Volume: 27, Issue:2, April 2016 pp: 101-106 CASE REPORT / OLGU SUNUMU

AN UNUSUAL COMPLICATION OF VERTEBROPLASTY: URINARY INCONTINENCE

VERTEBROPLASTİNİN NADİR BİR KOMPLİKASYONU: ÜRİNER İNKONTİNANS

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SUMMARY:

We present an unusual complication following a vertebroplasty performed under local anaesthesia and sedation in an osteoporotic patient with a lumbar burst fracture: urinary incontinence. Computed tomography showed retropulsion of the posterior wall of the fracture due to the effect of the cement in a patient who developed postoperative urinary incontinence immediately after a percutaneous vertebroplasty under local anaesthesia. An emergency laminectomy, with reduction of the retropulsed fragment, and instrumentation with a pedicle screw were performed. The urinary incontinence resolved within 24 hours after the second procedure. Surgeons should be aware of the risk of retropulsion in burst fractures, which might result in a neurogenic bladder. In such cases, urgent decompression is a good treatment option.

Keywords: Percutaneous vertebroplasty, neurologic deficit, cement leakage, local anesthesia

Level of Evidence: Case report, Level IV

ÖZET:

Osteoporotik bir hastada lumbar burst kırığı hastasında lokal anestezi ile yapılan vertebroplasti sonrasında gelişen üriner inkontinans vakasını sunduk. Lokal anestezi ile Perkütan vertebroplasti sonrasında postoperatif hemen uriner inkontinans gelişimine neden olan semente bağlı gelişen posterior duvar kırığının retropulsiyonu bilgisayarlı tomografide gösterildi. Acil olarak pedikül vidaları ile enstrümentasyon, laminektomi ve posterior duvar parçasının redüksiyonu yapıldı. İkinci cerrahiden sonra 24 saat içinde üriner inkontinans düzeldi. Cerrahlar burst kırıklarında nörolojik mesaneyle sonuçlanabilen retropulsiyon riski açısından dikkatli olmalıdır. Böyle vakalarda acil dekompresyon iyi bir tedavi seçeneğidir.

Anahtar kelimeler: Perkütan vertebroplasti, nöroljik deficit, sement kaçağı, lokal anestezi

Kanıt düzeyi: Olgu sunumu, Düzey 4

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Received: 11th December, 2015.
Accepted: 13th March, 2016.

INTRODUCTION:

Vertebroplasty is a common treatment method for burst fractures with low morbidity and mortality[12]. During vertebroplasty, cement may leak around the vertebral body[3]. Despite the leakage of cement into spinal canal or foramen, neurological deficits are rare[10]. Consequently, local anaesthesia and sedation, which enable communication with the patient and evaluation of the lower extremity motor muscle strength during the procedure, are preferred to general anaesthesia. However, it may be impossible to detect urinary incontinence during the procedure, especially in the presence of a urinary catheter. This case report discusses the treatment of an unusual complication, urinary incontinence, which developed suddenly due to posterior wall compression following percutaneous vertebroplasty (PVP).

CASE PRESENTATION:

An 84-year-old female was hospitalised with a burst fracture of an osteoporotic L3 vertebra (Figure-1).

Under local anaesthesia and sedation, PVP was performed using polymethylmethacrylate cement. During the surgery, neurological examination of leg movements revealed no abnormalities. Urinary incontinence developed immediately after the operation. The postoperative neurological examination revealed normal muscle strength. Bilateral stretch tests were negative. Emergency computed tomography (CT) showed retropulsion of the L3 vertebra posterior wall (Figure-2).

Two hours after the PVP, the patient was reoperated on for decompression. Through a posterior approach, L2-L4 stabilisation and L3 total laminectomy were performed (Figure-3).

Twenty-four hours later, the patient stated that she could feel urinary fullness and was continent. The patient was mobilised on the first day postoperative. Follow-up visits at 1, 3, and 12 months showed that her pain had resolved completely and there was no further incontinence.

