



Comparison of Motion Changes and Clinical Outcomes between Cervical Disc Replacement and Anterior Cervical Discectomy and Fusion in Single Level Cervical Degenerative Disease

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Introduction

The aim of this study is to investigate the safety and efficacy of CTDR by comparing it with ACDF in the treatment of single-level cervical degenerative disease, retrospectively.

Methods

This study included 61 patients, who underwent either stand-alone single-level ACDF (n = 33) or single-level CTDR (Bryan cervical artificial disc, n = 28) at C3 to C7 for degenerative cervical disease between June 2007 and December 2009. Cervical flexion, extension, and neutral lateral radiographs were obtained before surgery, immediately after surgery, at 1 and 12 months and annually after surgery to measure the overall cervical sagittal angle (CSA, C2-7 angle) and segmental angle (SA) of the treated level. Range-of-motion (ROM) of overall cervical spine (C2-7), treated level, and upper and lower adjacent segments were also measured. For evaluation for patient's pain, VAS scores for axial and radicular pain were measured, and the JOA score was measured to assess the patient's functional state.

Results

The average follow-up period was 26.7 months and 22.8 months in the ACDF and CTDR groups, respectively.

The SA was maintained at a significantly higher level in the CTDR group compared to the ACDF group during follow-up period (p < 0.05). The ROM of the the upper adjacent segment was significantly increased in the ACDF group compared to the CTDR group. However, there was no significant difference of the ROM of the lower adjacent segment between the two groups at the last follow-up.

The clinical results according to the JOA and VAS scoring systems were not significantly different between the two groups.

Conclusions

CTDR using a Bryan artificial disc provided a significant maintenance of the SA and the ROM at the treated level and prevented the hyper-mobility at the upper adjacent segment compared to ACDF.

Learning Objectives

The study about effectiveness of CTDR

