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

Abstract:

Osteoporosis 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. 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 calcium, or both.

Often fractures are the first indication of osteoporosis and are induced by minimal trauma, or without trauma resulting in compression fractures. Vertebroplasty is the most common complication of osteoporosis and results in significant mortality and morbidity including prolonged intractable pain. Vertebroplasty provides rapid and substantial relief of pain and improvement in the quality of life. This was observed in one of four of all postmenopausal women. 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 poly(methylmethacrylate), 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 metastases, metastases and aggressive vertebral haemangioma. Contra indications to the technique include bleeding disorders, unstable fractures and lack of definition of vertebral collapse. It is usually performed in thoracic and lumbar vertebrae and rarely in cervical vertebrae. In general, guidelines recommend vertebroplasty for fractures that have not responded to medical treatment.

Potential complications of percutaneous vertebroplasty are small but include foarnimal 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 subtle but definite risk of adjacent vertebral body fracture exists. There is potential for the procedure to increase the risk for new vertebral compression fractures in untreated vertebrae adjacent to the treated level. In one study, the incidence of new fractures after vertebroplasty was comparable with that expected to untreated osteoporotic fractures. Although the cause of this is unclear. 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 natural progression of osteoporosis. Rather volume of cement injected or extravasation of cement into the intravertebral disk affected likelihod of subsequent adjacent fractures. 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. In another study, vertebroplasty 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 analgesic use in patients with osteoporotic vertebral compression fractures. 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 group of patients who may gain significant and sometimes complete relief 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 patients symptoms of pain.

References: