Lessons Learned on Cervical Total Disc Replacement after 7 Years Follow-up
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Introduction: Degeneration of the spine is a very common phenomenon. The morphological changes have been described macroscopically, histologically, and using many different imaging techniques such as plain radiography, discography, magnetic resonance imaging, or computed tomography. Indications can range from conservative care, anterior or posterior surgical techniques. Cervical spine fusion was well adopted since the 1950s to stabilize, treat degenerative changes and reduce deformity. Various studies demonstrate that single-level ACDF procedures do alter spinal kinematics and multilevel procedures compromise global spinal motion. Along with critical clinical and scientific overview, arthroplasty technology was developed to maintain movement and reduce adjacent segment stress and degeneration. Here we show our 7 years experience with PCM total disc replacement.

Materials and methods: We studied radiographs of 270 levels in 158 patients treated with cervical TDR using the PCM device between C3-4 and C7-T1. The mean age was 45.4 years old. 74 patients were operated at one disc level, 62 at two, 16 at three, and 6 at four levels. Radiological (AP, lateral and dynamic) and clinical outcomes were collected preoperatively, 1 week and 1, 3 and 6 months and annually. The NDI, VAS and TIGT questionnaires were used to assess pain and functional outcomes. The McAfee scale for heterotopic bone formation evaluation was applied. For facet degeneration analysis, was used a four grade classification. Facet degeneration analysis was based on CT Scans.

Results: The clinical outcomes were statistically significant in all postoperative periods when compared to preop. The degenerative faceted join disease in the cervical spine after cervical arthroplasty exists. Using the four grade classification, the majority of patients belong to grade I and II. We didn't find relationship between the CT scan facet degeneration and clinical results in these stages, except in grade III and IV that outcomes scales had a worsening. From all levels studied, 21(7.7%) revealed some level of HO. Of these, 10 levels were rated to be grade I (47.6%), 7 to be grade II (33.3%), 3 to be grade III (14.28%) and 1 to be grade IV (4.76%). The affected disc level was part of a multi-level procedure in 41.6%, and 58.4% in a single level construction. In 92% of patients that developed HO, preoperative radiographs showed incipient osteophytes that progressed during the follow up period resulting in bone formation. Painful adjacent level disease occurred in 5.7% of patients, lower than the 20.3% described by Hilibrand et al for ACDF (2.9% a year).

Conclusion: Our experience in cervical TDR has revealed valuable clinical and radiological data when compared to ACDF. The motion preservation allowed a better biomechanical restoration of the spine, unloading the facets and preserving the adjacent discs. The good clinical results also corroborate with the superiority of cervical TDR in comparison to ACDF results described on the literature.