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Demographics And Histologic Patterns Of Musculoskeletal Tumors At The University Of Port Harcourt Teaching Hospital

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I. Introduction

Musculoskeletal tumours comprise a heterogeneous group of lesions arising from bone, cartilage, skeletal muscle, fibrous tissue, adipose tissue, vascular structures, peripheral nerve sheath, and related supporting tissues. They range from benign and locally aggressive lesions to high-grade malignant neoplasms and are clinically important because they may cause pain, swelling, deformity, pathologic fracture, neurovascular compromise, limb loss, and death when diagnosis or treatment is delayed [1-4]. Although uncommon relative to many other neoplasms, they carry disproportionate functional and oncologic consequences and often require multidisciplinary management involving orthopaedic surgeons, pathologists, radiologists, oncologists, and rehabilitation teams [1-4]. The contemporary framework for classifying these tumours is provided by the 5th edition of the World Health Organization (WHO) Classification of Soft Tissue and Bone Tumours, which integrates morphology, biologic behaviour, immunohistochemistry, and molecular alterations. This framework has improved diagnostic standardisation, facilitated comparison across institutions, and reinforced the continued importance of histopathology as the basis for definitive diagnosis [1,3,4]. Despite progress in molecular diagnostics, tissue morphology remains central to the recognition and categorisation of bone and soft-tissue tumours in routine practice, especially in low-resource settings where advanced ancillary tests may not always be available.

Bone tumours constitute an important component of musculoskeletal pathology. Primary malignant bone tumours are rare overall, but they are among the most consequential neoplasms encountered in children, adolescents, and young adults [2,3]. Osteosarcoma remains the commonest primary malignant bone tumour worldwide, while chondrosarcoma is seen more often in middle-aged and older adults and Ewing sarcoma predominates in childhood and adolescence [2,3,13]. In addition, plasma cell neoplasms such as multiple myeloma and plasmacytoma frequently present with destructive skeletal lesions in adults and may contribute substantially to the osseous tumour burden encountered in tertiary hospital biopsy series [2]. Soft-tissue tumors are similarly diverse and encompass many histologic subtypes with variable age distribution and biologic behaviour [1,4]. Some soft-tissue sarcomas, such as rhabdomyosarcoma, are especially relevant in children and adolescents, whereas others are more typical of adulthood [5]. In routine tertiary practice, the observed tumour spectrum may therefore reflect both the true biology of these lesions and the referral pathways through which patients present for biopsy and specialist care [1,4,5].

In sub-Saharan Africa, the epidemiology of musculoskeletal tumours is still described predominantly through retrospective hospital-based series rather than population-based registries [6]. Such studies remain important because they provide baseline clinicopathologic data in environments where delayed presentation, diagnostic constraints, and incomplete tumour registration are common [6,12]. In Nigeria, published reports from Lagos, Zaria, Ile-Ife, and Enugu have consistently shown male predominance in many series and have generally identified osteosarcoma as the commonest primary malignant bone tumour, although the exact profile varies according to case definition, age structure, and institutional referral pattern [7-11,13]. Eyesan et al. also highlighted late presentation, funding constraints, and limited diagnostic resources as important barriers to optimal care in Nigerian musculoskeletal oncology practice [12]. Published research from the Niger Delta region remain relatively limited. This study seeks to identify the local demographic profile and histologic spectrum of musculoskeletal tumors encountered within this region. Such data can support clinical suspicion, service planning, and future multicentre research.

II. Aim

To determine the demographic characteristics and histologic patterns of musculoskeletal tumours diagnosed at the University of Port Harcourt Teaching Hospital over a five-year period, from January 2020 to December 2024

III. Methodology

This was a retrospective descriptive hospital-based review of histologically diagnosed musculoskeletal tumours at the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt, Nigeria, over a five-year period from 1 January 2020 to 31 December 2024.

The study was conducted at UPTH, a tertiary referral centre in the Niger Delta that receives orthopaedic, trauma, surgical, maxillofacial, and oncology referrals from Rivers State and neighbouring states. Histopathologic diagnoses are established in the Department of Anatomical Pathology from biopsy and excision specimens submitted by the relevant clinical teams. The study population comprised all patients with musculoskeletal tumours diagnosed histologically within the study period. For the purposes of this review, musculoskeletal tumours included bone tumours, soft-tissue tumours, and related jaw/odontogenic lesions captured within the institutional dataset and managed through musculoskeletal pathology pathways.

Data were extracted from the departmental tumour data sheet for 2020 to 2024. Variables retrieved included age, sex, specimen type, anatomic site, and final histologic diagnosis. Records with available demographic and diagnostic information were included in the review. All 52 eligible records in the dataset were analysed.

For analysis, diagnostic labels were harmonised into standardised histologic categories, age was grouped into decades for descriptive presentation and anatomic sites were grouped into lower limb, upper limb, pelvis, spine, jaw, trunk/abdominopelvic region, and other/unspecified sites. Data were analysed descriptively. Continuous variables were summarised using mean, standard deviation, median, and range, while categorical variables were presented as frequencies and percentages.

As this was a retrospective review of existing histopathology records, there was no direct patient contact. Patient confidentiality was maintained throughout the analysis and no personal identifiers were included in the final report.

