



### Pattern of Primary Tumours and Tumour-Like Lesions of Bone in Zaria, Northern Nigeria: A Review of 127 Cases

*Tumeurs Primaires et lésions ressemblant au tumeurs osseuses à Zaria au Nord du Nigéria : Une Revue de 127cas.*

A. Mohammed\*, H. A. Isa†

#### ABSTRACT

**BACKGROUND:** There has been few published reports of primary bone tumours and tumour-like lesions in Zaria .

**OBJECTIVE:** To determine the relative frequencies of primary bone tumours and tumour-like lesions of bone and the anatomical sites of their occurrence.

**Methods:** A retrospective review of histopathology reports of all bone specimens received in the Department of Histopathology, Ahmadu Bello University, Teaching Hospital Zaria between 1995 and 2004.

**RESULTS:** Of the 127 histologically diagnosed tumours and tumour-like lesions, 74 (58.3%) were males and 53 (41.7%) were females, giving a male to female ratio of 1.5:1. Benign Tumours accounted for 38.6% of the tumours while the malignant tumours and the tumour-like lesions made up 39.4% and 22% respectively. Osteochondroma [20(15.7%)] and osteosarcoma [17 (13.4%)] were the most commonly encountered tumours while fibrous dysplasia [26(20.4%)] was the most common tumour-like lesion. The peak age incidence of occurrence of these tumours was in the 2<sup>n</sup> [ 47 (37.0%)] and 3<sup>rd</sup> [28(22.0%)] decades. The face was the most common site with 62 (48.8%) of occurrence followed by the femur accounting for 8 (6.3%).

**CONCLUSION:** Bone tumours, of which the most common benign and malignant tumours were osteochondroma and Osteosarcoma respectively appear to be mainly a problem of young adults in Zaria. *WAJM* 2007; 26(1): 37 – 41.

**Keywords:** Primary bone tumours, tumour-like lesions, Cancer.

#### RESUMÉ

**Contexte:** Il y a peu de documents publiés sur les Tumeurs Primaires et lésions ressemblant au tumeurs osseuses à Zaria.

**Objectif:** C'est de déterminer la fréquence de la tumeur et les sites primaire et lésion ressemblant au tumeur osseuse.

**Méthode.** Une revue retrospective histopathologique de tous les specimens osseux reçus au Département d'histopathologie, Centre Hospitalier Universitaire d 'Hamadu Bello, Zaria entre 1995 et 2004 est mise en étude.

**Résultats.** Des 127 Tumeurs Primaires et lésions ressemblant au tumeurs osseuses histologiquement étudiées, 74 (58.3%) provenaient des hommes et 53 (41.7%) des femmes avec un rapport de de 5 hommes sur 1 femme, 38.6% était des tumeurs benignes, 39.4% était des tumeurs malignante et 22% représentait des lésions ressemblant aux tumeurs. L'osteochondrome [20(15.7%)]et l'osteosarcome [17 (13.4%)] étaient les plus observés quand la dysplaisie fibreuse [26(20.4%)] était la plus courante des lésions ressemblant aux tumeurs. Les taux les plus élevés étaient observés chez des individus de la 2ieme [ 47 (37.0%)] et 3ieme [28(22.0%)] décennie. Le visage représentait la partie du corps la plus affectée avec 62 (48.8%) suivi du fémur avec 8 (6.3%) cas.

**Conclusion.** Les tumeurs osseuses parmi lesquelles l'ostechondrome et l'osteosarcome sont les tumeurs benignes et malignes les plus communes, constituent de serieux problemes medicaux chez les jeunes Nigériens. *WAJM* 2007; 26(1): 37 – 41.

**Mots clés :** Primaire, tumeurs osseuses, lésions ressemblant aux tumeurs, cancer.

\*Department of Pathology, Ahmadu Bello University Teaching Hospital Zaria, †Department of Haematology, Ahmadu Bello University Teaching Hospital, Zaria

**Correspondence:** Dr. A Mohammed, Department of Pathology, Ahmadu Bello University Teaching Hospital Shika, Zaria. E-mail: medvisory@yahoo.com.

