

Calcaneal Osteosarcoma: A case report

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Osteosarcoma of the foot is not common. A case of osteosarcoma of the calcaneum is presented where a patient had a four months history of progressive painful swelling of the right hind foot which was initially diagnosed as Madura foot (mycetoma). However after trying both medical and traditional remedies in his rural home town without any significant improvement he decided to go to hospital. Investigations showed that he had osteosarcoma of the right calcaneum. This case illustrates the importance of proper patient investigation.

Introduction

Although osteosarcoma is the second most frequent malignant bone tumour, affecting especially children and adolescents, osteosarcomas that involve the bones of the foot are infrequent¹. Osteosarcomas may also be misdiagnosed because other types of lesions may mimic their features^{2, 3}. The current prevalence of osteosarcoma in Uganda is unknown because of the paucity of related research however, in a study carried out in between 1964 and 1968 inclusive, osteosarcoma was found to be the commonest primary malignant bone tumour with a peak age of 10 - 19 years⁴. We present a rare case of osteosarcoma of the calcaneum.

Case report

An 18 year old secondary school student, presented to our hospital with a four-month history of progressive painful swelling of the right heel. The patient first developed pain in the heel without antecedent trauma. Two months later, he developed progressive swelling of the affected foot which prompted him to seek medical help from a local health facility where a diagnosis of Madura foot was made and some analgesics prescribed. Despite the treatment, the condition deteriorated and could no longer walk unsupported. He eventually dropped out of school because of inability to walk the 3 mile journey to school. He then sought the services of a traditional healer but still did not improve. Eventually he was brought to our orthopaedic out-patient clinic.

On examination, he was moderately wasted, ambulated with the aid of a stick and had enlarged right inguinal lymph nodes. He had marked wasting of the right lower limb muscles with a swollen right foot especially at the heel. The swelling was irregular, slightly warm, tender, and firm in consistency. He had no discharging sinuses and the ankle and subtalar joints were stiff (Figure 1).

Radiographs of the right foot showed a mixture of sclerotic and lytic lesions in the calcaneum (Figure 2). Chest radiographs were normal. An incision biopsy done showed tissue with chondroblastic differentiation, infiltration by pleomorphic hyperchromatic cells laying down osteoid bone and chondroblastic lobules surrounded by spindle cells with osteoid bone formation with mitoses. A diagnosis of osteosarcoma of the right calcaneum was then made. The patient was counselled about the different treatment options which included the possibility of a below knee amputation but he declined and opted to be discharged so that he could go back to the traditional healers.



Figure 1. The swollen Right Foot



Figure 2. Radiographs of the Right Foot

Discussion

Osteosarcomas comprise a family of connective tissue tumours with various degrees of malignant potential. All these tumours share the characteristic ability to produce bone or osteoid directly from neoplastic cells. Osteosarcomas constitute about 20% of all primary bone malignancies^{5,6}. Although, this tumour can occur in any bone, the appendicular skeleton is most frequently involved. Approximately 50% of lesions occur about the knee. In long bones it tends to occur in the metaphysis and multifocal involvement is extremely rare. In contrast to more conventional sites, where the tumour 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. Occasionally, osteosarcoma of the foot has been reported to be associated with Paget's disease and Werner's syndrome^{6,7}.

Extra-skeletal 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 type⁷. Patients present with pain accentuated at night, pain is often mistaken as an injury and is not recognized until the tumour has grown. The initial diagnosis was Madura foot (mycetoma) since the patient was from a rural setting and used to walk barefooted.

However, in mycetoma, the spores of the causal agents implanted in the patient incubate for a long period, during which there may be no clinical manifestations except slight pain following the initial injury⁸. It is characterized by a chronically swollen indurated foot with multiple scars and sinuses discharging grain-filled pus unlike in this case where the history was short, there were no discharging sinuses and the foot was very painful. Other differential diagnoses for osteosarcoma of the foot in our setting are chronic osteomyelitis of the tarsal bones, Kaposi's sarcoma and Ewing's sarcoma.

For diagnostic purposes, conventional radiography usually provides adequate information. The findings of bone destruction associated with sclerotic foci of tumour bone formation, an aggressive (sunburst-type, lamellated, or Codman triangle) periosteal reaction, and a soft tissue mass are highly suggestive 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. Definitive diagnosis is usually confirmed by histological examination of tissue biopsy.

Standard treatment for osteosarcoma in Africa has been amputation⁹. Increased success of chemotherapy and combined techniques of oncologic reconstruction have allowed the majority of patients with osteosarcoma to undergo limb salvage, and this has improved the survival rate. In Uganda, we usually amputate the affected limb because of unavailability of appropriate adjuvant chemotherapy and tumour prostheses. Sadly though amputations carry some level of stigma in Africa and make the patient disabled, non-productive and a burden to the family.

This case illustrates the importance of thoroughly investigations especially when disease presentation is atypical.

References

1. Campanacci M, Kotz R, Gennari L, Matejovsky Z, Nilsson U, Salzer-Kuntschik M, et al. Centralized diagnosis and treatment of bone and soft tissue tumors. *J Chemother* 1989; 1(4):277-8.
2. Spjut HJ, Dorfman HD. Florid reactive periostitis of the tubular bones of the hands and feet. A benign lesion which may simulate osteosarcoma. *Am J Surg Pathol* 1981; 5(5):423-33.
3. Erseven A, Garti A, Weigl K. Aneurysmal bone cyst of the first metatarsal bone mimicking malignant tumor. *Clin Orthop Relat Res* 1983(181):171-4.
4. Dodge OG. Tumours of bone and Jaw. *Recent Results Cancer Res* 1973; 41:222-33.
5. Arndt CA, Crist WM. Common musculoskeletal tumors of childhood and adolescence. *N Engl J Med* 1999; 341(5):342-52.
6. Tsuji Y, Kusuzaki K, Kanemitsu K, Matsumoto T, Ishikawa Y, Hirasawa Y. Calcaneal osteosarcoma associated with Werner syndrome. A case report with mutation analysis. *J Bone Joint Surg Am* 2000; 82(9):1308-13.
7. Choong PF, Qureshi AA, Sim FH, Unni KK. Osteosarcoma of the foot: a review of 52 patients at the Mayo Clinic. *Acta Orthop Scand* 1999; 70(4):361-4.
8. Sharif HS, Clark DC, Aabed MY, Aideyan OA, Mattsson TA, Haddad MC, et al. Mycetoma: comparison of MR imaging with CT. *Radiology* 1991; 178(3):865-70.
9. Ahuka OL, Lusi KM. Amputations in rural areas of another Zaire: an aetiological and epidemiological study. *East and Central J Surg* 1995; 1:33-35.