



Treatment approach in tandem (concurrent) cervical and lumbar spinal stenosis

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Spondylotic degeneration can manifest as tandem (concurrent) cervical and lumbar spinal stenosis. The primary manifestations include neurogenic claudication, gait disturbance and a mixture of findings of myelopathy and polyradiculopathy in both the upper and lower extremities. The purpose of this retrospective study was to report the existence and management of tandem (concurrent) cervical and lumbar spinal stenosis.

Between 1998 and 2004, 8 patients (6 women and 2 men) were diagnosed with tandem spinal stenosis in a series of 230 patients who underwent surgery for spinal stenosis (3.4%). Three patients received cervical surgery first and 5 patients lumbar surgery first. The Japanese Orthopaedic Association Score of all patients improved from an average of 8.1 preoperatively to an average of 11.8 points at discharge and maintained an average of 12.7 points at final follow-up. Oswestry Disability Score improved from mean 58.1 to 29 at discharge and 19.3 at latest follow-up. All the patients had excellent or good results and none deteriorated neurologically.

Although tandem spinal stenosis occurred relatively infrequently, we concluded that its possible presence should not be overlooked. The treatment plan must be designed according to the chief complaints and symptoms of the patient.

Keywords : cervical spinal stenosis ; lumbar spinal stenosis ; tandem ; concurrent ; decompression.

INTRODUCTION

As the population ages, degenerative and spondylotic changes of the spine, both segmental

and diffuse, are seen more often. Although spinal stenosis can occur at any level, it presents mostly at the most mobile segments of the spine, the cervical and lumbar levels (4). A progressive loss of the available space secondary to degenerative changes may give rise to the symptoms and signs of spinal stenosis at one or multiple levels. At either end of the spine, the symptoms and clinical signs of stenosis are a direct result of a critical reduction in the sagittal diameter sufficient to produce symptoms in either the central spinal canal or the lateral neural foramina and the lateral recesses (3). The combination of spinal stenosis at different segments may also confuse the clinical signs and symptoms.

Spondylotic degeneration can manifest as tandem (concurrent) cervical and lumbar spinal stenosis. It was first described by Teng and Papatheodorou in 1964 (11). In 1984, Epstein *et al* (4) reported that 5%

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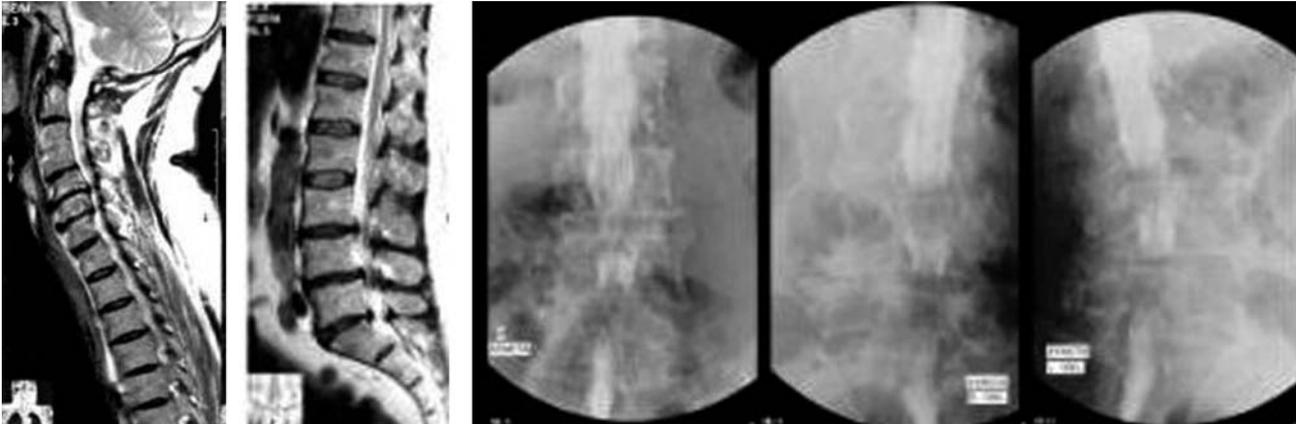


Fig. 1. — A 63-year-old male with muscle weakness in upper and lower limbs and quadriparesia. Preoperative radiological studies showed both cervical and lumbar spinal stenosis.

patients with spinal stenosis had symptomatic coexistent cervical and lumbar spinal stenosis. In 1987, Dagi *et al* (1) were the first to use the term “tandem spinal stenosis” to describe combined stenosis. The primary manifestations include neurogenic claudication, gait disturbance and a mixture of findings of myelopathy and polyradiculopathy in both the upper and lower extremities. The purpose of this retrospective study is to report the existence and management of tandem (concurrent) cervical and lumbar spinal stenosis.

MATERIALS AND METHODS

Between 1998 and 2004, 8 patients (6 women and 2 men) were diagnosed with tandem spinal stenosis in a series of 230 patients who underwent surgery for spinal stenosis (frequency : 3.4%). The mean age was 68 years (range : 51 to 80). In this group of patients, a staged surgery for cervical and lumbar spinal stenosis was performed. Three patients received cervical surgery first and 5 patients lumbar surgery first. Posterior or anterior decompressive surgery was performed and some type of posterior or anterior instrumentation was used for all the cases (fig 1).

