Giant cell tumour with a lipoma of the sacrum

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ABSTRACT

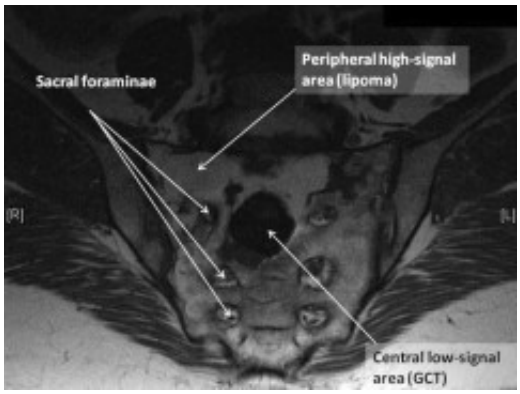
We report the case of a 58-year old female who presented with insidious low back pain radiating to the buttock and thigh. Magnetic resonance imaging revealed a heterogenous high-signal (on T2-weighting) in the midline of the sacrum. Within this mass was a distinct area of low-signal intensity. Computed tomography revealed a lytic lesion within the sacrum. Biopsy confirmed the presence of a lipoma that contained within it a giant cell tumour. The patient proceeded to have surgical excision and bone graft augmentation.

INTRODUCTION

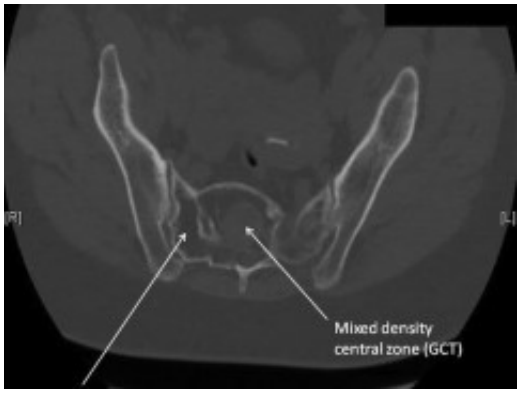
Giant cell tumours and intraosseous lipomas of the sacrum are both rare. To our knowledge this is the first case of the two occurring together at the same site. Depending on the size and location, these lesions can be excised surgically, supplemented by cement or bone graft augmentation. In inoperable cases embolisation and/or radiotherapy can be used for palliation. Denosumab offers a new treatment option for giant cell tumours and early results of its use are encouraging.

CASE REPORT

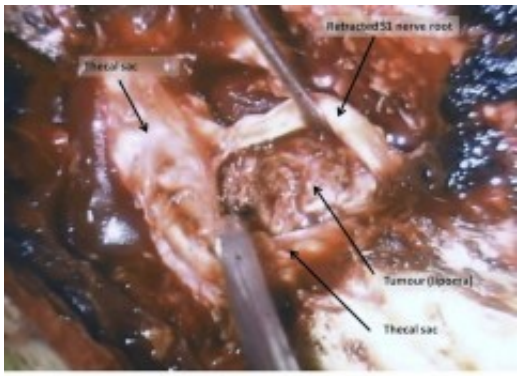
A healthy 58 year old female presented to our department complaining of acute-on-chronic low lumbar back pain. She had a history of diffuse non-radiating low back pain for over 20 years. Over a 6 month period the pain had intensified and begun to radiate to the right buttock and posterior thigh. She did not have any constitutional symptoms such as fever, sweats or weight loss. Physical examination revealed normal external appearances of the spine and lower limbs. She had objective sensory loss in the S1 and S2 dermatomes in the right lower limb. She had normal motor power and normal reflexes in the lower limbs. Rectal examination was normal.



