Anterior Cervical Fusion after Closed Reduction for Treatment of One-level Subaxial Cervical Spine Injuries: Comparison of Autologous Bone Graft versus Synthetic Cages Filled with Demineralized Bone Matrix


Chonnam National University Hospital & Medical School, Neurosurgery, Gwang-ju, Korea, Republic of

Objectives: The purpose of this study is to compare clinical and radiologic outcome of one-level anterior cervical discectomy and fusion for traumatic subaxial cervical injury between autologous bone graft group (Group I) and synthetic cage group (Group II).

Materials and methods: The patients were randomly divided in two groups. Sixty consecutive patients of traumatic cervical injury underwent anterior cervical discectomy and fusion (ACDF) using autologous bone graft (Group I, 25 patients) or synthetic interbody cage (Group II, 35 patients) with plate fixation system in our hospital. The mean age were 46.2 years (Group I) and 48.2 year (Group II). The affected level was C4-5 in 5 patients; C5-6 in 9, C6-7 in 11 (Group I) and C3-4 in 1 patient; C4-5 in 11, C5-6 in 11, C6-7 in 11 (Group II). Clinical outcome were assessed using a ASIA scoring system at follow-up visits. Radiological outcome, anteroposterior as well as lateral and flexion-extension radiographs. Mean follow-up duration were 15.5 months (Group I) and 13.5 months (Group II).

Results: Fusion at the last follow-up examination was demonstrated in all of the patients. In group I patients, the mean interbody angle (kyphotic angle) of 2.8° before surgery was reduced to -4.4° immediately after surgery, and at the last follow-up to be -1.9°. The mean interbody height of 35.8 mm before surgery was increased to 40.9 mm immediately after surgery, and at the last follow-up to be 38.9mm. In group II patients, the mean interbody angle of 2.1° before surgery was reduced to -1.2° immediately after surgery, and at the last follow-up to be -0.4°. The mean interbody height of 34.5 mm before surgery was increased to 41.9 mm immediately after surgery, and at the last follow-up to be 39.4 mm. There was a no significant difference between the two groups. There was one patient not achieving arthrodesis at last follow up. There were no patients with implant-related complications.

Conclusions: Based on our experience, anterior cervical discectomy and fusion using a synthetic interbody cage with plate system showed at least as safe and effective as traditional interbody fusion with autologous bone graft in patients with one-level subaxial spine injuries. There are some advantages of the lack of donor site morbidity, the cage’s radiolucency for assessment of bridging bone, absence of graft resorption.