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Osteosarcoma: A case report

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Abstract
Osteosarcoma (OS) is a primary malignant bone tumor with a worldwide incidence. OS is a rare sarcoma that has the histological findings of osteoid production in association with malignant mesenchymal cells. Osteosarcoma is the eighth-most common form of childhood cancer. The most common site of origin is the metaphyseal region of tubular long bones, with 42% occurring in the femur, followed by the tibia, and the humerus. We reported a case of osteosarcoma of the right tibia in a 12-year-old patient.

Keywords: Malignant mesenchymal cells, osteosarcoma, osteoid

Introduction
Osteosarcoma (OS) is a primary malignant bone tumor with a worldwide incidence of 3.4 per million people per year. For most of the twentieth century, five-year survival rates for classic OS were 20% [1]. In the 1970s, the introduction of adjuvant chemotherapy in the treatment of OS increased survival rates to 50%. OS is a rare sarcoma that has the histological findings of osteoid production in association with malignant mesenchymal cells [2]. OS has an annual incidence of 5.6 cases per million children under the age of 15 and accounts for about 20% of bone cancers. It is slightly more common in males than in females. The World Health Organization's histologic classification of bone tumors divides OS into Primary and secondary, the Primary is further divided into Central/Intramedullary, and surface tumors, with several subtypes under each group [3].
Intramedullary forms 80% of all Osteosarcomas, and is divided into conventional, telangiectatic, small-cell, low-grade central, periosteal, parosteal, and high-grade surface.
Conventional OS can osteoblastic, chondroblastic, and fibroblastic depending on the predominant features of the cells; there are no significant differences in clinical outcomes among these categories. Telangiectatic osteosarcoma (TOS) accounts for 4% of OS [5]. Histologically, dilated blood-filled cavities and high-grade sarcomatous cells on the septate and peripheral rim characterize TOS. Radiographically, TOS is metaphyseal, with geographic patterns of bone destruction and a wide zone of transition [6]. Hematogenous metastasis occurs early and has a high incidence, rapid progression, high mortality and is difficult to treat. Therefore, in recent years, the study of osteosarcoma has become an important issue in the medical community [7]. In this paper, we presented case report of osteosarcoma of right leg in 12 years old patient.

Case Report
A 12-year-old Togolese national was apparently in usual state of health until 2 years ago, while in playing in school, suddenly started feeling pains at her knee joint, more pronounced on her right knee, the pain was intermittent, and she would often complain about when it occurred. The pain was initially managed with ointments till patient noticed a lump in her right knee about a year ago, the lump grew over time, and was now of much concern. The patient was then taken to a community health center, where patient was reportedly given a hand full of pain medications and blood samples were taken for investigations, but according to mother of patient no information or understanding of the condition was communicated to them. The patient complied with the treatment for about 8 months, when the parents noticed no improvement, they resorted to herbal medication until it formed an ulcer, over time the ulcer margins expanded from the knee joint all the way down to the ankle. The parents reached out to a relative living in Ghana for aid and was advised to bring patient to our facility for further management.

Upon arrival in Ghana, the family sort treatment in a local Health center due to financial difficulties and lack of Health Insurance, but they were later referred to Sunyani Teaching Hospital.

On physical examination, a 10×5×5 cm large leg ulcer of the tibia (fig- 1) was noticed. X-ray of the chest and right tibial taken (fig- 2, 3) which showed a low-density shadow at the distal end of the left femur. There was significant limitation in the activity level of the patient and neurovascular defects in the right lower limb. Routine laboratory testing revealed severe anemia and erythrocyte sedimentation rate of 28 mm/hour. Further imaging also revealed a soft tissue mass shadow and a bony mass attached to the surface of the tibia bone and an area of irregular bone destruction in the tibia and femur. Bone biopsy revealed proliferating spindle cells in bundles or braids and peripheral osteoblasts were adhered to adjacent structures and areas of calcification were observed. Right leg amputation was performed.

