesis and tetraparesis in elderly patients.\(^4\)

It is essential to examine for signs of cervical myelopathy when evaluating any patient with spondylosis. This can affect the treatment strategy. Because the aetiology of cord compression is primarily chronic degeneration, patients rarely have acute signs as they would in a traumatic setting. However it can be exacerbated following minor trauma to the neck.

Symptoms can be subdivided on the basis of upper or lower motor neuron injury. Lower motor neuron injury is secondary to alpha motor neuron/ exiting nerve root compression.

Patients complain of myotomal weakness, tingling and numbness in associated dermatomes, and decreased fine motor coordination. Examination reveals atrophy and weakness of the arms or hands, diminished pinprick sensation in the fingers, and decreased deep tendon reflexes.

Upper motor neuron injury is secondary to long tract compression and subsequent dysfunction. The primary tracts responsible for symptoms in cervical compression myelopathy are the corticospinal (motor), spinothalamic (pain and temperature), dorsal column (vibration and proprioception), and spinocerebellar (motor tone and coordination) tracts. The usual complaints are of an unsteady/clumsy gait, leg rigidity, altered sensation, and bowel and bladder dysfunction (in the late stages).

Physical examination reveals lower extremity spasticity and diffuse hyperreflexia with the possible presence of the Babinski, clonus, or Hoffman reflexes, or any combination of these reflexes (Hoffman’s sign is present if the cord compression is higher than C7/C8 and is causing long tract injury). The deterioration in gait is generally the
result of overall lower extremity spasticity rather than weakness.  

Initial diagnosis is aided with plain radiographs which can provide a detailed rendering of the bony anatomy. Fractures of the vertebral body, pedicle, and lamina can be diagnosed. Pathologic bone changes in spondylosis include osteophytes, erosive lesions (infection, tumors), or trauma (fractures) can usually be seen. Sagittal canal diameter can be measured. The anteroposterior and lateral views provide important information on the overall alignment in any posture. Flexion and extension lateral radiographs are still the primary means of identifying instability. Computed Tomography is very useful at assessing both normal and abnormal cervical spine bony anatomy using sagittal, coronal, and three-dimensional reconstructions. The vertebral body, pedicle, lateral mass, laminae, and spinous process can all be visualised in fine detail. Fractures are seen as radiolucencies that (along with distortions in surrounding soft tissue anatomy) allow a more specific diagnosis and decrease the risk of missing pathology. CT-myelography (CTM) (with water-soluble intrathecal contrast material injected before CT) is invaluable in evaluating either cord or nerve root compression.  

With Magnetic Resonance Imaging one can also appreciate the relationship between two or more different structures because of different signals, such as a herniated disk and nerve root. In myelopathy, visualisation of the changes in signal within the cord aids in diagnosis and treatment planning.

Other complementary studies include neurophysiologic studies which can be useful to assess the integrity of the pyramidal and sensorial pathways. They are important adjuncts, especially in differentiating cervical radiculopathy from peripheral nerve injury processes. The test consists of a nerve conduction study (NCS) and needle electromyography (EMG).  

Case History

Our case report is about a 67 year old woman, who had suffered gait disturbance exacerbated following minor injury. Initially she experienced left leg weakness followed by both legs, and later by a change in sensation in both legs. She was evaluated by orthopaedic staff who decided on surgical intervention to her left knee (figure 1 D). Two months later her symptoms were unchanged. On the physical exam there was sensory disturbances (hyposthesia), hyperreflexia in her legs and arms, right ankle clonus, right Babinski, bilateral Hoffman sign, muscle atrophy in interoseous hand muscles (figure 1) and
spastic quadriparesis. MRI revealed three levels of compressions over the spinal cord. Anterior cervical disectomy, corpectomy and bone graft was performed. Cervical MRI T2 sequences showed spondyloarthritic changes with absence of the pre-medullar space and compression of cervical spinal cord, from the inferior boundary of C3 to C6 (figure 2). Surgery involved anterior C3-C4 and C4-C5 discectomy, medial corpectomy of C4 and bone graft (figure 4). Her outcome was satisfactory, with improvements in her sensory disturbance and muscle weakness (figure 5).

Discussion

This case demonstrates the need for a careful history and examination in patients presenting with abnormalities in gait or other neurological symptoms. In most patients the diagnosis is possible following this. Imaging confirms the diagnosis and helps plan treatment. Misdiagnosis can lead to symptom progression with worsening prognoses for a full recovery.

Clinical examination is not outdated; it continues to hold an important place in medical practice.

Learning points

1. Never assume a diagnosis on a few clinical findings. Take a detailed history.
2. There are clinical differences between first and second neuronal injury of pyramidal tract.
3. Anterior decompression of cervical spine is a good option in the surgical treatment of CSM.
Figures

Fig 1. This shows muscle atrophy on the patient’s arms and legs. A - interoseous muscles atrophy on dorsal area of her hands. B - tenar and hypotenar muscle atrophy on palmar area of her hands. C - deviation of her left foot. D - surgical scar on knee.
Fig 2. This shows MRI of cervical spine T2 sequence. A. Notice anterior compresion of spinal cord on C3-C4, C4-C5 level. B. Notice spondyloarthrosis from C3 to C6 accompanied by spinal stenosis. C. Notice absent premedular space.

Fig 3. This shows CT Scan of dorsolumbar spine. Notice extension of spondyloartrosis on verterbral body and articular facets however there isn¥t spinal stenosis.
Fig 4. This shows cervical spine X-Ray in anterior and lateral view. Notice extension of C4 medial corpectomy and disectomy in C5-C6 and bone graft.

Fig 5. Postsurgical clinical improvement regard her muscle force, mainly on her arms.
References


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Accepted Jan 2017

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