

Pathological compression wedging involving adjacent dorsal vertebrae in a 56 year female managed with percutaneous transpedicular biopsy and vertebroplasty : a case report .

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Abstract:

Introduction: Vertebral compression wedging leads to a high rate of morbidity and impaired physical and quality of life due to chronic backpain and progressive kyphotic deformity. Minimal invasive surgery techniques such as percutaneous cement augmentation with vertebroplasty restore stability to the vertebral column and treat the debilitating pain unresponsive to conservative measures.

Case report: We present the management protocol of a 56 year female with pathological wedging of D10, D11 vertebra treated with diagnostic transpedicular biopsy and percutaneous vertebroplasty.

Discussion: Vertebroplasty is an excellent procedure for pain relief in these patients provided the following criteria are met: The vertebral height loss of not more than 50% on radiological investigations, no bony canal compromise with an intact vertebral cortex and no compression of neural structures. It is a minimally invasive procedure under local anesthesia to restore stability to spinal column and provide pain relief when conservative measures fail while avoiding a major surgery.

Conclusion: Thorough clinic-radiological and hematological investigation of primary etiology in a patient with pathological vertebral compression fracture is essential to decide management. Transpedicular biopsy is the gold standard in diagnosis of pathological fractures of spine. Vertebral augmentation in the form of vertebroplasty is effective for management of severely painful vertebral fractures in the absence of neurological compromise or instability.

Keyword: Pathological compression wedging, Percutaneous vertebroplasty.

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I. Introduction

Vertebral compression wedging leads to a high rate of morbidity and impaired physical activities and quality of life due to chronic backpain and progressive kyphotic deformity¹. The treatment goals for pathological compression fractures of spine are to obtain definitive diagnosis through biopsy, stabilize the spinal column, preserve neurological function and treat the underlying case of fracture².

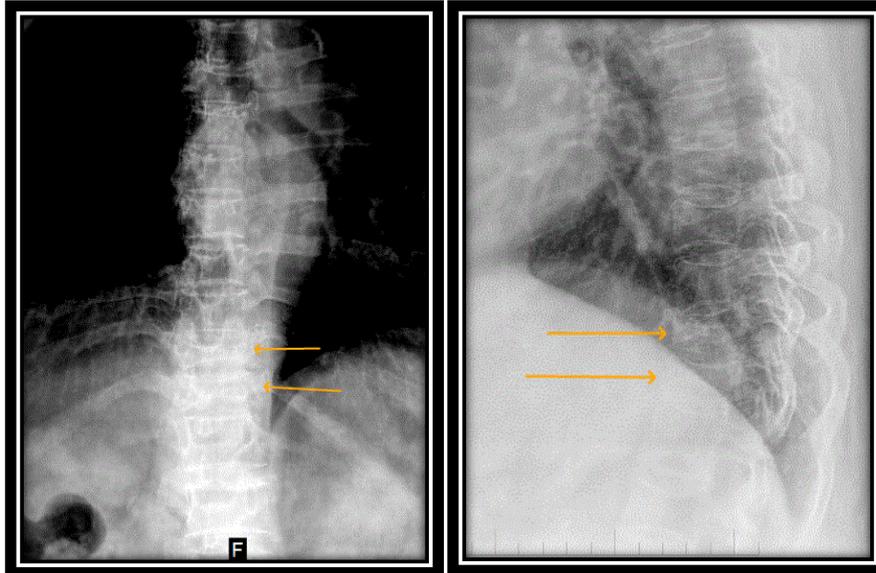
Minimal invasive surgery techniques such as percutaneous cement augmentation with vertebroplasty restore stability to the vertebral column and treat the debilitating pain unresponsive to conservative measures while limiting the morbidity associated with open surgical approaches³.

II. Case Report

History: A 56 year female presented to our opd with severe backpain since one month with difficulty in weight bearing. Patient has no significant history of trauma. Pain in dorsal spine was insidious in onset, gradually progressive with no diurnal variation and limited patients ADL gradually confining her to bed and not even allowing side turning. Pain is partially relieved with rest and oral analgesics and exacerbated by attempts to move. She does not have any weakness in both lower limbs. She does not give history of fever, recent loss of weight, or bowel and bladder complaints. She is under oral medication for Diabetes mellitus and Hypertension.

