



## Management of osteoporotic compression vertebral fractures

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**Pathological vertebral fractures including osteoporotic compression fractures are common problems with an incidence which increases as the age of the population increases. The aim of this study is to evaluate the clinical outcome of percutaneous vertebroplasty in patients with refractory pathological fractures. It is a clinical prospective study conducted on 56 patients. The patients were assessed pre- and post-operatively with (VAS) with a 0 to 10 scaling. Local anesthesia was used in 51 patients and general anesthesia was used in 5 patients. Biplanar fluoroscopy was used. Unipedicular approach was used. 87.5% of patients experienced partial or complete pain relief within the first 24 hours after the procedure. The mean preoperative VAS was  $8.4 \pm 1.6$ , which improved to  $2.5 \pm 0.3$  at four weeks after surgery. This mini-invasive procedure can immediately and significantly reduce pain and improve the quality of life of these patients.**

**Keywords :** bone cements ; osteoporotic fractures ; percutaneous vertebroplasty ; vertebral compression fracture.

### INTRODUCTION

Pathological vertebral fractures including osteoporotic compression fractures (OCFs) are common problems with an incidence which increases as the age of the population increases. These fractures are symptomatic in 23-33% of patients (9). In these patients, analgesic drugs, modifications in activity of

daily living and braces are supposed to be effective (6).

Some patients are refractory to conservative treatment and are not suitable to prolonged surgeries due to the various comorbidities with these elderly patients. To those patients, percutaneous cement augmentation (first reported in 1987) is a suitable modality of treatment (3). The aim of this study is to evaluate the clinical outcome of percutaneous vertebroplasty (PVP) in patients with refractory pathological fractures.

### MATERIALS AND METHODS

It is a clinical prospective study conducted on 56 patients (from January 2009 to December 2013). Inclusion criteria included failure of conservative treatment (analgesics and bracing) in the form of persistent back pain or its progression of more than 2 weeks, age more than 55 years with osteoporotic compression fractures, multiple myeloma or spinal metastasis, conformity of back pain with the location of the involved vertebra, recent fracture confirmed by magnetic resonance imaging (Fig. 1) or Technetium bone scan (8-10-11). Exclusion criteria included fractures with neurologic compromise,

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Fig. 1. — Male patient 79 yrs. with pathological fracture D12, L1 and L5

significant burst components involve the posterior vertebral body wall and fractures have a morphology that restricts vertebral body access (2). The patients were assessed pre- and postoperatively with the visual analogue scale (VAS) with a 0 to 10 scaling (1). Polymethylmethacrylate (PMMA) cement was routinely used.

