PRIMARY MALIGNANT TUMOURS OF LONG BONES IN UNIVERSITY OF MAIDUGURI TEACHING HOSPITAL: A REVIEW OF 35 CASES.

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ABSTRACT

Background: A working knowledge of bone tumours is of paramount importance. Though primary malignant bone tumours are rare compared to benign ones, critical are the decisions on treatment.

Aim: This study aims at describing the histopathological pattern of malignant long bone tumours as seen in University of Maiduguri Teaching Hospital.

Materials and Methods: The records of all histologically diagnosed long bone tumours between 1989 and 2004 were retrieved from the Histopathology and Medical record Departments of the University of Maiduguri Teaching Hospital. The age, sex, site of lesion and histological diagnosis were obtained from the histopathology registers, request forms and case notes of patients.

Results: There were 35 cases of Primary malignant long bone tumours. Osteosarcoma and malignant giant cell tumour were the most frequently encountered lesions with 37.1% and 34.3% respectively. The peak ages at presentation were 10-19 and 20-29 years in that order while the male: female ratio was 1.3:1 and the most common bone affected was the femur.

Conclusion: Osteosarcoma was the predominant primary malignant long bone tumour and most common among children and adolescents in Maiduguri and its environs.

INTRODUCTION

Malignant tumors arising from the skeleton are rare, representing only 0.2 % of all cancers[1]. Approximately 2100 new cases are reported in the United State annually.[1,2] In Uganda and Zimbabwe, the incidence rate varies between 0.5 and 1.6 per 100,000 population. In Ibadan, primary malignant bone tumours represent 11.8% of all bone tumours and 0.53% of all cancers recorded in Ibadan cancer registry between 1977 and 2000. The causes of most primary malignant bone tumours remain unknown. However some of them clearly have genetic predisposition[3]. Certain risk factors have also been associated with osteosarcoma. These include exposure to external radiation[4] and the use of alkalating agents in the treatment of childhood malignancies[5]. Similarly, Paget's disease of the bone is a known risk factor for osteosarcoma in adults over 40 years old[6]. Osteosarcoma and Ewing's sarcoma (among Caucasians) are the two most common malignant bone tumors, occurring mainly during childhood and adolescence.[2,7,8] Other mesenchymal (spindle cell) neoplasms (Fibrosarcoma, Chondrosarcoma and malignant fibrous histiocytoma) that characteristically arise after skeletal maturity are less common.

Most studies in Nigeria were carried out in the Southern part of Nigeria and may not be truly representative of the whole country,[2,8,9,10] in view of the environmental and genetic differences. There has not been any work on bone tumours from our center, which is a referral hospital in Northeastern Nigeria hence the relevance of the study.

The aim of the study was to describe the pattern of malignant long bone tumours as a preliminary to a more detailed study of these lesions in Maiduguri and its environs.

MATERIALS AND METHOD

A retrospective study of primary malignant long bone tumours seen in the University of Maiduguri Teaching Hospital, Maiduguri from January 1989 to December 2004 was undertaken. All histologically diagnosed malignant bone tumours from the Department of Histopathology register, request forms, cancer registry and patients case notes were retrieved and the clinical data extracted. The clinical data available for each patient include age, sex, site of the tumors and histological diagnoses. The tumors were classified according to the WHO (International Classification of Tumours No. 6).[11] The results were presented in simple statistical tables, photomicrographs and radiographs.

RESULTS

A total of 2,640 cases of malignancies were histologically diagnosed in the University of Maiduguri Teaching Hospital during the study period. Fifty two cases were malignancies of bones. Thirty five cases were malignancies of the long bones, which constituted 1.3% of all malignancies and 67.3% of bone tumours. The peak age group was 10-19 years (48.6%) and 20-29 years (25.7%). The male: female ratio was 1.3:1 as shown in Table 1.

Table 2 shows the age, sex and histological distribution of primary malignant long bone tumours. The commonest malignancy was osteosarcoma; 13 (37.1%) cases, followed by Malignant giant cell tumour; 12 (34.3%) cases, Chondrosarcoma; 7 (20%) and Ewing's sarcoma; 3 (8.6%) cases. Osteosarcoma was the predominant tumour seen in the 2nd decade of life with 7 males and 6 females. Malignant giant cell tumour was uniformly distributed from the 2nd to 6th decade of life with 8 males and 4 females while Chondrosarcoma and Ewing's sarcoma were mostly seen in the 3rd and 2nd decades of life respectively.

