Do the dynamic stress mobility radiographs predict the postoperative vertebral height restoration, kyphosis correction, and cement volume injected after vertebroplasty for osteoporotic thoracolumbar vertebral fractures with intravertebral clefts?

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Abstract
Background: This prospective clinical—radiological study was conducted to determine whether the dynamic mobility stress radiographs can predict the postoperative vertebral height restoration, kyphosis correction, and cement volume injected after vertebroplasty. Methods: Patients included had the diagnosis of significant back pain caused by osteoporotic vertebral compression fracture secondary to trivial injury. All the patients underwent routine preoperative sitting lateral spine radiograph, supine stress lateral spine radiograph, and supine anteroposterior spine radiograph. The radiological parameters recorded were anterior vertebral height (AVH), middle vertebral height (MVH), posterior vertebral height (PVH), MVH level below, wedge endplate angle (WEPA), and regional kyphotic angle (RKA). The supine stress versus sitting difference (SSD) for all the above parameters were calculated. Results: A total of 28 patients (4 males; 24 females) with the mean age of 75.6 ± 7.7 years were recruited into this study. The mean cement volume injected was 5.5 ± 1.8 ml. There was no difference between supine stress and postoperative radiographs for AVH (p = 0.507), PVH (p = 0.913) and WEPA (p = 0.379). The MVH (p = 0.026) and RKA (p = 0.005) were significantly less in the supine stress radiographs compared to postoperative radiographs. There was significant correlation (p < 0.05) between supine stress and postoperative AVH, MVH, PVH, WEPA, and RKA. The SSD for AVH, PVH, WEPA, and RKA did not have significant correlation with the cement volume (p > 0.05). Only the SSD-MVH had significant correlation with cement volume, but the correlation was weak (r = 0.39, p = 0.04). Conclusions: Dynamic mobility stress radiographs can predict the postoperative vertebral height restoration and kyphosis correction after vertebroplasty for thoracolumbar osteoporotic fracture with intravertebral clefts. However, it did not reliably predict the amount of cement volume injected as it was affected by other factors.

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