CASE REPORT

Imaging of an unusually located aggressive osteoblastoma of the pelvis: a case report

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Abstract

Introduction: We present a case of an aggressive osteoblastoma involving the posterior acetabular column and the ischium, which is very rare location for the tumor.

Case presentation: A 21-year-old man presented with a persistent pain on the left buttock which extended on the rear surface of the thigh and the front surface of the left hip. A plain radiograph, a CT and MRI examinations were performed. The tumor was radically excised and histologically it proved to be an aggressive osteoblastoma.

Conclusions: Although aggressive osteoblastoma is a rare entity it should be considered in the differential diagnosis of bone tumors. Our purpose is to reveal the radiographic presentation of this rare tumor. Hippokratia 2011; 15 (1): 87-89

Key words: aggressive osteoblastoma, ischium, bone tumors, MRI

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Osteoblastoma is an uncommon osseous lesion, accounting for less than 1% of primary osseous tumors. Its histological features are similar to those of osteoid osteoma but with a potential for progressive growth[1,2]. Aggressive osteoblastoma is a distinct clinicopathologic entity that radiographically may suggest malignancy[3]. In our case the tumor was located in the posterior acetabular column and ischium with erosion of the cortex and soft tissue involvement.

Case presentation

A 21-year-old man lacking any relevant medical history presented with a persistent pain on the left buttock which extended on the rear surface of the thigh and the front surface of the left hip. The pain which started a year ago was especially strong during the night and could only be relieved with the use of non-steroidal anti-inflammatory drugs. Physical examination showed that the mobility of the left hip was painful during the rotation. Atrophy of the muscles of the thigh, especially of the quadriceps, was also discovered. Hematological and biochemical blood tests were normal. (CRP: normal, ESR: normal, ALP: normal).

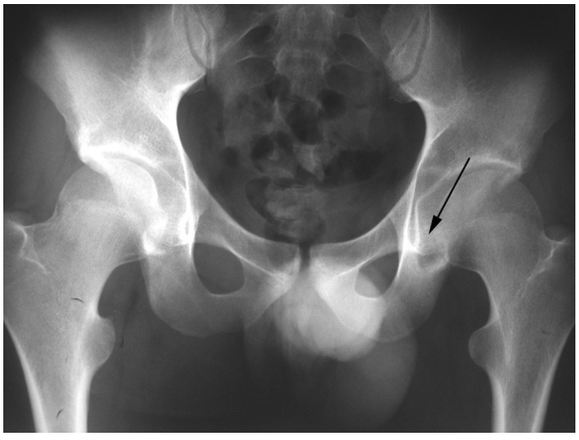

Figure 1: Pelvis radiograph shows a lytic lesion in posterior acetabular column (arrow).

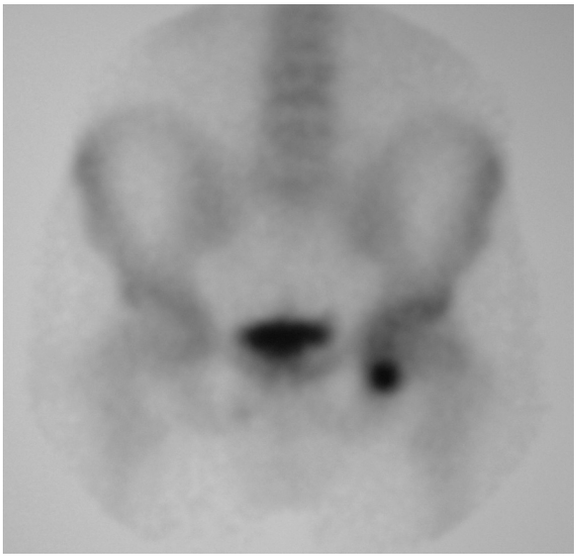

Figure 2: Bone scan shows intense uptake of the radionuclide by the tumor.

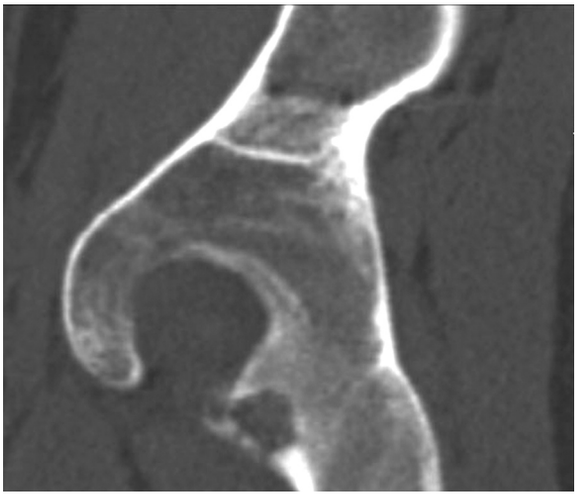

Figure 3: Sagittal reconstruction CT shows a destructive lesion with small foci of mineralized matrix centrally, without sclerotic margins and accompanied by cortical erosion and periosteal reaction.

