

Influence of Lumbar Lordosis Restoration on Clinical Outcome in Degenerative Lumbar Patients from the “Pre-Balance” Period: Ex Post Analysis of Spinal Parameters Restoration and Clinical Outcome in a Medium Follow-Up

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Introduction

Restoration of spinal balance is a widely accepted principle of spinal surgery planning. There is a huge amount of data supporting the correlation of clinical outcome and the restoration of theoretical physiological curves of the spine. Flat or hypolordotic fixations are rarely seen today, but there is someone who claims that spinal balance principles are too often pushed to extremes and, surprisingly, there is still some resistance to accept the routinary application of these concepts in the “simple” degenerative surgery, claiming that in short fixations for degenerative lumbar spinal disease it is not mandatory to be strict in the restoration of correct, theoretical spinal parameters to achieve satisfactory clinical results. In this study we present a homogeneous population of patients, operated by a single surgeon in a 3 years time, 7 to 10 years ago, with homogeneous degenerative pathology and similar constructs (2 to 4-level fixations). The peculiarity of this study is that all the patients have been operated regardless to spinal parameters restoration, because at the time of surgery the presurgical planning of spinal curves was not being systematically adopted. The population is therefore a kind of spontaneous randomization, with patients with a good restoration of spinal theoretical curves and patient who didn't get any correction of sagittal curves.

Material and Methods

36 patients with homogeneous diagnosis of degenerative spinal disease, operated by a single surgeon with a 2 to 4-level fixation until 2010 has been selected. ODI and Prolo scales has been used for direct clinical evaluation. The mean last follow-up was 4 years 4 months, with a minimum of 3 years. Radiological assessment has been performed by lumbar standing XRays AP and LL pre and postop, and PI-LL mismatch and the difference between theoretical lordosis and effective postoperative lordosis have been calculated. Statistical evaluation used Spearman correlation test between PI-LL mismatch and clinical scales values.

Results

Statistical correlation exists between clinical scale values and PI-LL mismatch. As a qualitative result, we observed that the higher is the difference between theoretical lordosis and effective postsurgical lordosis, the higher is the incidence of construct failure.

Conclusion

According to the results of this study, respect of the spinal balance principles seems to be helpful to achieve good clinical results in a medium follow-up for lumbar degenerative patients. These results come from a dataset that is not culturally influenced by spinal balance principles, coming from the past. Additionally, the single-surgeon, single-observer and single-center experience is somehow minimizing the confounding factors that usually affects this kind of studies.