

Calcaneal Osteosarcoma; a Case Report

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Abstract

Osteosarcoma of the foot is rare and, when presents, commonly observed in adults. We report a case of osteosarcoma of the calcaneus in an 11-year-old girl who was presented with a 4-month history of pain and swelling on her left ankle and inability to walk in her left lower extremity. On examination, there was a diffuse swelling involving her left ankle joint and foot. The radiograph showed soft tissue with calcification and ossification that involved the calcaneus with cortical bone destruction. Histologically, the tumor was consisted of variable foci of lacy osteoid formation and spindle pleomorphic stroma with typical osteoblasts. This rare location, histologic characteristics, and differential diagnostic points are discussed.

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Keywords • Osteogenic osteosarcoma • calcaneus • osteoid

Introduction

Although osteosarcoma is the second most frequent malignant bone tumor, affecting especially children and adolescents, osteosarcomas that involve the bones of the foot are infrequent.^{1,2} Osteosarcomas may also be misdiagnosed because other types of lesions may mimic their features.^{3,4} Some reports suggest that osteosarcomas of the foot are associated with a relatively favorable prognosis in comparison with those lesions involving more proximal anatomic sites.^{5,6} Many factors such as the histological grading, the patient's age, and the time to definitive diagnosis of the tumor may play a role in the clinical outcome and should be carefully considered.^{5,7}

In contrast to more conventional sites, where the tumor is usually high grade and found in adolescents, osteosarcoma of the small bones is more likely to be low grade, and is often seen in older individuals.⁸ Plain radiographs are diagnostic of osteosarcoma. Further radiographic evaluations for asserting the extent of the disease might be necessary together with computed tomography (CT), magnetic resonance imaging (MRI), and radionuclide bone scan.¹ The differential diagnosis for osteosarcoma in the foot is Ewing's sarcoma, which is common in the second to the third decade of life but it usually involves flat bones or diaphysis of the long bones.⁹

Here, we present a case of conventional osteogenic osteosarcoma of calcaneal bone in an 11-year-old girl and discuss the rare location, histologic characteristics, and differential diagnoses.

Case Presentation

An 11-year-old girl with a 4-month history of pain and swelling on her left ankle and inability to walk on her left lower extremity referred to our hospital. On examination, there was a diffuse

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swelling involving the left ankle joint and foot. The swelling was tender and the mobility at the joint was restricted. The overlying skin was normal. The results of hematological and biochemical investigations revealed a normal hemogram. Serum levels of alkaline phosphatase (ALK) and lactate dehydrogenase (LDH), which are elevated in bone destruction and metastasis, were in normal range. Liver and renal function tests were normal as well. A plain chest radiography showed no abnormality. Radiography of the left heel showed sunburst appearance with dense sclerotic lesion in calcaneus associated with cortical bone destruction and extraosseous expansion laterally, which are typical radiographic features of primary osteolytic bone tumor (figures 1,2). Adjacent bones were apparently normal. Calcaneal CT scan showed a large osteolytic lesion. Radionuclide bone scan was negative for any skip lesion.



Figure 1: radiograph (anteroposterior view) showing sclerotic calcaneal bone lesion with cortical destruction and irregular border.



Figure 2: Lateral view radiograph showing dense sclerotic lesion in calcaneus in association with cortical bone destruction and extraosseous extension laterally.

Calcaneal biopsy was performed. Histological examination revealed malignant mesenchymal

cells that modulated into malignant osteoblasts producing osteoid and tumor bone (figures 3, 4).

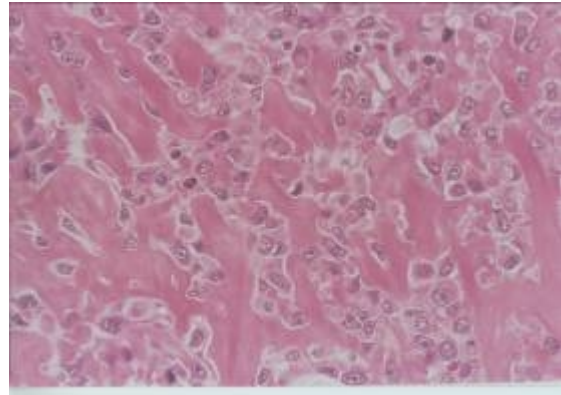


Figure 3: Osteoblastic osteosarcoma with osteoid formation areas (H/E; original magnification, x40).

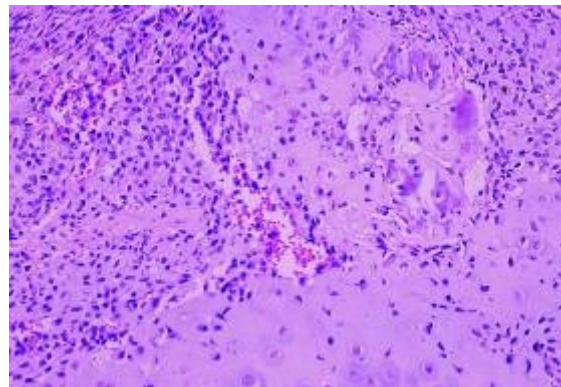


Figure 4: Osteoblastic osteosarcoma with sheets of pleomorphic osteoblasts, mitotic features and osteoid formation (H/E; original magnification, x40).

Based on histopathologic feature, the patient was diagnosed as having osteosarcoma in an extremely rare location.

The patient was admitted to the hospital and a left below knee amputation was performed. However, she refused chemotherapy and died after 11 months.

Discussion

Osteogenic sarcoma is the most common non-hematopoietic primary malignant neoplasms of the bone. Osteosarcoma commonly presents in the second to the third decade of life and is common in the metaphyseal region of the long bones. Histologically, osteosarcomas are commonly sclerotic in 45% of cases, purely lytic in 30%, and mixed sclerotic and lytic in the remaining 25%. Although plain radiographs are diagnostic of osteosarcoma, further radiographic evaluation for confirming the extent of tumor, may be necessary accompanied by other modalities such as CT, MRI, and radionuclide bone scan.^{10,11}

Researchers at Sloan-Kettering Memorial Cancer Center noted that incidence of foot

osteosarcoma was lower than Ewing's sarcoma.¹² Osteogenic sarcoma has been diagnosed less than both Ewing's sarcoma and chondrosarcoma at the Mayo Clinic.^{13,14} Occasionally, osteosarcoma of the foot has been reported to be associated with Paget's disease and Werner's syndrome.^{15,16} Extraskelatal osteosarcoma can also be presented as tarsal tunnel syndrome. In a case series of foot osteosarcomas that was reported by the Mayo Clinic physicians in 1999, osteosarcoma of the calcaneus was the common type.¹⁷ In another case series that was published in 1981, osteosarcomas of the foot constituted only 0.17 to 2.08% of all osteosarcomas, with a mean of 0.83%.³ Osteosarcomas seem to involve either the tarsal region or the tubular bones. The phalanges are rarely involved.^{5,6}

According to the clinical presentation and radiographic findings, osteolytic bone tumor was suspected for our patient. The location of tumor in our patient was unique. The diagnosis was confirmed by histopathological examination. Amputation and chemotherapy could help to prevent rapid recurrence of the tumor.

Conflict of Interest: None declared

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