Table 3 shows the histopathologic types of the 11 available osteosarcoma. Conventional osteosarcoma was the commonest and accounted for 8 (72.7%) cases, Telangiectatic; 2 (18.2%) cases and Periosteal, 1 (9.1%) case. The common site of presentation of osteosarcoma was the femur; 7 (54.8%), tibia; 5 (38.5%) and forearm; 1 (7.6%) as shown in Fig.1.

Table 1
Age and Sex distributions of primary malignant long bone tumours.

Age group (years)	Sex		Total (%)
	Male	Female	
0-9	1	-	1 (2.8)
10-19	9	8	17 (48.6)
20-29	4	5	9 (25.7)
30-39	2	1	3 (8.6)
40-49	3	-	3 (8.6)
>50	1	1	2 (5.7)
Total	**20**	**15**	**35 (100)**

Table 2
Age, Sex and histological distributions of primary malignant long bone tumours.

Age group (years)	Sex								Total (%)
	Male				Female				
	OS	MGT	CS	ES	OS	MGT	CS	ES	
0-9	-	-	-	1	-	-	-	-	1 (2.8)
10-19	6	2	-	1	5	-	2	1	17 (48.6)
20-29	1	1	2	-	1	2	2	-	9 (25.7)
30-39	-	2	-	-	-	1	-	-	3 (8.6)
40-49	-	2	1	-	-	-	-	-	3 (8.6)
>50	-	1	-	-	-	1	-	-	2 (5.7)
Total	**7**	**8**	**3**	**2**	**6**	**4**	**4**	**1**	**35 (100)**

KEY:
OS= Osteosarcoma
MGT= Malignant Giant Cell Tumour
CS= Chondrosarcoma
ES= Ewings sarcoma

Table 3. Histopathologic distribution of 10 available osteosarcoma slides.

Histopathologic type	Frequency (%)
Conventional/Classic	8(72.7)
Telangiectatic	2(18.2)
Parosteal	1(9.1)
Total	**11(100)**

LEGEND 1.

