



## Introduction

# Recommendations of WFNS Spine Committee



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This special issue of the *Neurospine* is dedicated to a very important subject “Cervical Spondylotic Myelopathy and OPLL.” It is a privilege for me as the cochairman of the World Federation of Neurosurgical Societies (WFNS) Spine Committee to be a part of this special issue. We have had long standing efforts to prepare guidelines of different spinal disorders. Among those, we organized a consensus meeting in Nagpur, India in September, 2018. During the consensus meeting each speaker had the task to create questions for the topic, to review the manuscripts of the last 10 years, find answers to those questions and make statements of recommendation. At the end of each talk those statements were voted by the committee members using Delphi method, and approved statements were declared as recommendations of the WFNS Spine Committee. There were 17 talks and we conjugated them in 5 papers. You will find those papers summarizing the efforts of WFNS Spine Committee to create some recommendations on the hot topic cervical spondylotic myelopathy (CSM).

Attempts to construct evidence-based guidelines for management of CSM are not new, nor will it be the last one. In 2009, the Joint Section on Disorders of the Spine and Peripheral Nerves of AANS (American Association of Neurological Surgeons) and CNS (Congress of Neurological Surgeons) has published their guidelines in the *Journal of Neurosurgery Spine*.<sup>1</sup> They called it “*Guidelines for the Surgical Management of Cervical Degenerative Disease*.” In 2010, the North American Spine Society published their guidelines on “*Diagnosis and Treatment of Cervical Radiculopathy from Degenerative Disorders*,”<sup>2</sup> although it was dealing mostly with cervical disc herniation, not CSM. They published it in a 2011 issue of *The Spine Journal*.<sup>3</sup> In 2013, a group of authors supported by AOSpine North America have published some guidelines in the special issue “*Surgical Treatment of Cervical Spondylotic Myelopathy*” of *Spine*.<sup>4,5</sup> In 2017 some members of this group headed by Michael Fehlings published their new guidelines with support of AOSpine and the CSRS (Cervical Spine Research Society). The publication of the guideline papers was in a special issue of the *Global Spine Journal*.<sup>6-10</sup> This was a very detailed study and we as the WFNS Spine Committee have endorsed those guidelines with some minor changes. You can find those guidelines on our web site [www.wfns-spine.org](http://www.wfns-spine.org).

The 5 papers you will find in the following pages are reviewing almost all aspects of the CSM: (1) Techniques for diagnosis and natural course. (2) Value of surgery and nonsurgical approaches for CSM. (3) Anterior surgical techniques for CSM. (4) Posterior surgical techniques for CSM. (5) Outcome measures and variables affecting prognosis of CSM.

Clinical presentation of CSM and scores defining the severity of the disease is the subject of the first paper. Natural course of CSM was examined in 4 different groups: (a) moderate to severe CSM patients (modified Japanese Orthopedic Association scale [mJOA] scores

less than 13), (b) mild CSM patients (mJOA scores between 13–17), (c) patients with myelopathy signs but no symptoms, and (d) patients with no symptoms having significant stenosis (premyelopathic). All these groups had particular attention for management of the disease. In some stages observation and avoiding trauma should be chosen, but in some other stage a surgical decompression must be applied.

Diagnostic tests for CSM are reviewed in 2 parts: electrophysiological tests and radiologic imaging. Value of electrophysiology in differential diagnosis of CSM from other neurologic diseases, in prediction of outcomes of CSM, in evaluation of presymptomatic CSM and in monitoring of surgeries for CSM are separately reviewed. Imaging techniques are quite variable. Canal diameters in computed tomography and magnetic resonance imaging (MRI), compression ratio, cross-sectional area of the spinal cord, occupation rate, signal intensity changes in MRI (high signal in T2 and low signal in T1) are the most reliable techniques. There are also new imaging techniques such as dynamic MRI, fiber tracking and magnetic resonance spectroscopy that are promising for evaluation of the spinal cord biology to warn us before irreversible damage occurs.

Value of surgery and nonsurgical approaches for CSM is another challenging discussion. Especially decision of surgery or nonsurgical therapies/policies are not well established for mild CSM, although there is a general consensus for surgery in moderate to severe CSM patients. In different geographic locations of the world, the treatment options may also change according to the available resources and local practices. If observing the patient is chosen, the predictors of possible deterioration during nonoperative management should be known. Some of them are circumferential compression in axial MRI, hypermobility of spinal segment, angular edged deformity, instability, and presence of ossification of the posterior longitudinal ligament.