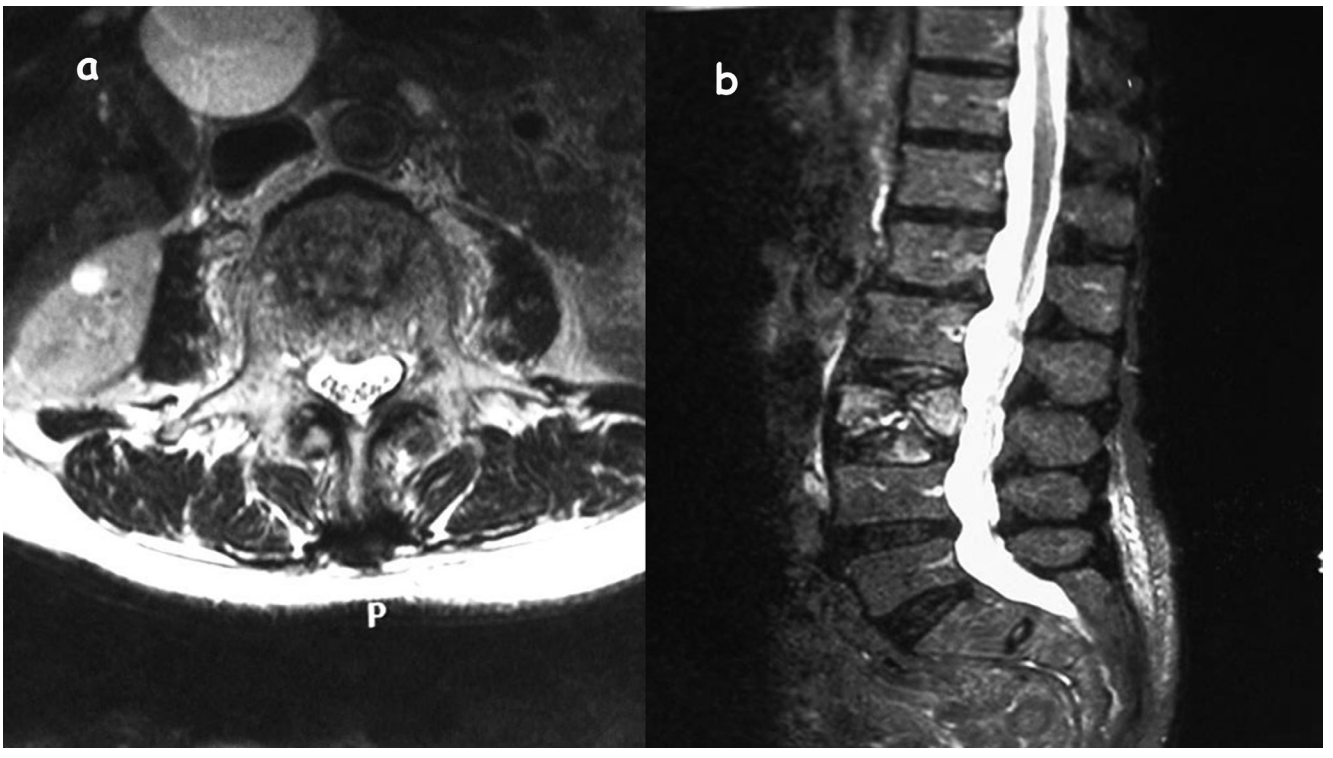

Figure-1. Magnetic resonance images on **a)** sagittal and **b)** axial planes of the third lumbar vertebra burst fracture before PVP.