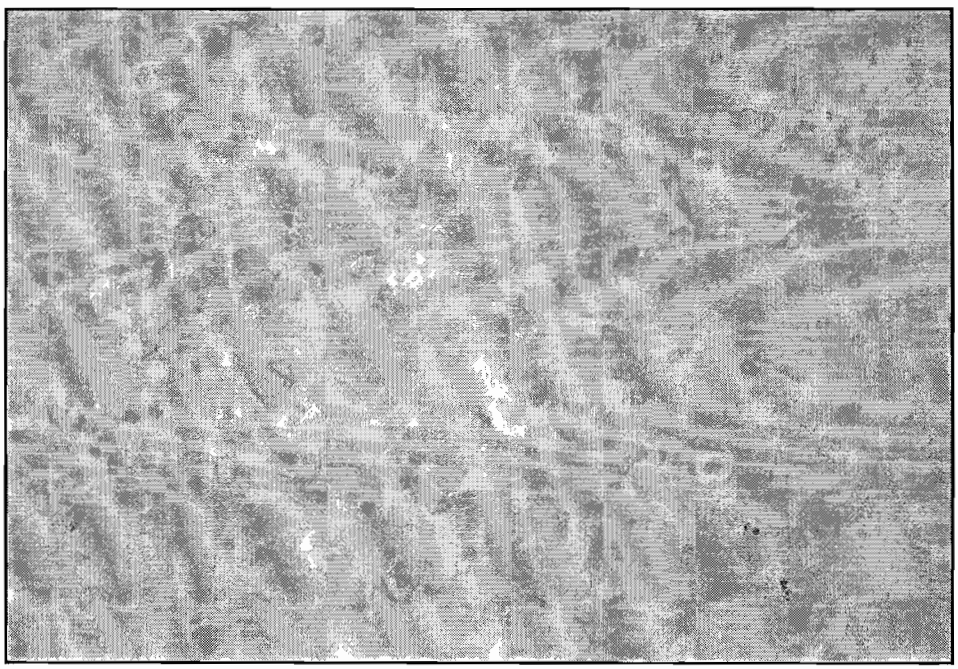
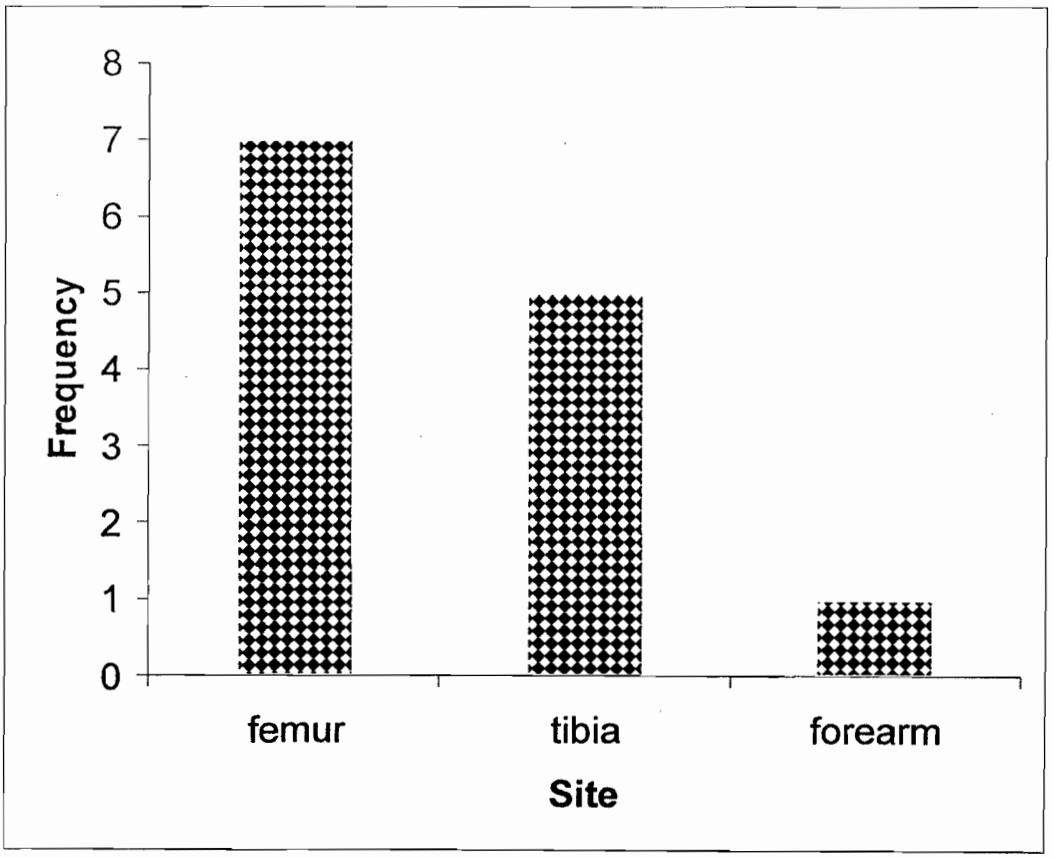


Figure 1. Photomicrograph of Osteosarcoma showing pleomorphism of the tumour cells, neoplastic bone and bizarre tumour giant cells. H&E.X132