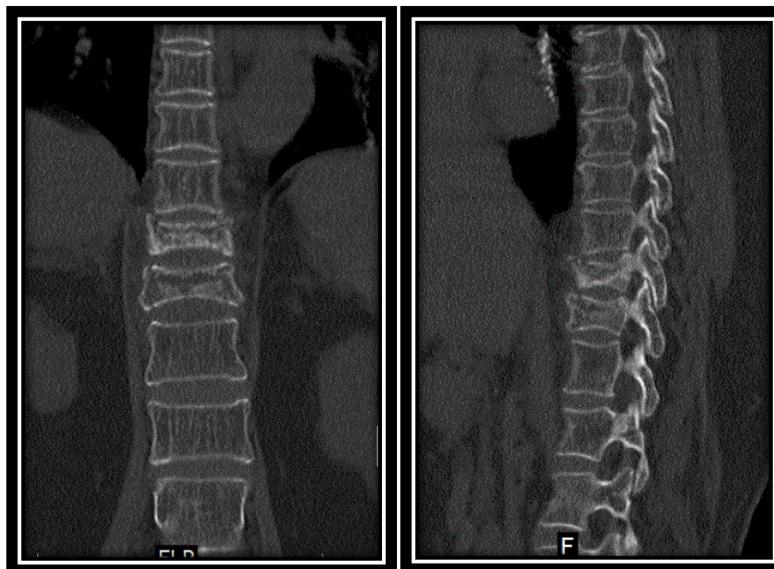
Physical examination: Tenderness is localized to D10, D11 vertebra. Paraspinal muscle spasm present in dorsal spine. No neurovascular deficit in both lower limbs. Bowel and bladder functions normal.

Radiological investigations: Xray of dorsal spine in AP and lateral views show compression wedging of D10 and D11 vertebrae with generalized osteopenia and degenerative changes in spine.

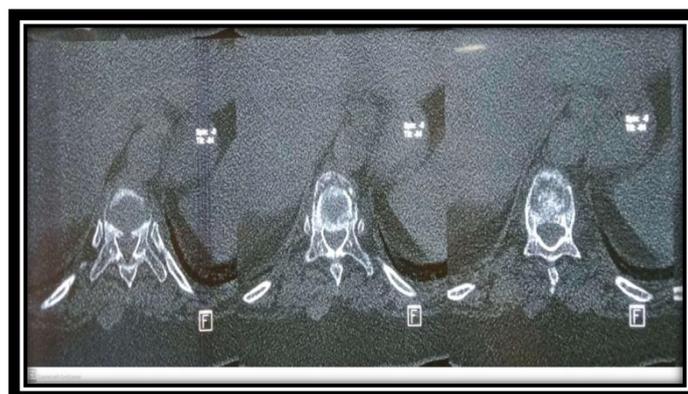


1. preoperative xray in AP and lateral views show D10, D11 compression fractures

CT scan of dorsal spine confirms relatively older D10 wedging with sclerosis fresh wedging of D11 vertebra with integrity of both vertebral cortices maintained and positive vacuum sign.



2. CT scan of dorsal spine showing fracture pattern in coronal and sagittal views



3. CT of D10,11 vertebrae in axial view showing no retropulsion of fragments and intact cortices

MRI of dorsal spine shows positive cleft sign in D10 and D11 vertebral body with no canal compromise and no compression of nerve roots. Edema seen around D11 vertebral body with endplate changes seen in D10 vertebral body.



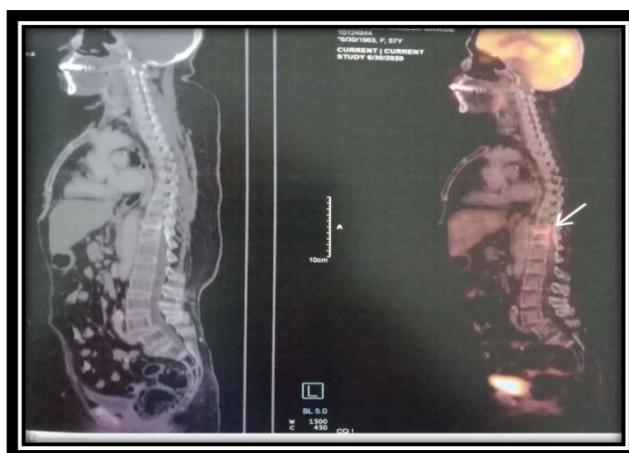
4. MRI T2 images show positive vacuum sign and intact spinal canal diameter with no compression of nerve roots

Laboratory and special investigations: Routine preoperative investigations show leukocytosis with raised neutrophil count (12.87) with raised ESR (42) and CRP (28.7) count.

Serum protein electrophoresis showed hypergammaglobulinemia with absence of M band following which hematologist opinion was sought. On his advise immunofixation study of the same sample was performed which turned negative for all antibodies. Tumor marker levels including CA 125 were found to be within normal limits.

Serum calcium were normal (10.1) but patient had low serum vitamin D3 levels (12.4) and raised serum alkaline phosphatase levels (154) and raised serum PTH levels (74).

