

New Classification for Degenerative Spondylolisthesis of the Lumbar Spine: a Reliability Study

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Summary

There is no consensus for a comprehensive analysis of degenerative spondylolisthesis of the lumbar spine (DSLS). A new classification system for DSLS based on sagittal alignment was previously proposed. Its clinical relevance with health-related quality of life scores (HRQOLs) and demographic parameters was explored.

Hypothesis

It was hypothesized that this radiographical classification system was correlated clinical and radiographical parameters as well as HRQOLs.

Design

Single-center retrospective cohort

Introduction

Various classifications attempted to provide further understanding of degenerative spondylolisthesis of the lumbar spine (DSLS). However, they were based on etiology, topography, or slippage grading (percentage) and were restricted to a segmental analysis. Therefore, the role of regional or global malalignment was not considered. Recently, several studies reported the close relationship between DSLS and sagittal alignment. The aim of the study was to explore the relationships between classification types and patient demographics, radiographical parameters and health related quality of life scales (HRQOLs).

Methods

Health-Related Quality of Life Scales (HRQOLs) and clinical parameters were collected: SF-12, ODI, low back and leg pain visual analog scales (BP-VAS, LP-VAS). Radiographical analysis included Meyerding grading and sagittal parameters: segmental lordosis (SL), L1-S1 lumbar lordosis (LL), T1-T12 thoracic kyphosis (TK), pelvic incidence (PI), pelvic tilt (PT), and sagittal vertical axis (SVA). Patients were classified according to three main types: 1A: preserved LL and SL; 1B: preserved LL and reduced SL ($\leq 5^\circ$); 2A: $PI-LL \geq 10^\circ$ without pelvic compensation ($PT < 25^\circ$); 2B: $PI-LL \geq 10^\circ$ with pelvic compensation ($PT \geq 25^\circ$); type 3: global sagittal malalignment ($SVA \geq 40\text{mm}$).

Results

166 patients (119 F: 47 M) suffering from DSLS were included. Mean age was 67.1 ± 11 years. DSLS demographics were respectively: type 1A: 73 patients, type 1B: 3, type 2A: 8, type 2B: 22, type 3: 60. Meyerding grading was: grade 1 (n=124), grade 2 (n=24). Affected levels were: L4-L5 (n=121), L3-L4 (n=34), L2-L3 (n=6), and L5-S1 (n=5). Mean sagittal parameter values were: PI: $59.3^\circ \pm 11.9^\circ$; PT: $24.3^\circ \pm 7.6^\circ$; SVA: 29.1 ± 42.2 mm; SL: $18.2^\circ \pm 8.1^\circ$. DSLS types were correlated with age, ODI and SF-12 PCS ($\rho = 0.34, p < 0.05$; $\rho = 0.33, p < 0.05$; $\rho = -0.20, p = 0.01$, respectively).

Conclusion

This classification was consistent with age and HRQOLs and could be a preoperative assessment tool. Its therapeutic impact has yet to be validated.