

A systematic review for the condition of adjacent segment between cervical disc arthroplasty and anterior cervical discectomy and fusion

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Objective: With the increasing of CDA and ACDF, surgeons pay more attention to adjacent segment degeneration (ASDeg) and adjacent segment disease (ASDis). There are more and more meta-analyses comparing CDA and ACDF. However, there were few data referring to adjacent segment within these meta-analyses. In our study, we performed a comprehensive meta-analysis to compare adjacent segment motion, degeneration, disease and reoperation between CDA and ACDF. We aim to elaborate the overall condition of adjacent segment between cervical disc arthroplasty (CDA) and anterior cervical discectomy and fusion (ACDF).

Methods: Several important databases were searched for controlled trials comparing CDA and ACDF before February 2016. The analysis parameters included: follow-up time, operative segments, cervical ROM, adjacent segment motion, adjacent segment degeneration, adjacent segment disease and adjacent segment reoperation. The risk of bias graph and modified NOS system were used to assess the papers. Subgroups analysis was used to assess the factors influencing the results and heterogeneity.

Results: 38 controlled trials fulfilled the including criteria, including 33 English papers and 5 Chinese papers. Comparing with ACDF, the rate of adjacent segment reoperation for CDA was significantly lower ($P < 0.01$). With the increasing of follow-up time, the amount of reoperation in CDA was more lower than ACDF according to subgroups. ASDeg in CDA was significantly lower than ACDF ($P < 0.01$), there was no difference with increasing the follow-up time. The same surgical method had no difference between superior ASDeg

and inferior ASDeg ($P > 0.05$). CDA had a greater cervical ROM than ACDF ($P < 0.01$). There was lower adjacent segment motion in CDA comparing with ACDF ($P < 0.01$).

Conclusion: Comparing with ACDF, the advantage of CDA was lower ASDeg, adjacent segment reoperation and adjacent segment motion, higher cervical ROM. However, there was no significant difference for adjacent segment diseases and inferior/superior adjacent segment motion.

Keywords: meta-analysis; cervical disc arthroplasty; anterior cervical discectomy and fusion; adjacent segment

None of the authors has any potential conflict of interest