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# ORIGINAL ARTICLE

## Giant Cell Tumour as the cause of an early Vertebra Plana. A Rare Case Report and Review of Literature

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We report a 20-year-old woman who presented with progressive weakness of the lower extremities following a sudden fall three weeks before presentation. Her radiographs showed vertebra plana of the seventh thoracic vertebral body which was initially thought to be as a result of pre-existing tumour or trauma with cord compression. Histological examination of biopsy following anterior decompression through a thoracotomy revealed the cause to be a Giant cell tumor (GCT). Not all vertebral planas are caused by Eosinophilic granuloma. Usually the image of choice for distinguishing a spinal GCT from other tumours of the spine is an MRI which can define the characteristic and extent of signal intensity of a tumour, its absence in most low and middle income countries like Mulago hospital in Uganda, coupled with inability of patients to afford its high cost makes it relatively unavailable but with high index of suspicion and clinical acumen such tumors can be diagnosed and treated successfully at low cost.
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**Key words :** Spine, Tumor, Giant Cell Tumors, vertebral plana, thoracotomy.

### INTRODUCTION

Complete compression of a vertebral body of the spine is more often than not a radiologic diagnosis of Vertebra plana (Baghaie *et al.,* 1996). Although a number of pathological conditions can be a cause of Vertebral plana, Eosinophilic granuloma is however the most frequent benign disease associated with this condition (Papagelopoulos *et al.,* 2002).

There is paucity of literature describing giant cell tumor (GCT) as a cause of Vertebral plana except in a few case reports in the medical literature which are without a detailed description (Baghaie *et al.,* 1996). To the best of our knowledge, the use of plain radiographs imaging features, presenting as vertebra plana have seldom been reported in the literature. We report here the case of a young woman presenting with an early vertebra plana which after surgery, GCT was diagnosed as the cause .

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### Case Report

A 20-year-old woman presented with a 14-day history of progressively worsening paraparesis. She also had a 1-month history of upper back pain that had been managed conservatively during which period she slipped and fell. The neurologic examination revealed bilateral paraparesis. No significant findings on review of other systems.

Her laboratory investigations were within the normal limits. A lateral radiographic view of the thoracic spine revealed, the height of the intervertebral space below T6 was increased by at least one-third compared to normal and no vertebral attachment for 7th rib, indicating collapse of the T7 vertebra, and this was consistent with vertebral plana (Figure 1).

Antero posterior view showed a paravertebral abscess. No CT or MRI was done because of their non availability at the time and patient could not afford it privately. A radiological working diagnosis of vertebral plana was made following identification of a hanging 7th rib associated with increased space between 6th and 8th vertebrae.

The presumptive preoperative diagnosis was a tumour based on the radiological findings of vertebra plana most likely Eosinophilic granuloma. The patient underwent anterior corpectomy of T7 and partial corpectomy of T6 and T8. An extradural tumor was identified primarily anterior to the spinal cord at T7. The tumor was removed subtotally and non-instrumented spine fusion with autologous rib strut grafts was performed.

Results of histopathology of two biopsy specimens, one processed at the hospital and another in a private facility, both revealed giant cell tumour.

## DISCUSSION

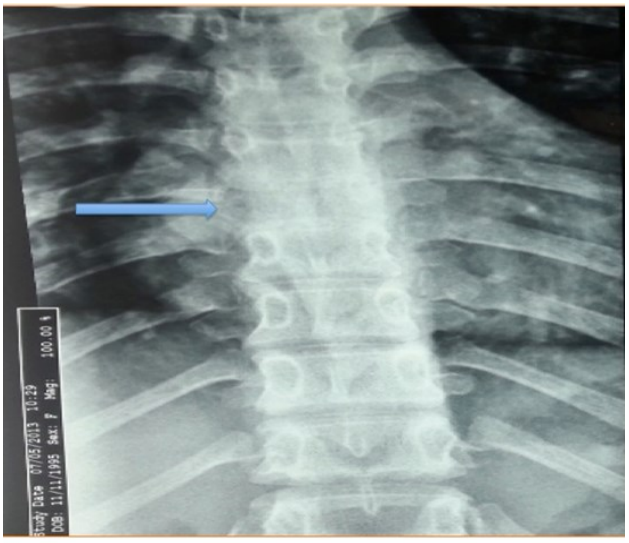

**Figure 1. Thoracic x-ray showing lesion at T 7 (arrow) preoperative**

GCTs are locally aggressive relatively common bone tumors accounting for 4% to 9.5% of primary osseous neoplasms and 18% to 23% of benign neoplasms of bone origin (Rodallec *et al.,* 2008; Murphey *et al.,* 2001). Commonly GCTs occur at

