Objective: The purpose of this study is to evaluate the incidence and predisposing factors of heterotopic ossification (HO) in patients who got artifical disc replacement (ADR) and followed up for more than 3 years.

Methods: In this prospective cohort study, 41 patients who underwent cervical ADR from December 2003 to January 2006 were enrolled. All the patients were followed up for more than three years, with an average of 41.7 months (range from 36.0 to 55.6). The average age at the most recent follow up was 48.1 years (range from 25 to 73). The preoperative diagnosis were 27 cases of degenerative cervical canal stenosis (DCCS), and 14 cases of cervical disc herniation (CDH). Coronal reconstruction CT scan was applied to evaluate the incidence of HO. The patients were divided into two groups according to HO grades. Scores of 0, 1, and 2 were grouped as “Radiographically Insignificant” and scores of 3 and 4 were grouped as “Radiographically Signigicant”. ROM at operation level in sagittal plane were compared between the two groups at pre-operation, three-month follow-up and the most recent follow-up. Chi-square test, independent samples t test were carried out with significance level of 0.05 using SPSS version 15.0.

Results: Of the 41 patients in the follow-up group, 21 patients (51.2%) show some degree of HO at the most recent follow-up, 6 patients were identified (28.6%) as having Grade 1 ossification, 9 (42.9%) as Grade 2 ossification, 3 (14.3%) as Grade 3 ossification, and 3 (14.3%) as Grade 4 ossification. There was no statistical difference between the two groups at pre-operation or three month follow up (P>0.05), but the ROM of “Radiographically Insignificant” group was better at the most recent follow up (P< 0.01), which means development of HO more than grade 3 will affect the midterm range of motion (ROM) of ADR. According to the chi-square test the patient who have less preoperative ROM at the operated level or the patient who’s preoperative diagnosis was DCCS would have more chance to have HO at the most recent follow up. The occurrence of HO was not related to age, sex and preoperative disc height (P>0.05).

Conclusion: Coronal CT scan is a very good method in displaying the occurrence of HO and classification. The development of HO more than Grade 3 can significantly affect the ROM at midterm follow up. Choose the patient who have preoperative ROM more than 10 degree or the patient who got CDH would have more chance to avoid HO at the midterm follow up.