

## Persistent pain after vertebroplasty: Not to miss facet joint pain

**Bigen Man Shakya, MD; Renu Gurung, MD; Anil Shrestha, MD; Binita Acharya, MD;**

**Ninadini Shrestha, MD**

Department of Anaesthesiology, Tribhuvan University Teaching Hospital, Maharajgunj Medical Campus, Institute of Medicine, Kathmandu, Nepal

### Corresponding author

**Renu Gurung, MD**

Email: drrenugrg@yahoo.com

Received 5 June 2020

Accepted 11 Aug 2020

### ABSTRACT

A patient can present with persistent pain even after vertebral compression fracture augmentation procedures. We report a case of a patient of carcinoma breast with L1 vertebral metastasis and fracture for which vertebroplasty was performed abroad. The patient had severe pain even after the procedure and multiple therapies. The patient's pain was finally relieved with radiofrequency ablation of target medial branch, which highlights the importance of facet joint as source of pain generator in such group of patients.

Key words : **Compression fracture, facet joint**

### Introduction

The Vertebral compression fracture augmentation procedures like percutaneous Vertebroplasty and Kyphoplasty with polymethylmethacrylate (PMMA) cement have become established procedure for alleviating pain and stabilization of vertebral fracture due to osteoporosis and metastatic tumor. Although one of the aims is to decrease pain, a patient can present with recurrence of pain and even persistent pain after procedure. We present a case of persistent pain after Vertebroplasty .

### Case report

A 54-year old lady presented to pain clinic with pain in lower back of 4 years duration. The pain was mainly axial in location but occasionally radiating to lower limbs not below the knees. The pain was aggravated by bending forward, sitting and walking. The numerical rating scale on rest was 7 and 10 on movement. The patient had poor sleep, and restricted to home due to pain. She had history of Carcinoma of breast with metastasis and compression fracture of L1 vertebrae. Vertebroplasty with bone cement was done

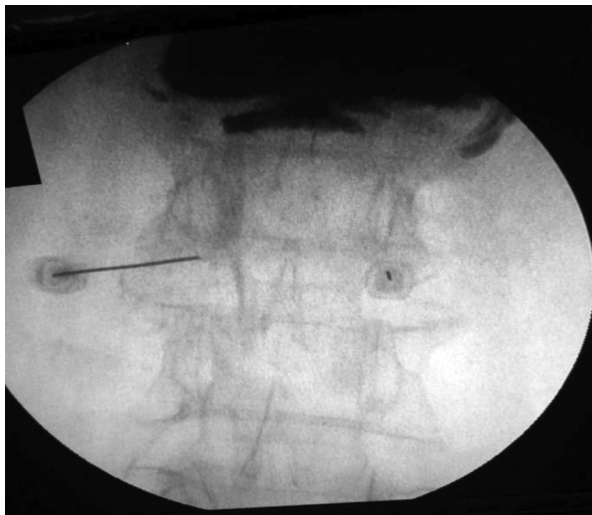
abroad 4 years back. She was in remission phase of carcinoma. The pain in did not better even after vertebroplasty. It actually worsened over time. She had tried a number of medicines and physiotherapy without any relief of pain.

On examination, there was tenderness over spinous process of L1, no facet joint tenderness, no SI joint tenderness. The straight leg raising test was not suggestive of nerve compression. There was no sensory deficit in lower limb and no motor weakness. X-ray and MRI after procedure showed the intradiscal leakage of cement and no new fracture.

The patient received fluoroscopic guided bilateral transforaminal epidural steroid. The pain was only improved by about 20% post procedure and returned to previous state after 2 days. We decided to do diagnostic medial branch block. The patient and family decided to go aboard for further treatment where radiofrequency ablation of medial branch T12 and L1 after diagnostic block was performed under ultrasound guidance. The pain decreased by about 50% and she could do her daily activities during follow up in our clinic.



**Figure 1:** X ray LS spine after vertebroplasty showing leakage of cement to disc space



**Figure 2:** Bilateral transforminal block being performed under C-arm

### Discussion:

One of the goals of percutaneous vertebroplasty is minimizing pain. However about 1.8% to 15.6% of the patients develop recurrent pain with significant impact on quality of life. The main causes of pain after vertebroplasty are rib fracture, infection, non healing bone cement interference, new symptomatic compression fracture, cement leakage<sup>1</sup>.

