Kang L, Lin D, et al. Artificial Disc Replacement Combined With Midlevel ACDF Versus Multilevel Fusion for Cervical Disc Disease Involving 3 Levels. Orthopedics 2013;36(1):e89-e94.

Design: Randomized clinical trial

Brief summary of results:

- 24 patients (15 men, 9 women, mean age 54) with 3-level cervical disc disease were surgically treated at a university hospital in Zhangzhou, China
- Patients with obvious instability, osteoporosis, or inflammatory disorders were excluded
- Two operations were compared, with patients randomized to either 3-level ACDF (n=12) or to a hybrid operation of disc replacement and fusion (n=12)
    - ACDF was done with iliac crest autograft and a cervical plate system
    - The hybrid operation was done with the top and bottom levels receiving a ProDisc-C arthroplasty while the middle level had fusion using an interbody cage filled with iliac crest bone
- Main outcomes (Neck Disability Index, neck and arm pain VAS) were followed at 1 mo, 3 mo, 6 mo, 12 mo, and 24 mo
    - Both groups improved from baseline; the two groups did not differ on any of these outcomes as of 24 months
- Radiographic outcomes were mixed
    - ROM at C2-C7 decreased postoperatively in both groups, regaining much preoperative mobility by 24 months
    - C2-C7 ROM at 24 months was closer to the preoperative values for the hybrid group than for the ACDF group, and was a few degrees greater for the hybrid group (mean 45.9°) than for the ACDF group (36.1°)
    - Similarly, ROM in both the superior and inferior adjacent segments decreased postoperatively for both groups, gradually increasing over the following 24 months, with no differences between groups at 24 months
- In the hybrid group, no adjacent segment degeneration was reported; one patient in the ACDF group had a second surgical intervention after 27 months for adjacent segment degeneration

Authors' conclusions:

- A hybrid operation combining artificial cervical discs at the top and bottom levels with fusion at the middle level generates a surgical efficacy similar to that of 3 level fusion
- Long term follow-up is necessary to evaluate the safety and efficacy of the hybrid technique; optimal treatment for cervical disc disease at 3 or more levels still remains to be developed

Comments:

- The study is too small to support evidence statements comparing a hybrid operation with multilevel fusion, but does advance a plausible hypothesis for further study
- Some details of the study are also lacking for supportable evidence statements; the inclusion and exclusion criteria are sketchy, and the allocation sequence was quasi-randomized by hospital chart, making it possible for allocation decisions to be influenced by knowledge of which operation the patient would be assigned to

Assessment: Inadequate for evidence of comparative efficacy of a hybrid operation with a 3 level fusion for multilevel cervical degenerative disc disease