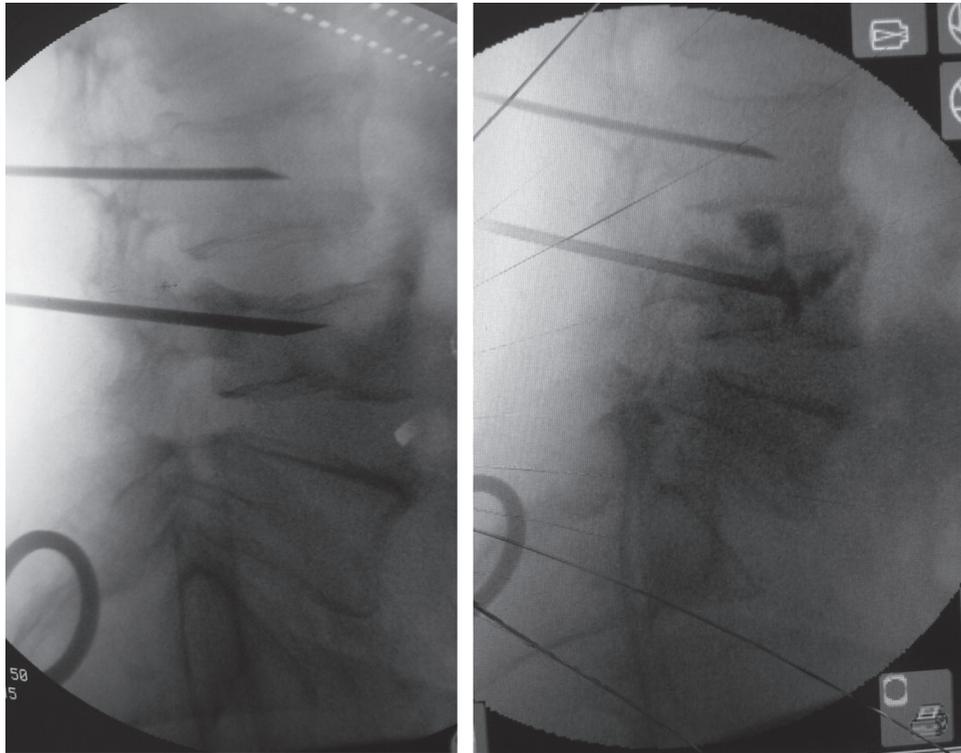
#### Surgical Technique

Local anesthesia was used in 51 patients and general anesthesia was used in 5 patients. The patients were positioned prone on two pillows. Biplanar fluoroscopy was used. Unipedicular approach was used with application of beveled needle number 11 into the anterior third of vertebra directed toward the fractured end plate and injection of PMMA (poly methyl methacrylate) (Fig. 2). Between 4 and 8 ml of cement is injected into the verte-

bral body. The patient was not moved from the prone position until the cement has cured.

#### RESULTS

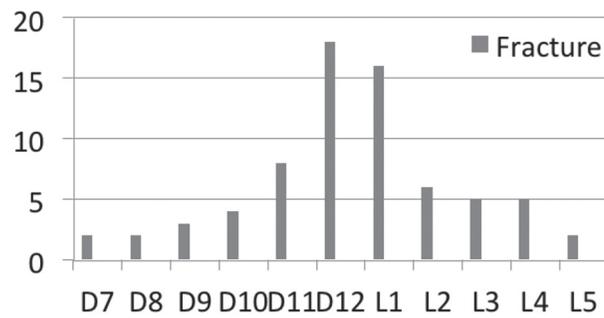
There were 71 injected levels in 56 patients divided between 44 patients with one level injection, 10 patients with two levels, one patient with 3 levels and one patient with 4 levels (Fig. 3 & 4). The youngest patient was 57 years while the oldest was 84 years. The mean age was 72.7 years. 15 patients were males while 41 patients were females. 87.5% of patients experienced partial or complete pain relief within the first 24 hrs. after the procedure. The mean preoperative VAS was  $8.4 \pm 1.6$ , which improved to  $2.5 \pm 0.3$  at four weeks after surgery.