Plain radiograph showed a radiolucent lesion, larger than 2 cm, on the left ischium (Figure 1). A radionuclide scan was performed which showed a marked increase in isotope uptake in the left ischium (Figure 2). CT findings included a lytic lesion with a central density without sclerotic margins and accompanied by cortical erosion and periosteal reaction (Figure 3). MRI of the pelvis indicated a local destructive tumorous lesion with soft tissue involvement. On T1-weighted MR images the infiltrative soft tissue component of the tumor demonstrated low signal intensity (Figure 4). Fat-suppressed T2-weighted images showed the predominantly high signal intensity from the adjacent muscle and bone marrow caused by edema. The high signal regions occupied the whole acetabulum and ischium (Figure 5). After the administration of contrast medium the soft tissue component of the tumor and the adjacent muscle and bone marrow demonstrated strong enhancement (Figure 6).

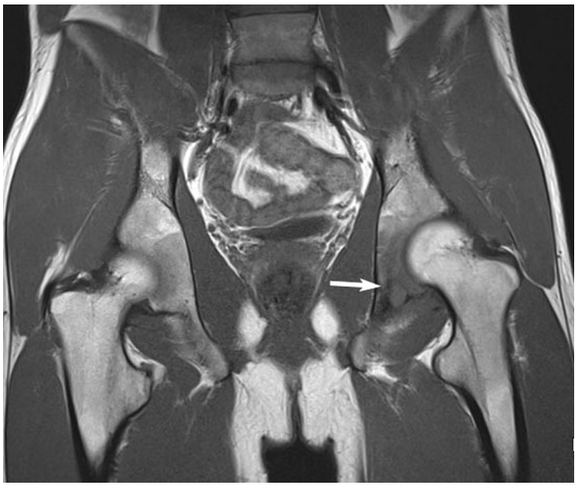

Figure 4: Coronal T1-weighted MR image demonstrates a low signal intensity mass (arrow).

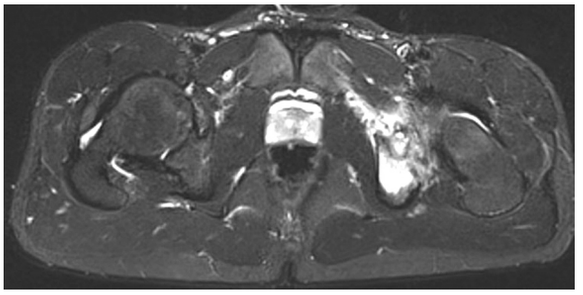

Figure 5: A fat-suppressed T2-weighted image shows diffuse edema from the adjacent muscle and bone marrow.

The tumor was radically excised. In order to excise the lesion and not to damage the major anatomic stractures of the area, we used a posterior approach of the hip and prepared the schiatic nerve. The gap was filled with autogenous bone graft. No biopsy was performed before the excision because the clinical presentation and the radiographic findings pleaded for the benign nature of the lesion. Histological examination of the resected specimen showed an irregular trabecular pattern of osteoid and an intertrabecular fibrovascular stroma, with proliferation of osteoblasts and osteoclasts. The osteoblasts focally had a distinctly epithelioid quality with atypic figures (Figure 7). The histologic

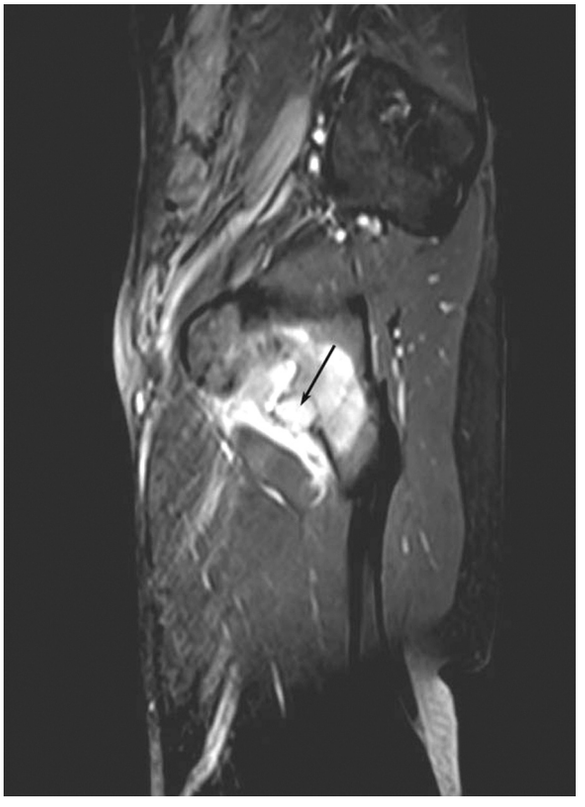

Figure 6: Sagittal fat-suppressed T1-weighted image after the administration of contrast medium shows an intense enhancement of the tumor and the adjacent muscle and bone marrow. (arrow).