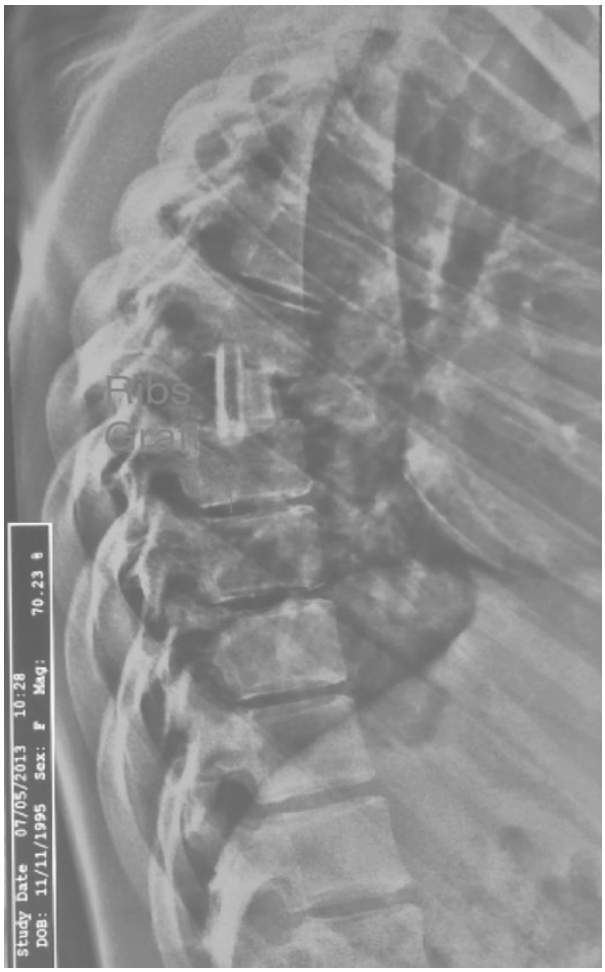


**Figure 2. Lateral thoracic x-ray showing strut bone grafting with ribs after thoracotomy**

growing ends of mainly long bones like the knee joint with only 7% occurring in the spine. In the spine, GCTs mostly occur in the sacrum, lumbar, thoracic and cervical region in decreasing order of frequency (Hart *et al.,* 1997).

Involvement of the thoracic spine was reported to be about only 1% to 2% of GCTs in a reported series (Sakurai *et al.,* 1999; Johnson *et al.,* 1993). Notably spine GCTs commonly occur in the second to fourth decades of skeletally matured patients in the spine and mostly in females (Murphey *et al.,* 2001; Sanjay *et al.,* 1993) as is the case in this our 20 year old female patient.
Spine GCTs usually presents with pain and

associated radiculopathy, weakness and sensory deficit(Kwon *et al.,* 2007; Bidwell *et al.,* 1987). Spinal GCTs like those in the appendicular bones usually show no sign of a mineralized matrix and tends to affect the anterior elements i.e vertebral body rather than the posterior elements of the spine which was seen in this patient even though it was more anterolateral..

Radiologically, GCTs show expansile lesions and osteolysis. Despite the fact that GCTs commonly show expansile destruction of bone or vertebra, a GCT can be seen as vertebra plana as was the case in this patient and is defined by the following radiological criteria: collapse of a single vertebral body, normal adjacent intervertebral disks, increased

**Figure 3- Patient 6 weeks after surgery**

height of the intervertebral space by at least one-third to the normal and collapsed vertebra shows increased density (Baghaie *et al.,* 1996). The differential diagnosis of Vertebra plana includes eosinophilic granulomas (commonly), aneurysmal bone cysts, osteosarcomas, Ewing's sarcomas, lymphomas and myofibromatosis, (Baghaie *et al.,* 1996; Pagelopoulos *et al.,* 2002). Vertebra plana can also be caused by some disease processes that involve most of a vertebral body including spinal fractures. In our case, the initial working diagnosis was tumour, with differentials of malignant or benign tumour because they are the most common cause of vertebra plana in young patients.

Characteristically, Eosinophilic granuloma is usually confined in vertebra and contained within its periosteum without expansion to involve paravertebral soft tissues (Rodallec *et al.,* 2008), which is different, compared to this patient in which the paravertebral soft tissues were involved but was difficult to appreciate on the x-ray but could have been clearer if the patient could afford an MRI scan. There has been a previous report that indicated the involvement of both the vertebral bodies and the posterior elements as well by Eosinophilic granuloma therefore a high index of suspicion is required for diagnosis in such circumstances (Johnson *et al.,* 1993).

Ewing's sarcoma being one of the most common malignant tumours causing vertebral plana can present with extension to involve the posterior elements of the vertebra which led us to include it in the differential diagnosis (Baghaie *et al.,* 1996; Papagelopoulos *et al.,* 2002).

Due to the rarity of GCT causing vertebra plana, it was therefore not considered as an immediate differential diagnosis but rather a remote one. This emphasizes the role of excision biopsy for diagnosis of tumours of any kind located in any part of the body no matter how benign it may appear based on clinical judgement.

Surgery is known to be the main treatment of choice for giant cell tumor of the spine since it can be completely excised. However, there is an associated increase in recurrence rate when the

GCT invades the spinal canal and paraspinous space (Rodallec *et al.,* 2008).

## CONCLUSION

In conclusion, although difficult, it is possible with good clinical practice for clinicians to radiologically diagnose vertebral plana by carefully reading plain radiographs in resource constraint settings. GCT should be considered in the differential diagnosis of vertebra plana, especially in young females and as often as possible biopsy should always be taken by surgeons for hisptopathology to confirm the diagnosis which is the gold standard.

## COMPETING INTERESTS

The authors declare that they have no competing interests.

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