

Giant cell tumor of first lumbar vertebra mimicking as metastasis- Rare Case Report and Review of literature

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Abstract: spinal giant cell tumors are very uncommon solitary benign neoplasms with locally aggressive nature. These tumors are most commonly seen in sacrum, rarely present above the sacral part of axial spine. Till now very few cases of giant cell tumors involving lumbar region have been reported in literature. Here in, we are reporting an unusual case of solitary giant cell tumor at [Lumbar]L1 vertebra in a 25 year old man presenting with low backache, paraparesis and urinary disturbances. He underwent near total excision of tumor through posterior approach followed by instrumentation and posterolateral fusion. Postoperatively patient improved neurologically. To the best of our knowledge till now 27 cases of Lumbar giant cell tumors have been documented in literature.

Key Words: Giant cell tumor (GCT), Lumbar region, Metastasis.

I. Introduction

Giant cell tumors of bone comprise approximately 5 to 8% of all bone tumors.¹ These tumors most commonly occur after skeletal maturity i.e during 20 to 40 years age group with slight female preponderance. Most common site of origin is epiphysiometaiphyseal region of long bones which includes distal femur, proximal tibia and distal radius.² The occurrence of Giant cell tumor in sacrum, distal tibia, proximal femur, proximal fibula, proximal humerus is also well described in literature. The axial skeleton above sacrum especially lumbar spine is an uncommon location, till now only 27 cases have been documented in literature.³

II. Case Report

A 25 year old male patient brought to our institution with low backache since 8 months with gradual onset of paraparesis for past 20 days. History of urinary incontinence since 2 days. He had history of weight loss(10 kgs) for past 6 months. Neurological examination revealed spasticity in bilateral lower limbs with the power of 2/5. Patient was catheterised, bilateral knee and ankle jerks are exaggerated, plantar reflex showed extensor response on right side and mute on left side. X ray lumbar spine showed lytic lesion at L1 vertebral body. MRI spine showed T1 hypointense, T2 heterogeneously hyperintense lesion in L1 vertebral body with soft tissue mass extending into spinal canal, compressing the spinal cord is noted. Metastasis workup had been done which showed normal study, serum electrophoresis did not reveal any abnormality. In view of paraparesis emergency surgery was planned through posterior approach. Intraoperatively yellowish brown cloured soft tissue mass is noted in L1 vertebral body with extension into the spinal canal, compressing the spinal cord. Near total excision of tumor been done followed by D12 and L2 pedicle screws fixation with rods and posterolateral fusion had been done. Post operatively both the lower limbs power improved to 4/5. Histopathological examination revealed Giant cell tumor.

III. Discussion

Giant cell tumors of bone are rare. These are solitary, benign bony tumors comprise approximately around 5-8% of all bony tumors. In 1818, Giant cell tumor was first described by Cooper and Travers. These are locally aggressive tumors most commonly seen in epiphysis of long bones like distal femur followed by proximal tibia and distal radius. The occurrence of spinal giant cell tumors are rare, comprises about 2.7% to 6.4% of all giant cell tumors of bone.⁴ In spine, sacrum is the most common site with approximate incidence of 2.5%.⁵ These are very rarely seen above the sacral axial skeleton.^{3,6,7} Although these are benign tumors, 3.5% of cases may show metastasis to lungs. This metastasis incidence is higher in primary tumors at sacrum and radius compared with other long bones. Giant cell tumors are mostly seen in 20-40 years age group with slight female preponderance.⁶ Giant cell tumors of spine are usually sited in vertebral body (55%) followed by body & arch(29%), more rarely in vertebral arch(16%).⁸ Multifocal giant cell tumors are extremely rare& account in <1%cases as per literature.³

Spinal giant cell tumor usually present with pain in most of the cases but can present with myelopathy and/or radiculopathy and even asymptomatic. The initial diagnostic tool is skiagram of local site followed by CT and MRI.^{9,10} On plain x-ray, GCT looks like eccentric, osteolytic lesion with expansile remodelling & extension into subchondral bone without peripheral sclerosis or periosteal reaction. CT and MRI will be helpful to know exact extent and invasion of tumor into surrounding vascular and neural structures. MRI of spinal GCT usually shows hypointense on T1, intermediate to hyperintense on T2 with heterogenous enhancement on contrast. For spinal GCTs two common oncology staging systems are used for the tumor classification and surgical planning. The Weinstein-Boriani-Biagini is a surgical classification where as Enneking system is a radiological classification for spine GCT tumors.^{3,11} Radiologically it is very difficult to differentiate GCT from metastasis, Aneurysmal bone cyst, brown tumor, plasmacytoma, chordoma and lymphoma of spine. However histopathological examination by either CT or MRI guided biopsy will rule out possibility of other tumors and will be helpful for proper planning of further treatment.

