



Minimally Invasive Translaminar Endoscopic Approach to Percutaneous Vertebroplasty Cement Leakage: Technical Note

Salim Şenturk, Goktug Akyoldas, Ülkün Ünlü Ünsal, Onur Yaman, Ali Fahir Özer

■ **BACKGROUND:** Percutaneous vertebroplasty (PVP) and percutaneous kyphoplasty are 2 common procedures that could be applied simply in treatment of vertebral compression fractures. Despite simplicity and safe application of these procedures, there are some drawbacks as well. Cement leakage into the spinal canal is the most common complication of PVP and PKV procedures. The aim of this article is to present a minimally invasive alternative technique for removing cement leakage fragment after the PVP.

■ **METHODS:** A 44-year-old female patient began to complain of L4 radiculopathy after L4 PVP. The lumbar computed tomography demonstrated cement fragment closed to upper medial aspect of the left L4 pedicle. A minimally invasive translaminar endoscopic procedure was performed to remove the cement fragment.

■ **RESULTS:** Following the endoscopic procedure, the patient's complaints resolved completely and she was discharged on postoperative day 1. The minimally invasive intervention provided shorter operation time, minimal blood loss, and reduced complication rate due to its simplicity. In particular, there was no need to undergo general anesthesia.

■ **CONCLUSIONS:** Endoscopic translaminar approach could be safely performed in patients with symptomatic cement leakage after PVP or a percutaneous kyphoplasty procedure.

BACKGROUND

Vertebral compression fracture (VCF) due to osteoporosis is a crucial public health problem with increasing socio-economic effects as society continues to age. VCFs affect approximately 20% of individuals older than 70 years.¹ Moreover, VCFs account for almost 50% of all osteoporotic fractures.² Percutaneous polymethylmethacrylate injection is a revolutionary procedure for treatment of selected VCFs. Percutaneous vertebroplasty (PVP) and percutaneous kyphoplasty (PKP) are 2 common procedures that could be applied simply for percutaneous polymethylmethacrylate injection into the vertebral body. Despite simplicity and safe application of these procedures, there are some drawbacks as well. Cement leakage, spinal hematoma, neurologic deficit, infection, pulmonary embolism, and systemic cement toxicity have been reported in several publications.³⁻⁵ In particular, cement leakage is the most common complication of PVP and PKP. A recent comprehensive meta-analysis study presented the cement leakage incidences of PKP and PVP as up to 18.4% and 54.7%, respectively.⁶ Additional surgery for removing cement fragment comes with many disadvantages in patients with osteoporosis. The aim of this article is to present a minimally invasive alternative technique for removing cement leakage fragment after the PVP procedure. To the best of our knowledge, this is the first report describing minimally invasive endoscopic translaminar approach for solution to symptomatic cement leakage.

CASE DESCRIPTION

A 44-year-old female patient who had previously been diagnosed with secondary osteoporosis was admitted to our hospital with L1-L4 compression fractures due to lifting a heavy object. The patient's T-score at L1-L4 was -3.9 on dual-energy

Key words

- Endoscopic
- Kyphoplasty
- Minimally Invasive
- Spine Surgery
- Translaminar
- Vertebroplasty

Abbreviations and Acronyms

- L4:** Fourth lumbar vertebra
PKP: Percutaneous kyphoplasty

PVP: Percutaneous vertebroplasty

VCF: Vertebral compression fractures

Department of Neurosurgery, Koç University, Istanbul, Turkey

To whom correspondence should be addressed: Goktug Akyoldas, M.D.

[E-mail: goktug_akyoldas@hotmail.com]

Citation: *World Neurosurg.* (2018) 117:15-19.

<https://doi.org/10.1016/j.wneu.2018.05.214>

Journal homepage: www.WORLDNEUROSURGERY.org

Available online: www.sciencedirect.com

1878-8750/\$ - see front matter © 2018 Elsevier Inc. All rights reserved.

x-ray absorptiometry. The PVP procedure was planned for the treatment. Preoperative neurologic examination was unremarkable. Two segments PVPs were performed for the L1 and L4 vertebral compression fractures by our neurosurgery team. Immediately following the PVP procedure, the patient began to complain of severe left leg pain radiating to the hip, anterior thigh, and medial aspects of the knee and calf. Neurologic examination revealed loss of sensation in the left L4 dermatome without accompanying any loss of motor function. The lumbar computed tomography (Figure 1A and B) and spinal radiographs (Figure 2) demonstrated cement fragment closed to upper medial aspect of the left L4 pedicle due to leakage after incorrect (medial) positioning PVP cannula. It started from within the vertebral body, traversed the spinal canal, and extended into the lamina. In particular, it was located in the "hidden zone" (see Figure 2A). A minimally invasive endoscopic translaminar procedure was performed, and the cement fragment was removed successfully in the postoperative first day (Figure 1C–E). Following the endoscopic procedure, the patient's complaints resolved completely. Neurologic examination described as normal on discharge the next day.