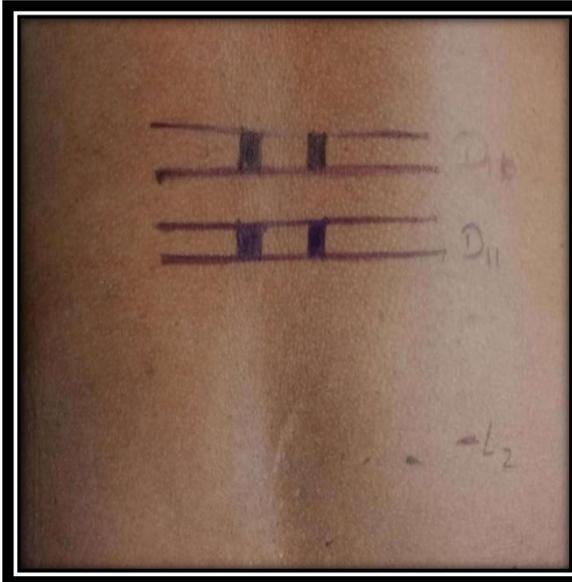
FDG-PET CT scan performed to rule out metastasis showed hotspots only in previously known D10, D11 fractures



5. PET CT shows hotspots in D10, D11 body

Treatment: After ruling out other infective and metastatic causes of pathological fracture, we decided to perform a diagnostic percutaneous transpedicular biopsy with percutaneous vertebroplasty for pain relief and mobilization in the same sitting under local anesthesia.

With patient in prone position, bilateral pedicles of D10 and D11 vertebrae were marked under image intensifier guidance. After injection of superficial and deep local anesthetic, Cooks biopsy needle is advanced under image intensifier guidance through left pedicle of D10 and right pedicle of D11 vertebrae into vertebral body.



6. Skin marking of pedicles

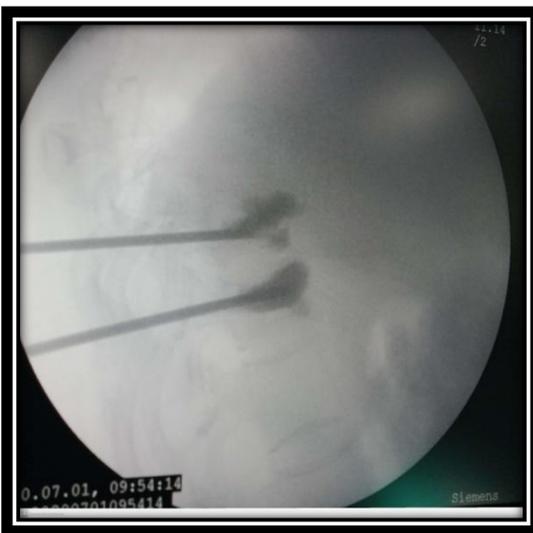


7. Cooks biopsy needle inserted under IITV guidance

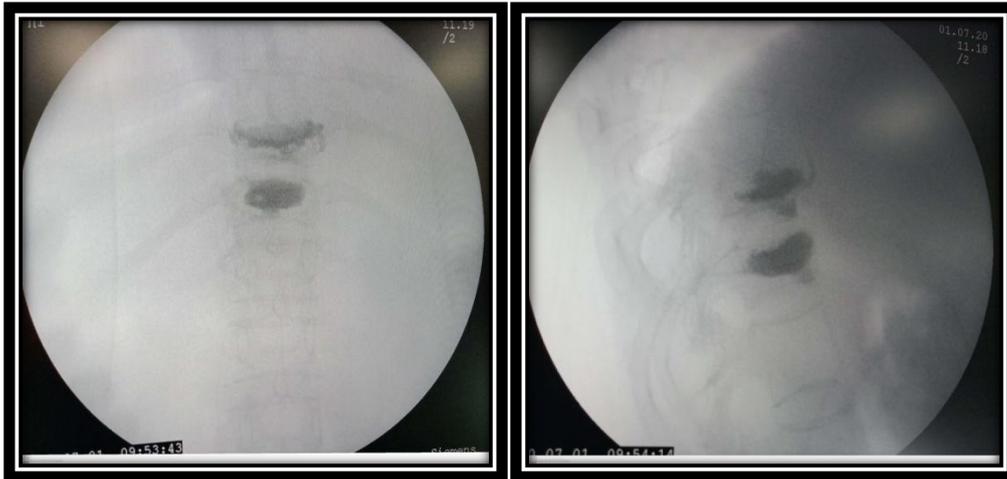
Biopsy taken from vertebral body and cleft fluid sent for cytology and culture studies. Cooks Needle is now reinserted and Radiopaque dye injected through needle in D10 and D11 vertebral bodies and position and cortical integrity and no leakage reconfirmed in AP and lateral views on fluoroscopy. Now cleft fluid and dye is aspirated and bone cement is injected into both vertebra at 1cc intervals till cleft is filled with 4 cc bone cement in each vertebral body under image intensifier guidance in both views to check for any leakage and allowed to set.



