

Cervical disc arthroplasty combined with two-level ACDF for the treatment of contiguous three-level cervical degenerative disc disease: A comparative study

Objective

To compare the differences among constructs with one-level cervical disc arthroplasty (CDA) and two-level anterior cervical discectomy and fusion (ACDF).

Methods

A retrospective study was conducted involving patients who underwent one-level CDA and two-level ACDF between June 2012 and July 2020. According to the different locations of CDA and ACDF, we divided the constructs into three types: type Ia: CDA-ACDF-ACDF; type Ib: ACDF-CDA-ACDF; type Ic: ACDF-ACDF-CDA. The differences of clinical and radiological outcomes were evaluated.

Results

Fifty-three patients were included with 29 in type Ia group, 11 in type Ib group, and 13 in type Ic group. After surgery, all groups showed significant improvement in Japanese Orthopedic Association, Neck Disability Index, and Visual Analog Scale scores ($p < 0.001$). Range of motion (ROM) of the total cervical spine in type Ic group decreased significantly compared with those in type Ia and type Ib groups ($p < 0.05$). The fusion rates of the superior ACDF segments were significantly higher at 6 and 12 months postoperatively than those of the inferior ACDF segments ($p < 0.05$).

Conclusions

The clinical outcomes were similar among constructs concerning different locations

of CDA and ACDF in three-level hybrid surgery. ROM of the cervical spine in type Ic group decreased significantly compared with that in type Ia and type Ib groups.

The fusion rates of superior ACDF segments were higher at early time points after surgery than those of inferior ACDF segments.

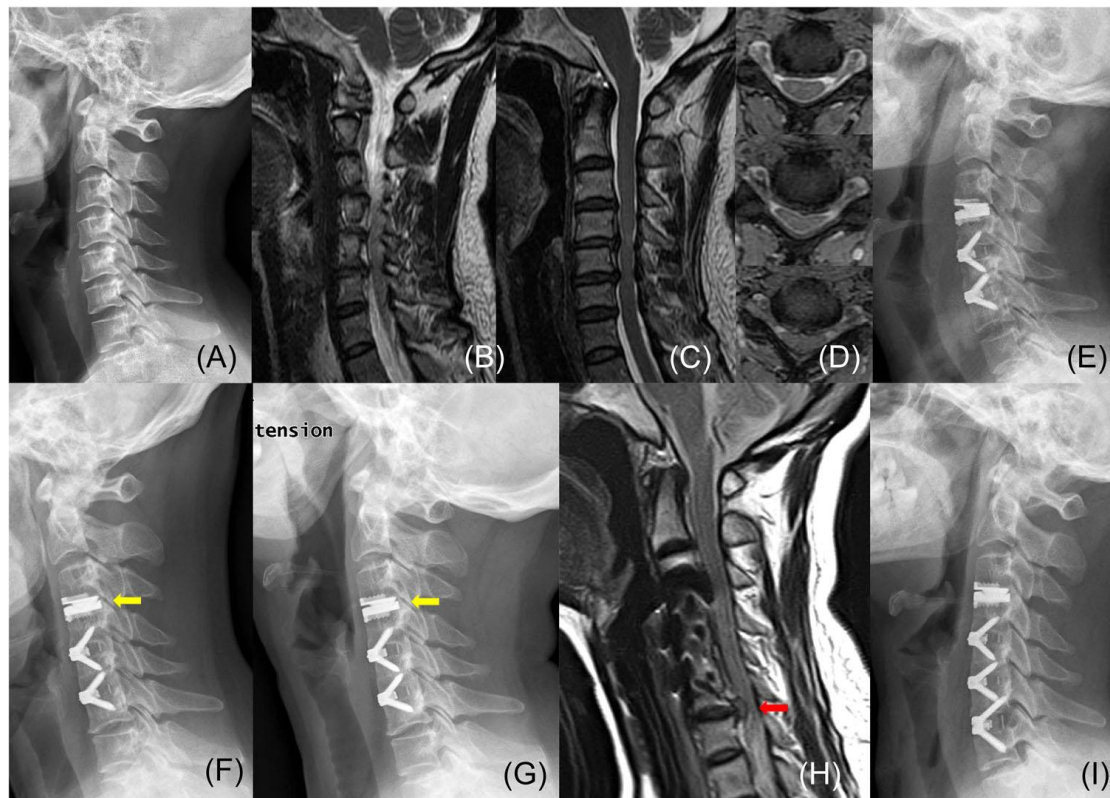


Fig 1. One case of ASD. A 41-year-old woman diagnosed with spondylotic radiculopathy at C3-4 and spondylotic myelopathy at C4-5 and C5-6 (A–D). Type Ia HS was performed (E). At 3.5 years after surgery, the patient came back to our hospital with a severe symptom. A class IV HO was observed at the CDA segment with the absence of motion (F and G), and ASD was found at the inferior adjacent level (H). An addition ACDF was performed (I). ACDF, anterior cervical discectomy and fusion; ASD, adjacent segment disease; CDA, cervical disc arthroplasty; HS, hybrid surgery.

