Surgical Correction in Patients with Lumbar Degenerative Kyphosis Who Had Low Bone Mineral Density: An Analysis of 40 Patients with a Minimum Follow-Up of Two Years

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Study Design: Retrospective study.
Purpose: To investigate influence of bone mineral density (BMD) on the surgical correction of lumbar degenerative kyphosis (LDK).
Overview of Literature: No studies so far have reported the influence of BMD on the surgical correction of LDK.
Methods: Forty LDK patients with more than 2 years follow-up were studied. Pelvic incidence (PI), pelvic tilt, sacral slope, sagittal vertical axis (SVA), lumbar lordosis (LL), and thoracic kyphosis were measured preoperatively, immediately postoperatively and at final follow-up. Adverse outcomes: proximal adjacent fractures, sagittal decancellation, pseuodarthrosis, and cage subsidence were documented.
Results: There were 37 females and 3 males. Average age was 65.1±4.5 years and mean follow-up was 34.2±16.7 months. 42.5% were Takemitsu type 3 curves, 27.5% type 2, 20.0% type 4 and 10.0% type 1. 37.5% had osteoporosis, 40.0% osteopenia and 22.5% had severe osteoporosis. SVA improved from 237.0±36.7 mm preoperatively to 45.3±41.8 mm postoperatively (p=0.000). LL improved from 13.5±14.7° to 40.6±10.9° postoperatively (p=0.000). At final follow-up SVA deteriorated to 89.8±22.2 mm and LL to 34.7±15.8° (p<0.000). The association between late sagittal decancellation, pseuodarthrosis, or proximal adjacent fractures and osteoporosis was insignificant. The difference between immediate postoperative LL and PI (P<0.01) had a significant association with sagittal decancellation and pseudarthrosis.
Conclusions: Osteoporosis did not influence the degree of correction, late sagittal decancellation, proximal adjacent fractures, and pseudarthrosis in LDK. PSEUD had a significant association with sagittal decancellation and pseudarthrosis.

Keywords: Lumbar degenerative kyphosis; Bone mineral density; Surgery; Outcome; Osteoporosis

Introduction

Kyphotic deformities of the spine alter the mechanics of the vertebral column as well as the muscles enveloping the vertebral column [1,2]. The clinical implication of this deformity is difficulty in maintaining sagittal balance.