Blood tests including full blood count, urea & electrolytes and inflammatory markers were normal. The patient underwent plain radiographs, MRI and CT scans of the lumbar spine and pelvis. Plain radiographs of the spine and pelvis were normal. The MRI scan (fig. 1) revealed a heterogeneous mass within the proximal sacrum (high signal on T2-weighting), occupying the midline and extending to the sacral ala on the right side, measuring approximately 5x6 cm. Within this lesion was a 3cm area of abnormal low signal towards the midline of the sacrum. The lesion was in close proximity to the exiting right S1 and S2 nerve roots. The CT scan of the pelvis (fig. 2) confirmed the presence of a lytic lesion in the sacrum containing a smaller focus of different signal intensity.



A percutaneous biopsy was performed which revealed the presence of adipose cells in the periphery of the mass. The central portion showed polygonal multinuclear tumour cells with mild atypia consistent with a giant cell tumour. The peripheral tissue was confirmed as adipose in nature. The management of our patient consisted of surgical excision from a posterior approach. The thecal sac and exiting L5, S1 and S2 nerve roots were identified and protected (fig 3). The peripheral fatty tissue was removed using an ultrasonic surgical aspirator, exposing the central GCT mass. This was carefully dissected free and removed en-bloc. The cavity left behind was filled with frozen femoral head allograft.



The patient made an uneventful recovery with no alteration in neurological function. She was allowed to mobilise partial weight bearing on crutches, and was discharged within a few days. Histological analysis of intra-operative samples confirmed the presence of a giant cell tumour within a lipoma. At follow-up she shows no sign of recurrence to date but will be kept under radiological surveillance.

DISCUSSION

This 58 year old female presented with acute-on-chronic low back pain with features of neurological compromise. Our patient's presentation of diffuse low back pain with radiation to the lower limb is typical of degenerate disc disease but could also be seen in a sacral GCT. MRI revealed a mass within the sacrum consisting of two distinct parts: a peripheral high-signal area and a central low-signal area. The high intensity signal (on T2-weighting) was characteristic of fatty tissue. Radiographically, the central area was in keeping with a giant cell tumour (GCT), although typically these tend to occur eccentrically rather than in the midline. GCTs are low signal intensity on T1 and T2-weighted images, relating to the haemorrhagic and fibrotic components of the tumour (1). Histology revealed multinucleated cells, characteristic of the giant cells (resembling osteoclasts) that are pathognomic of GCT.

Giant cell tumours are more common in women between the ages 15-40 years (2,3). They are most often found in the epiphyses of long bones, typically the distal femur and proximal tibia. In the axial spine GCTs are most frequently found in the sacrum. A recent study (4) found that sacral GCTs represented 1.7% of all GCTs treated at that unit, with a male to female ratio of 1:2. Sacral giant cell tumours have low malignant potential although local recurrence rates can be up to 50% after surgical treatment (4,5). The risk of malignant change is less than 2% (6,7). After the diagnosis has been made, management is usually surgical. Pre-operative embolisation can be used to down-size large lesions or those in close proximity to vital structures. Surgical management can be excision by curettage or, preferably, en-bloc excision followed by bone graft or cement stabilisation (4,8,9). For inoperable cases embolisation and/or radiotherapy have a role in palliation (4,9).

Intraosseous lipomas are rare, accounting for 0.1% of bone tumours. They are often asymptomatic and found incidentally on imaging, particularly MRI. Where symptoms are present they usually consist of minor aching in the region of the lesion. They are divided into three pathological stages with corresponding radiological changes. Stage 1 lesions are solid and consist of viable lipocytes. Stage 2 is a transitional stage of partial fat necrosis and focal

calcification. Stage 3 consists of fat necrosis, cyst formation, calcification and new bone formation. It is likely that the fairly extensive intraosseous lipoma in her sacrum was at least in part responsible for some of her symptoms hence the sacrum was grafted with allograft following removal of the fat and the giant cell tumour.

It is worth noting that in future the management of giant cell tumours of the sacrum may be transformed by the use of Denosumab, a Rank ligand inhibitor which has shown to be effective in controlling GCTs in most cases. The results of an ongoing prospective study are still awaited although early results look promising (10).

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