Fig 1: Ulcer of right leg

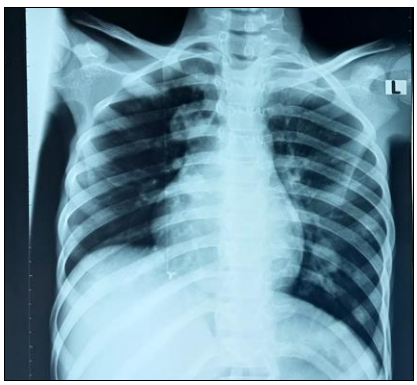

Fig 2: Chest radiograph

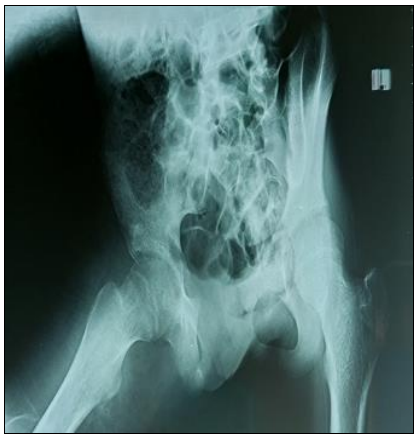

Fig 3: AP view of pelvis

Fig 4: Amputation of right leg

Discussion

Most studies on the diagnosis and treatment of osteosarcoma have focused on adolescents [8]. The diagnosis of osteosarcoma is based on the combination of clinical, radiography and pathological results. Pathological confirmation of the formation of osteoid tissue and/or bone by tumor cells is key to the diagnosis [9]. Early diagnosis of osteosarcoma in adults is difficult, and misdiagnosis or a missed diagnosis is common [10]. This may be associated with the following factors: I) The incidence of osteosarcoma in elderly individuals is rare; ii) osteosarcoma in elderly individuals can be confused with osteoarthropathy; iii) following the discovery of lesions, clinicians tend to focus on bone metastases and other primary tumors that occur more commonly in elderly individuals. For example, chondrosarcoma occurs predominantly in the elderly [11]. In some cases, focal ossification can be visualized under the microscope; this feature is similar to that observed for osteosarcoma. However, intraosseous ossification of chondrosarcoma appears as trabecular bone in a background of cartilage. In addition, residual chondrocytes are observed in trabecular bone, as well as around the stroma [12].

Xu *et al*. [13] reported 3 cases of advanced osteosarcoma in elderly patients. The pathological findings in all 3 cases confirmed the diagnosis of primary osteosarcoma. Notably, each patient received different treatment options. Chemoradiotherapy was recommended in case 1 due to the age of the patient. Conversely, in case 2, the 62-year-old female patient underwent systemic chemotherapy, but no surgical treatment, and in case 3, the 51-year-old male patient underwent complete tumor resection and received systemic chemotherapy for late tumor recurrence. Early diagnosis of osteosarcoma in elderly patients is difficult, and misdiagnosis or a missed diagnosis is common. In clinical practice, bone tumors in elderly patients should be investigated carefully. Imaging examinations are essential for diagnosis, and biopsy is required for confirmation.

Zhou *et al*. [14] presented a 50-year-old man patient who visited hospital due to local bone pain in the left leg. He was initially diagnosed with osteoblastic osteosarcoma. The patient suffered repeated resection surgeries but developed multiple lung metastases. Positive staining for CD31, CD34, and VEGFR-2 were detected in the tumor section. As he refused to receive chemotherapy due to concerns regarding the chemotherapy toxicities and sorafenib due to high cost, apatinib was given at a dose of 500 mg daily. Eleven months following apatinib administration, the patient achieved a partial response according to the RECIST 1.1 standard. No severe toxicity or drug-related side effect was observed during the treatment.

Conclusion

Osteosarcoma is a malignant and aggressive bone cancer which is common in adolescence, early diagnosis and treatment is key to reducing metastasis and mortality. Diagnosis in adults is difficult because it is rare in this age group and is also often mistaken for an osteoarthropathy.

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