Percutaneous Vertebroplasty in Painful Osteoporotic Vertebral Collapse: A Safe Treatment Option for Intractable Pain

Abstract:

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Osteoporois is a rapidly growing condition in Ireland and the Western world and is associated with significant morbidity, primarily due to pain and immobility. In the past, pain from osteoporotic vertebral collapse could only be treated by limited means including pain killers and external supports. In recent years, percutaneous vertebroplasty of painful osteoporotic vertebral collapse has made a significant contribution to treating such patients. However its role remains largely unknown to many health care professionals denying potential access of patients with often severe symptoms to a potential relief of their pain. Osteoporosis is a condition of decreased bone mass resulting from a combination of inadequate accumulation of bone mass and rapid resorption after menopause [1]. Criteria for diagnosis have been established by World Health Organisation and are based on comparing the bone mineral density (BMD) of a patient to that of a typically young female. BMD values 2.5 standard deviations below the mean are deemed osteoporotic and are measured by densitometry. Routine hormonal replacement treatment is no longer first line due to ongoing concerns regarding adverse effects identified in long- term follow- up studies. Primary treatment is based on correction of underlying metabolic abnormalities with provision of calcium and vitamin D supplementation combined with bisphosphonates or calcitonin, or both. [1]

Often fractures are the first indication of osteoporosis and are induced by minimal trauma, or without trauma resulting in compression fractures. Vertebral fracture is the most common complication of osteoporosis and results in significant mortality and morbidity including prolonged intractable pain [2]. Vertebral compression fractures affect at least one in four of all postmenopausal women.1 While many fractures respond to analgesia and conservative methods, many patients are left with intractable pain that is often resistant to analgesia and it causes significant reduction in the quality of life for such patients. It is in these patients that percutaneous vertebroplasty may play an invaluable role in pain alleviation. Percutaneous vertebroplasty uses surgical polymethylmethacrylate, PMM, which is essentially a type of cement, and this is injected into a vertebral body under imaging guidance. The procedure is done under local anaesthetic and conscious sedation and usually is carried out in under an hour. As well as treatment for painful osteoporotic collapse, percutaneous vertebroplasty can also be used for non radicular pain caused by compression fractures due to myeloma, metastasis, metastases and aggressive vertebral haemangioma. Contra indications to the technique include bleeding disorders, unstable fractures and lack of definable vertebral collapse. It is usually performed in thoracic and lumbar vertebrae and rarely in cervical vertebrae [3]. In general, guidelines recommend vertebroplasty for fractures that have not responded to medical treatment [4].

Potential complications of percutaneous vertebroplasty are small but include foraminal and epidural leakage of PMM. Rarely this can require emergency surgical decompression. There have been a few case reports in the literature describing pulmonary embolism as a complication, but this is rare. Neurological complications are also rare. A small but definite risk of adjacent vertebral body fracture exists [3]. There is potential for the procedure to increase the risk for new verterbral compression fractures in untreated vertebral bodies at other levels. Incidence of adjacent fracture, one year or less after vertebroplasty was comparable with that expected to untreated osteoporotic fractures. Although the cause for this is uncertain, it has been suggested that new fractures may be attributable to augmented stiffness of the treated vertebrae as a result of the amount of cement injected or as a result of cement leakage in the adjacent vertebral disk space. Also it has been attributed to the natural progression of osteoporosis. Neither volume of cement injected nor extravasation of cement into the intravertebral disk affected likelihood of subsequent adjacent fractures. [5] The presence of more than two existing pre-existing vertebral fractures was shown to be an independent risk factor for development of new vertebral fractures [6].

Vertebroplasty in osteoporotic fractures has been shown to significantly improve many patientsâ global quality of life scores and function. The ingestion of analgesics in morphine equivalents showed a trend towards reduction post vertebroplasty and significant improvement was demonstrated in patient mobility and function [7]. In one prospective clinical follow up after percutaneous vertebroplasty that assessed short term, mid term and long term pain relief, it was shown that visual analog scale scores for pain at the treated vertebral levels and use of analgesic agents were significantly reduced compared with before treatment at every follow up period [8]. Within 24 hours after the procedure, the decreases in all scores were less comparable with scores at later follow up periods but this was not significant. In the short term, patients used less analgesia and 86% of patients were satisfied with the outcome. At midterm and long term follow up patients used even less analgesia and 95 â 100 % of patients were satisfied.

Both the visual analog scale and a validated osteoporosis specific health related quality of life instrument were used in another prospective study and demonstrated rapid and substantial relief of pain and improvement in the quality of life. This was observed and maintained for at least six months. [9] In another study, verterbroplasty performed at a single fracture site fracture level and that performed at multiple fracture levels were equally effective in facilitating long term pain relief, increased activity level, and decreased analagesic use in patients with osteoporotic verterbral compression fractures [10]. In summary, painful osteoporotic fractures may result in significant morbidity for patients. While some patients respond well to conservative treatment and analgesic medication, some patients develop intractable pain, and it is this sub group of patients who may get significant and sometimes complete relieve of their symptoms and should be considered for percutaneous vertebroplasty. It is a safe, well tolerated procedure with minimal complications and the potential to substantially improve patientâ s symptoms of pain.

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Comments: