

Giant Cell Tumor of Dorsal Spine

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ABSTRACT

Giant cell tumor (GCT) is a low-grade malignant tumor that commonly involves ends of the long bone. The most common site for GCT of the spine is sacrum. These are rare above the sacrum. We present a case of GCT involving dorsal vertebral body and review regarding the treatment modalities.

Keywords: Giant cell tumor, Sacral giant cell tumor, Spinal giant cell tumor.

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INTRODUCTION

Giant cell tumor (GCT) is a low-grade malignant tumor that commonly involves ends of the long bone. The most common site for GCT of the spine is sacrum. These are rare above the sacrum and usually present with destruction of vertebral body and neural arch. Giant cell tumors are locally aggressive, and tumor recurrence is frequently seen after intralesional or incomplete excision. 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 21-year-old male presented to our department with complaints of pain in his upper back, which radiated to both shoulders for 2 months. There was numbness and weakness of B/L lower limbs. Also, history of off and on fever was present. The patient was earlier treated for pulmonary tuberculosis in childhood. On examination, the patient was conscious and alert. The B/L upper limbs were normal. Tone was increased in B/L lower limbs. Motor power was 5/5 in all limbs. Knee and ankle reflexes were exaggerated in B/L lower limbs, ankle clonus was present B/L, and B/L plantars were extensor.

On sensory examination, sensation to pain, touch, and temperature was decreased by 50% below T4 level. The patient was investigated and magnetic resonance imaging (MRI) was done, which showed wedge compression of T2 vertebral body with cord compression with edema in vertebral body? Lymphoma?? Tuberculoma. A high-resolution computed tomography (CT) chest was done, which showed near-total destruction of D2 vertebral body with associated soft tissue component in the prevertebral and anterior epidural spaces causing spinal canal narrowing. The patient was planned for surgery. Anterior median sternotomy with anterior low cervical approach with D2 corpectomy with right iliac bone grafting with D1–D3 plate and screw fixation was done. Biopsy showed features consistent with GCT D2 vertebral body. Radio-oncology consult was sought. Postoperatively the patient improved and was discharged. At the time of discharge, motor power in B/L lower limbs was 5/5 and sensory deficit improved. The patient is advised follow-up in neurosurgery and radio-oncology.

DISCUSSION

Giant cell tumor of bone accounts for 5% among all primary bone tumors.¹ Mobile spinal segment involvement is seen in only 1 to 1.5% of these cases. Incidence in all three mobile spinal segments above the sacrum is approximately equal. It occurs in the age group of 20 to 45 and sex incidence is equal.² Common symptoms of patients with spinal GCT include back pain, neurological deficit due to compression of spinal cord, bladder and bowel dysfunction, and structural deformity of the spine.

Sacral GCTs present as an expansile lytic lesion involving both sides of the midline, without a sclerotic rim.³ Radiologically, spinal GCTs also present as expansile lytic lesion that most often involves the vertebral body,⁴ and soft-tissue involvement may be present. Giant cell tumor in the long bone usually has epiphyseal-metaphyseal location, which is a clue to the radiographic diagnosis.

The most common site for metastasis is the lung. The histologic appearance of GCT is suggestive of uniform distribution of multinucleated giant cells against a background of round to spindle-shaped mononuclear stromal cells. For planning treatment, the Enneking staging system is used, which divides low-grade tumors into stage 1 and high-grade tumors into stage 2.⁵

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Various modalities of treatment used for spinal GCTs are 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. The treatment of long bones GCT is curettage, sclerotherapy, and filling of the defect with bone cement.⁶ This is not always possible in the spine due to the unacceptable risk of permanent neurological deficit.⁷ Adjuvant radiotherapy should be reserved for incomplete tumor excision and local recurrence due to risk of myelitis and bone graft complications.

Recurrence rates reported range from 29⁸ to 50%⁹ in patients with sacral GCTs. Sacral GCTs that are large for *en bloc* excision should be treated by preoperative embolization followed by intralesional resection. Local recurrence rates reported following intralesional resection of spinal GCT range from 0 to 71%.¹⁰⁻¹³ For spinal GCT in the mobile spine, embolization followed by intralesional resection should be reserved for patients with extensive disease who cannot be treated with *en bloc* excision.