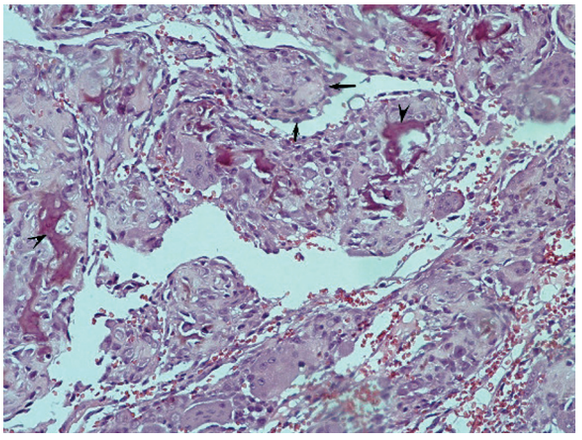

Figure 7: Photomicrograph shows minimal amount of osteoid (arrowheads) and large epithelioid osteoblasts (arrows).

diagnosis was aggressive osteoblastoma. The distinction from osteosarcoma was based on the absence of atypical mitotic figures and cellular pleomorphism.

Discussion

Osteoblastoma and osteoid osteoma are similar but distinct benign bone tumors. Both are osteoid-producing tumors, but in the typical osteoblastoma the bone trabeculae are broader, longer and seem less densely packed than those in osteoid osteoma[2]. Pathologically, the typical osteoblastoma is larger than 1,5-2,0 cm[3]. The term "aggressive osteoblastoma" is applied to large, locally destructive lesions that on microscopic examination may mimic a low-grade osteosarcoma[4]. This tumor occurs without any regard to age, being more common in young adults[5]. A wide variety of bones may be involved including the spine, femur, skull, bones of hands and feet, humerus, tibia, and fibula[6]. The pelvis is a rare location of the tumor[7]. An aggressive osteoblastoma usually presents with sever pain, which is relieved only with strong anti inflammatory drugs, disability in movement and atrophy of the muscles of the area in which it is located.

The most distinctive microscopic feature of aggressive osteoblastoma is the cytologic appearance of many epithelioid osteoblasts. These cells are about twice as large as typical osteoblasts. Also these tumors contain wider and more irregular trabeculae than that of typical osteoblastoma[1,6].

Radiographically, aggressive osteoblastoma tends to be slightly larger than typical osteoblastoma. It appears as a lytic lesion with well-defined margins and variable amount of perilesional sclerosis. Occasionally it has marginal irregularities, periosteal reactions and soft tissue involvement[6]. In the case of the pelvis, the sclerotic bone reaction may be absent or scarce[7]. Radionuclide bone scintigraphy demonstrates an intense focal increase of activity[2] and can be of great assistance in localizing the tumor specifically in the pelvis. The intra-and extraosseous growth of the neoplasm is better delineated with CT[2]. CT scan of aggressive osteoblastoma depicts a destructive lesion with small foci of mineralized matrix and invasion of the surrounding soft tissues[3]. MRI references of aggressive osteoblastoma are limited in the literature. Few reports mentioned that the tumor demonstrated low or intermediate signal intensity on T1-weighted images and intermediate to high signal intensity on T2-weighted images. None of them mentioned the behavior of the tumor after the administration of contrast medium[2,3].

In our case MRI imaging studies revealed a large and infiltrative soft tissue component. On T1-weighted images the tumor demonstrated low signal intensity. Fat-suppressed T2-weighted images allowed the most accurate delineation of the edema of the adjacent muscles and bone marrow. The T1-weighted images after the administration of contrast medium showed an intense enhancement of the soft tissue component of the tumor and the surrounding bone marrow and muscles.

Treatment of aggressive osteoblastoma is surgical resection. The recurrence rate is far greater than that of conventional lesions, approaching 50% of patients[3]. Malignant transformation of osteoblastoma to osteosarcoma is rare and only a few cases have been reported[8,9].

Conclusion

This case establishes that aggressive osteoblastoma should be considered in the differential diagnosis of bone tumors. The radiographic examination should definitely include a plain radiograph, a CT and MRI scan. The tumor radiographic presentation is vital to the diagnosis and the preoperative planning.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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