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RESEARCH ARTICLE

GIANT CELL TUMOR IN THE THORACIC SPINE: A RARE PRESENTATION

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ABSTRACT

Giant cell tumor (GCT) of the bone is an uncommon neoplasm that accounts for about 4% of all primary bone tumors. GCT most frequently occurs at the end of long bones. GCT in spine (above sacrum) is a rare presentation. We present here a case of 30 years old female who presented with complaints of progressive weakness in bilateral lower limbs with the involvement of bladder and bowel. MRI showed collapse of D4 vertebral body. Biopsy was taken from thoracic vertebra. Histopathological examination revealed the presence of Giant Cell tumor in thoracic spine, which is a rare presentation.

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INTRODUCTION

Giant cell tumor (GCT) of the bone is an uncommon neoplasm that accounts for about 4% of all primary bone tumors (Hwang *et al*., 2003). Giant cell tumor (osteoclastoma) is usually seen in patients over 20 years of age. It is more common in women. GCT most frequently occurs at the end of long bones. Sacrum is the commonest site in the axial skeleton (Reid, 2002). Giant cell tumors also occurs in the spine above the sacrum, but this location accounts for only 2-4% of cases (Campanacci *et al*., 1987; McDonald , 1986; Sung *et al*., 1982). We present here a case of 30 years old female diagnosed with Giant cell tumor of thoracic vertebra.

Case Presentation

A 30 year old female presented with complaints of progressive weakness in bilateral lower limbs from last 2-3 months. Bladder and bowel were involved with the chief complaint of constipation from last 6 days. On examination, sensory loss was present upto xiphisternum. Power in lower limbs was found to be 3/5 on examination.

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Patient was operated a year back and biopsy from lumbar region showed morphological features suggestive of Giant Cell Tumor. MRI of the dorsal spine now showed accentuated dorsal kyphosis with almost complete collapse of D4 vertebral body and enhancing lesion involving D3 to D5 vertebrae causing significant cord compression; suggesting ?Residual/ Recurrent lesion (Figure 1). We, in the Department of Pathology received multiple grey white soft tissue pieces along with pieces of bone collectively measuring 1x0.8x0.3cm. Whole of the tissue was processed and slides were made for histopathological examination. On microscopy, there was a uniform distribution of multinucleated giant cells against a background of round to spindle shaped mononuclear stromal cells. (Figure 2) The cytoplasm of the giant-cell had a granular appearance. There were more than fifteen to twenty nuclei in a single giant-cell. The appearance of these nuclei was identical to that of the nuclei of the mononuclear stromal cells. (Figure3) The overall histological features were those of Giant Cell Tumor.

DISCUSSION

Giant-cell tumor of bone is defined by the World Health Organization as a benign, locally aggressive neoplasm which is composed of sheets of neoplastic ovoid mononuclear cells interspersed with uniformly distributed large osteoclast like giant cells (Reid *et al*., 2002).