## INTRODUCTION

Bone, a connective tissue, consists of many cells and tissue types, which include osteoblasts, osteoclasts, fibrous tissue and reticular or reticulo-endothelial cells in the marrow. Others include vascular structures, haematopoietic elements and nerves; these are incorporated in the developing and mature bony parts. These constituents are capable of proliferating and giving rise to diverse tumours, which form the basis of classification of bone tumours. This diversity makes it critical to diagnose tumours correctly, stage them accurately and treat them appropriately. Aetiologically, most bone tumours arise de-novo from somatic mutation<sup>1</sup>. However, several other factors have been implicated. These include chemotherapy (alkylating agents), irradiation<sup>2</sup>, bone infarcts<sup>3,4</sup>, around foreign bodies<sup>5,6</sup>, and pre-existing bone lesions like trauma with fracture or sub-periosteal haematoma<sup>7</sup>.

In a survey of cancer rates in Ibadan, Western Nigeria by Edington and Maclean<sup>8</sup>, bone tumours accounted only for 52(2.7%) out of the 1920 patients with tumours studied. Of the 52 patients, there was a slight male preponderance (1.4:1).

In a similar study in Tanzania, East Africa, malignant disease of the bone was not found<sup>9</sup>. Five cases of chondrosarcoma of the jaws and a series of osteosarcoma of the jaws from Kaduna were reported by Adekeye<sup>10</sup> and Adekeye et al<sup>11</sup> respectively. Omololu et al<sup>12</sup> in a study of primary malignant bone tumours found a very low incidence of 0.53% of all new cancers. The aim of this report is to present our experience.

## MATERIALS AND METHODS

This was a retrospective study undertaken at the Histopathology Department of Ahmadu Bello University Teaching Hospital (A.B.U.T.H), Zaria covering the period from 1<sup>st</sup> January 1995 to 31<sup>st</sup> December 2004.

The histopathology reports and slides of patients who had bone tissue biopsies were retrieved together with their request forms from the Department of Histopathology. The bench books for the years covering the period of study were also examined. These materials were reviewed for relevant information on age, sex, histological type of tumour and the anatomical site of occurrence. All bone tumours of odontogenic origin were

excluded. The World Health Organization Classification of Tumours by Fletcher et al<sup>13</sup> was adopted. Frequency tables were then generated and analyzed from the data obtained. A principal limitation encountered was that of non specificity of sites in few of the request cards.

## RESULTS

A total of 19,130 histological specimens were received in the department during the period under review. Only 342 (1.8%) of these were bone specimens. Neoplasms accounted for 6687 (35.0%) of the total number of specimens and this comprised of 3,060 (45.8%) and 3,627 (54.2%) benign and malignant tumours respectively. Out of the 6687 neoplasms, bone neoplasms were 127 (1.9%). These were made up of 74 (58.2%) males and 53 (41.7%) females. Forty-nine (38.6%) were benign and 50 (39.4%) were malignant tumours. The remaining 28 (22.0%) were tumour-like lesions. The most common benign and malignant tumours were osteochondroma 20 (15.7%) and osteosarcoma 17 (13.4%) respectively; while the most common tumour-like lesion was fibrous dysplasia 26 (20.4%) (Table 1). The age range was

**Table 1: Frequency of Histological Types of Bone Tumours by Sex**

Histological Type	Frequency N(%)		
	Male	Female	Total
<b>Benign Tumours</b>			
Osteoma	3 (2.4)	3 (2.4)	6 (4.8)
Osteoid osteoma	0 (0)	1 (0.8)	1 (0.8)
Chondroma	2 (1.6)	1 (0.8)	3 (2.4)
Osteochondroma	15 (11.8)	5 (3.9)	20 (15.7)
Chondromyxoid fibroma	1 (0.8)	0 (0)	1 (0.8)
Giant cell tumour (Osteoclastoma)	3 (2.4)	5 (3.9)	8 (6.3)
Fibroma	8 (6.3)	2 (1.6)	10 (7.9)
<b>Sub total</b>	<b>32 (25.2)</b>	<b>17 (13.4)</b>	<b>49 (38.6)</b>
<b>Malignant tumours</b>			
Osteosarcoma (osteogenic)	7 (5.5)	10 (7.9)	17 (13.4)
Chondrosarcoma	3 (2.4)	0 (0)	3 (2.4)
Ewing's Sarcoma	2 (1.6)	2 (1.6)	4 (3.2)
Myeloma	2 (1.6)	2 (1.6)	4 (3.2)
Burkitt's Lymphoma	8 (6.3)	8 (6.3)	16 (12.6)
Large Cell Lymphoma	2 (1.6)	0 (0)	2 (1.6)
Fibrosarcoma	4 (3.2)	0 (0)	4 (3.2)
<b>Sub total</b>	<b>28 (22.0)</b>	<b>22 (17.4)</b>	<b>50 (39.4)</b>
<b>Tumour-like lesions</b>			
Fibrous dysplasia	12 (9.4)	14 (11.0)	26 (20.4)
Aneurysmal bone cyst	1 (0.8)	0 (0)	1 (0.8)
Non-ossifying fibroma	1 (0.8)	0 (0)	1 (0.8)
<b>Sub total</b>	<b>14 (11.0)</b>	<b>14 (11.0)</b>	<b>28 (22.0)</b>
<b>Total</b>	<b>74 (58.2)</b>	<b>53 (41.7)</b>	<b>127(100.0)</b>