Fig 2. Site distribution of osteosarcoma



LEGEND 2

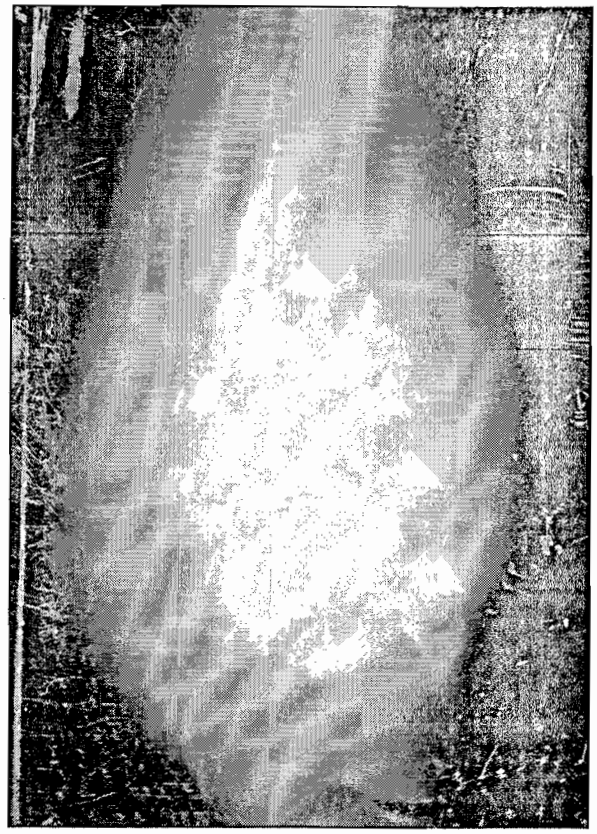


Figure 3. Radiograph of osteosarcoma of the distal femur in a 13-year-old boy.

LEGEND 3

Figure 4. Radiograph of Giant cell tumour of the proximal tibia .

DISCUSSION

Primary malignant bone tumours are relatively rare worldwide[12]. Studies have shown that the incidence of malignant bone tumours in African countries such as Uganda and Zimbabwe ranges between 0.5 and 1.6 per 100,000 population[13]. In Ibadan, a prevalence rate of 0.53% was recorded[2]. In our series we recorded 0.6%. The low prevalence rate in our environment was due to the icebera phenomenon resulting from the common believe among the populace that bone lesions are better handled by traditional healers. This is prompted by ignorance, underestimation of the seriousness of the condition and the fear of aggressive surgery like amputation in the orthodox hospital.

Primary malignant bone tumours characteristically occur below 70 years compared to secondary variety which are seen in the elderly[2,14,15]. In our series most of the lesions (48.6%) occurred in children and young adults with slight male preponderance (1.3:1) similar to other studies by Omololu et al[2] in Ibadan and Odetayo[9] in Lagos, Nigeria, Thialand,[14] South West England[15] and Pakistan.[16]

Osteogenic sarcoma (37.1%) and malignant giant cell tumour (34.3%) were the most frequently encountered long bone tumours in our series followed by chondrosarcoma (20%). This agrees with similar studies in Thailand with 22.7%[14], but at variance with studies from Ibadan[2] in which chondrosarcoma ranked 2nd in that series. Similar to other studies,[2,8,14,15,16] osteogenic sarcoma in our series occurred commonly among those under 20 years age group. There are plenty morphologic variations of osteosarcoma based on the amount of osteoid, pleomorphism of the cells, growth pattern (diffuse, nesting and pseudopapillary) and blood vessels[17]. However, the conventional/classic histopathologic type of osteosarcoma is the commonest in the study. Other variants are uncommon. The frequency is said to coincide with periods of skeletal growth spurt[18]. This is explained by the abnormalities in genes that regulate cell cycling such as p53, CDK4, p16, INK4A, CYCLIN D1 and MDM2 which have been implicated in the genesis of nonhereditary osteosarcomas[19]. The femur was the commonest site of presentation (54.8%) similar to findings in Ibadan[2], Thailand[14] and Pakistan,[16] and majority of our patients presented with swelling around the knee.

The malignant Giant cell tumour was the second most common lesion (34.3%). The age mostly affected were the 3rd and 4th decades of life, buttressing the earlier findings[20] that the tumour mostly affect mature skeleton. Chondrosarcoma, believed to be second in occurrence in Western Nigeria[2], is superceded by malignant giant cell tumour in our series. This could be partly explained by the restriction of our study to long bones, since chondrosarcoma is known for its predilection for shoulder girdle and pelvic bones[20].

Ewing's sarcoma is a rare, highly malignant tumour of uncertain histogenesis[21], recognized as an uncommon bone tumour in Black African children[2,8]. This was equally the least common cancer in our series; we recorded 3 cases with an average age of 8.7 years at presentation.

In conclusion, osteosarcoma was the predominant primary malignant long bone tumour most common in children and adolescent in Maiduguri and its environs.

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