*Fig. 2.* — Fluoroscopy shows vertebroplasty needle during Cement filling



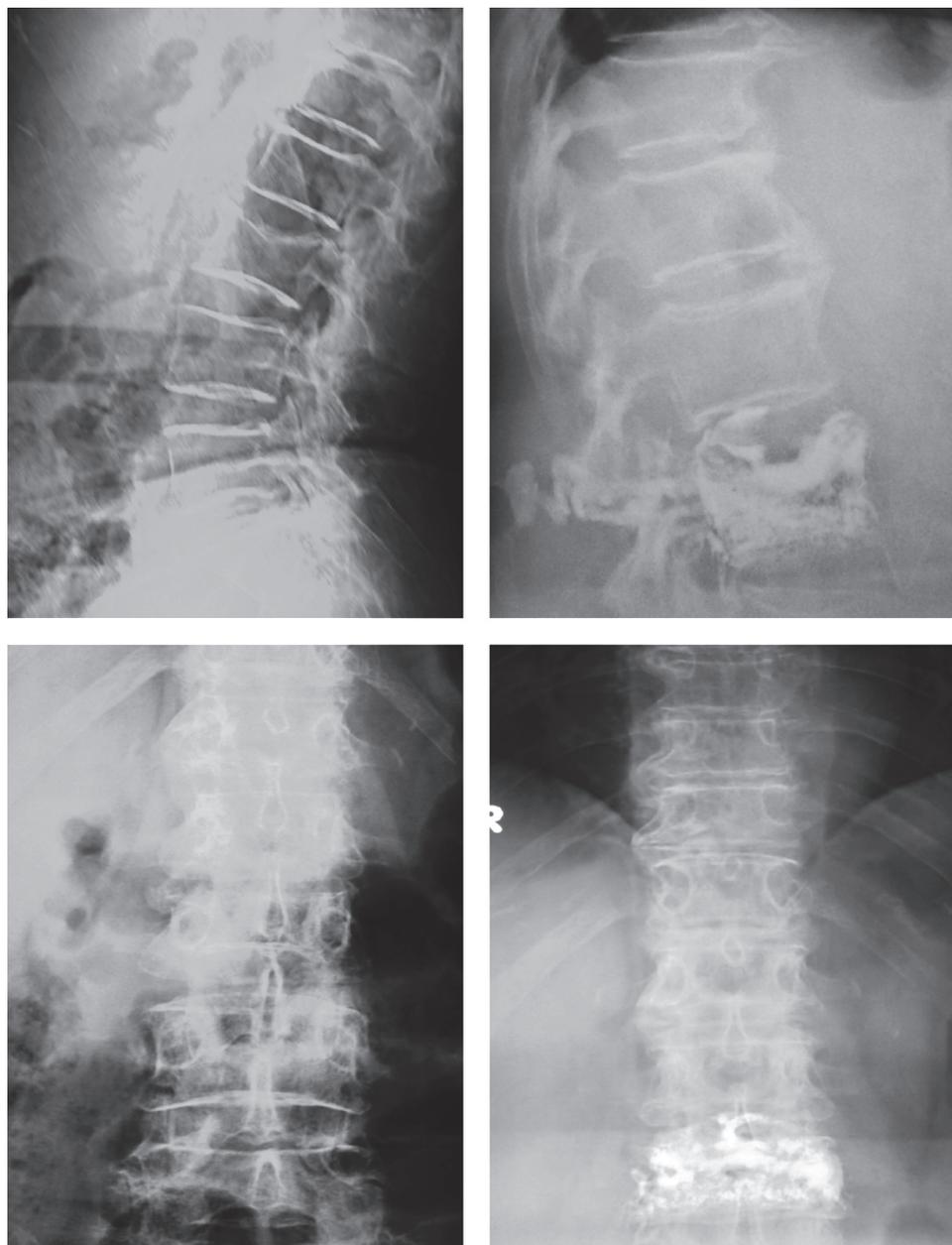
*Fig. 3.* — Intraoperative picture showing 3 level cement injection.



*Fig. 4.* — Level of injection (71 injected level)

The complications encountered with the technique are shown in Table I.

Clinically, 2 cases complained of sciatic pain postoperatively (possibly extravasation into neural foramen) and needed local injection with good improvement (Fig. 5).



*Fig. 5.* — Female pt. with pathological fracture L3

## DISCUSSION

Grados *et al* in 2000 reported a study on 25 patients with OCF (4). The mean preoperative VAS scale was 8.0 which became 3.7 one month after surgery and 3.4 at the last visit. No significant complications other than some adjacent segment frac-

tures were reported, with a conclusion of being a safe and successful procedure in the treatment of OCFs. In our study, the mean preoperative VAS was 8.4 which became 2.5 at one month. Adjacent vertebral fracture occurred in three patients (5.3%). Li *et al* in 2012 (5) in a study on 166 cases reported a 38% re-fracture rate. Most of them occurred

Table I

Type of complication	Incidence
Cement leakage into disc space	23 level
Cement leakage paravertebral	11 level
Cement leakage into spinal canal	1 level
Adjacent vertebral fracture	3 cases

within the first three months and was positively correlated with the volume of injected cement. Our re-fracture rate was somewhat lower (5.3%), in comparison with Li *et al* study, and occurred adjacent to the previously injected vertebra. Lotfinia and Sayyahmelli in 2010 reported that their main complication (7) is leakage of the bone cement the prevalence was disc space leakage in 23.3%, epidural and foraminal leakage in 20%, and venous epidural leak in 6.7%. In comparison to our study, the prevalence of disc space leakage was 32.3%, paravertebral leakage was 15.4% and spinal canal leakage was 1.4%.

### CONCLUSION

This mini-invasive procedure should be carried out by experienced surgeons in a well equipped theatre for the possibility of immediate neurologic decompression. It can immediately and significantly reduce pain and improve the quality of life of these patients.

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