Macroscopically giant cell tumors are reddish brown or yellowish brown friable masses with high vascularity,¹² microscopically it is difficult to differentiate GCT from aneurysmal bone cyst. Usually old age suggest GCT where as young age favours to aneurysmal bone cyst.¹³ Histopathologically both tumors contain giant cells but cavernous vascular spaces are the hall mark for aneurysmal bone cysts, but are absent in GCTs.^{14,15} Microscopically, giant cells in GCT lie among stromal cells where as in aneurysmal bone cyst giant cells are very small with small nucleoli unlike giant stromal cells in GCT.^{13,14,15}

Here our case had few peculiarities. (1) Giant cell tumors are rare in spine above the sacral axial skeleton, till now only 27 cases of lumbar giant cell tumors have been documented in literature. (2) Giant cell tumors are more common in females but our case was a male patient. As per literature surgery is the gold standard in the management of these tumors. Many surgical options have been documented in literature ranging from intra lesional curettage with/without bonegraft to wide total resection. The role of radiotherapy as primary or an adjuvant therapy is still controversial. Munoz-Bendix et al in 2015 proposed algorithm for management of spinal GCT.³ Most of the authors accept radiotherapy in incompletely resected, recurrence or metastatic giant cell tumors. Some recent studies had shown usage of bisphosphonates will help symptomatic benefit and local disease control but their mechanism of action is still not fully understood. The role of chemotherapy is still not standardised. A new monoclonal antibody (Denosumab) targeting on RANKL ligand is under trial. Branstetter et al described that this drug had remarkable effect on tumor burden and increase bone formation in GCT of bone.¹⁶

Local recurrence is very high when total excision is not possible. In spinal GCT the overall recurrence rate is between 25 and 45%.¹⁷ Boriani et al in 1976 reported 22% recurrence rate in 49 patients with spinal GCT where as Sanjay et al in 1993 documented recurrence rate of 41.7% in his 24 spinal GCT case series.^{8,18,19} Ninety percent of recurrences usually occur within 3 yrs of initial treatment. In present case we did near total excision of tumor on emergency basis, planning for serial imageology to find out recurrences. In literature treatment for spinal GCT is still not fully standardised in view of adjuvant radiotherapy and chemotherapy. We hope that in near future more cases will be published and will give more appropriate treatment plan.

IV. Conclusions

Spinal Giant cell tumors are rare tumors, in that involvement of lumbar vertebra is very rarest entity. CT and MRI are investigating modalities of choice for diagnosis of spinal giant cell tumors. Wide total resection is the treatment of choice for spinal giant cell tumors. Regular serial images should be done to find out recurrence.

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Figure 1



Figure 2



Figure 3

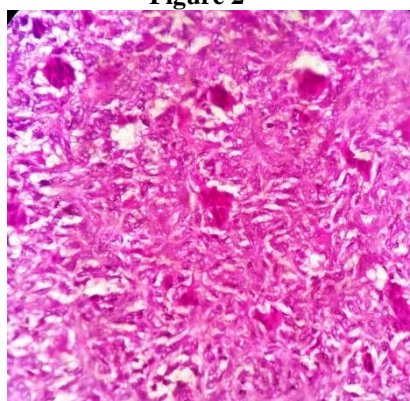


Figure 4

Figure 1- MRI lumbar spine sagittal section both T1 and T2 images showing L1 vertebral body Giant cell tumour invading spinal canal and compressing the spinal cord.

Figure 2 – MRI lumbar spine axial section of L1 body Giant cell tumour.

Figure 3 – Post operative X-ray showing near total excision of tumour in L1 vertebral body and D12-L2 pedicle screw fixation with rods and postero-lateral fusion was done.

Figure 4 – Histopathological confirmation of L1 body Giant cell tumour.