Analysis of the Formation and Grade of Heterotopic Ossification that May Influence the Postoperative Segmental Range of Motion after Bryan Cervical Artificial Disc Replacement

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Objectives: To evaluate the influence of the formation and grading of heterotopic ossification (HO) on the postoperative segmental range of motion (ROM) after Bryan cervical artificial disc replacement (CADR).

Methods: A total of 40 patients undergoing single level Bryan disc replacement from December 2003 to August 2009 were reviewed retrospectively. There were 18 men and 22 women with a mean age of 42.6 years (range, 20-54 years). All cases were followed up for more than 1 year (range, 12-69 months; average, 38.8 months). The occurrence of HO was defined by the McAfee classification, and segmental ROM (full flexion angle-full extension angle) was measured in Picture Archiving and Communication System (PACS). Correlations between the occurrence and grading of HO and segmental ROM at last follow-up were analyzed.

Results: The occurrence rate of HO in this study was 37.5% (15/40), and the classification of HO by McAfee’s criteria distributed as follows: grade I 2 cases, grade II 3 cases, grade III 8 cases, grade IV 2 cases. For all the patients, the mean segmental ROM changed from 8.82° preoperatively to 8.52° at last follow-up. ROM of the patients with or without HO was 9.77°±2.74° and 6.43°±3.23° respectively at last follow-up (p < 0.05). ROM of the HO patients identified McAfee grade I, II and grade III, IV was 8.76°±3.40° and 5.26°±2.64° respectively at last follow-up (p < 0.05).

Conclusions: The occurrence of HO after CADR with Bryan disc prosthesis may reduce the segmental ROM, especially for the McAfee grade III and IV.