Title: Impact of the preoperative cervical range of motion on C5 palsy after cervical laminoplasty

Background: Cervical laminoplasty (CLP) is an established technique, but the risk of C5 palsy (C5P) after surgery has not been resolved.

Research question: To investigate the effect of preoperative cervical spine range of motion on the development of C5 paralysis after CLP.

Design: Retrospective radiological analysis

Methods: 210 patients (134 males and 76 females, mean age 67.7 years) who underwent CLP at our hospital were included in the study. CLP was performed with a double-door technique using a suture anchor, and MRI was performed in all postoperative patients. Patient demographic data, operative time, number of CLP, cervical alignment, decompression width and the diameter of posterior shift of the cord were measured from postoperative MRI and were used as parameters to study. C2-7 Cobb angle, sagittal vertical axis (SVA), C7 slope, and preoperative range of motion (ROM) were examined, and compared between the C5P and non-C5P groups.

Results: C5P occurred in 10 patients (10/210, 4.8%). Larger BMI and smaller preoperative ROM were significant in the C5P group than non-C5P one. Logistic regression analysis showed that preoperative ROM was significantly related to C5P ($P<0.05$, OR: 0.94). No significant differences were found in other parameters.

Discussion: C5P is known to occur more frequently in patients with foraminal stenosis, and it has been suggested that it may anchor the nerve root. A small preoperative range of motion makes it difficult to adjust the foramen because of lack of the mobility, which may be a risk factor to the development of C5 palsy.

Conclusion: Cervical preoperative ROM is involved in C5 palsy, and preoperative range of motion training may be a preventive measure for C5 palsy.