Case Report

Kyphoplasty for Vertebral Augmentation in the Elderly With Osteoporotic Vertebral Compression Fractures: Scenarios and Review of Recent Studies

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ABSTRACT

Background: Vertebral compression fractures caused by osteoporosis are among the most common fractures in the elderly. The treatment focuses on pain control, maintenance of independence, and management of the osteoporosis. Elderly patients often encounter adverse effects to pain medications, do not tolerate bed rest, and are not ideal candidates for invasive spinal reconstructive surgery. Percutaneous vertebral augmentation (vertebroplasty or kyphoplasty) has become popular as a less-invasive alternative. However, studies have questioned the effectiveness of these procedures.

Methods: The authors conducted a MEDLINE search using relevant search terms including osteoporosis, osteoporotic vertebral compression fracture, elderly, kyphoplasty and vertebroplasty.

Case summary/Results: Two elderly patients presented with a fracture of their third and first lumbar vertebral body, respectively. One patient progressed well with conservative treatment, whereas the other patient was hospitalized secondary to pain after conservative measures failed to offer improvement. The hospitalized patient subsequently opted for a kyphoplasty and was able to resume his normal daily activities after the procedure.

Conclusions: Selecting patients on an individual case-by-case basis can optimize the effectiveness and outcomes of a vertebral augmentation. This process includes the documentation of an osteoporotic vertebral compression fracture with the aide of imaging studies, including the acuity of the fracture as well as the correlation with the physical examination findings. Patients who are functional and improving under a conservative regimen are not candidates for kyphoplasty. However, if the conservative management is not successful after 4 to 6 weeks and the patient is at risk to become bedridden, an augmentation should be considered. A kyphoplasty procedure may be preferred over vertebroplasty, given the lower risk profile and better outcomes regarding spinal alignment. (*Clin Ther*. 2013;35:1721–1727) Published by Elsevier HS Journals, Inc.

Key words: elderly, kyphoplasty, osteoporosis, vertebral augmentation, vertebral compression fracture, vertebroplasty.

INTRODUCTION

The World Health Organization found that vertebral compression fractures were the most common type of osteoporotic fractures, mostly affecting the elderly.[1] In addition to pain, compression fractures also lead to additional morbidities, including an increased rate of having an additional vertebral compression fracture, height loss, kyphosis, loss of mobility, depression, and even pulmonary dysfunction.[2] Recent studies have shown an increased rate of mortality in the population with vertebral compression fractures. Both 4- and 5-year

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mortality rates in patients with compression fractures in their thoracic or lumbar spine exceeded those of patients suffering from hip fractures.[3] The treatment of osteoporotic vertebral compression fractures in the elderly focuses on pain control, prevention of progression and deformity, and treatment of the underlying osteoporosis. The overall goal in this vulnerable patient population is to maintain their independence and functional status while avoiding prolonged hospitalizations and bed rest.[2] Several treatment options are available to achieve these goals, ranging from conservative treatment (including pain control) to invasive, reconstructive surgery (including dorsal and ventral instrumentation of the spine). Vertebral augmentation procedures, namely vertebroplasty and kyphoplasty, offer far less invasive alternatives to open-spine surgery.[3] Although initial reports were very promising, recent studies have raised concerns about the effectiveness of vertebroplasty or kyphoplasty, including recommendations by some medical societies against certain types of vertebral augmentation.[4]

The objective of the present article was to discuss the controversy regarding vertebral augmentation in the context of 2 case presentations and to provide guidance to physicians about when to consider a patient for referral to be evaluated for vertebroplasty or kyphoplasty for an osteoporotic vertebral compression fracture. This article does not review or discuss the use of vertebral augmentation for metastatic disease of the spine.

METHODS

The authors conducted a MEDLINE search using relevant search terms including osteoporosis, osteoporotic vertebral compression fracture, elderly, kyphoplasty and vertebroplasty.

CASE DESCRIPTIONS

The first patient is a 74-year-old woman presenting with lower back pain without radiation and with no neurologic deficits. She has a history of chronic lower back pain. The current back pain has progressively increased in intensity, and she does not recall a trauma. The increased pain has been present for the past 3 months. Additional medical history includes breast cancer. Lumbar magnetic resonance imaging (MRI) with and without contrast revealed an acute/subacute fracture of her third lumbar vertebral body with fracture line and edema. The patient initially was prescribed hydrocodone/acetaminophen and tramadol for the ongoing pain; however, she did not have significant improvement and experienced intolerable adverse effects such as increased sedation. The patient's other medications included ibuprofen as needed (<2000 mg/d), a proton pump inhibitor, and Vitamin D. The patient was functional and able to perform her normal daily activities. Overall, her pain was improving slowly, and she decided not to escalate her oral pain medications or to proceed with a surgical intervention given her progress. At her 6-month follow-up, her lower back pain had receded to baseline levels.

The second patient is a 64-year-old man who presented with severely limited activities of daily living caused by thoracolumbar back pain present for >4 weeks after a "rough sit-down" on a chair. No neurologic deficits were noted on examination. He had a history of chronic lower back pain and successful placement of an interspinous process spacer 3 years ago to distract and open the corresponding neural foramen to decompress the spinal nerve and relieve associated leg pain. The patient's imaging studies demonstrated an acute fracture of his first lumbar vertebral body seen on plain radiographs. His pain did not improve, and the MRI obtained 5 weeks after the trauma demonstrated persisting edema and a fracture line (Figure 1). He was treated with opioids, including morphine and hydrocodone/acetaminophen and various NSAID medications, without adequate pain control. Eventually, he had to be hospitalized secondary to this persistent pain. After discussing his options and the risks, the patient decided to proceed with kyphoplasty under local anesthesia. The procedure was uneventful (Figure 2), and he was able to ambulate without braces on the day of the procedure and be discharged home. The patient's follow-up after 8 months was unremarkable.

Treatment of the underlying osteoporosis was continued by the primary care physicians of both patients.

Permission was granted by the institutional review board of the University of Texas Medical Branch (IRB 12-159). This protocol allows the retrospective review of patients treated in the Pain Clinic including publications. Patient information has to be de-identified.

DISCUSSION

Various treatment options have been described in the literature for osteoporotic vertebral compression fractures.