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Cervical spine and cord angle mismatch in the pathogenesis of myelopathy

Tomasz Tykocki and Guy Wynne-Jones

Royal Victoria Infirmary Newcastle upon Tyne Hospital, UK

Background: Cervical Myelopathy is a complex pathology and dynamic compression of the tethered cervical cord, which may be responsible for clinical symptoms.

Methods: Patients with Cervical Canal Stenosis who had magnetic resonance imaging in flexion and extension positions were retrospectively reviewed. All cases were evaluated in Nurick grade. The cervical parameters-Cervical Cord (CC) angle, Cervical Lordosis, and Spine/Cord (S/C) angle ratio-were measured on the magnetic resonance imaging. Mean values of these parameters were compared between non-myelopathic (Nurick grade 0) and myelopathic groups (Nurick grades 1-5). A multinomial ordinal logistic regression was used to predict outcome for Nurick grade using the CC angle, the cervical lordosis angle, and the S/C angle ratio as independent variables.

Results: A total of 65 patients (35 men) with the mean age of 58.6

± 11.4 years were analyzed. A comparison of means between Nurick grade 0 against each of myelopathic grades 1-5 revealed significant differences only for the S/C angle ratio. A cumulative comparison between non-myelopathic and myelopathic grades for the S/C angle ratio showed significant difference of 0.29 (1.16 ± 0.5 vs. 1.45 ± 0.6 , respectively; $P < 0.05$). Cumulative comparison for the CC angle difference in flexion and extension lordosis did not show substantial differences. The S/C angle ratio was the only significant parameter in the prediction of the Nurick grade with an odds ratio of 2.63 (95% confidence interval 2.11-2.79).

Conclusions: A positive correlation between Nurick grade and cervical spine and cord angle mismatch was found.

e: ttykocki@gmail.com