

Case Report

Giant cell tumor of dorsal vertebral body

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Abstract

A 30-year-old female patient presented with complaints of backache, weakness in both lower limbs and bladder/bowel dysfunction. Imaging showed an osteolytic lesion at tenth dorsal (D10) vertebra with anterior compression on the spinal cord. Complete intralesional tumor excision with reconstruction was carried out using the anterolateral extrapleural approach. Histopathological examination was suggestive of giant cell tumor (GCT). Because of complete intralesional tumor excision and fear of post-radiation osteonecrosis of bone used for delayed bony union, a conservative approach was used, and radiation therapy was not given. After one year of follow-up patient is doing well without any recurrence of the tumor and is ambulant with support. GCT of dorsal vertebral body is an uncommon entity and total en bloc excision is difficult. Therefore, the treatment strategy is not well-defined. We discuss in brief about incidence, presentation and various treatment modalities available for spinal GCT.

Key words: Dorsal vertebral body, en bloc excision, giant cell tumor, tumor recurrence

INTRODUCTION

Giant cell tumor (GCT) is low grade malignant tumor commonly involving ends of long bone. It is locally aggressive, and tumor recurrence is frequently seen after intralesional or incomplete excision. Most common site for GCT of the spine is sacrum. They are distinctly rare above the sacrum and present with destruction of vertebral body and neural arch. Total spondylectomy with appropriate reconstruction for preservation of spinal integrity is the treatment of choice. Radiation therapy can be given in cases of subtotal resection.

CASE REPORT

A 30-year-old female patient presented with complaints of

backache, progressive weakness of both lower limbs and bladder and bowel incontinence of 4 months duration. On examination, she had tenderness over lower dorsal region and power of grade 2-3 in the right lower limb and grade 1-2 in the left lower limb. Magnetic resonance imaging (MRI) was suggestive of osteolytic lesion involving tenth dorsal vertebral body and left neural arch with extension into posterior mediastinal space [Figure 1a]. A thin rim of anterior vertebral body was spared [Figure 1b] and there was marked anterior compression on the dorsal cord from the tumor mass. Left anterolateral approach with excision of left tenth rib was used to excise the soft moderately vascular osteolytic tumor. Reconstruction was done using expandable cage and pedicular screw and rod fixation in ninth and eleventh dorsal vertebrae [Figures 2a and b]. Histopathological examination of the tumor was suggestive of GCT [Figures 3a and b]. Patient improved in power in both lower limbs after surgery. Radiation therapy was not given in the present case due to fear of osteoradionecrosis and myelitis. After more than 1 year of follow-up patient is doing well without any evidence of local and distant tumor recurrence.

DISCUSSION

GCT of bone has incidence of 5% among all primary bone tumors^[1] and involvement of the mobile spinal segment is seen

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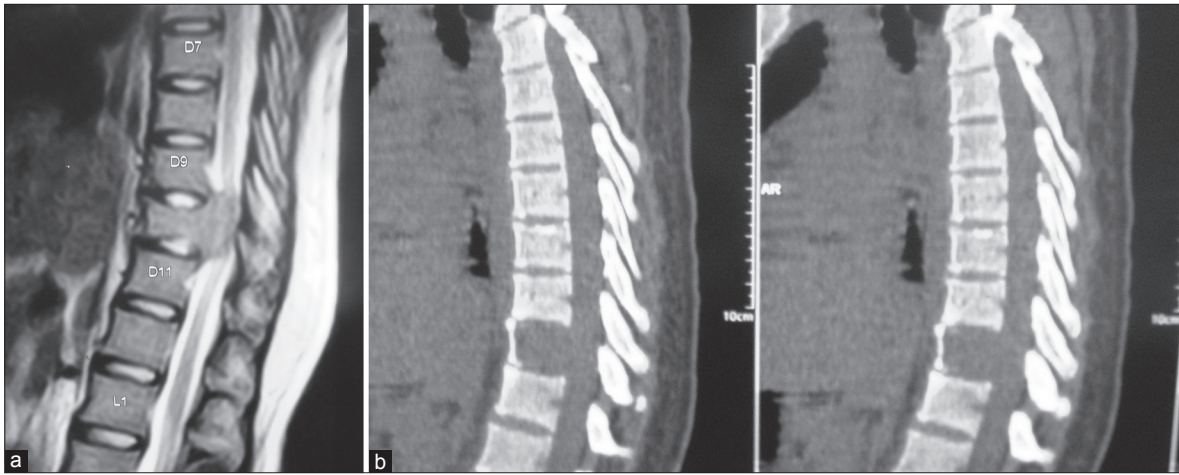


Figure 1: (a) Saggital T2 weighted magnetic resonance image showing tumor mass destroying tenth dorsal vertebral body leading to loss of height of the vertebra and extension into the spinal canal causing severe compression on the spinal cord, (b) Computed tomography showing the destruction of vertebral body with preservation of only anterior rim