In the cervical surgery first group, the main symptoms were upper motor neuron signs due to myelopathic lesion of the cervical spinal cord. In the lumbar surgery first group, radiculopathy and neurogenic claudication of lower extremities predominated. Diagnosis of the patients in both groups was made both clinically and radiologically. Neuroradiological investigations, myelo-

graphy, myelography-CT and MRI were used preoperatively. Patients requiring cervical surgery had stenosis with a spinal canal equal to or less than 10 mm in anteroposterior diameter. Those requiring lumbar surgery presented with stenosis and a canal below 11 mm in depth. In all patients, neurophysiological investigations like somatosensory evoked potentials, motor evoked potentials and electromyography were also done.

The mean follow-up period was 34.6 months. The clinical results were evaluated according to the Japanese Orthopaedic Association (JOA) score for cervical stenosis and Oswestry Disability Score for lumbar stenosis.

RESULTS

The JOA score of all patients improved from an average of 8.1 preoperatively to an average of 11.8 points at discharge and maintained an average of 12.7 points at final follow-up. Oswestry Disability Score improved from mean 58.1 to 29 at discharge and 19.3 at latest follow-up. There were no infections. Intraoperative and postoperative complications included one dural tear and one late deep venous thrombosis. All the patients had excellent or good results and none deteriorated neurologically.

DISCUSSION

Spinal stenosis leads to narrowing of the spinal canal and neural foramina. Depending on the level

of stenosis, compression symptoms of spinal cord or nerve roots may arise. Symptoms may differ according to compressed neural elements. Besides the segmental stenosis of cervical and lumbar spine, concurrent (tandem) cervical and lumbar spinal stenosis is rarely seen. With tandem spinal stenosis, the symptoms of either cervical or lumbar stenosis initially predominate, and management, diagnosis and subsequent treatment are the main problems in this patient group.

In the management of tandem spinal stenosis, a clear distinction between the two conditions regarding diagnosis and subsequent treatment. Neurogenic claudication is the major clinical diagnostic feature of lumbar stenosis, whereas myelopathy, often accompanied by radiculopathy, is that of cervical spinal stenosis.

In 1984, Epstein *et al* (4) reported that in a hospitalised cohort of patients with spinal stenosis, 5% had symptomatic "coexistent cervical and lumbar spinal stenosis." In 1987, Dagi *et al* (1) were the first to use the term "tandem spinal stenosis" to describe combined stenosis. The incidence of tandem spinal stenosis varies between 5% and 28% (4, 6, 7). In our series, the overall proportion of patients with combined complaints of cervical and lumbar spine stenosis was 3.4% among 230 patients who underwent surgery for spinal stenosis.

The differential diagnosis of tandem spinal stenosis includes other upper neuron diseases like amyotrophic lateral sclerosis in which brain stem signs, bulbar signs are evident (9). In our series, there were no signs of brain stem disease and cranial MRI of patients was normal. Intermittent claudication from peripheral vascular disease is also a diagnostic problem, especially in lumbar spinal stenosis. In this situation, peripheral angiography and Doppler ultrasonography are the diagnostic tools in suspected cases (2). In two cases of our study group, patients had cramping type discomfort associated with walking but peripheral angiography showed no signs of arterial insufficiency. Another diagnostic dilemma for cervical symptomatic stenosis is fibromyalgia but the observation of an absolute canal stenosis in MRI with signs of upper motor neuron disease should distinguish fibromyalgia from cervical spinal stenosis (5).



Fig. 2. — Postoperative radiographs after decompressive surgery.

Although non-operative therapy should initially be recommended in almost all cases of lumbar spinal stenosis, advanced cervical myelopathy and cervical stenosis may require earlier surgical consideration.

In several current studies, surgical treatment of tandem spinal stenosis was performed by simultaneous cervical and lumbar spinal decompression. Most observers have recommended initial decompression of the cervical spine (8, 10). Yamada *et al* (12) compared tandem surgery and two-staged operation in the treatment of a similar patient group. In their study, early results of two-stage surgery were better, but later results were better in the tandem surgery group (12).

In our management policy, cervical surgery is performed first if the patients had predominant signs in the upper extremities or in the upper motor neuron region. In the patients who had significant

symptoms in the lower extremities and no signs of upper motor neuron, lumbar surgery was performed first. We have performed a staged surgery for all the cases. We avoided simultaneous same-day surgery because of the risks of anaesthesia, long operation time and possible excessive bleeding. Second surgery was performed 2 weeks to 2 months after the first one.

In the study of Dagi *et al* (1), 9 of 19 patients showed excellent and good results after a mean follow-up period of 22 months. Hsiah *et al* (6) have reported excellent and good results in 8 of 12 patients. Our results showed an improvement at both JOA score and Oswestry Disability Score at final follow-up.

As a result, although tandem spinal stenosis occurred relatively infrequently in this series, we concluded that its possible presence should not be overlooked. The treatment plan should be designed according to the chief complaints and symptoms of the patient. The operation should also be staged. Staged surgery eliminates the risks of same-day surgery in this patient group, which typically has an advanced age and comorbidities prior to surgery. Our results showed that, given a correct diagnosis and management, patients with tandem spinal stenosis had satisfactory outcomes.

As in previous reports, this study is a review of hospitalised patients with tandem spinal stenosis. Undoubtedly, the unrecognised occurrence of combined stenosis in the general population is higher. Its possible presence should therefore always be kept in mind in the primary management of either cervical or lumbar spinal stenosis.

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