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Editorial

Management of Osteoporotic Spine Fractures: Controversy Continues

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EDITORIAL

Vertebral compression fractures due to osteoporotic disease represent an increasingly significant public health problem [1]. There is no sharp line demarcation between stages of the fracture; acute, subacute and chronic. Lines of treatment include conservative treatment (e.g. brace and pain killers), cement augmentation (vertebroplasty, kyphoplasty and stentoplasty) and surgical treatment. Treatment remains an area of controversy with respect to best line of treatment, and indications, timing and type of surgical management [2]. Percutaneous vertebroplasty began as a simple, low-cost procedure that aimed to provide pain relief for patients with vertebral compression fracture. Balloon kyphoplasty was introduced later, and was presented not only as a "pain killer," but also as a deformity correction procedure (1). Again, a recently developed technique - stentoplasty includes vertebral body stenting system stabilizes the vertebral body after balloon deflation until cementation [3]. The symptomatic benefits of spinal augmentation for the treatment of osteoporotic vertebral compression fractures are still controversial [4]. Consequently, there is no international agreement about indications of cement augmentation procedures [5]. It is well -understood that the indications differ in different stages of the fracture; acute, subacute and chronic but the indications in every stage at a lot of instants are different in research works. A debate raised by 2 multi- center studies published in the "New England Journal of Medicine" in 2009 comparing vertebroplasty with a sham procedure. The results of these studies showed that improvement in osteoporotic compression fracture pain and pain-related disability was similar in patients treated with vertebroplasty and patients treated with simulated vertebroplasty without cement (sham procedure) [6,7]. However, criticism was directed to these two studies as regards definition of acute fracture, method of enrollment of the patients in the 2 study groups and evaluation of the outcomes. North American Spine Society Statement considered that the conclusions drawn by the authors may not be as decisive as they appear.

Among spine surgeons who consider cement augmentation is a better line of treatment, controversy still exists about the indications, the best timing and method of cement augmentation. No much report in the literature is available concerning results of stentoplasty in treatment of osteoporotic fractures. However, the superiority of kyphoplasty over vertebroplasty might be questionable in some studies. Mathis et al found that the height gain in vertebroplasty was estimated at 3–4 mm with a 9° reduction in kyphotic angle [8]. While Lieberman et al reported an average height restoration of approximately 3 mm per vertebra after kyphoplasty [9]. This raises the issue of reliability of kyphoplasty in superior restoration of vertebral height compared to vertebroplasty, and there are no clinical trials available that show the maximum height gain after kyphoplasty [10]. Other surgeons reported higher compression stiffness after vertebroplasty as compared to kyphoplasty [11]. Another controversial issue is a possible increase in the risk of vertebral collapse of adjacent vertebrae following vertebroplasty. While, there is insufficient evidence to conclude that kyphoplasty can reduce the incidence of adjacent fractures [12]. Aquarius et al in a recent cadaveric study concluded that vertebral augmentation with clinically relevant amounts of bone cement does not lead to stress peaks under the endplate. It is therefore unlikely that vertebroplasty, in itself, causes detrimental stresses in the adjacent vertebrae, leading to new vertebral fractures [13].

To conclude, treatment of vertebral compression fractures remains an area of controversy with respect to best line of treatment, and indications, timing and type of surgical management. At first we are in need to unify the definitions of stages of the fractures by sharp line demarcation. Second, future randomized controlled trials should be planned with strict mechanism so that true results could be concluded by the end of these studies.

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