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Comparative Analysis of Radiographic, Clinical, and Surgical Outcome in Cervical Arthroplasty in Terms of Numbers of Involved Level

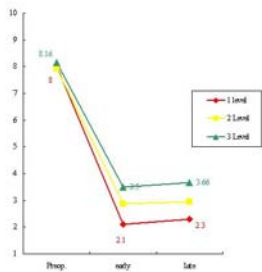
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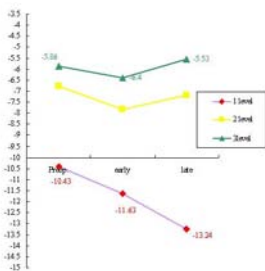
Introduction: Cervical arthroplasty has been developed as an alternative to ACDF. There are many reports about the success of the single level arthroplasty. However, the multilevel cervical arthroplasty is still the one of the controversial issue. Comparative study on the clinical, radiological and surgical outcome according to the numbers of involved arthroplasty level is rare.

Method: Total 168 level arthroplasty were performed in 120 patients from March 2004 to March 2009(1level:81, 2level:30, 3level:9). Previous arthroplasty and hybrid surgery cases were excluded in this study. In each case, disability and pain was assessed using the Neck Disability Index(NDI) and the Visual Analogue Scale(VAS). Sagittal alignment and range of motion(ROM) at C2-C7, implanted levels and adjacent levels were measured using Cobb's method. Clinical, radiographical evaluations are collected pre-operatively, early(< 6months) and late(>6months) post-operatively (mean duration of follow up : 17.8 months) and surgical outcomes(operation time, mean blood loss and complications) were also reviewed. We divided all patients into 3 groups according to the number of the involved level(group1: 1 level, group2: 2 level, group3: 3 level). All data was analyzed in order to find the any differences between groups and relationship between the outcome and the number of the involved level.

Results: In all groups, VAS and ODI was significantly decreased. but little bit less decrease in group 2(VAS:5, ODI:20.6) and group 3(VAS:4.5, ODI:18.7) compared to group 1(VAS:5.7, ODI:25.5)(figure2.) Preoperative lordosis at C2-C7 increased at early follow up(F/U) in all groups(group1:-1.2, group2:-1.07, group3: -1.54). At later F/U, group 1 showed further increase(-1.61), but kyphotic, statistically insignificant, change in group 2(+0.66) and group 3(+0.87) was observed(figure1.). ROM at C2-7, index levels and adjacent levels in all groups was decreased at early F/U, but recovered to almost preoperative status at later F/U. Operation time and blood loss increased as the number of the levels increased. 8 cases of heterotrophic ossification and 5cases of subsidence were noted. there were no significant relationship between the complications and number of the involved level.



[Fig 1. VAS]



[Fig 2. Sagittal alignment]

Conclusion: Comparing to single level arthroplasty, multilevel cervical arthroplasty is feasible to maintain the ROM at C2-7, individual ADR levels and nonoperative levels adjacent to construct. but long term follow up study should be required to address the association between postoperative kyphosis and clinical outcome in multilevel cervical arthroplasty.