Leggon et al showed no benefit of adjuvant radiation therapy following conservative surgical management of sacral GCT.¹⁴ Few authors still advocate its use following intralesional resections.¹⁵⁻¹⁷

Donthineni et al¹⁸ reported 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. A close follow-up for detecting recurrence should be done. Plain radiograph of local site and chest can detect recurrent and metastatic lesions. Periodic CT and MRI are excellent tools to identify the recurrent lesion and plan out the necessary treatment.

REFERENCES

- Mendenhall WM, Zlotecki RA, Scarborough MT, Gibbs CP, Mendenhall NP. Giant cell tumor of bone. *Am J Clin Oncol* 2006 Feb;29(1):96-99.
- Campanacci M, Baldini N, Boriani S, Sudanese A. Giant-cell tumor of bone. *J Bone Joint Surg Am* 1987 Jan;69(1):106-114.
- Gerber S, Ollivier L, Leclere J, Vanel D, Missenard G, Brisse H, de Pinieux G, Neuenschwander S. Imaging of sacral tumors. *Skeletal Radiol* 2008 Apr;37(4):277-289.
- Kumar R, Guinto FC Jr, Madewell JE, David R, Shirkhoda A. Expansile bone lesions of the vertebra. *Radiographics* 1988 Jul;8(4):749-769.
- Rajesh R, Rajpal P. Giant cell tumor of dorsal vertebral body. *J Craniovertebr Junction Spine* 2012 Jul-Dec;3(2):67-69.
- Turcotte RE. Giant cell tumor of bone. *Orthop Clin North Am* 2006 Jan;37(1):35-51.
- Boriani S, Weinstein JN, Biagini R. Primary bone tumors of the spine. Terminology and surgical staging. *Spine (Phila Pa 1976)* 1997 May 1;22(9):1036-1044.
- Guo W, Ji T, Tang X, Yang Y. Outcome of conservative surgery for giant cell tumor of the sacrum. *Spine (Phila Pa 1976)* 2009 May 1;34(10):1025-1031.
- Randall RL. Giant cell tumor of the sacrum. *Neurosurg Focus* 2003 Aug 15;15(2):E13.
- Christopher M, Edward MF. Giant cell tumor of the sacrum and spine: series of 23 cases and a review of literature. *Iowa Orthop J* 2010;30:69-75.
- Junming M, Cheng Y, Dong C, Jianru X, Xinghai Y, Quan H, Wei Z, Mesong Y, Dapeng F, Wen Y, et al. Giant cell tumor of the cervical spine: a series of 22 cases and outcomes. *Spine (Phila Pa 1976)* 2008 Feb 1;33(3):280-288.
- Yang SC, Chen LH, Fu TS, Lai PL, Niu CC, Chen WJ. Surgical treatment for giant cell tumor of the thoracolumbar spine. *Chang Gung Med J* 2006 Jan-Feb;29(1):71-78.
- Sanjay BK, Sim FH, Unni KK, McLeod RA, Klassen RA. Giant-cell tumors of the spine. *J Bone Joint Surg Br* 1993 Jan;75(1):148-154.
- Savini R, Gherlinzoni F, Morandi M, Neff JR, Picci P. Surgical treatment of giant-cell tumor of the spine. The experience at the Istituto Ortopedico Rizzoli. *J Bone Joint Surg Am* 1983 Dec;65(9):1283-1289.
- Leggon RE, Zlotecki R, Reith J, Scarborough MT. Giant cell tumor of the pelvis and sacrum: 17 cases and analysis of the literature. *Clin Orthop Relat Res* 2004 Jun;(423):196-207.
- Caudell JJ, Ballo MT, Zagars GK, Lewis VO, Weber KL, Lin PP, Marco RA, El-Naggar AK, Benjamin RS, Yasko AW. Radiotherapy in the management of giant cell tumor of bone. *Int J Radiat Oncol Biol Phys* 2003 Sep 1;57(1):158-165.
- Thangaraj R, Grimer RJ, Carter SR, Stirling AJ, Spilsbury J, Spooner D. Giant cell tumor of the sacrum: a suggested algorithm for treatment. *Eur Spine J* 2010 Jul;19(7):1189-1194.
- Donthineni R, Boriani L, Ofluoglu O, Bandiera S. Metastatic behaviour of giant cell tumor of the spine. *Int Orthop* 2009 Apr;33(2):497-501.