

# Artificial Disc Replacement Combined With Fusion versus Two-Level Fusion in Cervical Two-Level Disc Disease with 5 Years Follow-up

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#### Introduction

In the previous study with 2 years follow-up, hybrid surgery(HS)is superior to 2-anterior cervical discectomy and fusion(2-ACDF) in terms of better neck disability index(NDI) recovery, less postoperative neck pain, faster C2–C7 range of motion(ROM) recovery, and less adjacent ROM increase.



#### Methods

Between 2004 and 2006, 40 patients undergoing 2-level cervical disc surgery at our hospital were identified who met the following surgical indications: 2 consecutive level degenerative disc disease between C3/4 and C6/7; either a radiculopathy or myelopathy; and no response to conservative treatment for >6 weeks. Forty patients (20 patients of the HS group and 20 patients of the 2-ACDF group) were follow-up for 5 years. Patients were asked to check the neck disability index(NDI) and grade their pain intensity before surgery and at routine postoperative intervals of 1, 2, 3, 4, and 5 years. Dynamic flexion and extension lateral cervical

radiographs were obtained in the standing position before surgery and at routine postoperative intervals. The angular ROM for C2-C7 and adjacent segments were measured using the Cobb method with PACS-software.

## **Learning Objectives**

The purpose of this study was to compare the long-term(5 years)clinical and radiologic outcomes of HS, consisting of cervical artificial disc replacement(C-ADR) combined with ACDF and 2level ACDF in patients with 2-level cervical disc disease.







# Figure 6. The superior adjacent segment ROM



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## Results

The HS group had better NDI recovery 1, 2 and 3 years after surgery (P<0.05). Postoperative neck pain was less in the HS group 1-3 years after surgery(P<0.05). There was no difference in arm pain relief between the groups. The HS group showed more angular ROM for C2-C7 at 2-3 years after surgery. The superior adjacent segment ROM shows hypermobility in the 2-ACDF group and hypomobility in the HS group at all follow-up period without statistical significance. The inferior adjacent segment ROM showed significant differences between the groups at 1-2 years after surgery(P<0.05).

### Conclusions

HS is superior to 2-ACDF(better NDI recovery, less postoperative neck pain, faster C2-C7 ROM recovery, and less adjacent ROM increase) in 2 years follow-up, but these benefits of HS becomes similar to 2-ACDF with 5 years follow-up.