



# Treatment for thoraco-lumbar osteoporotic vertebral body fractures

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To further distinguish *Annals of Palliative Medicine* as a premier journal in the fields of palliative medicine and palliative care, and to ensure the publication of impactful content, *Annals of Palliative Medicine* moved from monthly to bimonthly publications beginning with Volume 12 in 2023. The March 2023 issues of *Annals of Palliative Medicine* featured 9 Original Articles, 6 Editorials, 3 Review Articles, and 3 Editorial Commentary Articles. This Message From the Editor-in-Chief focuses on one of those Original Articles and one of those Editorials, each pertaining to the management of thoraco-lumbar osteoporotic vertebral body fractures.

Thoraco-lumbar osteoporotic vertebral fractures (TLOVF) affect millions of people worldwide each year, with the incidence rising with the increasing aging of the world's population (1). These fractures can be associated with significant pain and loss of mobility, and they can greatly impact quality of life, mental health, and even overall survival (2). While a cornerstone of treatment for TLOVF is medical management, including analgesics, braces, bed rest, and rehabilitation, these interventions aim to improve pain but do not improve the biomechanics of the spine. Furthermore, adequate pain response is often not achievable with medical management, and prolonged bed rest can lead to disuse syndrome and even worsen bone demineralization, leading to additional risk of osteoporotic-associated fractures.

Two commonly employed percutaneous surgical interventions for TLOVF include vertebroplasty and balloon kyphoplasty. Vertebroplasty can be effective at improving pain but, like medical management, is often ineffective in normalizing spinal biomechanics. Balloon

kyphoplasty is generally thought to be more effective in normalizing spinal biomechanics by optimizing recovery of vertebral body height and kyphosis, and it is perhaps the preferred modality for vertebral fractures associated with vertebral body height loss greater than 30% (3,4). However, cement migration may occur with balloon kyphoplasty, as may adjacent vertebral body fractures, occurring in up to 29% of patients post-procedurally (5,6). Notably, though, the use of percutaneous pedicle screw (PPS) placement in combination with balloon kyphoplasty may alleviate the decrease in kyphosis and vertebral body height in the late setting after surgery (7).

Kojima and colleagues compared balloon kyphoplasty combined with PPS to percutaneous vertebroplasty using hydroxyapatite block combined with PPS for the treatment of TLOVF. They retrospectively compared 14 patients receiving each surgical modality treated at Funabashi Orthopaedic Hospital in Funabashi, Japan who had at least 2 years of follow-up. Although the analysis was a retrospective study of a relatively small cohort of 28 patients, the groups of patients were well balanced, and a single surgeon performed all procedures, allowing for nice hypothesis-generating findings.

The investigators found that patients receiving balloon kyphoplasty had shorter operative times, less blood loss during surgery, and shorter hospitalization times. Both procedures lead to similar pain improvements. Both procedures also achieved complete and durable bone union. Balloon kyphoplasty, however, achieved less progression of wedging angle of the fractured vertebra. Specifically, the wedging angle of fractured vertebra at 1 and 2 years following the procedures was significantly higher than that

of immediately post-operative assessment for percutaneous vertebroplasty, whereas there was no difference between early and later timepoints following balloon kyphoplasty.

Salle and colleagues from the Department of Neurosurgery, CHU Limoges, France wrote an accompanying comprehensive Editorial on this manuscript, and they detailed current trends, limitations, and suggested approaches for percutaneous treatment of TLOVF. They provide great details on current limitations and impediments of the two procedures studied by Kojima *et al.*, including cement leaks, posterior fixation, posterior wall protrusion, secondary adjacent-level fracture, and Magerl classification. They provide insightful suggested management strategies, including treatment approaches for patients with recent osteoporotic fractures that are immediately symptomatic and for patients in whom osteoporotic fractures are initially asymptomatic and later become symptomatic due to kyphosis. For immediately symptomatic patients, the authors recommend early consideration of percutaneous treatment but generally advise against posterior fixation. For patients becoming symptomatic due to kyphosis, the authors recommend percutaneous approaches in patients without neurological deficits due to the lower complication rate of percutaneous procedures relative to open surgical approaches, and they maintain that both balloon kyphoplasty and vertebroplasty have prominent roles in select patient populations.

It is likely that balloon kyphoplasty will become increasingly favored over vertebroplasty, especially with the recent advent of third-generation augmentation that offer the promise of better preserving the recovered body height of the fractured vertebra. The work by Kojima *et al.* and others is an important step in critically assessing the pros and cons of these two percutaneous treatment approaches, and future randomized trials comparing these modalities would be of interest to advance our understanding of the best way to manage patients with TLOVF.

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