



Editorial

Imaging evaluation of osteoporotic vertebral fracture



As the world's population ages, the incidence of osteoporosis defined by decreased bone mass and alteration of microarchitecture has inevitably increased. This results in osteoporosis-associated fracture and leads to debilitating health outcomes and a considerable economic burden on the health care system.^{1,2} In this issue of the *Journal of the Chinese Medical Association*, Lin and colleagues have contributed an interesting article entitled *Determination of the painful level in osteoporotic vertebral fractures: retrospective comparison between plain film, bone scan, and magnetic resonance imaging*.³ The authors studied 52 patients with osteoporotic vertebral fracture (OVF) treated by vertebroplasty in a single institute in Northern Taiwan and found that the pain level of single-level compression vertebral fracture could be identified accurately by either plain film or bone scan; however, the pain level of multiple-level compression vertebral fractures should necessitate the use of magnetic resonance imaging (MRI) to provide an improved and more sensitive diagnosis to localize multiple sites of vertebral fractures.³ In addition, when a vacuum cleft sign appeared on plain film in patients with supposed vertebral fractures, two other diagnostic tools, bone scan and MRI, both showed positive findings.³ Although we applaud the successful publication of this article, there are several controversial issues that require further discussion.

First, what is the aim of this study? In our understanding, the authors would like to localize the fracture sites of the osteoporotic vertebral bones more precisely by comparing the detection accuracy of three commonly used tools: plain film, bone scan, and MRI. However, it is unknown why the authors compared pain score (visual analog scale) of these 52 patients with OVF treated by vertebroplasty, preoperatively and postoperatively. As would be expected, patients after treatment had a significant decline of pain score from 7.6 to 2.8. However, this reduced pain score might in fact represent the benefits or effectiveness of the use of vertebroplasty in the management of patients with OVF. However, this was not a main outcome of the study and, furthermore, was not a conclusion presented by the authors. A recent meta-analysis from Tian et al⁴ showed that patients with OVF treated by vertebroplasty had statistically significant improvements in pain relief compared with the traditional treatment. Additionally, there was the similar incidence of adjacent vertebral fracture between those patients

treated by vertebroplasty and traditional treatment.⁴ Therefore, it would be our suggestion that the method for Dr. Lin's³ study in this issue should more productively focus on the cost-effectiveness or convenience of these different diagnostic tools.

Second, it remains unknown as to why the authors said that it is difficult to determine the actual painful vertebral level in the evaluation of OVF, especially when there are simultaneous acute and chronic fractures. Has there been an alteration in the treatment of vertebroplasty for acute or chronic OVF? The authors failed to study or discuss this. Son et al⁵ found that early vertebroplasty might achieve a better immediate surgical result with improved cost-effectiveness, suggesting that accurate localization of new onset of OVF could be of considerable importance. Since the authors commented that MRI was further needed in cases involving multiple OVF, did the authors mean that the use of MRI could clearly distinguish the new and old OVF in these patients? By contrast, Tan et al⁶ in their prospective study showed that vertebroplasty was effective in patients with chronic painful OVF and pain relief after vertebroplasty was immediate. This might suggest that differential diagnosis between acute and chronic OVF might not have any influence on the therapeutic effects of vertebroplasty.

Third, it is still undetermined as to whether all fracture sites of vertebral bodies of patients with multiple OVF could be simultaneously corrected by vertebroplasty. It is also uncertain whether patients with multiple OVF would benefit by correction of all fracture sites by vertebroplasty at once. Saracen and Kotwica⁷ found that vertebroplasty significantly diminished the level of pain in 90% of patients with multiple OVF and suggested that this procedure should be seriously considered as an efficacious choice of treatment.

Finally, vertebroplasty is a minimally invasive procedure intended to relieve pain and reduce disability in people with OVF; however, the potential complications and cost-effectiveness of the procedure should always be kept in mind. In addition, double-blinded trials associated with vertebroplasty were shown to have no more benefit than local anaesthesia.⁸ Therefore, the use of multimodality assessment to provide scientific evidence in vertebroplasty selection and planning is encouraged for all patients, to help obtain cost-effective and accurate results and further reduce the risk of mortality.

Conflicts of interest

The authors declare that there are no conflicts of interest related to the subject matter or materials discussed in this article.

Acknowledgments

This article was supported by grants from the Ministry of Science and Technology, Executive Yuan (MOST 103-2314-B-010 -043 -MY3), and Taipei Veterans General Hospital (V102C-141; V103C-112; V104C-095; V102E4-003; and V103E4-003). We thank the Medical Science & Technology Building of Taipei Veterans General Hospital for providing experimental space and facilities.

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Peng-Hui Wang*

Department of Obstetrics and Gynecology, Taipei Veterans General Hospital, Taipei, Taiwan, ROC

Department of Obstetrics and Gynecology, National Yang-Ming University, Taipei, Taiwan, ROC

Institute of Clinical Medicine, National Yang-Ming University, Taipei, Taiwan, ROC

Department of Medical Research, China Medical University Hospital, Taichung, Taiwan, ROC

Immunology Center, Taipei Veterans General Hospital, Taipei, Taiwan, ROC

Infection and Immunity Research Center, National Yang-Ming University, Taipei, Taiwan, ROC

Wen-Ling Lee

Department of Obstetrics and Gynecology, National Yang-Ming University, Taipei, Taiwan, ROC

Department of Medicine, Cheng-Hsin General Hospital, Taipei, Taiwan, ROC

Department of Nursing, Oriental Institute of Technology, New Taipei City, Taiwan, ROC

Ming-Hui Cheng

Department of Obstetrics and Gynecology, National Yang-Ming University, Taipei, Taiwan, ROC

Medical Division, Eli Lilly and Company (Taiwan) Inc., Taipei, Taiwan, ROC

*Corresponding author. Dr. Peng-Hui Wang, Department of Obstetrics and Gynecology, Taipei Veterans General Hospital, 201, Section 2, Shih-Pai Road, Taipei 112, Taiwan, ROC.

E-mail addresses: phwang@vghtpe.gov.tw, phwang@ym.edu.tw (P.-H. Wang)