

Less invasive spinal surgery using bone cement for metastatic disease to the spine: a report of two cases

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Abstract

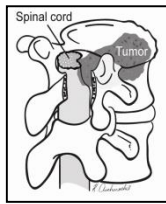
Metastases to the spine is a cause for pain and neurological compromise. Less invasive techniques to stabilize the vertebra is an effective method of treatment while minimizing complication compared to increased operative risk of open surgery. Two cases of cement augmentation are presented here. Patient 1 having multiple myeloma that had a percutaneous kyphoplasty performed at L4 and patient 2 also having multiple myeloma who underwent a Unilateral-posterolateral decompression (UPLD) and open vertebroplasty at T7 was performed on patient 2. Less invasive techniques have been shown to improve patients' quality of life and shorten hospital stays.

Objective

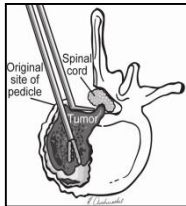
In this study, two cases of cement augmentation are described. Both patients had multiple myeloma that spread to the spine. In patient 1, this created mechanical instability from a pathological fracture at L4. Treatment of patient 1 was percutaneous kyphoplasty. Patient 2 reported severe back pain, myelopathy and foot numbness. In this case, the patient received UPLD and open vertebroplasty. In addition to the indications for this procedure a potential complication is described.

Materials & Methods

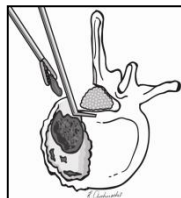
Procedure for patient 2: Unilateral PL decompression and open vertebroplasty



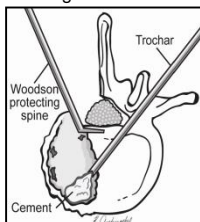
Step 1: Unilateral laminectomy.



Step 2: Pediculectomy to preserve contralateral facet.

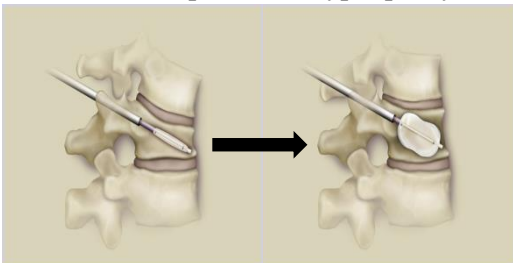


Step 3: Decompression and tumor debulking.



Step 4: Ipsilateral cement packing and contralateral vertebroplasty.

Procedure for patient 1: Kyphoplasty

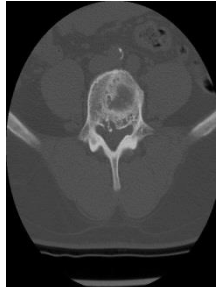


An inflatable bone tamp (IBT) is inserted trans/extrapedicular to the vertebral body. The inflated balloon compacts the bone, reduces the fracture and may elevate the endplates. This leaves a defined cavity ready for cement insertion.

Results

Patient 1 is a 54 year old male with multiple myeloma, the patient was neurologically intact. He had multiple small, well defined osteolytic lesions throughout the lumbar spine, pelvis and sacrum resulting in widespread myelomatous involvement.

Preop



Axial preop CT scan showing pathological fracture and lytic lesion at L4.

Pre-op radiation therapy failed to treat the pain. There was bone collapse at the L4 level. A kyphoplasty procedure was performed at L4. This provided immediate pain relief. However eight days later the patient reported pain at the right lower back and hip. A post-procedure CT scan showed bone cement in the vertebral body (where it belongs) as well as in the neuroforamen (where it does not belong). The patient's pain resolved a few weeks later.

Postop



Sagittal CT scans: the shiny-white represents the inserted polymethyl methacrylate (PMMA) used for cement augmentation.

Patient 2 represents a 44 year old female suffering with multiple myeloma and having a plasmacytoma at T7. Patient had early myelopathy and foot numbness due to spinal cord compression. The patient underwent UPLD and open vertebroplasty.

Preop



MRI scans showing plasmacytoma at T7 impinging on the spinal cord.

Postop



Lateral radiograph after vertebral augmentation with bone cement visible.

Post operatively, the patient was unchanged neurologically however the townsend functional outcome score improved from C to B.

Discussion

Less invasive surgical techniques are ideal as a palliative method toward treating metastatic spine disease. This improves quality of life for the patient with less surgical morbidity allowing for quicker recovery, less surgical pain and less risk of a complication. However, complications can still occur due to cement extravasation as demonstrated in patient 1. Happily, his pain resolved and no further treatment was required. Pain relief is a primary objective for treatment of metastatic bone disease.

Conclusion

Less invasive surgical approaches to the spine like the two cases shown here (percutaneous kyphoplasty or UPLD and open vertebroplasty) may be effective options for candidates who are typically less fit for surgery. These methods reduce the risk of complications, shorten hospital stays and minimize blood loss during surgery. Complications may still occur and patients and physicians need to be aware of these risks such as pulmonary embolus, dural tears, and complications associated with the displacement of bone cement.

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