Is Preoperative Duration of Symptoms a Significant Predictor of Functional Status and Quality of Life Outcomes in Patients Undergoing Surgery for the Treatment of Degenerative Cervical Myelopathy?

Lindsay Tetreault Bsc; Jefferson R. Wilson MD , PhD; Branko Kopjar MD; Paul M. Arnold MD; Pierre Cote DC, PhD; Michael G. Fehlings MD PhD FRCS(C) FACS

University of Toronto; University of Washington; University of Ontario Institute of Technology

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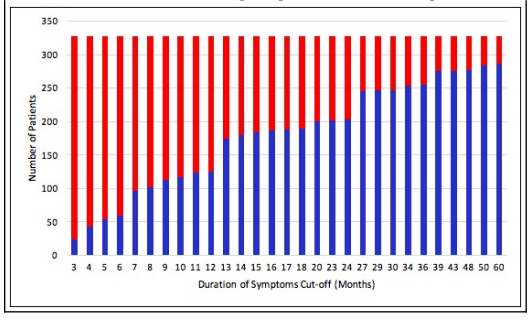
Introduction

The objectives of this study are (i) to define the relationship between preoperative duration of symptoms and myelopathy severity, (ii) to determine the optimal timing for decompressive surgery by comparing outcomes above and below certain duration of sympomts cutoffs and (iii) to evaluate if results vary based on preoperative myelopathy severity.

Methods

350 patients with symptomatic DCM were prospectively enrolled in either the CSM-North America or International study at 12 sites in North America. Postoperative functional status was evaluated at 6-, 12- and 24-months using the modified Japanese Orthopaedic Association (mJOA). Duration of symptoms was dichotomized into a "short" and "long" group at several cut-offs. An iterative mixed model analytic approach procedure was used to evaluate differences in change scores on the mJOA between duration groups in 1-month increments. This analysis was repeated for subgroups of patients with mild (mJOA=15), moderate (mJOA=12-14) and severe (mJOA<12) myelopathy.

Distribution of Patients in Various Duration of Symptoms Groups



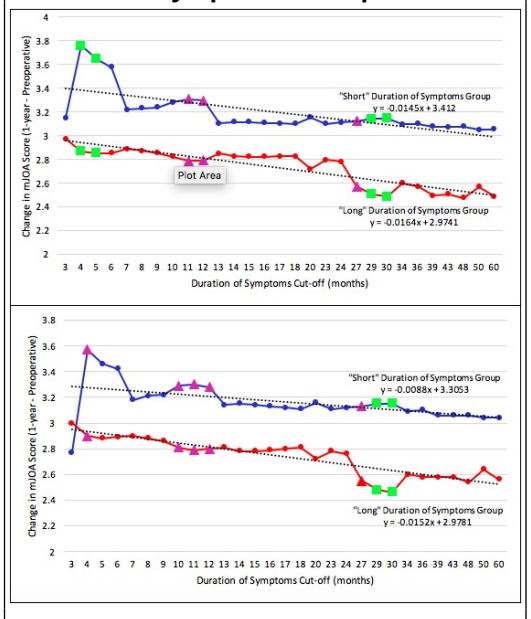
Results

Our sample consisted of 189 males and 138 females, with ages ranging from 29 to 87 years. Based on the mJOA, 75 patients presented with mild myelopathy, 147 with moderate and 105 with severe disease. The mean duration of symptoms was 25.71±36.68 months, with 268 and 202 patients reporting a duration of greater than 6- and 12-months, respectively.

Part I:

Duration of symptoms was not correlated with preoperative mJOA (R=-0.014), Nurick (R=-0.0087), NDI (R=-0.069), SF-36 PCS (R=0.027) or SF-36 MCS (R=0.028)

Differences in Outcomes between a "Short" and "Long Duration of Symptoms Group

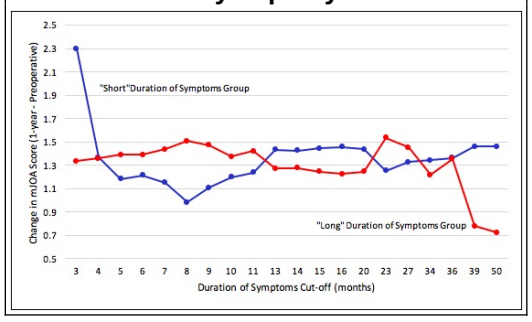


Green squares: p<0.05; Purple triangles: p<0.01

Part II:

Patients with a duration of symptoms shorter than 4 months had significantly better functional outcomes based on the mJOA than patients with a longer duration of symptoms (>4 months). Patients with a shorter duration of symptoms improved by 3.76 points on the mJOA, whereas those with a duration 4 months or longer only exhibited a 2.87 mean gain (p=0.0276). Twenty-nine months was identified as the next important cut-off beyond which patients had a significantly worse outcome on the mJOA.

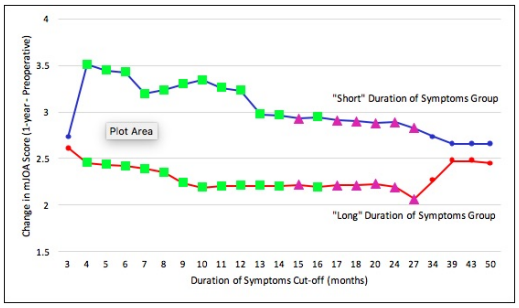
The Importance of Duration of Symptoms in Patients with Mild Myelopathy



Part III:

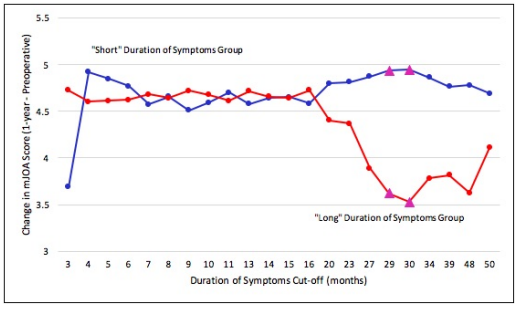
When stratifying by myelopathy severity, we were unable to identify an appropriate cut-off for patients with mild or severe myelopathy. In patients with moderate disease, however, each 1-month delay in surgery significantly impacted clinical outcomes. This subgroup likely reflects patients with progressive myelopathy; it is critical to intervene as early as possible to halt further neurologic decline, prevent irreversible damage to the spinal cord and optimize outcomes.

The Importance of Duration of Symptoms in Patients with Moderate Myelopathy



Green squares: p<0.05; Purple triangles: p<0.01

The Importance of Duration of Symptoms in Patients with Severe Myelopathy



Purple triangles: p<0.01

Conclusions

Patients who are operated on within 4 months of symptom presentation have better mJOA outcomes than those treated after this 4-month cut-off. This is especially true in patients with moderate and progressive disease. It is recommended that patients with DCM are diagnosed in a timely fashion and referred early for surgical consultation.