The leaking of the cement during vertebroplasty is one of the common problems during vertebroplasty with incidence rate of 13.5% to 70%<sup>2</sup>. The leakage is more common in vertebroplasty compared to kyphoplasty<sup>3</sup>. The risk factors for leakage are osteolytic metastatic disease, excess amount of injected cement, injection technique and injection time<sup>1</sup>. The paraspinal soft tissue and perivertebral venous system are two common sites for leakage

of cement. The major leakage into perivertebral venous system can lead to life threatening pulmonary cement embolism. Otherwise the cement leakage into paraspinal soft tissue is not considered significant. Postprocedural CT scan is the investigation of choice to determine the extent of leakage. The leakage of cement can cause neurological symptoms in lower limbs due to mass effect or thermal damage to the nerve. This can manifest either as radiculopathy, or in worst case paraplegia too. The leakage also increases the incidence of new fracture. One of the developing concern is the intradiscal leakage and the its consequences. It has been found that the quantity of the intradiscal cement leak is associated with rate of progression of disc degeneration<sup>4</sup>.

There is the proposed grading system for the quantification of amount of intradiscal cement leakage<sup>4</sup>.

- Grade I : minimal cement leak into disc space considered minimal/cloud
- Grade II : cement leak filled <20% of disc space
- Grade III: cement leak filled 20-40% of the disc space
- Grade IV: cement leak filled >40% of the disc space

During the evaluation of the patient with post procedure pain , It is useful to know whether the pain is at same/adjacent level or non adjacent level. The same/adjacent level pain are result from cement leakage, nerve root compression, infection, non healing bone cement interface, new fracture and facet arthropathy. The non adjacent level pain are due to lumbar spine pathology , facet arthropathy<sup>5</sup>.

After the evaluation of our patient and having ruled out other possible causes from radiographic films, we made a differential diagnosis of source of pain generator. First it might have been due to cement leakage causing disc degeneration and secondly the facet joint arthropathy . We first decided to perform epidural steroid injection as the significant cement leakage was obvious and patient had same level pain with no facet joint tenderness. Our second plan was to perform diagnostic medial branch block.

There are retrospective studies which focus on need of intervention after vertebral augmentation procedures due to persistent pain. The main

intervention was epidural steroid injection in study by Georgy et al. , whereas the intervention targeting the facet joint was more successful in decreasing pain in study by Hatgis et al. and Kin et al.<sup>5,6,7</sup>. Our patient benefited with RF ablation of medial branch.

### Conclusion:

The pain after vertebral augmentation procedures have to be carefully evaluated and after ruling out the other causes, one should focus on facet joint as possible source of pain generator even in absence of facet joint tenderness.

### References:

1. Lin CC, Shen WC, Lo YC, Liu YJ, Yu TC, Chen IH, et al. Recurrent pain after percutaneous vertebroplasty. *AJR Am J Roentgenol.* 2010;194(5):1323-9.
2. Chen WJ, Kao YH, Yang SC, Yu SW, Tu YK, Chung KC. Impact of cement leakage into disks on the development of adjacent vertebral compression fractures. *J Spinal Disord Tech.* 2010;23(1):35-9.
3. Zhao G, Liu X, Li F. Balloon kyphoplasty versus percutaneous vertebroplasty for treatment of osteoporotic vertebral compression fractures (OVCFs). *Osteoporos Int.* 2016;27(9):2823-34.
4. Jamjoom B, Patel S, Bommireddy R, Klezl Z. Impact of the quantity of intradiscal cement leak on the progression of intervertebral disc degeneration. *Ann R Coll Surg Engl.* 2017;99:529-533.
5. Hatgis J, Granville M, Jacobson R E. Evaluation and interventional management of pain after vertebral augmentation procedures. *Cureus.* 2017;9(2):e1061.
6. Georgy BA. Interventional techniques in managing persistent pain after vertebral augmentation procedures: A retrospective evaluation. *Pain Physicain.* 2007;10:673-6.
7. Kim TK, Kim KH, Kim CH, Shin SW, Kwon JY, Kim HK et al. Percutaneous vertebroplasty and facet joint block. *J Korean Med Sci.* 2005;20:1023-8.