

Morphological analysis of OPLL progression in cervical spinal cord injury cases treated with posterior fusion

Kento Inomata¹, Kota Suda¹, Satoko Matsumoto Harmon¹, Hiroki Ushirozako², Ryo Fujita¹, Keiichi Nakai¹, Masao Koda³, Masashi Yamazaki³, Tsutomu Endo⁴, Katsuhisa Yamada⁴, Norimasa Iwasaki⁴

¹*Hokkaido Spinal Cord Injury Center, Department of Orthopaedic Surgery, Bibai, Hokkaido, Japan*

²*Morimachi public hospital, Department of Orthopaedic Surgery, Shizuoka, Japan*

³*University of Tsukuba, Department of Orthopaedic Surgery, Tsukuba, Ibaraki, Japan*

⁴*Hokkaido University, Department of Orthopaedic Surgery, Hokkaido, Sapporo, Japan*

Background: The patients with cervical OPLL have a high frequency in Asians. The presence of OPLL is a risk factor for cervical spinal cord injury (CSCI). In previous studies, there is no consensus on CSCI with OPLL after fusion surgery.

Objective: To investigate the natural progress of ossification in CSCI cases with OPLL treated by posterior fusion surgery.

Methods: The subjects included 42 cases of CSCI with OPLL that underwent posterior fusion surgery between 2017 and 2021 and were amenable to follow-up with CT for more than 6 months. We investigated the union of the OPLL at the level of CSCI on postoperative CT. We measured the thickness of OPLL at the level of injury by CT at the time of injury and 6 months after surgery and calculated the thickness of OPLL. We divided the subjects into two groups: one with the union of OPLL after surgery and one without the union. We performed comparative analyses between the two groups and binary logistic regression analyses on the differences in thickness of OPLL, and DM. We assessed the rates of union for OPLL longitudinally at intervals of 3 months, 6 months, 1 year, and 2 years postoperatively.

Results: At the final observation, 30 cases (71.4%) got the union of OPLL at the level of injury, and the mean time from injury to the union of OPLL was 8.4 (2-28) months. The mean difference in thickness of the OPLL was -0.07 (-1.2-0.6) mm. There were no significant differences between the two groups in age, gender, BMI, presence of DM, and the difference in thickness of OPLL. The rate of transformation into continuous type OPLL at intervals of 3 months, 6 months, 1 year, and 2 years were 12%, 37%, 57%, and 73%.

Conclusion: This study suggested that spinal fusion surgery has some effect of transforming OPLL into the continuous type and preventing the increase in thickness of their ossification. The rate of transformation into continuous type in both OPLL showed a progressive escalation over the specified period.