8. Radiopaque dye injection and core biopsy

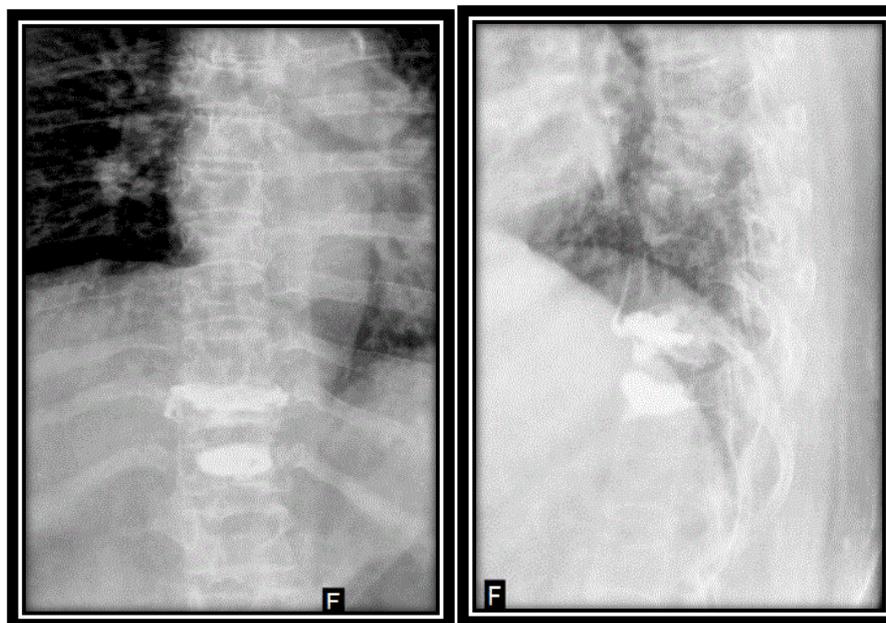


9. Bone cement injection



10. Cement position confirmed intraoperatively in AP and lateral views

Post operative neurological status checked on table and found to be same as before surgery. Patient was mobilized on the same day with Taylors brace for support. Patient had excellent pain relief after surgery following which spinal exercises and core strengthening exercises were started. Postoperative x-rays showed good cement position and stable spine on AP and lateral views.



11. Postoperative xray in AP and lateral views

Post operatively patient was given weekly dose of inj. Arachitol 6 lakh units for 3 weeks followed by weekly oral vitamin D3 supplements of 60,000 units for 12 weeks with calcium supplements for correction of hypovitaminosis of vitamin d3.

Subsequent histopathological examination of biopsy specimen and cytology of cleft fluid confirmed absence of infective or tumor pathology with diagnosis in favor of osteoporotic collapse.

III. Discussion

A study by Alexandra et al states that the most common cause of pathological vertebral compression fractures is osteoporosis, followed by metastatic spine disease.² Women are more susceptible to osteoporosis than men due to lower bone mass. Post menopausal osteoporosis due to increase in bone resorption due to fall in estrogen levels is common after 50 years of age.⁴

A study by Dante et al states that metastatic spine lesions present between 50 and 60 years of age with equal proportion in both sex. These patients are at risk of developing pathological vertebral fractures and symptomatic spinal cord compression with neurodeficits.⁵

A study by Tony et al found Dorsolumbar spine to be most susceptible to osteoporotic compression fractures.⁶

In our patient, we performed clinical, radiological and hematological evaluation to ascertain the cause of pathological compression fractures of D10, D11 vertebrae followed by a diagnostic percutaneous Transpedicular biopsy with percutaneous vertebroplasty for pain relief and mobilization in the same sitting under local anesthesia.

Vertebroplasty is an excellent procedure for pain relief in these patients provided the following criteria are met: The vertebral height loss of not more than 50% on radiological investigations, no bony canal compromise with an intact vertebral cortex and no compression of neural structures.⁷ It is a minimally invasive procedure under local anesthesia to restore stability to spinal column and provide pain relief when conservative measures fail while avoiding a major surgery like fixation especially in a patient with comorbidities.

IV. Conclusion

Thorough clinic-radiological and hematological investigation of primary etiology in a patient with pathological vertebral compression fracture is essential to decide management. Transpedicular biopsy is the gold standard in diagnosis of pathological fractures of spine. Vertebral augmentation in the form of vertebroplasty is effective for management of severely painful vertebral fractures in the absence of neurological compromise or instability as it can be performed along with transpedicular biopsy.

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