DCI

see Delayed cerebral ischemia.

DCI™ DYNAMIC CERVICAL IMPLANT Adjacent Segment Protection The DCI™ implant* provides stable, controlled motion, allowing the spine to be functionally dynamic. After insertion, the implant works as a shock absorber to effectively prevent accelerated degeneration in the segments above and below.

DCI™ Features Anatomical Design Excellent endplate accommodation for primary stability Atraumatic anchorage to avoid heterotopic ossification Teeth located anteriorly for secure anchorage Three implant heights for appropriate height restoration Four different footprints for proper endplate coverage Single-Piece Implant Excellent fatigue strength No wear debris Titanium alloy

Functionally Dynamic Physiological center of rotation Controlled rotational stability

Axial Compliance Shock absorption capabilities Compressible in flexion Ease of Use Standard surgical technique Easy instrumentation Implant insertion under compression (reduced height) Depth stop for trial implants and insertion instrument DCI™ Videos

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Few studies have compared biomechanical behavior of various prostheses as they relate to clinical results after two-level total disc replacement (TDR). METHODS: Three arthroplasty devices Mobi-C, PCM and DCI were inserted at the C4-C6 disc space and analyzed. Displacement loading was applied to the center of the endplate at the C3 level to simulate flexion and extension motions. RESULTS: The motion distributions in extension with DCI and in flexion with DCI and Mobi-C were relatively close to that in the intact model. Mobi-C and PCM obviously increased the combined extension range of motion at the index levels, but both resulted in about 45% decrease in extension moment. DCI showed a trend in strain energy similar to that of healthy discs. PCM exhibited an facet joint stress (FJS) distribution almost similar to that of the intact model. DCI did not generate significant overloading at cartilage between the index levels, whereas the maximum FJS increased with Mobi-C was about 39%. The maximum stress on a UHMWPE core was above the yield stress (42.43 MPa for Mobi-C and 30.94 MPa for PCM). CONCLUSION: Each prosthesis shows its biomechanical advantages and disadvantages. However, DCI has the capacity to preserve motion and store energy under external loading, similar to the behavior of normal discs. Compared with Mobi-C, both DCI and PCM showed a lower stress at cartilage between index levels, which may avoid facet joint degeneration to some extent. Such a well-controlled arthroplasty device with a stand-alone structure may be a potential candidate and needs to be investigated in future studies [1)].

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Li Y, Fogel GR, Liao Z, Tyagi R, Zhang G, Liu W. Biomechanical Analysis of Two-level Cervical Disc Replacement with a Stand-alone U-shaped Disc Implant. Spine (Phila Pa 1976). 2017 Feb 14. doi: 10.1097/BRS.0000000000002128. [Epub ahead of print] PubMed PMID: 28198781.