The indications for surgery include persistent or recurrent radiculopathy nonresponsive to conservative treatment, progressive neurological deficit, static neurological deficit with severe radicular pain when associated with confirmatory imaging and clinical-radiological correlation. There are several factors that should be considered for selection of surgical approach in patients with CSM: sagittal curvature, locations of the compressive pathology, number of levels involved, and patient comorbidities.

Anterior surgical techniques for CSM is the subject of third paper. We know that there are many options for anterior decompression such as anterior cervical discectomy and fusion, anterior cervical corpectomy and fusion, oblique corpectomy,

skip corpectomy and hybrid surgery. Complication rate of anterior surgeries for CSM varies from 1.6% to 31.3% and most are approach related or graft and fusion related complications. Improvement after anterior surgery for CSM has been reported in 70% to 80% of patients. The success rates appear to be similar for different forms of anterior surgery.

Posterior surgical techniques for CSM consist of laminectomy alone, laminectomy with fusion, and laminoplasty. Posterior surgery is used in cases with significant posterior compression at 1 or 2 levels, and if there are 3 or more levels anterior compressions. In kyphotic cases, especially if it is a flexible kyphosis, laminectomy and posterior fixation with fusion should be chosen. However, in rigid kyphosis, an anterior surgery combined with a posterior decompression should be preferred. In cases with preserved lordosis, laminoplasty is a good option. Cases with severe axial neck pain should not be a candidate for laminoplasty. Combined approach should be chosen in patients with significant ventral and dorsal osteophytic compression which cannot be handled holistically with a single anterior or posterior surgery. In comparing laminectomy to laminoplasty, there is a trend towards laminoplasty being better than traditional laminectomy but relatively equivalent to newer techniques of minimally invasive skip laminectomies.

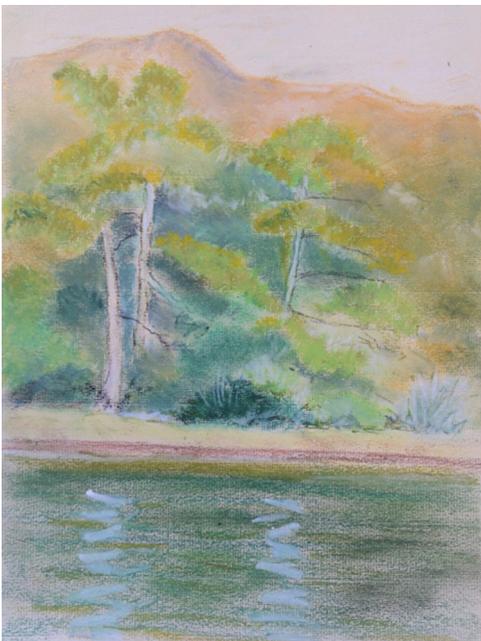
Ideal outcome scale for CSM is the mJOA which is validated by many studies and has been adapted to be used by almost every country and nation. Other than this, Nurick's grade and Myelopathy Disability Index are also reliable outcome scales that can be used.

Three clinical variables that affect the outcomes are age, duration of symptoms and severity of the myelopathy. The predictive variables affecting the outcomes among examination findings are hand atrophy, leg spasticity, clonus and Babinski's sign. Among the radiological variables, the curvature of the cervical spine is the most important predictor of prognosis. Patients with instability are expected to have a poor surgical outcome. Spinal cord compression ratio and high signal intensity on T2 weighted magnetic resonance images are negative predictors for prognosis.

I wish the spine surgeons all over the world will benefit from the WFNS Spine Committee recommendations on this very challenging spinal disorder. I acknowledge the great efforts of the Spine Committee members and all authors in setting up to finish this important task and especially the helps of Dr. Jutty Parthiban and Dr. Se-Hoon Kim.

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Title: Göcek, Turkey  
Artist: Mehmet Zileli  
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Göcek is a district in south-west part of Turkey. The turquoise blue waters and joining with forest costs are so attractive for wanderers especially those with gullet yachts which is called blue-voyage. Copyright: None