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Zero-P cage versus stand-alone cage for ACDF in terms of sagittal alignment reconstruction for multiple levels degenerative cervical diseases

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Introduction: ACDF is one of the most common surgical procedures in the treatment of the degenerative cervical spine stenosis (DCSS). The interbody cage allows for restoration of the disc height, induction of fusion and lordotisation of the operated segment. However, the intraoperative lordotisation of the motion segment may subsequently regress.

This study compares the radiological and clinical outcomes, with a focus on the sagittal alignment reconstruction of ≥ 3 -level ACDF using Zero-P spacers versus those using stand-alone cage.

Patients and methods: From Sep 2020 to Mai 2023, a total of 65 patients who received multiple levels ACDF surgery due to DCSS were recruited. Standalone Cage was used in 35 patients and Zero-P spacer was used in 30 patients (group ZP).

Clinical outcomes were analysed by Neck Disability Index (NDI), VAS and dysphagia was evaluated using the Bazaz score. Segmental lordosis (SL) and cervical lordosis (CL) were the radiological measures.

Results: The VAS, NDI and JOA scores differed significantly between the two groups postoperatively ($p < 0.05$); however, there was no significant difference between the 2 groups at the 3- and 6-month and last follow-up ($p > 0.05$). At the 24-month follow-up, the fusion rate and ASD were similar between the two groups ($p > 0.05$).

Patients using stand-alone cage had a significantly lower postoperative CL and SL, compared to those using Zero-P cage ($p < 0.05$); meanwhile, the fused segment disc wedge was also found to be significantly smaller in patients using stand-alone cage after surgery ($p < 0.05$).

Conclusion: Zero-P spacers used in multiple level ACDF surgery could provide better radiological and clinical outcomes compared to the stand-alone cage. The study showed that stand-alone cage was inferior to the Zero-P cage in terms of sagittal alignment reconstruction.

We recommend applying Zero-P spacers even for multiple levels ACDF to maintain physiological curvature of the cervical spine postoperatively.