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CLINICAL CASE

Giant cell tumor of the bone with an asymptomatic huge solitary lung metastasis; case presentation and literature review

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Summary

A case concerning a man having giant cell tumor (GCT) of the leg and huge lung metastasis is presented. This case is discussed with a brief review of the revelant literature regarding detection and treatment of this rare condition.

Key words: giant cell tumor, lung metastases, radiotherapy

Introduction

GCT of the bone- also known as osteoclastoma- is a rare disease forming 4-8% of all primary bone tumors [1,2]. Although it is known as a benign tumor, distant metastases, mostly to the lungs, were reported in 2-13% of all patients [3-6]. In those metastatic cases synchronous or metachronous local recurrence is frequently reported [7]. Most papers on metastatic GCT are single case reports and only a few small series are available [8].

In this paper a case with GCT of the right femur, which later developed a huge solitary metastasis to the lung is presented and the literature is reviewed.

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Case presentation

A 30-year-old male presented with pain in his right hip. Plain radiograph demonstrated a lytic lesion of the right femur (Figure 1). Biopsy was performed and revealed a tumor composed of uniformly distributed mononuclear cells and osteoclast-like multinucleated giant cells. Histologic and nuclear features favored a diagnosis of GCT. Scarce mitotic activity was noted but neither atypical mitoses nor cytological atypia were present. Entrapped bony trabecules neighboring

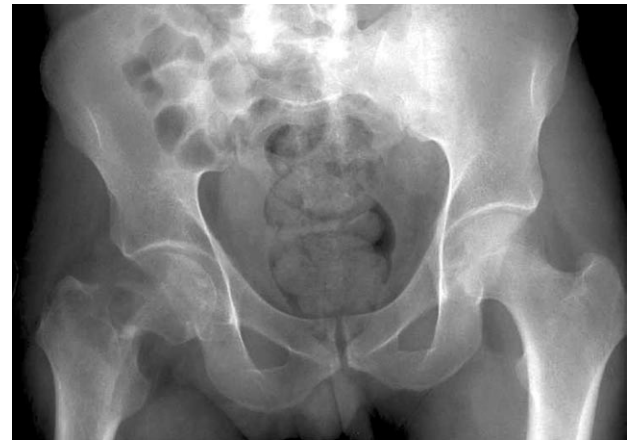

Figure 1. Plain radiography showing osteolytic lesion in the right proximal femoral neck with a pathologic fracture.

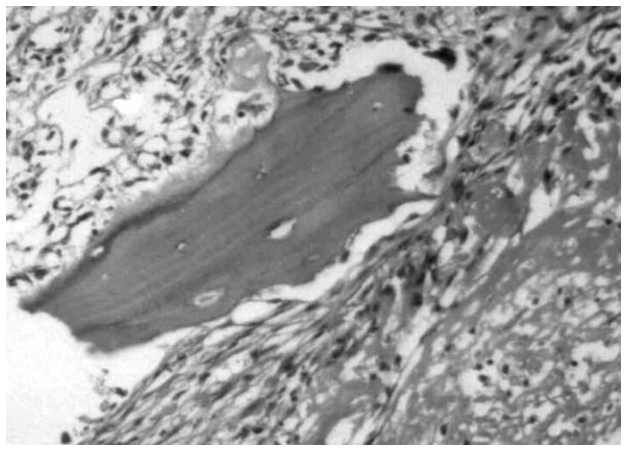

Figure 2. Tru-cut biopsy specimen. Entrapped bony trabecule between mononuclear spindle cells. Note the osteoclastic resorption at the edges of the trabecule and necrosis at the bottom right (H&E ×200).