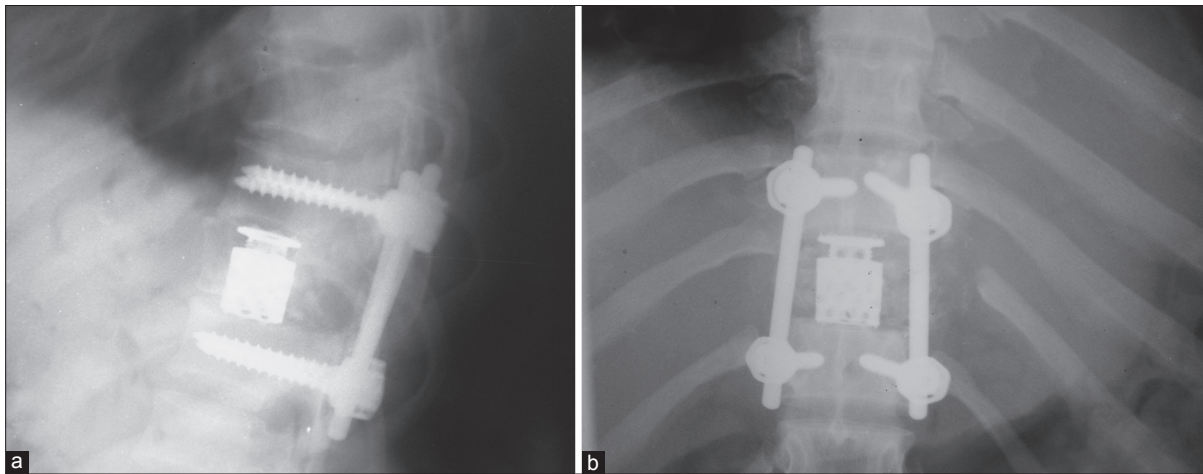


Figure 2 (a) Post-operative lateral X-ray image showing reconstruction using expandable cage in place of excised tumor and pedicular screw and rod fixation, (b) Post-operative postero-anterior X-ray image with expandable cage in place and pedicular rod and screw fixation

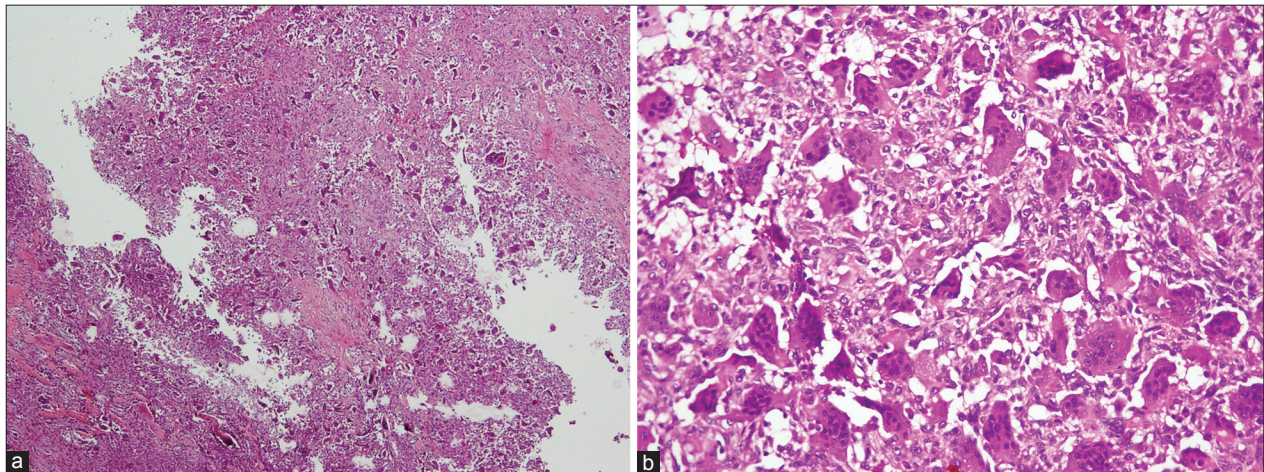


Figure 3 (a) Photomicrograph showing biphasic population of stromal cells and regularly scattered osteoclastic giant cells (H and E stain, $\times 10\times 4$), (b) Photomicrograph with higher magnification showing bland nuclear chromatin of the tumor cells (H and E stain, $\times 10\times 20$)

in only 1-1.5% of these cases. Roughly, equal incidence is seen in all three mobile spinal segments above the sacrum. It occurs in the age group of 20-45 with equal sex incidence.^[2] Common symptoms include, back pain, neurological deficit due to compression of spinal cord, bladder and bowel dysfunction, and structural deformity of the spine.

The radiographic characteristics of spinal GCT are considered to be a round or oval extrapleural mass with shell-like calcification of the marginal lesion and the absence of a mineralized matrix. As opposed to other tumors they involve the vertebral body and soft-tissue involvement may be present. Most common site for so called "benign metastasis" is the lung. The histologic appearance of GCT is a uniform distribution of multinucleated giant cells against a background of round to spindle shaped mononuclear stromal cells. Enneking staging system is used to the plan treatment for GCTs. This classification system divides low grade tumors into stage 1 and high grade tumors into stage 2.

Various modalities of treatment are recommended for spinal GCTs such as surgery, radiotherapy, embolization, cryosurgery, cementation, and chemical adjuvant like phenol or liquid nitrogen. Total en bloc surgical excision is the treatment of choice in long bones as well as spine but is not always feasible in the spine due to the unacceptable risk of permanent neurological deficit.^[3] Earlier adjuvant radiotherapy was thought to convert this low grade tumor into high grade malignant tumor with poor prognostic outcome, but with improved treatment protocols this is not the case.^[4] However, due to the risk of myelitis and bone graft complications, it should be reserved for incomplete tumor excision and local recurrence.

Close follow-up is required to detect recurrence of the tumor. Donthineni *et al.*^[5] noted higher rate of lung metastases from GCT of the mobile spine as compared to long bones. Metastasectomy of lung nodules can be considered in view of prolonged survival. Plain radiograph of local site and chest are simple tools to look for any recurrent lesion. Periodic computed tomography and MRI are excellent tools to clearly identify the recurrent lesion and plan necessary treatment.

In the present case, total tumor excision was achieved by intralesional approach and solid reconstruction was achieved using pedicular screw and rod fixation. As en-bloc excision could not be carried out, close follow-up is required for any sign of local and distant recurrence.

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