

Segmental slope is a predictor of fusion rate in single level anterior cervical discectomy and fusion

Abstract

Objectives: To explore preoperative segmental slope as a predictor of fusion rate after single-level anterior cervical discectomy and fusion (ACDF).

Methods: Data of consecutive patients with single-level cervical spondylosis who underwent ACDF between 2011 and January 2019 were retrospectively reviewed. Preoperative parameters including baseline characteristics, segment slope, T1 slope, range of motion, intervertebral disk height, and bone density were evaluated. Data were analyzed using Student's t-test, Mann–Whitney U test, χ^2 test, Fisher's exact test, multivariate logistic regression analysis, and receiver operating characteristic curve.

Results: In total, 253 patients were selected. The mean follow-up was 32.1 months (range 24-99 months). Male sex, body mass index, preoperative segment slope, T1 slope, operative levels, and osteoporosis or osteopenia were associated with non-fusion at an early stage after surgery. However, no statistically significant difference was observed at the last follow-up. Multivariate logistic regression analysis revealed that the preoperative segment slope was an independent predictor for non-fusion at 3, 6, and 12 months postoperatively. Osteoporosis or osteopenia was an independent predictor of non-fusion at 6 and 12 months postoperatively. The area under the curve was 0.874 at 3 months ($p<0.001$, cutoff value 10.21°), 0.888 at 6 months ($p<0.001$, cutoff value 14.56°), and 0.825 at 12 months ($p<0.001$, cutoff value 21.08°).

Conclusion: Preoperative segment slope can be used as a predictor of early fusion rate

after single-level ACDF. We determined detailed cutoff values . This study may help surgeons take measures to promote early fusion in advance.