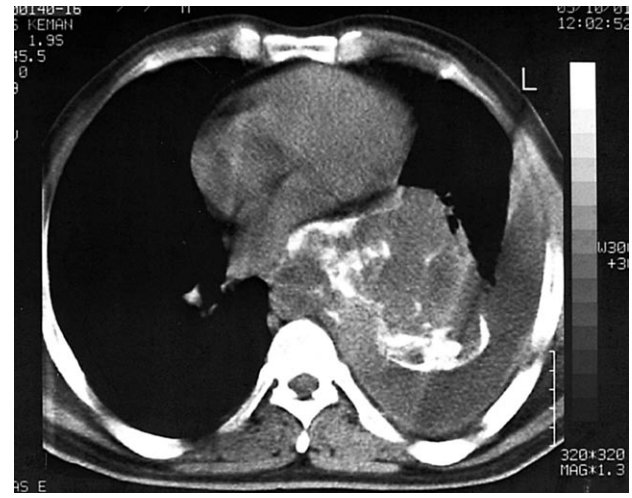

Figure 4. CT scan acquired at the mediastinal level shows the mass with calcifications at the left paravertebral space, and left pleural effusion.

areas of necrosis was a surprising feature and could be noted as a possible sign of the tumor's local aggressive behavior (Figure 2). The patient was operated in August 1998, and curretage was performed. Curretage material was consistent with GCT. Despite its apparent local aggressiveness no features of malignancy were detected; however, in marrow spaces dilated sinusoid structures distant from the main tumoral mass hosted embolic tumoral tissue, alarming for a possible metastatic potential.

No further therapy was planned and the patient was lost to follow up until December 2001, when a routine chest radiograph showed a huge left pulmonary mass (Figure 3). Computerized tomography (CT) scan showed a lobulated mass 10 cm in diameter containing calcifications, displacing the heart anteriorly and the descending aorta laterally (Figure 4). On magnetic resonance imaging (MRI) the mass showed an inhomogeneous signal intensity on both on T1 and T2 weighted images (Figure 5). Interestingly, there were no symptoms related to this mass; there was no local recurrence at the primary site either. A tru-cut biopsy of the lung lesion showed metastasis of GCT. The bioptic material was identical with that of the primary tumor. The only unusual finding was the presence of focal areas of metaplastic bone tissue.

The metastatic mass was evaluated as non-resectable and thoracic irradiation was planned. Radio-

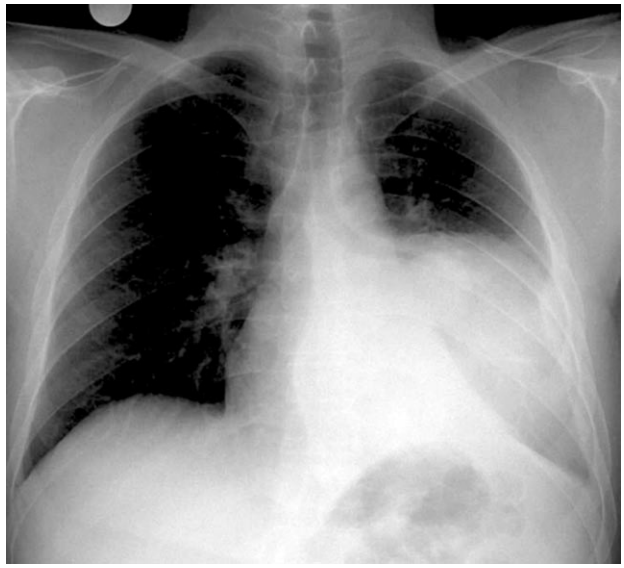

Figure 3. Chest radiography showing a large lobulated mass in the left lower zone. Calcifications are not seen in this radiography.

