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The Effect of Anterior Cervical Discectomy and Fusion on Cervical Lordosis in Expandable versus Non-Expandable Cages

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Background: ACDF is known to influence cervical lordosis, with restoration of lordosis linked to clinical improvements. Malalignment of the cervical spine may contribute to adjacent segment disease. Prior research has reported a reduction in lordosis on follow-up imaging, particularly in multilevel procedures.

Research Question: Does the use of expandable cage maintain cervical lordosis compared to non-expandable cages?

Design: A retrospective cohort study assessing local lordotic angles in ACDF surgeries performed by a single surgeon over the last four years.

Methods: Patient data including cage type, number of levels fused, surgical indications, comorbidities, and complications were recorded. Relevant imaging was reviewed by three independent radiologists. Measurements included anterior, middle, and posterior disc heights, functional spinal unit height, stationary cage measurements, local lordotic angle, C2-7 Cobb angle and sagittal vertical axis.

Results: 102 cages were analysed (39 non-expandable [NE] vs 63 expandable [Ex]), corresponding to 30 NE and 47 Ex patients. The mean age was 58 in the NE group and 61 in the Ex group ($p=0.23$). Multilevel procedures were performed in 19 Ex vs 9 NE patients. The immediate post-operative lordotic angle showed no significant difference between groups (Ex: 3.4° vs NE: 1.6° ; $p=0.24$). However, on follow up X-ray expandable cages exhibited a smaller reduction in local lordotic angle (Ex: 2° vs NE: -0.5° ; $p=0.04$).

Discussion: Expandable cages are thought to enhance stability and maintain lordosis. This study confirms a loss of lordosis following ACDF; however, radiological measurements indicate greater lordotic stability in expandable cages compared to non-expandable ones despite having more multi-level procedures. Further long-term follow-up is necessary to determine whether this translates into clinical benefit.