



# Vertebral compression fractures: to brace or not to brace?

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Comment on: Squires M, Green JH, Patel R, *et al.* Clinical outcomes after bracing for vertebral compression fractures: a systematic review and meta-analysis of randomized trials. *J Spine Surg* 2023;9:139-48.

**Keywords:** Bracing; orthosis; osteoporosis; vertebral compression fracture (VCF)

Submitted May 15, 2023. Accepted for publication Jul 19, 2023. Published online Jul 27, 2023.

doi: 10.21037/jss-23-71

View this article at: <https://dx.doi.org/10.21037/jss-23-71>

The cited article by Squires *et al.* presents a systematic review and meta-analysis of three randomized trials with level 1 evidence comparing clinical outcomes of treating thoracolumbar vertebral compression fractures (VCF) with rigid bracing, soft bracing, or no bracing at all (1). This is a very important question given the high incidence of about 1.5 million osteoporotic fractures in the US per year (2). About one-fourth of post-menopausal women will suffer a VCF (3). This study found rigid bracing resulted in significantly less pain at 3- to 6-month follow-up compared to no bracing. However, they did not find a difference between rigid and soft bracing across all studied metrics, including pain control. Most importantly, there was no difference between the three groups in terms of progressive kyphosis (and subsequent surgical intervention), development of new neurologic deficits, opioid use, function, or quality of life. Among all 447 patients in this study, only 3 (0.7%) failed non-operative management and required instrumented spine surgery and 3 (0.7%) underwent kyphoplasty. One patient (0.2%) developed a new neurologic deficit.

As noted by the authors, osteoporotic fractures represent a significant cost to the healthcare system, both due to the indirect costs incurred because of fracture-associated disability, and because of the direct costs of the orthotic device. Rigid orthoses are associated with greater direct costs, previously reported as \$1,212 for an off-the-shelf thoraco-lumbar-sacral-orthosis (TLSO) and \$2,471 for a custom TLSO (4). This compares to only \$250 for a

lumbosacral corset. Given patient utilization of prescribed rigid orthosis has been shown to be quite poor—37% compliance in one prospective study—the study's finding of clinical equipoise between rigid and soft orthoses suggests that the latter may prove advantageous from the perspective of healthcare sustainability (5). Additionally, rigid bracing can precipitate skin breakdown, negatively impact pulmonary mechanisms, worsen muscle atrophy (through spinal column off-loading), and increase caretaker burden (6,7). As such, an initial trial of soft bracing for VCF may be a reasonable alternative to rigid orthosis. Regardless of the type of brace utilized, the results additionally suggest the risk of catastrophic failure leading to neurologic deficit (1 patient out of 477 in the cited study) is very low among patients with VCF. In fact, the findings suggest the main benefit of bracing manifests as modestly improved short-term pain control.

Following the initial diagnosis of an acute VCF, more emphasis should be placed on osteoporosis assessment/optimization and less on rigid bracing. This is especially true if the patient does not already have a diagnosis of osteoporosis. The presence of a single VCF increases the risk of subsequent VCF by fivefold and the risk of hip and other fractures by up to three folds (8). Initial assessment can include opportunistic Hounsfield unit measurements on the computed tomography (CT) likely already obtained to diagnose the fracture followed by traditional dual energy X-ray absorptiometry (DXA) with outpatient referral to endocrinology (9-11). However, even in the absence of

T-scores  $<-2.5$  on DXA, a vertebral fragility fracture is enough to make the clinical diagnosis of osteoporosis, and appropriate treatment can be started (12).

## Acknowledgments

*Funding:* None.

## Footnote

*Provenance and Peer Review:* This article was commissioned by the editorial office, *Journal of Spine Surgery*. The article did not undergo external peer review.

*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (available at <https://jss.amegroups.com/article/view/10.21037/jss-23-71/coif>). BDE reports that he received study support/research grants from SI Bone and Stryker, consults for DePuy Synthes and SI bone, participates in the data safety monitoring board for SI bone and medical advisory board for injectsense, serves on the executive board for the International Society for Hydrocephalus and CSF, and owns stock in injectsense. JLF reports that he received consulting fees from Medtronic. The other authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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**Cite this article as:** Mikula AL, Pennington Z, Elder BD, Fogelson JL. Vertebral compression fractures: to brace or not to brace? *J Spine Surg* 2023;9(3):236-237. doi: 10.21037/jss-23-71