A Prospective Comparative Study between Anterior Decompression and Fusion and Posterior Decompression with Laminoplasty for Cervical Myelopathy Caused by Ossification of the Posterior Longitudinal Ligament

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INTRODUCTION: Although numerous procedures have been proposed, anterior decompression and fusion (ADF) and posterior decompression with laminoplasty (LAMP) have become the most widely adopted surgical methods for treating cervical myelopathy. The decision to use either an anterior or a posterior approach depends on many factors, including the source of spinal cord compression, the number of vertebral segments involved in the disease process, cervical alignment, and the surgeon’s familiarity with various techniques. Ossification of the posterior longitudinal ligament (OPLL) of the cervical spine compresses spinal cord from anterior side and provokes cervical myelopathy. For that condition, it would be expected that an anterior approach is a reasonable procedure for spinal cord decompression rather than a posterior one. On the other hand, some authors have reported that clinical results of LAMP for OPLL of the cervical spine were even satisfactory. However, there has been no prospective comparative study between ADF and LAMP for cervical OPLL. The purpose of this study is to compare the clinical results of these procedures during a 2-year period by conducting a prospective single-institution method.

METHODS: Thirty-six consecutive patients under 75-year-old who had suffered from cervical myelopathy caused by OPLL had prospectively undergone ADF or LAMP since 1996. In 1996, 1998, 2000 and 2002, 24 patients had been treated with midline open-door LAMP at C3 to C6 or C7 and additionally dome-like LAMP at C2 if needed. In 1997, 1999, 2001 and 2003, 11 patients had been treated with anterior corpectomy within OPLL lesion and stabilized with an autograft and fixed with a cervical plate, except for a patient who had OPLL extending to C2 level too difficult to achieve decompression by ADF. All the patients were stable enough to allow early ambulation at 2 or 3 postoperative days and rehabilitation with an Ortho-collar for 4 weeks in LAMP patients or 3 months in ADF ones. At the 2-year follow up, 8 of ADF patients and 17 of LAMP patients could be evaluated using a scoring system proposed by the Japanese Orthopedic Association (JOA score), and the recovery rate was calculated using the Hirabayashi method. Preoperative proper anteroposterior
diameter of the spinal canal and thickness of OPLL were measured on cervical CT-myelogram. Canal narrowing ratio (CNR) were defined.

RESULTS: The maximum CNR of ADF and LAMP patients averaged 46.3±12.6% and 50.3±15.7%, respectively. The mean JOA scores were 11.6±2.6 and 10.7±2.4 preoperatively, 15.6±0.9 and 14.8±1.2 at the 2-year follow up. The recovery rates at the 2-year follow up were 69.4±21.5% and 62.2±21.3%. There were no statistically significant differences between ADF and LAMP patients. However, the recovery rate of the LAMP group was in inverse correlation with the CNR, but not of the ADF group (Fig. 1).

CONCLUSIONS: Although both of ADF and LAMP for cervical OPLL generally resulted in a good clinical outcome, LAMP cases with high CNR over 60% became a limited result. Limitations inherent in this study included lack of ADF cases with high CNR and long-term follow-up.

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