Persistent pain after vertebroplasty: Not to miss facet joint pain

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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.
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 its consequences. It has been found that the quantity of the intradiscal cement leak is associated with rate of progression of disc degeneration.

There is the proposed grading system for the quantification of amount of intradiscal cement leakage.

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 interference, new symptomatic compression fracture, cement leakage.

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

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.

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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.\textsuperscript{5,6,7}. 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:**