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CASE REPORT

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Malignant fibrous histiocytoma arising in a previous fracture site: a case report

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Abstract A 16-year-old boy with severe cerebropathy sustained a midshaft fracture in his right femur. He was treated by application of a Wagner external fixator. Complete healing of the fracture was obtained 14 weeks later. Ten months later, the patient complained of a swelling on his right thigh; it was warm and painful. The pain referred to the same site of the previous healed fracture. The boy was investigated by radiography, computed tomography and biopsy. The final diagnosis was malignant fibrous histiocytoma. The boy had a resection of his right lower limb and several cycles of chemotherapy, but he died 1 year later.

Key words Malignant fibrous histiocytoma • Tumor • Fracture

Introduction

Malignant fibrous histiocytoma (MFH) is a soft tissue sarcoma presumed to arise from mesenchymal tissue or from nonhematopoietically derived "histiocytes" with fibroblastic potential [1]. Secondary sarcomatous transformation has been reported in association with infarction of bone, irradiation and trauma[2].

We report the case of a boy in whom this kind of bone tumor developed in the femur 10 months after a fracture. There was no clinical or radiographic evidence of preexisting neoplasia.

Case report

A 16-year-old boy with severe cerebropathy sustained a mid-shaft fracture in his right femur (Fig. 1a). He was promptly treated by application of a Wagner external fixator (Fig. 1b). Complete healing of the fracture was obtained 14 weeks later (Fig. 1c). The patient had complete recovery of his condition and was able to walk again without any aid.

Ten months later, the patient complained of a swelling on his right thigh; it was warm and painful. The patient referred to the site of the previous healed fracture. The boy was investigated by radiography and computed tomography, which showed an osteolytic area with cortical interruption and periosteal reaction at the distal one-third of the right femur (Fig. 2). A biopsy was performed. The histological diagnosis was malignant fibrous histiocytoma. A biopsy of the inguinal lymph nodes showed metastatic involvement.

The boy had a resection of his right lower limb and several cycles of chemotherapy, but he died 1 year later with lung metastases.

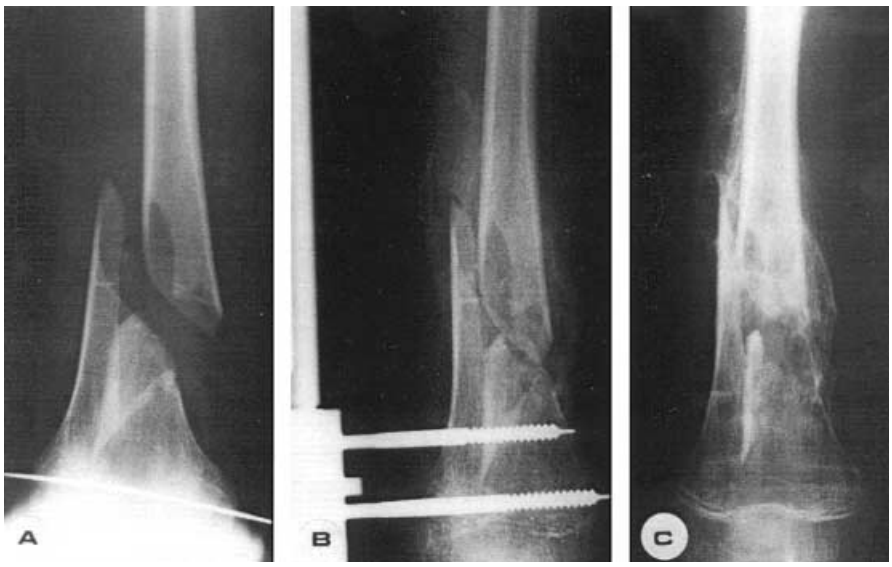
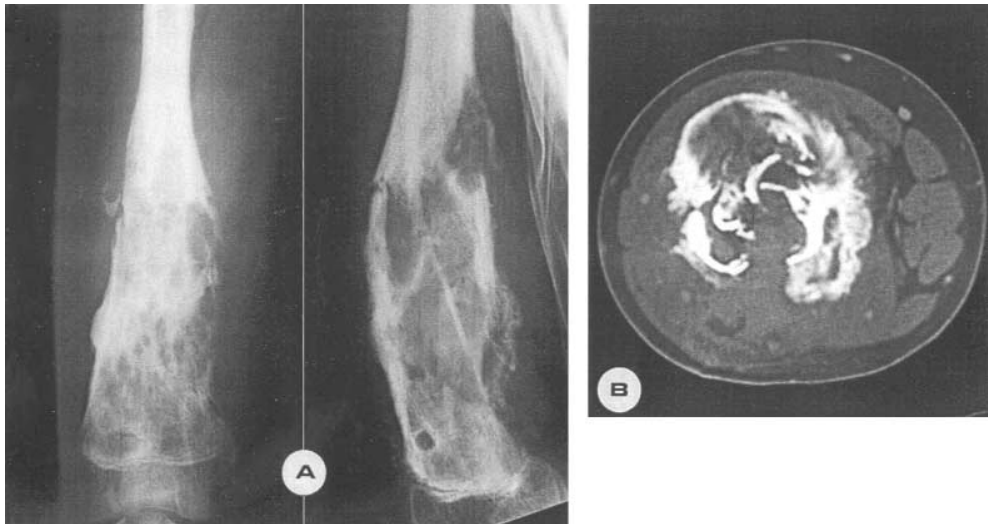


Fig. 1a-c *Femoral fracture in a 16-year-old boy*. **a** Mid-shaft fracture in the right femur. No signs of pathological fracture. **b** Fracture reduction by Wagner external fixator. **c** X-ray 4 months after surgery. Good consolidation with formation of bone callus

Fig. 2a-b *Pathological fracture of the same femur 13 months later*. **a** Malignant aspect of the bone (MFH). **b** CT image of the distal third of the thigh: bone destruction and soft tissue invasion of the surrounding area



Discussion

MFH has been previously included in the osteosarcoma or fibrosarcoma groups [3]. Currently the clinical and radiographic features of MFH of bone are well known. An interesting feature of this tumor is that it tends to arise more frequently in pre-existing bone abnormalities, in contrast to other types of sarcomas [2]. The location of the tumor does not significantly differ from that of osteosarcoma and fibrosarcoma, with about 50% of the tumors being located in the knee region [1]. Histologically, the lesion is characterized by spindle cells arranged in storiform or whorled patterns and mixed with large histiocytic cells, foam cells, multinucleated giant cells and, occasionally, chronic inflammatory cells [3,4]. Hematogenous dissemination is the dominant form of metastatic spread. The lungs and other bones are frequently involved. Initial spread to regional lymph nodes rarely occurs.

Some cases with a history of previous trauma to the area of the tumor have been reported in the literature [2, 4, 5].

Our patient had no clinical or radiographic evidence of a previous pathological process at the time of initial injury, and the patient had no symptoms during the latency period. The diagnosis was histologically confirmed.

The time interval from the traumatic event to clinical detection of the tumor should be consistent with the cellular kinetics of MFH: the minimum time is 2.5 years. This

factor is mandatory to establish a cause-and-effect relationship between a traumatic episode and the formation of a sarcoma [4].

Primary MFH is unusual in people who are as young as our patient: less than 12% of these tumors has been described in people younger than 40 years of age [4].

An explanation for the formation of the tumor could be the stimulation by the reparative process of the bone, even if the growing rapidity of tumor and the young age of the patient are unusual in our case.

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