Dynamic cervical stabilization

A number of dynamic stabilization systems have been used to overcome the problems associated with spinal fusion with rigid fixation recently and the demand for an ideal dynamic stabilization system is greater for younger patients with multisegment disc degeneration.

Dynamic cervical stabilization is a motion-preserving concept that facilitates controlled, limited flexion and extension, but prevents cervical axial rotation and lateral bending, thereby reducing motion across the facet joints.

Shock absorption of the Dynamic Cervical spinal Implant (DCI) device is intended to protect adjacent levels from accelerated degeneration.

Matt et al. conducted a prospective evaluation of 53 consecutive patients who underwent DCI stabilization for the treatment of 1-level (n = 42), 2-level (n = 9), and 3-level (n = 2) cervical disc disease with radiculopathy or myelopathy. Forty-seven patients (89%) completed all clinical and radiographic outcomes at a minimum of 24 months. Clinical outcomes consisted of Neck Disability Index (NDI) and visual analog scale (VAS) scores, neurological function at baseline and at latest follow-up, as well as patient satisfaction. Flexion-extension radiography was evaluated for device motion, implant migration, subsidence, and heterotopic ossification. Cervical sagittal alignment (Cobb angle), functional spinal unit (FSU) angle, and range of motion (ROM) at index and adjacent levels were evaluated with WEB 1000 software. RESULTS The NDI score, VAS neck and arm pain scores, and neurological deficits were significantly reduced at each postoperative time point compared with baseline ($p < 0.0001$). At 24 months postoperatively, 91% of patients were very satisfied and 9% somewhat satisfied, while 89% would definitely and 11% would probably elect to have the same surgery again. In 47 patients with 58 operated levels, the radiographic assessment showed good motion (5°-12°) of the device in 57%, reduced motion (2°-5°) in 34.5%, and little motion (0-2°) in 8.5%. The Cobb and FSU angles improved, showing a clear tendency for lordosis with the DCI. Motion greater than 2° of the treated segment could be preserved in 91.5%, while 8.5% had a near segmental fusion. Mean ROM at index levels demonstrated satisfying motion preservation with DCI. Mean ROM at upper and lower adjacent levels showed maintenance of adjacent-level kinematics. Heterotopic ossification, including 20% minor and 15% major, had no direct impact on clinical results. There were 2 endplate subsidences detected with an increased segmental lordosis. One asymptomatic anterior device migration required reoperation. Three patients underwent a secondary surgery in another segment during follow-up, twice for a new disc herniation and once for an adjacent degeneration. There was no posterior migration and no device breakage. CONCLUSIONS Preliminary results indicate that the DCI implanted using a proper surgical technique is safe and facilitates excellent clinical outcomes, maintains index-and adjacent-level ROM in the majority of cases, improves sagittal alignment, and may be suitable for patients with facet arthrosis who would otherwise not be candidates for cervical TDR. Shock absorption together with maintained motion in the DCI may protect adjacent levels from early degeneration in longer follow-up [1)]

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Matgé G, Berthold C, Gunness VR, Hana A, Hertel F. Stabilization with the Dynamic Cervical Implant: a novel treatment approach following cervical discectomy and decompression. J Neurosurg Spine. 2015 Mar;22(3):237-45. doi: 10.3171/2014.10.SPINE131089. Epub 2015 Jan 2. PubMed PMID: 25555050.