Osteosarcoma: A clinical radiological pathological study in Mulago Hospital, Kampala, Uganda.

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Key words: Osteosarcoma, clinical, radiology and histopathology.

Purpose: **To describe the clinical, radiological and pathological presentation of osteosarcoma at Mulago Hospital, Kampala-Uganda.**

Methods: **A cross sectional descriptive study was carried out between January 1999 and December 2001 at Mulago Hospital. A total of 32 Patients were recruited consecutively during this period. All patients had a clinical examination, plain radigraphs and biopsies of the affected Parts.**

Results: **Thirty-two patients were recruited. The age range was 9-42 yrs with a M: F ratio of 1:1. 87.5% of the lesions were in the appendicular skeleton while 12.5% were in the axial skeleton. The commonest clinical presentation was pain. The commonest radiological presentation was that of a metadiaphyseal mixed density lesion. The commonest site was the proximal tibia. Histology showed marked pleomorphic osteoblasts with osteoid formation.**

Conclusion: **Osteosarcoma in Mulago hospital has not changed its clinical radiological and histopathological manifestation over the years. All mixed density lesions located in the metaphysis of long bones at the knee joint in an adolescent with sharp pain should be investigated as Osteosacoma until proven otherwise.**

Introduction

Osteosarcoma is a primary malignant tumour of bone that has been found to be more common in males than females. It has been reported to be the commonest primary malignant bone tumour.

A review of literature reveals that sarcomatous lesions were demonstrated in the femur and humerii of Egyptian mummies as far back as ancient Egypt[1]. For a long time, osteosarcoma has been associated with a low social-economic strata[2]. This is a major problem in the developing countries where limb-sparing surgery is not yet possible. Amputation is therefore often the mode of treatment making the patient disabled, non productive and a burden to the family[3, 4, 5].

A systematic approach to clinical history, radiographic evaluation and histopathology is necessary for accurate diagnosis of osteosarcoma.

In a study carried out in Uganda between 1964 and 1968 inclusive, osteosarcoma was found to be the commonest primary malignant bone tumour with a peak age of 10 – 19 years[2]. The commonest site was the lower femur[2]. This is similar to what has been reported elsewhere[6]. It has been suggested that major histo compatibility complex linked genes may determine susceptibility to osteosarcoma[7]. Other epidemiological factors mentioned are confounded by mechanical trauma, ionising radiation and chronic osteomyelitis[8,9,10,11,12]

Radiological diagnosis takes into account the site of lesion, borders of the lesion, type of matrix, type of bone destruction, type of periosteal reaction, nature and extent of soft tissue involvement and number of

lesions. Radiologically, osteogenic sarcoma presents commonly around the knee joint and is meta-diaphyseal. It presents as an eccentric area of bone destruction with cortical erosion and a soft tissue mass. At scintigraphy, it may show increased vascularity. Other investigative modalities of value in osteosarcoma are computerized tomography, magnetic resonance and angiography.

Patients and methods

A cross sectional descriptive study was carried out from 1st January 1999 to 1st December 2000 at Mulago Hospital, Kampala, Uganda. Thirty-two consecutive patients with histopathologically proven osteosarcoma were recruited.

All the patients presented to the Orthopaedic clinic and were referred to the X-ray department. Radiographs of the affected area were taken in at least two perpendicular views, an antero-posterior and lateral view, and the radiologist interpreted the radiographs. The surgeons later performed biopsies of the lesions and gave a detailed description of their surgical findings.

The specimens were fixed in 10% formaldehyde and delivered to the pathologists for histological analysis. A histological diagnosis was then made. The clinical history, radiological and histopathological data was then recorded. The data was analysed using EPINFO software with the help of a stastician.

Results

Thirty-two patients with Osteosarcoma were seen. The age range was 9 – 42 years. The most commonly affected age group was 10 – 19 years. The male to female ratio was 1:1. The presenting complaints included sharp pain, swelling, tenderness and venous engorgement. The commonest complaints were pain and swelling.