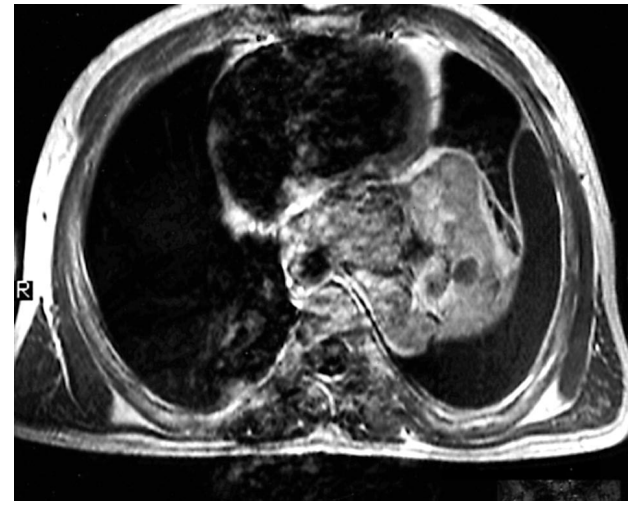

Figure 5. Pre-contrast T1-weighted MR image depicts a huge solid mass with inhomogeneous signal intensity, associated with ipsilateral pleural effusion. The mass displaces the heart anteriorly and the descending aorta laterally.

therapy was delivered using a telecobalt machine, and 45 Gy in 25 fractions were given. One month after the completion of radiotherapy there was no regression of the mass and the patient was administered doxorubicin-based chemotherapy. Following 4 cycles no response was detected, and chemotherapy was discontinued. The patient was alive and asymptomatic at the 48th month of follow up. No local recurrence was noted and the pulmonary metastasis was stable.

Discussion

GCT is a benign disease that usually appears in the 3rd and 4th decade of life. GCT has a predilection for the proximal tibia, fibula and distal femur [9]. Most GCTs are located in the epiphyses of long bones but they often extend into the metaphysis. In several published series only 1.2% of GCTs involved the metaphysis or diaphysis without epiphyseal involvement [10].

Local pain is the most common presenting symptom. Swelling and deformity are associated with larger lesions. Soft tissue extension is common. The incidence of pathologic fracture at presentation is 11-37% [10,11].

The natural history of GCT of bone is unpredictable. Clinical behavior varies widely and can range from local bony destruction to local metastasis, metastasis to the lung, metastasis to lymph nodes or true malignant transformation [2,12,13]. It may metastasize to the lungs and bones [14,15]. The natural course of pulmonary metastases remains unpredictable, and sometimes spontaneous regression was recorded [3,13]. Predictive factors of lung metastasis have not been defined yet.

According to Campanacci et al. radiographic grading system [10] and grade do not correlate with the rate of lung metastasis or recurrence; however, cases that metastasized to the lung or recurred tended to be radiographically aggressive [6]. Only one study showed that p53 expression correlated with high rates of lung metastasis and recurrence. The authors concluded that expression of mutant p53 in a tumor is a sign of high potential for lung metastasis and recurrence [6].

Locally aggressive disease and multiple recurrences appear to be risk factors for pulmonary metastasis [12]. In most of the cases with metastatic disease there was a clear association with local recurrence. However, no local reccurence was present in our case.

In some studies the mean interval from the diagnosis of the primary bone tumor to the appearance of pulmonary metastasis ranged between 3 and 12 years, and occasionally more than 20 years [5,7,12,14,15]. Metastases had occurred mainly within 3 years after diagnosis. In our case lung metastasis occurred at the third year. Long-term follow-up and careful observation for distant metastasis is necessary for this histologically benign disease.

Pulmonary metastases have been reported as cause of death in 16-25 % of the cases [13,16-21]. Treatment modalities for lung metastasis of GCT vary in the literature. Most of the studies suggest that surgical resection is the primary treatment of choice with a reported reasonable survival in some of them [3,4,7,12,13,15,17]. Whole lung radiotherapy was recommended in a few trials due to its promising results [17-19]. The results of local thoracic radiotherapy and chemotherapy vary in different reports.

Rarely patients were detected with asymptomatic lung metastases [3] as in the presented case. Early detection and regular follow-up for lung metastases is important , since patients with complete tumor resection have better prognosis.

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