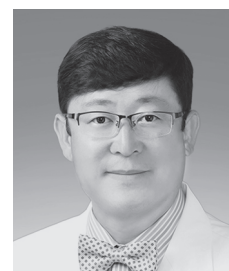


Cervical Spinal Arthroplasty in the Perspective of Biomechanical Changes: Myth or Reality?

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Anterior cervical discectomy and fusion (ACDF) has been a widely accepted procedure for treatment of cervical disc diseases. However, several reports about post-fusion exacerbation of adjacent segments gave rise to development of motion preserving prosthesis. There has been a recent vogue for the use of artificial disc prostheses to decrease the risk of accelerated degenerative disease at adjacent levels. The short-term results of total disc replacements (TDRs) have been encouraging, but the long-term justification for using this new technology hinges on whether the incidence of adjacent segment disease decreases. It will also be necessary to demonstrate that movement at the operated levels is maintained and the incidence of device failure is low.

The author presents the retrospective analysis of patients who received cervical arthroplasty with Activ C or ACDF using stand-alone cage for single-level cervical disc disease with radiculopathy and/or myelopathy at C4/5 or C5/6. The segmental range of motion of operated level, rostral adjacent level, and caudal adjacent level were measured from plain dynamic radiographs using Cobb angle. We found that cervical arthroplasty showed favorable motion preservation at the operated level. Radiologically, the ACDF group showed more increase of adjacent segment motion 2 years after surgery, which implies that cervical arthroplasty may have advantages in preventing adjacent segmental diseases compared with ACDF.

The radiological, biomechanical and clinical evidence for adjacent segment disease, and the rationale for using cervical TDR will be reviewed, along with the author's clinical experiences.

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