



GIANT CELL TUMOR OF DORSAL VERTEBRAL BODY AND RIB - A CASE REPORT KOTI KRISHNA AMULYA

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Abstract :

INTRODUCTION Giant cell tumor (GCT) is a benign tumor with malignant potential commonly involving ends of long bone. It is locally aggressive, and tumor recurrence is frequently seen after intralesional or incomplete excision. GCT of bone has incidence of 5 among all primary bone tumors. It is commonly seen in age group 20-45 years with a slight female preponderance. Most common site for GCT of the spine is sacrum and involvement of the mobile spinal segment is seen in only 1-1.5 of these cases. **CASE REPORT** A 26 year old lady presented with upper back pain for 2 years duration. There was no history of cough or hemoptysis. No chest pain or orthopnea or paroxysmal nocturnal dyspnoea. There were no neurological deficits. Chest X-ray showed large homogenous opacity in the left mid zone suggestive of mediastinal mass. CT imaging showed a large expansile lytic lesion with multiloculated cystic structure arising from left 6th rib posteriorly and adjacent T6 vertebra with extension into spinal canal and was in favor of aneurysmal bone cyst. She underwent left thoracotomy, excision of the posterior mediastinal mass, T6 corpectomy with Harms cage placement in lateral position followed by T6 laminectomy and T4-8 pedicular fixation. Histopathology showed giant cell tumor of bone. She received adjuvant radiation therapy (IMRT Indication for radiation As tumor was excised piece meal and margin could not be commented on by the pathologist 46 Gy in 25 fractions to PTV GTV post operative site and suspected residual lesion CTV 1.5 cms margin to GTV PTV 0.5 cms margin to CTV) **CONCLUSION** 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 it is not always feasible in the spine to perform a function preserving radical surgery due to the unacceptable risk of permanent neurological deficit. Adjuvant radiation therapy can be considered in cases of incomplete tumor excision and those with high features of local recurrence

Keyword :

Giant cell tumor, IMRT, vertebral body, adjuvant radiotherapy



IMAGE 1

INTRODUCTION:

Giant-cell tumor (GCT) is an uncommon tumor of the bone, characterized by the presence of multinucleated giant cells (osteoclast-like cells). Giant cell tumors are benign but with unpredictable behavior. In most patients, the tumors are slow to develop, but may recur locally in as many as 50% of cases. It has incidence of 5% among all primary bone tumors. GCT usually occurs after skeletal maturity, with a peak incidence in the 3rd decade of life, and there is a slight female predominance. Here we present a rare case of giant cell tumor of dorsal vertebrae masquerading as a posterior mediastinal mass treated with surgery and radiation therapy.

CASE REPORT:

A 26 year old female with no known co-morbidities presented with complaints of upper back ache for 2 years duration. It was gradually progressing in nature and radiating to left side of back. There were no neurological deficits or weight loss. General and systemic examination was within normal limits. Chest X-ray showed mediastinal mass (Image1) Further evaluation with CT showed large lytic lesion with multiloculated cystic structure arising from left 6th rib posteriorly and adjacent T6 vertebra with extension into spinal canal through left T5- 6 & T6-7 neural foramina and indenting the spinal cord and abutting the aorta, descending pulmonary artery (Image 2)

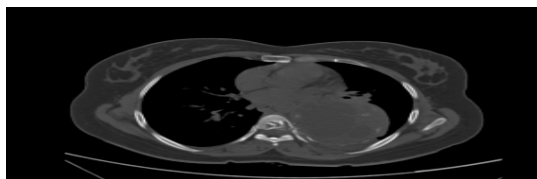


IMAGE 2

Differentials of aneurismal bone cyst Vs primary bone tumor were considered. She underwent left posterolateral thoracotomy, excision of mediastinal mass, D6 corpectomy with cage fixation and D6 laminectomy with D4-D8 pedicle screw fixation.

PER OP FINDINGS

– 8 cm degenerated and partly cystic tumor involving D6 vertebral body & head of 6th left rib

– Lung was partly stuck to tumor

– Medial end of 5th rib showed sclerosis

Histopathological examination showed (Image3) multinucleated osteoclastic giant cells with monomorphic plump spindle shaped stromal cells. Tumor was abutting the superior margin, 0.1 cms from anterior, inferior and posterior margin, 0.2cm from lateral margin.

