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Characteristics of Residual Symptoms following Laminoplasty in Diabetic Patients with Cervical Spondylotic Myelopathy: A Prospective Cohort Study in 505 Patients with Cervical Spondylotic Myelopathy

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Introduction: Diabetes is one of the most frequent coexisting diseases; therefore, surgical options have been increasing for diabetic patients. However, there has been no study to assess the postoperative residual symptom after cervical laminoplasty in a large series of patients with cervical spondylotic myelopathy (CSM). This study aimed to compare the outcome of cervical laminoplasty in diabetic patients and non-diabetic patients with CSM and to characterize the residual symptoms following laminoplasty in diabetic patients with CSM.

Materials and Methods: A total of 505 consecutive patients with CSM (331 males; 189 females) who were followed up for more than one year after surgery were enrolled. All patients underwent double-door laminoplasty. Exclusion criteria included the following: 1) ossification of the posterior longitudinal ligament; 2) history of rheumatoid arthritis, cerebral palsy, or tumors; 3) injuries; 4) destructive spondyloarthritis caused by hemodialysis; 5) previous cervical surgery; 6) spinal fusion with instrumentation; 7) thoracic spondylotic myelopathy; and 8) lumbar spinal canal stenosis. The patients were divided on the basis of diabetic criteria for glucose intolerance into two groups: the diabetic group (n = 105) and non-diabetic group (n = 400). We consulted diabetes specialists at our hospital for these patients, and all patients had well-controlled blood glucose levels during the perioperative period. We evaluated differences in pre- and post-operative Japanese Orthopedic Association (JOA) scores, recovery rate (RR) between both groups.

Results: There was no significant difference in age, gender, symptom duration of CSM, body mass index (BMI), smoking history, preoperative cervical alignment and range of motion (ROM), occurrence of increased signal intensities (ISI) on magnetic resonance T2-weighted imaging (MRT2WI) between both groups. There was also no statistically significant difference in the follow-up period, operation time, blood loss, postoperative cervical alignment and ROM, change of alignment and ROM between two groups. The mean RRs of motor function of the upper extremities in the diabetic and non-diabetic groups were 59.2% and 60.5% with no significant difference. The diabetic group showed significantly low RR of motor function of the lower extremities compared with the non-diabetic group (36.1% vs. 43.4%, p < 0.05). There was significant difference in RR of sensory function of the upper extremity (36.8% vs. 49.6%, p < 0.05).
However, the mean RRs of sensory function of the lower extremity and trunk were 59.7 and 59.2 %, 69.3 and 74.1 %, respectively. The Mean RRs of urinary bladder function were 42.1 and 53.7 % with significant difference (p < 0.05).

**Conclusion:** In the diabetic patients, motor function impairments of the lower extremities, sensory function impairments of the upper extremities and urinary bladder function impairments are persist more than other symptoms after surgery compared with the non-diabetic group. These findings provide baseline data that may allow clinicians to accurately assess preoperative impairment and postoperative outcomes in diabetic patients with CSM.