Vertebroplasty in the Treatment of Spine Fractures

Thesis
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By

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Abstract

Vertebral fractures; are highly painful, can hinder mobility, affect quality of life and lead to an increase in mortality rate amongst elderly populations. Consequences of untreated vertebral fracture are; reduced height, kyphosis, and chronic back pain.

Vertebroplasty technique was carried out on 15 patients with a total of twenty one osteoporotic fractures. Patients ages varied from 55-75 years with the series being predominately female (2:1) .

Seven patients were treated in the sub acute period (between two to eight weeks), six patients (between two months and one year) following trauma. Two patients were done after one year following trauma.

The insertion of the trocar needle was done via the intrapedicular route which was deemed the safest approach to avoid cement extravasation. We used 10-13 gauge trocar needles injecting 4-8ml of Simplex P cement into thoracic and lumbar fractures, filling the vertebral body. This was done under C-arm imaging in AP and Lateral views.

The results showed an 87% improvement in pain levels immediately postoperatively and assessed again after two weeks. These results coincided with other studies done under similar conditions.
No significant complications with this procedure intraoperatively were witnessed.

With proper technique and patient selection, complications can be minimized. Patients who have had recent trauma, showed better results regarding pain relief and fracture stabilization than patients who suffered from older fractures (more than one year) .

Keywords

Vertebroplasty, bone cement, Posterior fixation, anterior fixation, burst fractures, titanium cages, pedicular screws.

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Abbreviations

BPO: Benzoyl peroxide
BisGMA: Bis-phenolglycidyldimethacrylate,
BisEMA: Bis-phenol ethoxydimethacrylate
DMPT: N,Ndimethylparatoluidine
MM: Multiple myeloma
MMA: Methylmethacrylate
OPM: Oral pain Medication
MMA: Methyl methacrylate monomer
NRS: Numerical Rating Scale
PMMA: Polymethylmethacrylate
PV and PVP: Percutaneous Vertebroplasty
Sr-HA: strontium-containing hydroxyapatite
TEGDMA: Triethyleneglycoldimethacrylate

Aim of work

The purpose of this study is to determine the best methods to achieve a stable and pain free fracture while minimizing complications.

In our study we evaluate 15 patients with 21 cases of vertebral compression fracture, all cases had osteoporotic vertebral fractures and underwent PVP (Percutaneous vertebroplasty). The purpose of this study is to evaluate the results and to discuss if vertebroplasty is a viable and effective technique in managing osteoporotic vertebral fractures.

Introduction:

Vertebral compression fractures associated with osteoporosis occur with increasing frequency as skeletal mass and bone strength diminish with the aging process [1]. These fractures generally involve collapse and compression of the vertebral body, associated with a wedge deformity, which may lead to kyphotic angulation of the spine [2]. In the United States alone, it is estimated that one-quarter of white postmenopausal women are affected by fractures of the vertebrae [3], and among persons 65 years of age or older, vertebral fractures account for 150,000 hospital admissions in the United States annually [4]. Vertebral compression fractures are usually associated with acute pain, which is frequently severe and functionally disabling, resulting in diminished quality of life and substantial medical care costs [3,5–7]. Conventional management of vertebral fractures includes primary relief of pain through therapy with narcotics, analgesics,nonsteroidal anti-inflammatory agents, and immobilization. Mobilization,with or without a brace, and exercise are subsequently prescribed as rehabilitation progresses.

With this approach, pain from the fracture generally eases by 4 weeks to 3 months [8]. More recently, stabilization of the vertebral bodies has been attempted with injection of polymethylmethacrylate (PMMA) into the fractured vertebrae through a needle [9–12]. This procedure, known as Percutaneous PMMA vertebroplasty, has been reported to result in substantial and immediate pain relief [11,12], perhaps because of the mechanical stabilization of the spine, or secondary to neurotoxic effects of the PMMA [13]. However, the current amount of literature on the efficacy of Percutaneous PMMA vertebroplasty for the treatment of vertebral fractures is limited, and this study is a case series of our results .