Multifocal epithelioid hemangioendothelioma of the foot and ankle: a case report

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INTRODUCTION

Epithelioid hemangioendothelioma (EH) of bone is a rare vascular tumour characterised by endothelial cells with an epithelioid appearance, with an intermediate malignant potential and unpredictable clinical course. It has a tendency to develop multifocal disease, primarily in the axial skeleton.1,2 This group of vascular tumours also includes benign haemangioma and malignant angiosarcoma. Local infection is reported to have a favourable effect on skeletal malignancies and improve the prognosis.3–5 We report on a 41-year-old man with multiple EH in the left foot and ankle.

CASE REPORT

In April 2006, a 41-year-old man presented to a district hospital with a 5-month history of left ankle pain. He had no previous trauma or surgery. Radiographs showed multiple osteolytic lesions in the left foot and ankle. Laboratory studies were unremarkable.
Magnetic resonance imaging revealed multiple osteolytic lesions in the distal fibula, tibia, talus, calcaneus, navicular, and first cuneiform (Fig. 1). He underwent an open biopsy, curettage, and fixation of the fibula using 2 separate plates (Fig. 2). The biopsy revealed EH. Three weeks later, the patient developed a discharging sinus in the surgical wound, which was treated with antibiotics.

Four months later, there was no significant improvement and the patient presented to our hospital with swelling and tenderness all over the distal third of the tibia and ankle joint, with intermittent discharging of the sinus. His C-reactive protein (CRP) level and erythrocyte sedimentation rate (ESR) were high indicating deep infection. He underwent debridement and 2 months of antibiotic treatment (based on culture and sensitivity findings). Gradually, the wound dried up and his CRP level and ESR were within the normal reference range. However, swelling and pain of the ankle joint recurred. It was difficult to bear weight and perform activities of daily living. Radiographs of the ankle joint showed cortex destruction in the medial malleolus and widening of the calcaneal lesion. A full-body 3-phase $^{99}$Tc bone scan showed increased uptake throughout the distal tibia and fibula and the malleoli as well as the eighth left rib (Fig. 3). Laboratory test results were unremarkable. A trucut biopsy of the medial malleolus and calcaneus revealed EH again, without any features of malignancy (Fig. 4). Immunohistochemical studies were positive for vimentin, CD34, and CD31 antigen. Computed tomography of the chest and ultrasonography of the abdomen excluded any other visceral lesion. The unpredictable clinical behaviour of the tumour and its potential for malignancy was explained to the

Figure 1  Magnetic resonance imaging showing multiple osteolytic lesions in the distal third of the tibia, fibula, talus, and calcaneus (arrows).

Figure 2  Biopsy, curettage, and fixation of the fibula with 2 separate plates.

Figure 3  Bone scan with $^{99}$Tc showing increased uptake in multiple lesions of the foot, ankle, and 8th left rib.

Figure 4  Histology of the epithelioid hemangioendothelioma showing parts with vascular mesenchymal tissue and local mild hyperplasia of endothelial cells (H&E, x10).
patient, and a below-knee amputation and excision of the middle third of his eighth left rib was suggested. The patient declined surgery and was treated symptomatically with close monitoring.

The patient underwent removal of the plates, excision of the distal fibula and lateral malleolus, intralesional curettage of all lesions, and fusion of the ankle and subtalar joints with a retrograde intramedullary nail (Fig. 5). He refused to have his rib lesion excised, as it was asymptomatic. The tumour was considered definitively benign.

Postoperatively, weight bearing was started gradually, and he was able to work as a taxi driver. He was followed up every 6 months. After 5.5 years, the patient had recovered well and had no evidence of malignancy. The tumour was considered definitively benign.

**DISCUSSION**

The first description of EH entailed 41 cases; EH was regarded as a neoplastic entity akin to haemangioma and angiosarcoma. Multiple terms have been used for malignant vascular tumours, including hemangioendothelioma, hemangioendothelial sarcoma, hemangiosarcoma, and angiosarcoma. These rare tumours constitute approximately 1% of all primary malignancies of bone. They may occur at any age after the first decade, have a slight male predominance, and may coexist with visceral lesions. Moreover, they have a tendency to develop multifocal disease and have an unpredictable clinical course. EH is usually considered a low-grade malignant vascular tumour, whereas angiosarcoma is regarded as a high-grade malignant vascular tumour.

Radiographically, EH appears as a lytic lesion, sometimes with cortical expansion and destruction in the metaphyseal or diaphyseal areas involving both cancellous and cortical bone. In approximately half the reported cases, the tumour is multifocal, and usually affects a single bone or adjoining bones of a single extremity. It typically involves long bones (such as the tibia, fibula, femur, and humerus), and less often the vertebrae and bones of the foot and hand; radiographic findings are non-specific.

Biopsy and immunohistochemical studies are necessary to establish a diagnosis. Immunoreactivity to CD-34 and CD-31 is specific for endothelial cells. Given the multifocal distribution of osseous lesions, complete skeletal scanning should be performed before definitive treatment. The biological course of EH is unpredictable and has the potential for malignant transformation. The prognosis is poor when visceral organs are involved.

The treatment options, prognosis, and histological grading of EH remain controversial. Treatment depends on the number, size, and location of the tumours. A 24-year-old man with a grade-one multifocal EH of the foot was treated with surgical resection and remained asymptomatic but the follow-up was short. In a series of 7 patients presenting with EH of bone, treatment entailed curettage (n=4), wide excision (n=2), and below-knee amputation (n=1); 2 of whom also received radiotherapy. Two of them were disease free 18 and 120 months later, one developed local recurrence after 36 months, one died after 18 months from a lung metastasis, and 2 were lost to follow-up. One patient with multifocal bone EH was treated successfully with radiotherapy, but the follow-up was short. A 70-year-old man with unicentric grade-one bone EH was treated with intravenous pamidronate (bisphosphonate) as a single agent, and the tumour was in complete remission after 6 years. Deep infection has a positive influence in the tumour prognosis in some types of skeletal tumours such as osteosarcoma. Whether this applies to EH is not known. Long-term follow-up is mandatory, as malignancy or even distant metastases may occur.

**DISCLOSURE**

No conflicts of interest were declared by the authors.
REFERENCES