OBJECT: The aim of this study was to test the hypothesis that kyphoplasty is an effective treatment in painful osteoporotic vertebral fractures, even with involvement of the posterior cortical wall. METHODS: Between December 2001 and May 2004, 74 consecutive patients were treated with kyphoplasty for 118 painful osteoporotic compression (38%) or burst (62%) fractures. Additional decompression of the spinal canal was performed in six patients, internal fixation in three. Data were collected in a prospective observational design until May 2005. The preoperative workup included neuroimaging (plain x-ray films, densitometry, short tau inversion recovery magnetic resonance imaging, and computed tomography scanning) and clinical parameters (general and neurological examinations, visual analog scale [VAS], Karnofsky Performance Scale [KPS], and 36-Item Short Form Health Survey [SF]-36). At predefined time intervals (at discharge and 6 weeks and 3, 6, 12, and 24 months posttherapy) the patients were evaluated (x-ray films, neurological status, VAS, KPS, and SF-36). Kyphoplasty led to a significant reduction in kyphotic deformity (mean +/- standard error of the mean, sagittal index: preoperative 10 +/- 1 degrees, postoperative 5 +/- 1 degrees), and an improvement in pain (VAS: preoperative 70 +/- 3, postoperative 23 +/- 2), activity (KPS score: preoperative 51 +/- 3, postoperative
71 +/- 2), and mental and physical health (SF-36, mental status: preoperative 43, postoperative 58; SF-36, physical status: preoperative 24, postoperative 35). No secondary narrowing of the spinal canal by the retropulsed posterior wall was observed after the procedure. Clinical improvement was durable (mean follow up 15 +/- 1.1 months), although the VAS score secondarily increased slightly. All patients, who suffered from a compression-induced motor deficit, recovered completely during the follow-up interval. The main procedural complications consisted of one symptomatic extravertebral cement leakage (permanent monoparesis) requiring open revision, two nerve root contusions (transient radiculopathy), and one wound infection. CONCLUSIONS: Kyphoplasty is effective in the treatment of painful osteoporotic vertebral compression and burst fractures, at least under medium-term conditions. The potential complication of procedure-related secondary narrowing of the spinal canal by the retropulsed posterior wall in burst fractures appears to be more of a theoretical than an actual risk.

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