from 4 years to 72 years. The peak age incidence for most tumours was between the 2<sup>nd</sup> and 3<sup>rd</sup> decades of life accounting for 75 (59.0%) cases. (Table 2). The most common site of occurrence of tumours was in the face [62 (48.8%)] followed by the femur [8 (6.3%)]. A total of 15 (1.2%) tumours occurred in the long bones (Table 3).

**Table 2: Age Frequency of the various Histological types of Bone Tumours**

Histological Type	0 – 10	11 – 20	21 – 30	31 – 40	41 – 50	51 – 60	>60	Unspeci.	Total
<b>Benign Tumours</b>									
Osteoma		1	1	1	1		2		6
Osteoid osteoma				1					1
Chondroma			2	1					3
Osteochondroma		15	1	2	1			1	20
Chondromyxoid fibroma		1							1
Giant cell tumour (Osteodastoma)	1	5	1				1	8	
Fibroma		6	1	1	1	1			10
<b>Malignant Tumours</b>									
Osteosarcoma (Osteogenic sarcoma)	1	4	6	3	2	1		17	
Chondrosarcoma			2				1		3
Ewing's sarcoma		3					1		4
Myeloma					3		1		4
Burkitt's Lymphoma	14	1			1				16
Large cell Lymphoma		1		1					2
Fibrosarcoma		1	2		1				4
<b>Tumour-like lesion</b>									
Fibrous dysplasia	2	12	7	2	1			2	26
Aneurysmal bone cyst		1							1
Non ossifying fibroma			1						1
<b>Total (%)</b>	<b>17(13.4)</b>	<b>47(37.0)</b>	<b>28(22.0)</b>	<b>13(10.2)</b>	<b>12(9.4)</b>	<b>2(1.6)</b>	<b>5(3.9)</b>	<b>3(2.6)</b>	<b>127(100)</b>

**Table 3: Anatomical Distribution of Primary Tumours and Tumour-like Lesions of Bone Anatomical Site**

Histological Type	Face	Shoulder	Humerus	Radius/ ulna	Pelvis	Femur	Tib/ fibular	Others	unspecified	Total
<b>Benign tumours</b>										
Osteoma	2	1		1				1	1	6
Osteoid osteoma					1					1
Chondroma						1	1		1	3
Osteochondroma	6	1	1			2		1	9	20
Chondromyxoid fibroma	1									1
Giant cell tumour					1	2		3	2	8
Fibroma	7								3	10
<b>Malignant Tumours</b>										
Osteosarcoma (osteogenic sarcoma)	7			2		2	1	1	4	17
Chondrosarcoma	2					1				3
Ewing's sarcoma	1									4
Myeloma		1			2				1	4
Burkitt's lymphoma	14				1				1	16
Large cell Lymphoma	1								1	2
Fibrosarcoma	2								1	3
<b>Tumour-like lesion</b>										
Fibrous dysplasia	19								7	29
Aneurysmal bone cyst									1	1
Non ossifying fibroma	1									1
<b>Total (%)</b>	<b>62(48.8)</b>	<b>3(2.4)</b>	<b>1(0.8)</b>	<b>3(2.4)</b>	<b>5(3.9)</b>	<b>8(6.3)</b>	<b>3(2.4)</b>	<b>6(4.7)</b>	<b>33(26.0)</b>	<b>127(100)</b>

## DISCUSSION

This study shows a male preponderance (1.6:1) for both benign and malignant tumours. This is similar to the report of Edington and MacLean (1.4:1)<sup>8</sup>. There was no significant difference in the frequency of benign and malignant tumours.