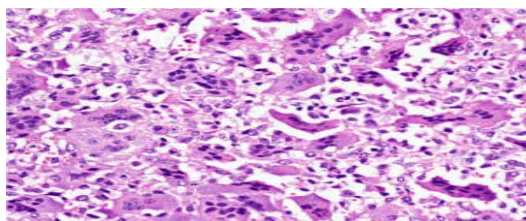


IMAGE 3

Adjuvant radiation therapy was considered for the following reasons :

1. Tumor was stuck to lung and was shaved off indicating probable microscopic disease left behind

1. Close margin on histopathological examination

2. Tumor was excised in piece meal leading to ambiguity in ascertaining margin status Radiotherapy was delivered using Intensity modulated radiation therapy in view of dose constraints to adjacent critical structures such as spinal cord, nerves, lung and heart

DETAILS OF RADIATION THERAPY: (Image 4)

Region	Left posterior mediastinum
Beam	8 MV photons
Technique	IMRT
Number of beams	7
Dose	48 Gy in 25 fractions to 100% isodose

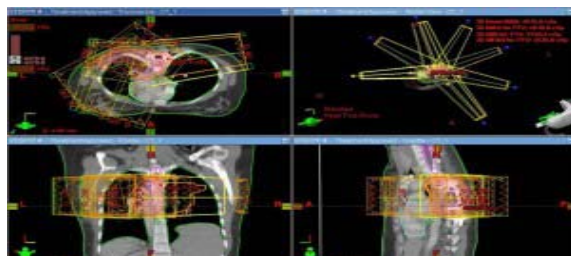


IMAGE 4

FOLLOW UP

Patient was on regular follow up and was found to be disease free at 2 years (Image 5)

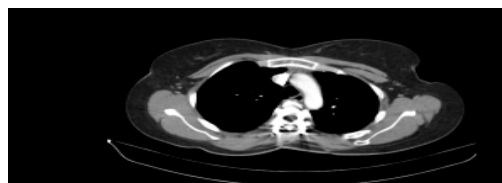


IMAGE 5

REVIEW OF LITERATURE :

INCIDENCE

GCT is frequently seen involving ends of long bones (epiphyseal / metaphyseal region of long bone) and rarely involves axial skeleton. Most common site for GCT of the spine is sacrum and involvement of the mobile spinal segment is seen in only 1-1.5% the cases involving the spine. They present with destruction of vertebral body and neural arch^{1, 5}

SITE	INCIDENCE IN PERCENTAGE
Around knee	50-60%
Distal radius	10-12%
Sacrum	4-9 %
Other vertebrae	1-1.5%

PRESENTATION

The patients commonly present with complaints of pain, swelling, and limitation of joint movement in cases of involvement of long bones. With tumors in the axial skeleton, the patients often complain of back pain and may present with neurologic signs or symptoms⁵

MOLECULAR PATHOGENESIS

It is generally accepted that the characteristic large osteoclastic giant cells are not neoplastic. The mononuclear cells, which represent the neoplastic component, are thought to arise from primitive mesenchymal stromal cells. These cells have characteristics of osteoblast progenitors and express RANKL (Receptor Activator of Nuclear factor Kappa B (NF-κB) Ligand), a growth factor that is essential for the recruitment of osteoclasts by osteoblasts and their maturation under normal physiologic conditions⁷

DIAGNOSIS

On a plain radiograph, GCT is seen as an expansile eccentrically-placed lytic area, which is the result of intratumoral hemorrhage. Based upon the radiographic findings, the differential diagnosis may include a lytic metastasis, a primary bone tumor, a brown tumor of hyperparathyroidism, an aneurysmal bone cyst, or nonossifying fibroma. Diagnosis is confirmed by histopathological examination which shows sheets of round to oval polygonal or elongated mononuclear cells interspersed with uniformly distributed large osteoclast giant cells^{5,7}

MANAGEMENT

Surgery is the preferred modality of treatment. However, when GCT involves axial skeleton, complete resection with adequate margin and preserved function is not feasible. Adjuvant radiation therapy should be considered in cases of incomplete tumor excision^{1,3,4,6}

CONCLUSION:

Management of spinal GCTs poses a unique challenge to oncologists. Total en bloc surgical excision is the treatment of choice. However, it is not always feasible in the spine due to the unacceptable risk of permanent neurological deficit. A function preserving radical surgery of GCT in axial skeleton is the treatment of choice. Hence adjuvant radiation therapy should be considered in cases of incomplete tumor excision and those with high features of local recurrence.

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