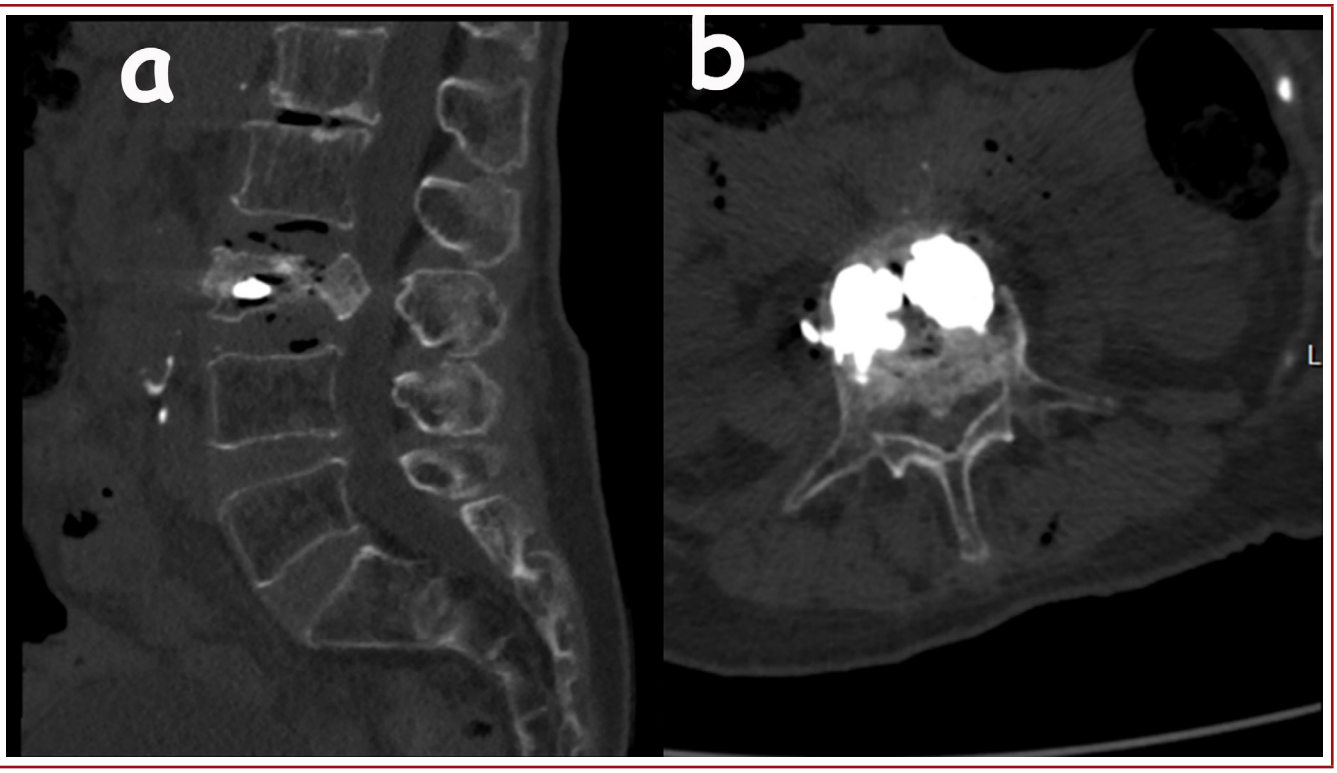

Figure-2. a) Computed tomography images on on sagittal and **b)** axial planes showing posterior wall retropulsion of the third lumbar vertebra after PVP.