SURGICAL TECHNIQUE

The patient was positioned prone on the radiolucent operating table after administration of epidural anesthesia. An 8-mm skin incision was made 7 mm lateral to the midline. The Joimax

TESSYS endoscopic system was used for the surgery. Under fluoroscopic guidance, a standard 18-gauge needle with 25-cm length was placed on the left L4 hemilamina. Dilation of the soft tissue between the muscle fibers with the use of special dilators was performed (Figure 3A). Subsequently, the working channel docked on the left L4 lamina carefully. Lateral and anterior-posterior fluoroscopy views were used to ensure that the working channel was placed on the lamina correctly (Figure 3B and C). An 8-mm bone window was opened by high-speed drill with a diameter of 3.2 mm to the medial side of the cement fragment (Figure 3D and E). The left L4 nerve root was identified on the medial side, and then the bone cement that compressed the nerve root was seen on the lateral side (Figure 3F). The cement fragment started from within the vertebral body and extended into the lamina. The left L4 nerve root was elevated with the hook, and the bone cement was isolated to remove it (Figure 3F). Despite the medial positioned cement leakage, no dural injury and cerebrospinal fluid leakage were observed. Figure 3G demonstrates removal of the cement fragment by using an endoscopic grasper. Figure 3H shows a lateral fluoroscopy view after cement removal. The decompressed left L4 nerve root that traversed freely in the epidural space was observed. The removed cement fragment is showed in Figure 3I.

DISCUSSION

Cement leakage into spinal canal is the frequently seen complication of PVP and PKV procedures.⁷⁻⁹ In particular, wide ranges

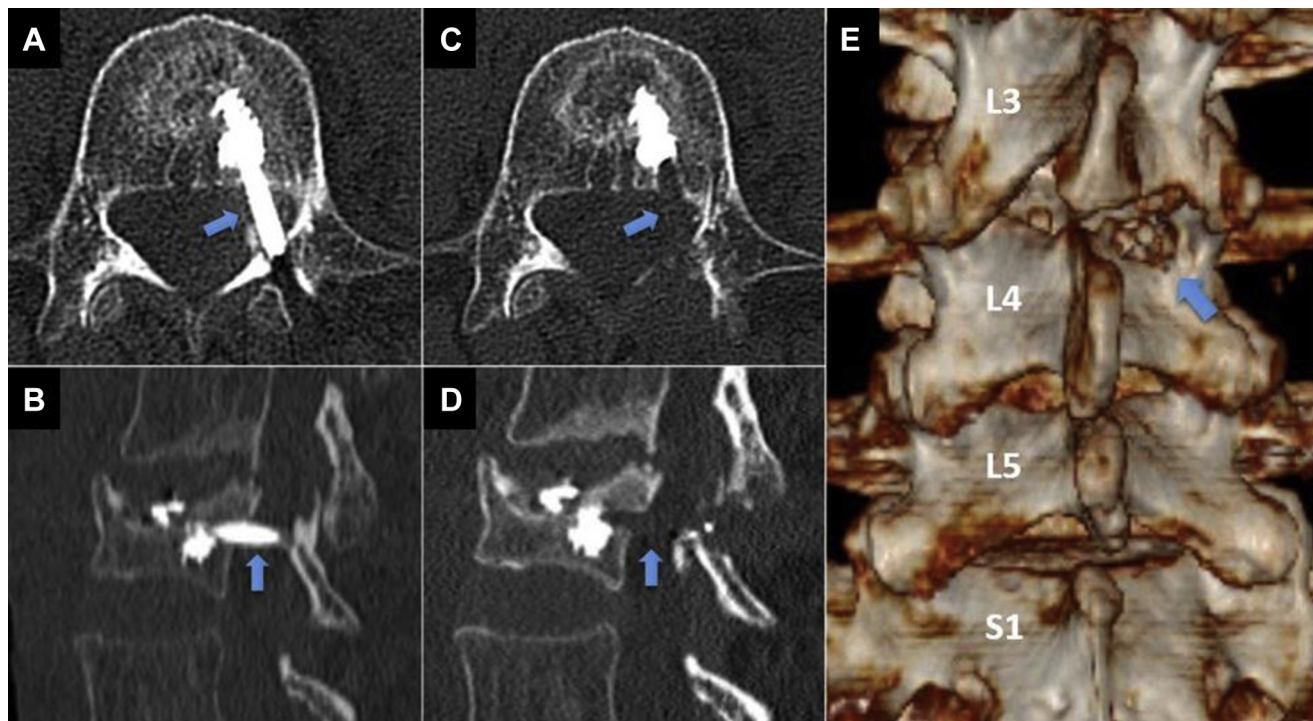


Figure 1. (A and B) Preoperative axial and sagittal computed tomography (CT) scan. Blue arrow shows cement fragment. (C and D) Postoperative axial and sagittal CT scan. Blue arrow shows cement fragment space after removal. (E) Postoperative 3-dimensional CT view. Blue arrow shows trans laminar entrance window.

Download English Version:

<https://daneshyari.com/en/article/8691286>

Download Persian Version:

<https://daneshyari.com/article/8691286>

[Daneshyari.com](https://daneshyari.com)