

NICE Technology Appraisal

Vertebroplasty and Kyphoplasty

Personal Statement

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I have performed vertebroplasties for approximately 10 years. Anecdotally I have several patients who experienced immediate relief (within hours of the procedure) of severe pain that had required opiate analgesia and had confined them to bed rest. Patients that are in this extreme state are few in numbers, unlikely to agree to take part in a blinded randomised study and not represented by the patients enrolled into the available clinical studies.

The studies of Buchbinder and Kalmes indicate that for the majority of patients with persisting back pain after osteoporotic vertebral fracture, vertebroplasty confers little benefit over local anaesthetic injection. Therefore, if there is a benefit from vertebroplasty, then these studies failed to show one because the patient selection criteria were insufficiently stringent.

Some osteoporotic vertebral fractures show progressive deformity over a few months after fracture (Kümmel phenomenon). There is one paper in the literature (Sugita et al) that assesses initial fracture morphology on plain radiography and identifies certain initial fracture shapes that carry a high risk of progressive deformity. Such progressive deformity may result in more persistent and severe fracture pain. Early cement injection in these fractures may both ease pain and prevent progressive deformity. More severe fracture deformity also has consequences such as increasing kyphosis and respiratory compromise.

As time from fracture passes, true fracture pain will diminish as fracture healing occurs but secondary causes of persisting pain may increase (for example from biomechanical causes secondary to alteration of spine alignment). The patients' perceived pain may be a near continuous experience. There is therefore logic to the use of cement injection early after fracture and local anaesthetic injection later, but little logic to cement injection into a fracture that has, by imaging criteria, healed. Anterior wedge fracture of a vertebra also causes posterior disruption, with occasional spinous process fractures and probably more often ligamentous injury. These will contribute to the acute pain and may be responsive to local anaesthetic injection, whilst anterior vertebral fracture pain is inaccessible to local anaesthetic injection. Consequently, early anaesthetic injection may also be beneficial in acute fracture.

In my opinion, the studies published to date do not adequately address all the above potential contributing causes for persisting pain after osteoporotic fracture, nor separate out the relative contributions of each cause at different time points after fracture.

Despite the paucity of good quality direct supporting evidence, I therefore conclude that vertebroplasty should be available for the treatment of acute painful osteoporotic fracture, with the aims of providing rapid pain relief and prevention of fracture deformity progression. Early kyphoplasty similarly, with the potential for some reversal of deformity. Late cement injection (after 10 weeks from fracture) needs further study to identify selection criteria that predict a greater benefit from the procedure than that provided by local anaesthetic injection.

Kallmes DF, Comstock BA, Heagerty PJ, et al. A randomized trial of vertebroplasty for osteoporotic spinal fractures. *N Engl J Med* 2009; 361: 569e79.

Buchbinder R, Osborne RH, Ebeling PR, et al. A randomized trial of vertebroplasty for painful osteoporotic vertebral fractures. *N Engl J Med* 2009; 361: 557e68.

Sugita M, Watanabe N, Mikami Y, Hase H, Kubo T. Classification of vertebral compression fractures in the osteoporotic spine. *J Spinal Disord Tech* 2005; 18: 376e81.