Pretic-I

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Abudouaini et al. creatively designed an elastically deformable cervical implant to reduce the postoperative stress concentration.

They aimed to investigate the biomechanical performance of this novel cervical implant and compare it with the commonly used cervical devices.

A biomechanical test was conducted on twelve fresh-frozen human cadaveric cervical spines (C2-C7) and randomly divided into four groups according to implant types: the intact group, Cervical interbody zero-profile stand-alone cage (ACDF) group, the novel cervical implant group, and the Pretic-I artificial cervical disc (ACDR) group. An optical tracking system was used to evaluate the segmental range of motion (ROM) of the C4/C5, C5/C6, and C6/C7 segments, and a micro pressure sensor was used to record the maximum facet joint pressure (FJP), maximum intradiscal pressure (IDP) at the C4-5 and C6-7 segments.

There were no significant differences in the ROM of adjacent segments between the groups. Compared with the intact group, the ACDR group essentially retained the ROM of the operated segment. The novel cervical implant decreased some ROM of the operated segment, but it was still significantly higher than in the fusion group; The maximum FJP and IDP at the adjacent segments in the ACDF group were significantly higher than those values in the other groups, and there were no differences in the other groups. While the newly developed elastically deformable cervical implant does not completely maintain ROM like the artificial cervical disc, it surpasses the fusion device with regard to biomechanical attributes. After further refinement, this novel implant may be suitable for patients who are prone to severe adjacent segment degeneration after fusion surgery but no indication for artificial cervical disc surgery [1].

[1]

Abudouaini H, Wu T, Meng Y, Ding C, Liu H, Beiyu W. Biomechanical properties of a novel cervical spine implant with elastic deformation: a cadaveric study. Front Bioeng Biotechnol. 2023 Aug 29;11:1214877. doi: 10.3389/fbioe.2023.1214877. PMID: 37711451; PMCID: PMC10497878.

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