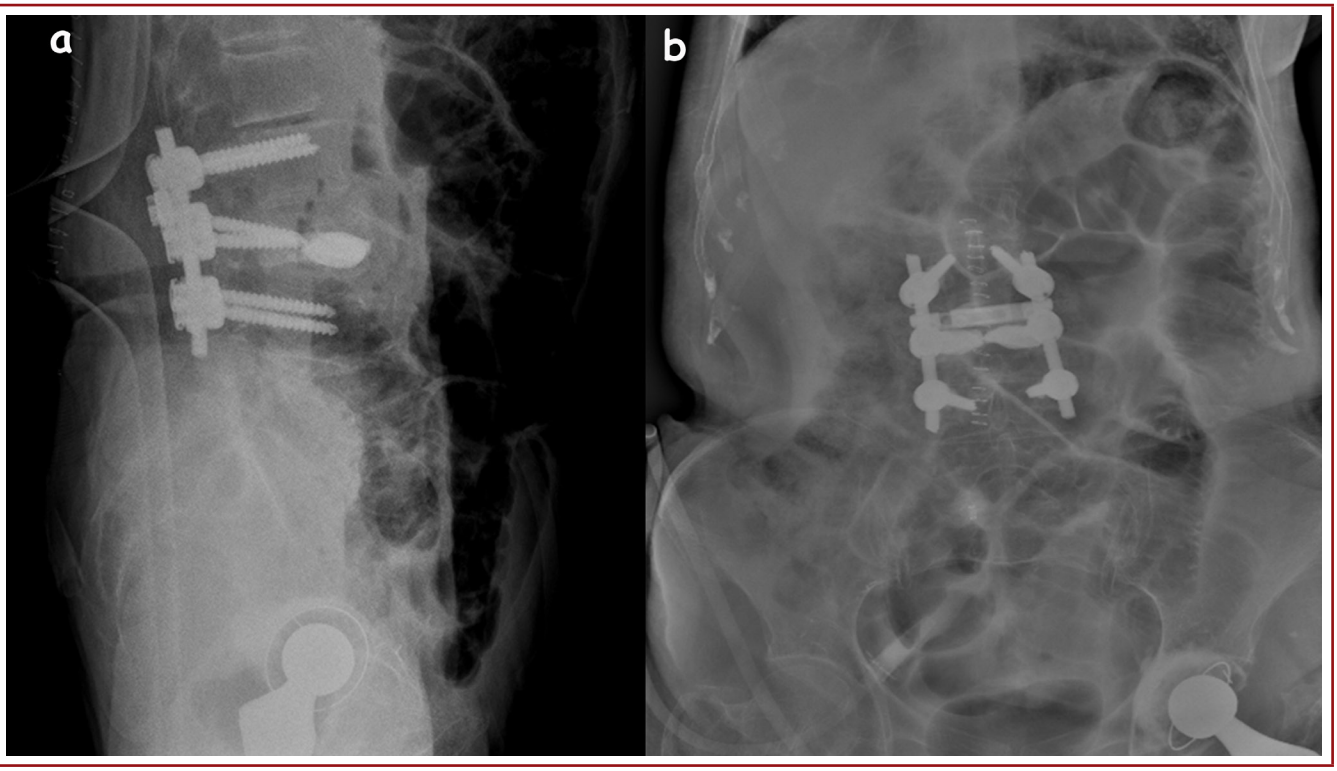

Figure-3. a) Anteroposterior and **b)** lateral radiological examination after posterior instrumentation of vertebra L2–L4.

DISCUSSION:

There are many systems for classifying thoracolumbar burst fractures. Some of them are descriptive, while others use the fracture pattern and treatment strategy[1,4-9,11,12]. Nevertheless, there is no consensus on which fractures need surgical treatment or the surgical technique that should be used[1,4-9,11,12].

Chen and Lee presented the results of vertebroplasty alone in six patients in whom conservative treatment was unsuccessful. The patients' pain decreased to basal levels within 72 hours despite cement leakage into the disc space or paravertebral field in four patients[1]. Huwart treated 62 neurologically intact patients with AO Type A-2 fractures using CT-guided PVP. Despite the CT-assisted intervention, 11% of the patients had cement leakage into the disc space[7].

For AO Type A3.1–A3.3 fractures involving posterior wall protrusions, Hartmann performed kyphoplasty without instrumentation. At the final follow-up visits at an average of 14.6 months, most of the patients showed a 6° loss of kyphosis, but no patient had canal encroachment[6].

Posterior wall fractures pose a risk of a neurological deficit in osteoporotic burst fractures. Yang et al. reported different techniques to prevent cement leakage in thoracolumbar burst fractures based on anterior, posterior, or lateral locations of the fracture line[11].

In a patient who developed paraplegia at the T-6 level due to cement leakage after PVP, Lopes performed a T-5 to T-7 laminectomy 7 hours after the initial operation and obtained complete neurological improvement 1 month postoperatively[9]. In our patient, the neurological deficit likely developed while she was under local anaesthesia, but it was impossible to identify this deficit using neuro-monitoring or perioperative muscle testing. This is the first report of isolated urinary incontinence due to posterior fragment compression after vertebroplasty. All of the reported neurological complications have resulted from cement leakage.

In a neurological deficit due to cement leakage, the symptoms often occur immediately[9], although Cosar et al.[2] and Ross and Fineman[8] reported patients with late-onset neurological deficits.

Surgical decompression should be performed as soon as the deficit is verified[9]. Two of three reported cases that did not undergo surgical decompression failed to resolve[3,5]. Wu[10] reported neurological improvement in a patient who underwent surgical intervention 4 months after the onset of symptoms. We observed improvement in our patient within 24 hours after the emergency decompression.

Computed tomography is the gold standard for evaluating cement leakage[4]. In our case, emergency CT imaging revealed bone fragment retropulsion.

In conclusion, Surgeons should consider the risk of bone fragment retropulsion according to the type of fracture. If the patient requires a urinary catheter during the procedure, the surgeon should check for a neurogenic bladder postoperatively. If suspected, a detailed neurological examination together with imaging should be performed, with emergency decompression as required.

Conflict of Interests:

The authors declare no conflict of interests.

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