

Comparison of Anterior Cervical Decompression and Fusion and Muscle-preserving Selective Laminectomy in Patients with Degenerative Cervical Myelopathy

Background: Muscle-preserving selective laminectomy (MSL) is a less invasive alternative to conventional decompression surgery in patients with degenerative cervical myelopathy (DCM). Therefore, the preferred treatment for DCM has changed from anterior decompression and fusion (ADF): anterior cervical discectomy and fusion (ACDF) and corpectomy and fusion (ACCF), towards MSL at our institution.

Research question: Are there any differences in surgical outcomes between ADF and MSL?

Design: Retrospective cohort study

Methods: All patients with DCM who underwent ADF or MSL at our institution from 2008 to 2019 were reviewed. Using analysis of covariance (ANCOVA), changes in patient-reported outcome measures (PROMs) from baseline to the 2-year follow-up were compared, adjusting for clinicodemographic parameters, baseline PROMs, number of decompressed levels, and magnetic resonance imaging (MRI) measurements (modified K-line interval). The PROMs included the European Myelopathy Score (EMS), the Neck Disability Index (NDI), and the European Quality of Life-5 Dimension Questionnaire (EQ-5D).

Results: Ninety patients (mean age 60.7 years, 51 men [57%]) were included in the ADF group, and 63 patients (mean age 68.8 years, 41 men [65%]) in the MSL group. The ADF and MSL groups presented similar PROMs (13.3 vs 13.1 [EMS], 38.6 vs 38.4 [NDI], 0.32 vs 0.36 [EQ-5D]) and modified K-line intervals (4.08 versus 4.88, $p=0.07$) at baseline. The ANCOVA-adjusted comparison of 2-year changes in PROMs presented no significant differences between the groups. The reoperation rate was comparable (16.7% versus 7.9%, $p=0.146$), but the overall complication rate was twice as high in the ADF group (22.2% versus 9.5%, $p=0.049$). The average in-hospital treatment cost per patient was 6,870 USD for MSL, 7,737 USD for ACDF, and 14,953 USD for ACCF.

Discussion: MSL provides similar PROMs after 2 years, a significantly lower complication rate, and better cost-effectiveness compared with ADF.