Twenty-eight (87.5%) lesions were found in the appendicular skeleton and 4 (12.5%) were seen in the axial skeleton. All lesions involved the cortex and medulla of bone. Nineteen were of mixed density, 12 were sclerotic and 1 was completely lytic. All were solitary lesions with a wide zone of transition. All had a periosteal reaction. Sixteen had a Codman's triangle. Other types of periosteal reaction included sunburst 4, interrupted lamellated 3, lamellated 1. Seven lesions had a combination of two types of periosteal reactions and one had a combination of 3. The combinations included sunburst and Codman's triangle 4, sunburst and lamellated 2, Codman's triangle and lamellated in 1. One patient had all 3 Codman's triangle, lamellated and spiculated. Figures 1 and 2 show typical radiological appearances of osteosarcoma.

Two lesions were diaphyseal both were in the tibia while the rest were metadiaphyseal. Three patients presented with pathological fractures.

Thirty-one of the lesions extended to the soft tissue. Soft tissue amorphous calcifications were seen in 24 lesions. Isolated soft tissue swelling without calcification was found in 8 (25%).

The histology revealed marked pleomorphic, osteoblasts associated with Osteoid in all patients . In 12 patients osteoblasts were predominant and these also appeared sclerotic on the radiographs. One of the specimens was vascularised, haemorrhagic and necrotic and this was suggestive of a telangiectatic Osteosarcoma.

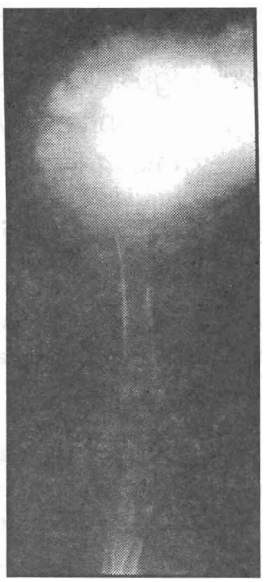

Fig. 1. Osteosarcoma of the proximal humerus, predominantly osteoblastic with amorphous calcification in the soft tissue + Codman's triangles noted.

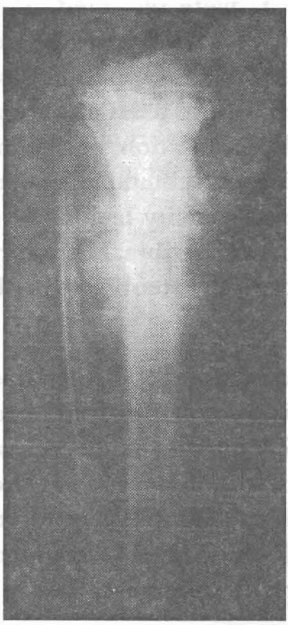

Fig.2. Osteosarcoma of proximal tibia, predominantly osteoblastic, cortical destruction and periosteal reaction noted.

Discussion

Osteosarcoma has been reported to be the commonest primary malignant bone tumour. It was commonest in the age range 10 and 19 years, which is similar to Dodges series[2]. The increased incidence of Osteosarcoma during this period has been attributed to the increased growth spurt in adolescence.

In this series 3(9.4%) of the patients were over 36 years but none had a premalignant condition like Paget's disease, multiple exostoses, fibrous dysplasia or had had irradiation. These benign conditions have been reported to undergo transformation to malignancy[13]. The female to male ratio in this study was 1:1, similar to Dodge's series[2]. It was noted that most of these patients came from the central and western region of Uganda as reported earlier by Dodge and Sebaggala[2,3]. Pain was the commonest presenting symptom and this is similar to what has been reported in other series, this was followed by swelling[3, 14, 15].

In this series the proximal third of tibia was the commonest site affected unlike other studies where the distal 1/3 femur was the commonest site[16]. Osteosarcoma has been noted to be rare in the axial skeleton, it was found in the axial skeleton in 4 (12.5%) of these patients. Radiographically 37.5% of the lesions were sclerotic, 59.4% mixed and 3.1% lytic. It is important to note the different patterns as the lytic lesions can easily lead to error in diagnosis. Osteosarcoma shows pleomorphism at histology; osteoblastic chondroblastic and fibroblastic cells are seen. .

Conclusion

Osteosarcoma at Mulago hospital has not changed its clinical radiological and histopathological manifestation over the years. All mixed density lesions located in the metaphysis of long bones at the knee joint in an adolescent with sharp pain and swelling should be investigated as Osteosarcoma until proven otherwise.

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