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Case Report

A case of thoracic giant cell tumor of bone and discussion of radiological features and current management practices

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ABSTRACT

Giant cell tumor of bone (GCTB) is a rare condition with distinct radiological features that aid diagnosis. We present the case of an adult female patient, with locally invasive GCTB and review important radiological and management principles. Specific radiological features include locally aggressive, lytic radiolucent lesions, which can demonstrate cortical thinning and expansile remodeling of bone and typically involve the epiphysis and metaphysis. Management is primarily surgical, and denosumab has a role in the advanced setting.

Case

We present the case of a 31-year-old Polish lady who presented to the Emergency Department with a 10-month history of progressively worsening thoracic pain. This pain radiated laterally, and she had associated parathesia. On examination, she was in significant distress due to pain. She was afebrile, her pulse was 93 bpm; oxygen saturation on room air 99%; respiratory rate 16; blood pressure 122/85. Full clinical examination did not reveal a cause for her symptoms. Her laboratory investigations were normal. She had no significant personal or family medical history. A thoracic x-ray demonstrated a radiolucent T8 vertebral body. (Fig. 1)

A noncontrast computed tomography (CT) thoracic spine demonstrated an expansile soft tissue mass within the T8 vertebral body extending into the pedicles bilaterally. There was associated cortical destruction, and the mass abutted the right posterior pleura and extended into the right anterior spinal canal. There was a lack of matrix mineralization (Fig. 2).

Magnetic resonance imaging spine demonstrated diffusely abnormal marrow signal within the T8 vertebral body with a solid and cystic mass lesion extending into the pedicles bilaterally; worse on the left. The solid component displayed mild postcontrast enhancement. The spine at other levels was normal, and there was no evidence of metastatic disease (Figs. 3-5). Possible differentials included a plasmacytoma,

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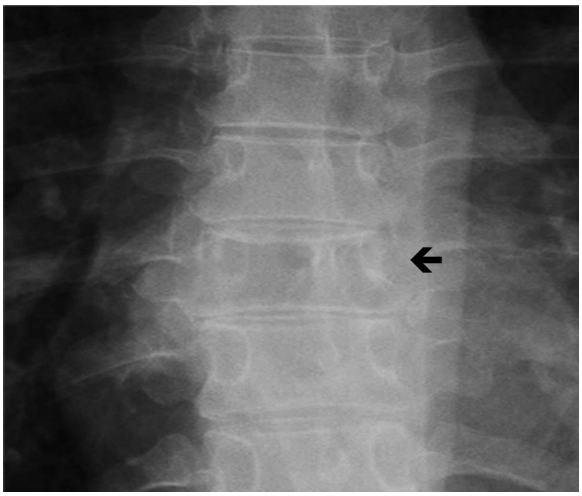

Fig. 1 – AP radiograph of thoracic spine. The arrow demonstrates subtle increased lucency of the T8 vertebral body with mild loss of vertebral body height. No evidence of sclerosis.

Langerhans cell histiocytosis, metastatic lesion, giant cell tumor, chordoma, chondroblastoma or lymphoma.

She had a CT guided core biopsy of T8. Histology from this sample revealed a giant cell tumor of bone (GCTB) with surrounding reactive and regenerative changes of surrounding bone (Fig. 6). Numerous multinucleated giant cells were present but no necrosis and only occasional mitoses. This process infiltrated the bone, but there was no atypia present (Fig. 2). Radiological features were consistent with a grade 3 lesion as per the Campanacci grading system for GCTB [1].