Osteochondroma was the most common benign tumour with a male to female ratio of 3:1. Seventy five percent of the patients fell within the 11 to 20 years age range. This corresponds to those reported by Kikum<sup>14</sup> where it occurred more frequently in late adolescence and early adulthood with a male to female ratio of 3:1. However there was variation in the sites of occurrence. The most common site in our review was the face [6 (30%)] whereas in the above series it occurred mostly in the long bones. The probable reason for this variation is because majority of the bone specimens received in the department came from the Maxillo-facial Unit (MFU). There was also limitation regarding the anatomical sites of tumour occurrences because many request forms 33 (26.0%) did not carry this information.

Our findings on chondroma were similar to those of Boriani et al<sup>15</sup>. They found a male to female ratio of 2:1, most common in adolescents and young adults and mostly affecting the long bones.

Giant cell tumour (osteoclastoma) made up 8 (6.3%) of the total bone tumours. More than 87.5% of affected patients were between 20 years and 50 years. There was a female preponderance (62.5%). These findings agree with those of Lawrence et al<sup>16</sup> who found that the tumour rarely occurs under 20 or over 55 years and was more common in females than in male individuals.

The most common malignant tumour was osteosarcoma, 17 (34.0%) of the 50 malignancies. There was male to female ratio of 1:1.4. It affected all age groups, but the peak age incidence was in the 3<sup>rd</sup> decade (35.3%). Lawrence et al<sup>16</sup> also found a similar peak age incidence. The most common site was the face, 7 (41.2%) and a total of 5 (29.4%) occurred in the long bones. In a study of 27 cases, Ayala et al<sup>17</sup> also found that more females than males were affected and the age range in their series was from 6

years to 28 years. Long bones were mostly affected. Klien et al<sup>18</sup> also found osteosarcoma to be the most common primary bone malignancy, affecting all age groups but with greater than 75% of patients being under 20 years of age. The most common site also was the long bones. This finding is similar to a report from Ibadan, Western Nigeria as per the frequency and site of occurrence<sup>12</sup>.

Osteosarcoma was closely followed by Burkitt's lymphoma. This constitutes 16(32.0%) of the malignant lesions. Over 80% occurred in the first decade with the most common site being the face (jaws), a finding that is consistent with the study done in Ibadan<sup>12</sup>. All the three cases of chondrosarcoma in this review occurred in males and the peak age incidence was in the 3<sup>rd</sup> decade. This is similar to two other separate studies<sup>19-20</sup>. The most common site was in the face (66.7%) and then the femur (33.3%) whereas in the Bernes et al<sup>19</sup> series the pelvis, femur, ribs and the shoulder girdle were the most common sites. Ewing's Sarcoma occurred equally in both sexes with peak age incidence in the second and third decades (75%). Kissane et al<sup>21</sup> in a very large series of 303 cases found a male to female ratio of 1.5:1 with the highest age frequency between 10 and 15 years. The most common site affected was the face in our review but the long bones were much more affected in their series. All the 4(12.5%) cases of fibrosarcoma occurred in males. The peak age incidence was in the 3<sup>rd</sup> decade mostly affecting the facial bones. This is at variance with a larger series of 114 cases reported by Dahlin et al<sup>22</sup>. They had a female preponderance with the peak age incidence occurring in the 4<sup>th</sup> decade and with the long bones being mostly affected.

Majority of the tumour-like lesions were fibrous dysplasia 26(92.9%). The others (7%) comprised of aneurysmal bone cyst, and non-ossifying fibroma. Eighty percent of the fibrous dysplasia occurred in patients under the age of 30 years with a slight female preponderance. This is similar to a series of 80 cases by Park et al<sup>23</sup>. The age range in their series was from 3 weeks to 35 years. They also had a slight female preponderance.

In our series, the absence of

important aetiological agents such as irradiation thorotrast<sup>24</sup>, alkylating agents<sup>25</sup> may have had a significant role to play in the general rarity of primary bone tumours in our environment. This study has shown that bone tumours are mainly a problem of young adults in Zaria Northern Nigeria. The most common benign and malignant tumours were osteochondroma and osteosarcoma respectively.

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