



Comparison of L5-S1 fusion rate between single-level, two-level, and three-level instrumented lumbar interbody fusion; minimum 2-year analysis

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Introduction

L5-S1 pseudarthrosis is common in patients with multilevel fusion to the sacrum in spite of instrumented lumbar interbody fusion (LIF) at the L5-S1 level. A retrospective radiological analysis was performed to compare the fusion rate at the L5-S1 level between single-level (L5-S1), two-level (L4-S1) and three-level (L3-S1) fusion

Methods

A total 70 patient with mean 41.6 (24-81) months follow-up underwent lumbosacral LIF between September 2003 and August 2004. There were 18 males and 52 females with mean age of 56.7 years. The affected levels were 28, 19, and 23 cases in single-level, two-level, and three-level, respectively. Bone fusion was assessed on CT and dynamic radiographs. If there was no movement on dynamic view and continuity of the trabecular bony bridging on CT, it was termed “union.” “Nonunion” was defined if there was any movement or discontinuity of the bony bridging. It was termed “probable union” if the bony bridging was vague in spite of no movement in flexion-extension.

Results

“Union” was achieved in 27 (96.4%), 17 (89.5%), and 12 (52.2%) of single-level, two-level, and three-level group, respectively. In three-level group, “probable union” was 6 (26.1%), and “nonunion” was 5 (21.7%).

Learning Objectives

In 3-level lumbar fusion surgery, the incidence of pseudarthrosis at L5-S1 level is higher than those in 1-level or 2-level fusion surgery.

Conclusions

This study demonstrates relatively higher rate of pseudarthrosis at the L5-S1 level in three-level fusion group. Meticulous attention is necessary to fuse the L5-S1 level. Sacropelvic fixation with iliac screw coupled with S1 screw might be needed to provide better distal fixation for multilevel lumbosacral fusion.