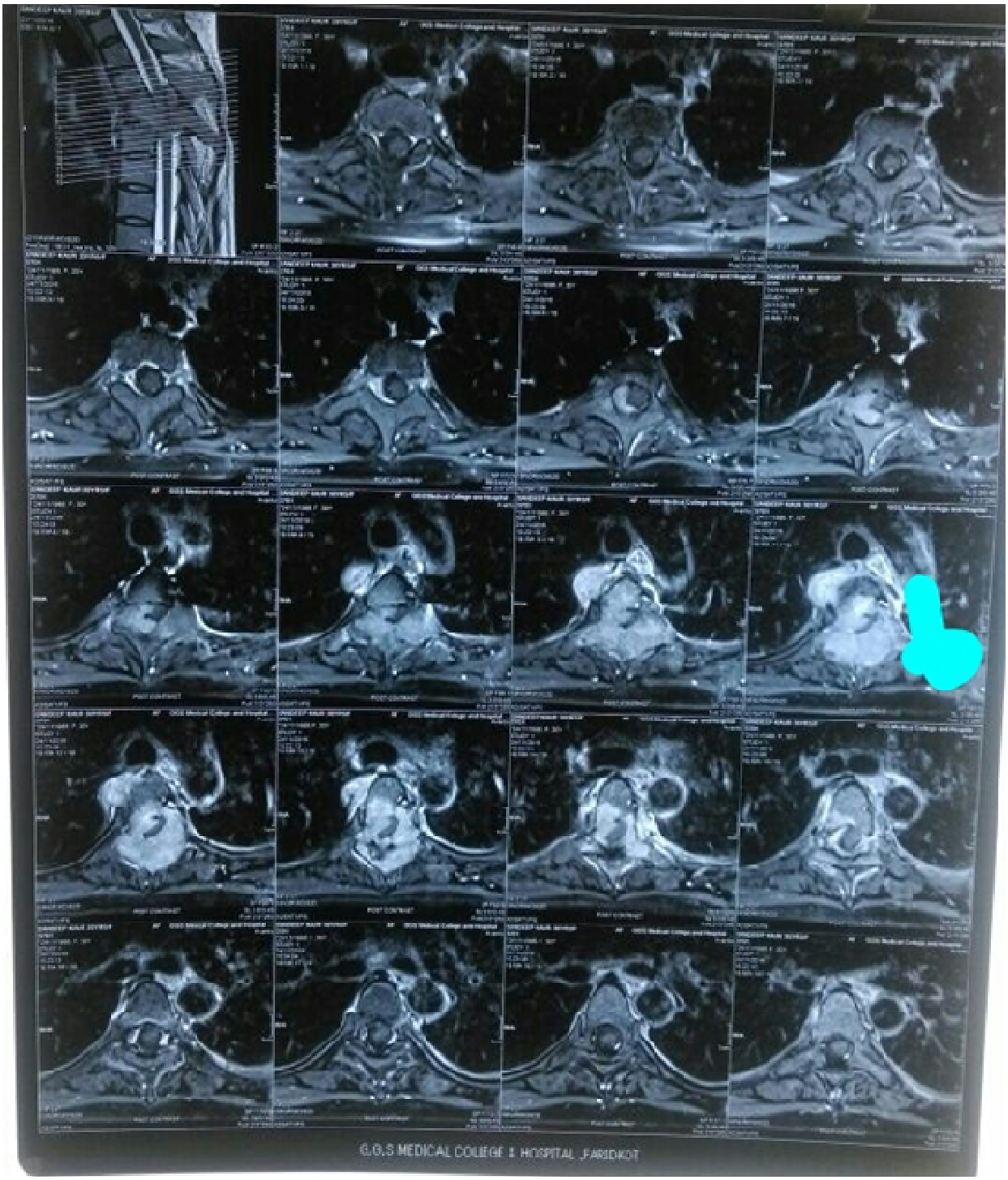

Figure 1 Axial T1 weighted fat suppressed post contrast image showing an enhancing soft tissue mass involving D4 vertebral body extending posteriorly into epidural space and associated with enhancing soft tissue mass in prevertebral space on right side

Giant cell tumors of bone typically affect ends of long bones. GCT occurs most commonly between the ages of 20-45 years of age. There is a slight female predominance (Reid *et al*., 2002). The classic location of Giant Cell Tumors is the epiphysis of long bones. The sites most commonly affected (in order of frequency) are the lower end of the femur, the upper end of the tibia, and the lower end of the radius. It also occurs in the humerus, fibula, and skull, particularly the sphenoid bone. Involvement of the bones of the hands and feet, jaw, and vertebrae (other than sacrum) is distinctly unusual. They are rare in the vertebrae above the sacrum (Rosai, 2011). Roughly, equal incidence is seen in all three mobile spinal segments above the sacrum i.e. cervical, thoracic and lumbar segments (Sanjay, 1993).

A review of 1277 giant cell tumors reported from several countries showed only 34 (2.7%) to be in the spine (Shankman, 1988). Of 396 cases from India and China, only 1.8% were in the spine (Rockwell, 1961). A report from Sweden showed a prevelance of 9.3% in the vertebrae above the sacrum (Larson, 1975). Giant cell tumor (GCT) of the spine remains an intriguing and unpredictable entity. It is the most aggressive of the benign primary tumors of the spine, with a high predilection for recurrences. Most of the available literature reports small series, clearly indicating that it is not a common occurrence. Spinal GCTs often present with the unique problem of spinal cord compression due to extension into the spinal canal. Recurrence may exacerbate neurological deficits, increase management difficulties, and even lead to death when

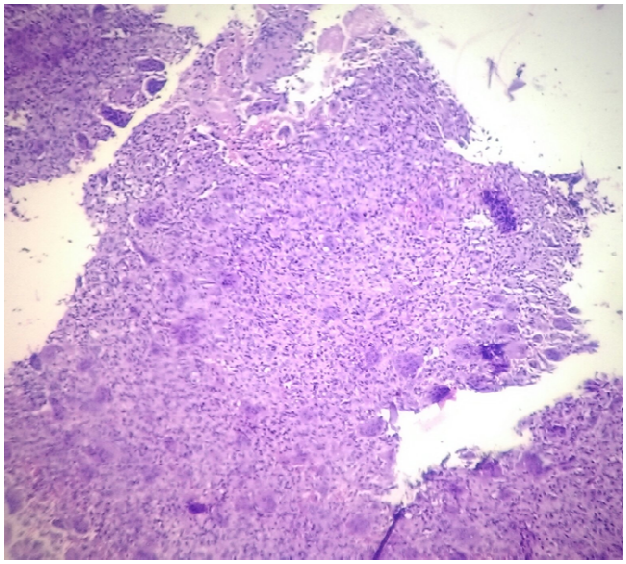

Figure 2. H and E stained sections from tissue sent as thoracic vertebra on low power (10X) show the presence of uniform distribution of multinucleated giant cells against a background of round to spindle shaped mononuclear stromal cells

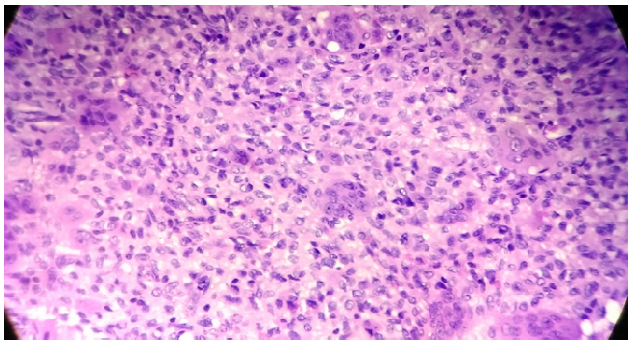

Figure 3. H and E stained sections of biopsy thoracic vertebra at high power (40X) show the presence of multinucleated giant cells in the background of mononuclear stromal cells

the opportunity for reoperation is missed. Due to a potentially aggressive behavior, the most important management issue is the prevention of recurrence.

Conclusion

Giant cell tumors of the spine are rare. Therefore, scientific communication and multicenter studies on this disease entity are required. Our case report highlights a rare diagnosis at an unusual site so that we can prevent its recurrence.

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