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Physical and Mental Life Quality in Patients Treated with Dynamic Cervical Implant

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Introduction: New implants for cervical disc replacement aim at maintaining or restoring function. The Dynamic Cervical Implant (DCI™, Paradigm Spine) seeks to combine the advantages of the gold standard fusion technique with the motion preservation philosophy. DCI has a constrained motion: it works like a shock absorbing spring and may help to slow down adjacent segment degeneration.

Methods: Between 2007 and 2011 we selected 121 patients aged 32 to 73 years for treatment with DCI at either one or two levels (13 patients). Indications were radiculopathies (n=69), axial pain (n=6) or spondylotic spinal stenosis (n=46) without chronic myelopathy. Patients are followed up at 3, 6, 12, and 24 months after surgery with NDI, pain and satisfaction questionnaires as well as SF12.

Results: Disc surgery was performed at C3/C4 (n=2), C4/5 (n=8), at C5/6 (n=65), C6/7 (n=57) and at C7/T1 (n=2). In flexion/extension radiographs motion rapidly increased after surgery. However, 5 of 19 segments treated during the initial phase of our study were fused (seen at 6 or 12 months). After implant footprint was changed and larger sizes were provided only 7 of 99 segments fused within 12 months (7%). More than 90% of the patients rated their clinical result as excellent or good. There were no implant related complications or revision surgery. Anterior migration of the implant resulted in fusion of the operated segment (2 cases) without need for additional measures. Neck pain, arm pain, and NDI continuously decreased in successive follow-ups. SF12-measures returned to normal (physical score) and even reached scores better than normal (mental scores). Correspondingly all satisfaction scores continuously increased.

Conclusions: Cervical disc replacement with DCI is positioned in between ACDF and TDR. The change of implant footprint after an initial trial has significantly reduced long-term fusion-rate. Clinical results after 24 months follow up are as good as or better than in anterior cervical fusion. Adjacent segment protection may be liable for this improvement, which is associated with enhanced life quality. DCI-patients will be followed-up continuously for the next years in order to validate these findings.