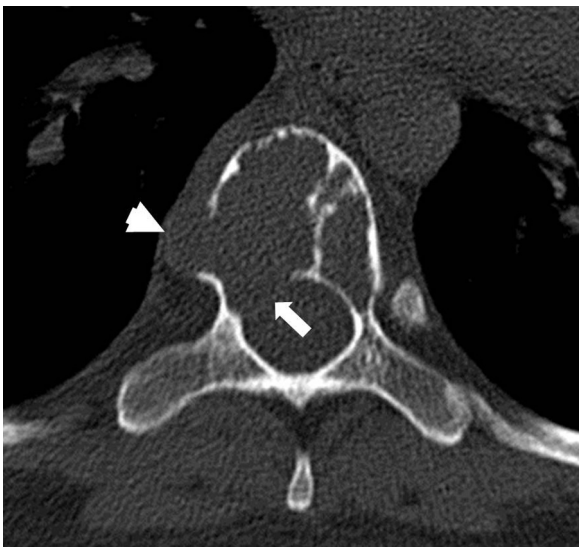

Fig. 2 – Noncontrast computed tomography (CT) thoracic spine. Expansile soft tissue mass within the T8 vertebral body extending into the pedicles bilaterally. There is extraosseous extension at sites of cortical destruction, abutting the right posterior pleura (arrowhead), and extending into the right anterior spinal canal (long arrow). Note lack of internal bone matrix within the lesion.

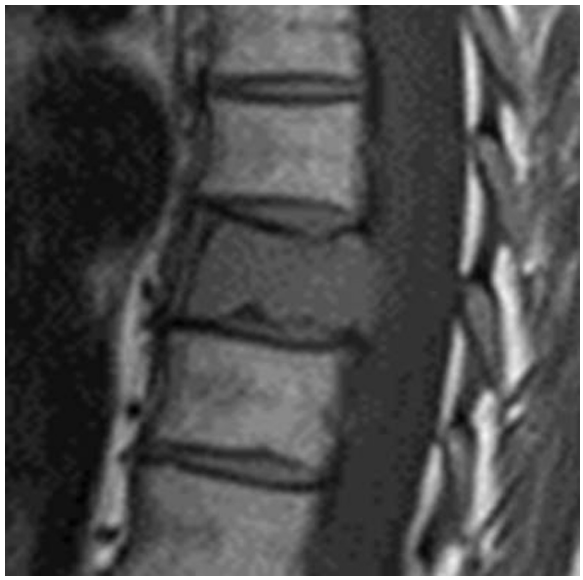

Fig. 3 – T1-weighted magnetic resonance imaging spine (sagittal). Diffusely abnormal marrow signal within the T8 vertebral body with complete replacement of the vertebral body by tumor demonstrating T1 hypointense signal. Bowing of the posterior cortex into the spinal canal.

The patient underwent an anterior T8 corpectomy, spinal decompression, and fusion without complication. Subsequently, she proceeded to a posterior stabilization of T8 (Fig. 7). Final histology demonstrated a well-circumscribed GCTB with negative margins. The case was reviewed at the Oncology Multidisciplinary Team Meeting. The decision was made to proceed with active surveillance and not for adjuvant therapy because of the limited evidence for benefit. The patient is currently doing well 18 months from her initial diagnosis.

Discussion

GCTB is a rare, locally aggressive tumor, which accounts for 5% of primary bone tumors. It rarely manifests in an immature skeleton and usually occurs in patients with closed physes [4–6] between the ages of 20-40 years; typically effecting females slightly more frequently than males [1]. GCBTs typically occur within the epiphysiometaphyseal region of long bones and are eccentric in location [5,16–20]. Lesions, typically demonstrate geographic bone lysis, are usually associated with a narrow zone of transition, abut the articular margin, and lack a surrounding sclerotic rim [4]. Involvement of the vertebra is uncommon, and the most common sites of GCBT are around the knee: distal femur and proximal tibia (50%-65%) followed by the distal radius (10%-12%) and sacrum (4%-9%) [1]. Metastases are rare occurring in 1% of cases [2,3].

X-ray and CT imaging can demonstrate well the locally aggressive processes associated with GCBT. Plain radiographs typically demonstrate a radiolucent lesion with a sharply defined, nonsclerotic border [21]. There is no periosteal response [4–6], unless fractured. Pathologic fractures are