
P.A.Hulme¹, J. Krebs¹, S.J. Ferguson¹, U. Berlemann²

¹ MEM Research Center, University of Bern, Bern, Switzerland
² Das Rückenzentrum, Thun, Switzerland

INTRODUCTION: Vertebroplasty and kyphoplasty have been gaining popularity for treating vertebral fractures. Current reviews provide an overview of the procedures but are not comprehensive and tend to rely heavily on personal experience. This paper aimed to compile all available data and evaluate the clinical outcome of the two procedures.

The objective was to evaluate the safety and efficacy of vertebroplasty and kyphoplasty using the data presented in published clinical studies, with respect to patient pain relief, restoration of mobility and vertebral body height, complication rate, and incidence of new adjacent vertebral fractures.

METHODS: This is a systematic review of all the available data presented in peer reviewed published clinical trials (69 papers). The methodological quality of included studies was evaluated and data was collected targeting specific standard measurements. Where possible a quantitative aggregation of the data was performed.

Data was collected for each study under the headings: general information, participants, intervention, outcomes, complications, and follow-up. Outcome data was collected detailing: pain relief, general health, functional improvements, satisfaction with treatment, and reduction in kyphosis. Complications included: cement leakage (asymptomatic and symptomatic), neurological deficits, cardiovascular, pulmonary and any other clinically relevant complication. Long term follow-up information included all the items recorded under the heading “outcome” with the addition of new fracture details.

RESULTS: A large proportion of subjects experienced some pain relief (87% vertebroplasty, 92% kyphoplasty). Vertebral height restoration was possible using kyphoplasty (average 6.6°) and for a subset of patients using vertebroplasty (average 6.6°). Cement leaks occurred for 41% and 9% of treated vertebrae for vertebroplasty and kyphoplasty respectively. New fractures of adjacent vertebrae occurred for both procedures at rates that are greater than the general osteoporotic population but approximately equivalent to the general osteoporotic population that had a previous vertebral fracture.

DISCUSSION & CONCLUSIONS: The problem with stating definitely that vertebroplasty and kyphoplasty are safe and effective procedures is the lack of comparative, blinded, randomized clinical trials. Standardized evaluative methods should be adopted.

The pain relief experienced by patients appears to be promising for both kyphoplasty and vertebroplasty in the short term (<1 year).

Leakage of the PMMA is the most common complication and may pose significant physical danger, even in small quantities. Higher leakage rates have been reported for single-group cohort vertebroplasty studies compared to kyphoplasty studies. However, the only study that compared kyphoplasty and vertebroplasty using matched groups found little difference in leakage rates (28% and 23% of vertebra had cement leaks for vertebroplasty and kyphoplasty, respectively).

Both kyphoplasty and vertebroplasty have the ability to reduce the kyphotic angle and restore vertebral height associated with vertebral fractures. The critical factor for the restoration of vertebral height would appear to be fracture age rather than the technique used.

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