Clinical Outcomes of Surgical Management of Mild Cervical Compressive Myelopathy Based on Minimum Clinically Important Difference

Objective: Cervical compressive myelopathy (CCM), caused by cervical spondylosis or ossification of the posterior longitudinal ligament, is a common neurological disorder in adults worldwide. For patients with moderate and severe CCM, surgical management is recommended. However, the therapeutic management of patients with mild CCM remains controversial. In recent years, there has been a trend toward surgery in the early disease state of CCM, and several studies have examined the outcomes after surgical decompression for mild CCM. Nonetheless, the current knowledge is insufficient to inform patients with mild CCM of the specific surgical effect in clinical setting: whether surgery can provide perceptible improvement of neurological symptoms or not. Hence, the present study aimed to examine the surgical outcomes of mild CCM using the minimum clinically important difference (MCID).

Methods: Patients who underwent surgery for CCM between 2013 and 2021 were retrospectively reviewed. The Japanese Orthopedic Association score (JOA score) was employed as the clinical outcomes, and the MCID was set as 1 point, as previously determined. The patients with the JOA score of ≥14.5 points at baseline were stratified into the mild CCM cohort, which was dichotomized into the improvement group, including the patients with the achieved MCID (JOA score ≥1 point) or with the JOA

score of 17 points (full mark) at 1 year postoperatively, and the non-improvement group, including other ones. Demographics, symptomatology, and radiographic variables were compared between the two groups; subsequently, studied using receiver operating characteristic (ROC) curve.

Results: Of 310 patients, 42 were stratified into the mild CCM cohort (mean age, 59.1 years; 64.3% male; the mean JOA score, 15.4 and 16.2 points at preoperatively and 1 year postoperatively, respectively). Twenty-four patients (57.1 %) were assigned to the improvement group. The improvement group was significantly younger than the non-improvement group; however, other variables did not differ significantly. The ROC curve analysis revealed that 58 years was the optimal cutoff age for discriminating between the two groups (area under the curve=0.689, *P*=0.025). The Cochran–Armitage test showed a significant linear trend, with younger age group associated with higher proportion of the improvement group.

Conclusions: In the present study cohort, the majority of patients with mild CCM experienced neurological improvement reaching the MCID after surgery. Further, this study suggests that for younger patients with mild CCM, especially below 60 years, subjective improvement of neurological symptoms can be more expected after surgery.

Whereas, for the older patients, surgery becomes more prophylactic significance to halt disease progression.

Figure legend: The figure shows proportion of the improvement group by age.