

DOES CERVICAL DISC ARTHROPLASTY REDUCE ADJACENT SEGMENT DISEASE AND OTHER COMPLICATIONS IN COMPARISON TO ANTERIOR CERVICAL DISCECTOMY AND FUSION? A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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SUMMARY: A meta-analysis of the literature was performed to assess the development of adjacent segment degeneration/disease between cervical disc arthroplasty (CDA) to that of anterior cervical discectomy and fusion (ACDF) at 2 and 4 year follow-up periods. Due to weaknesses in study design, heterogeneity in management, and relatively high withdrawal/drop-out rates, robust conclusions supporting the advocacy of CDA over ACDF cannot be made at this stage.

INTRODUCTION: To reduce the risk of adjacent segment disease and other procedure-related complications following anterior cervical discectomy and fusion (ACDF), cervical disc arthroplasty (CDA) has been advocated for one-level cervical disc disease. However, it remains unknown whether CDA decreases the occurrence of such complications. As such, the following study addressed a meta-analysis of randomized controlled trials assessing the efficacy of CDA in reducing adjacent segment disease and other complications in comparison to ACDF.

METHODS: Three reviewers performed a literature search for randomized controlled trials comparing CDA to ACDF for radiculopathy and/or myelopathy for one-level cervical disc disease. Studies with 2 years or greater follow-up were selected. Adjacent segment disease, secondary surgery (i.e. revision, reoperation, instrumentation/graft removal), and adverse events were assessed and pooled for analyses.

RESULTS: Eight studies were included for review. Due to limitations with study design, studies presented with Level II evidence. CDA exhibited a decrease risk for reoperation attributed to adjacent segment disease, but was not statistically significant ($p>0.05$). Additional procedure-related complications did not statistically differ between groups ($p>0.05$).

CONCLUSION: Up to 4 year follow-up, CDA does not significantly reduce the risk of adjacent segment disease and other complications in comparison to ACDF. Due to the lack of blinding, variation in surgical management, and relatively high withdrawal/dropout rates among studies at 2 and 4 year follow-up, robust conclusions supporting the advocacy of CDA over ACDF cannot be made at this stage. High-quality studies are needed to properly assess the true efficacy of such interventions.