IV. Results

A total of 52 histologically diagnosed musculoskeletal tumours were reviewed during the study period. There were 27 males (51.9%) and 25 females (48.1%), giving a male-to-female ratio of 1.1:1(fig 1). Patients ranged in age from 5 to 93 years, with a mean age of 43.7 ± 20.9 years and a median age of 45 years (fig 2). Age distribution showed that the commonest age group was 41–50 years, accounting for 11 cases (21.2%), followed by 51–60 years with 10 cases (19.2%) and 11–20 years with 9 cases (17.3%). The least represented age groups were 81–90 years and 91–100 years, with one case each.

The lower limb was the most frequently involved site group, accounting for half of the cases. (table 1). Bone tumours predominated (78.8%), while soft-tissue tumours accounted for 9 cases (17.3%) and jaw/odontogenic tumours for 2 cases (3.8%) (table 2). When grouped by biologic behaviour, primary malignant tumours accounted for 43 cases (82.7%), locally aggressive/intermediate lesions for 7 cases (13.5%), and hematolymphoid malignancies for 2 cases (3.8%) (table 3).

Multiple myeloma was the commonest diagnosis, seen in 14 cases (26.9%), followed by osteosarcoma in 13 cases (25.0%). Chondrosarcoma and giant cell tumour each accounted for 4 cases (7.7%), while rhabdomyosarcoma accounted for 3 cases (5.8%). Fibrosarcoma, plasmacytoma, ameloblastoma, and lymphoma each occurred in 2 cases (3.8%), while malignant peripheral nerve sheath tumour, pleomorphic sarcoma, chondroblastoma, pleomorphic rhabdomyosarcoma, Ewing sarcoma, and liposarcoma each occurred once (1.9%) (table 4).

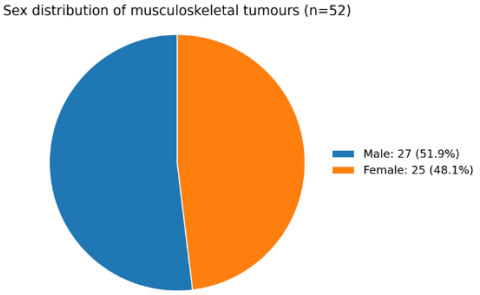

Figure 1. Sex distribution of musculoskeletal tumours.

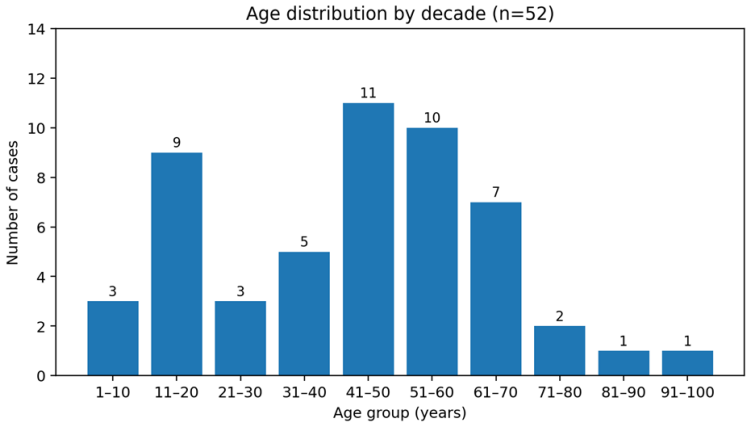

Figure 2. Age distribution of musculoskeletal tumours.

Site group	Frequency	Percentage
Lower limb	26	50.0
Upper limb	9	17.3
Pelvis	8	15.4
Spine	5	9.6
Jaw	2	3.8
Trunk/abdominopelvic	1	1.9
Other/unspecified	1	1.9

Table 1. Anatomic site distribution of musculoskeletal tumours.

Tumour group	Frequency	Percentage
Bone	41	78.8
Soft tissue	9	17.3
Jaw/odontogenic	2	3.8

Table 2. Broad tumour-group distribution.

Biologic behaviour	Frequency	Percentage
Primary malignant tumour	43	82.7
Locally aggressive/intermediate	7	13.5
Hematolymphoid malignancy	2	3.8

Table 3. Distribution by biologic behaviour.

Histologic diagnosis	Frequency	Percentage
Multiple Myeloma	14	26.9
Osteosarcoma	13	25.0
Giant Cell Tumour	4	7.7
Chondrosarcoma	4	7.7
Rhabdomyosarcoma	3	5.8
Fibrosarcoma	2	3.8
Plasmacytoma	2	3.8
Ameloblastoma	2	3.8
Lymphoma	2	3.8
Malignant Peripheral Nerve Sheath Tumour	1	1.9
Pleomorphic Sarcoma	1	1.9
Chondroblastoma	1	1.9
Pleomorphic Rhabdomyosarcoma	1	1.9
Ewings Sarcoma	1	1.9
Liposarcoma	1	1.9

Table 4. Histologic diagnosis of musculoskeletal tumours.

V. Discussion

This study provides institution-based data on the demographic profile and histologic spectrum of musculoskeletal tumours diagnosed at UPTH over a five-year period. It demonstrated a slight male predominance, a broad age range, and a clear predominance of lower-limb lesions. Histologic pattern was dominated by multiple myeloma and osteosarcoma.

The slight male predominance observed is in keeping with several Nigerian reports on bone tumours and tumour-like lesions, which have generally shown more cases in males than in females [7-11,13]. However, the male excess in the present study was modest, which may reflect the broader case mix analysed here, including plasma cell neoplasms, locally aggressive lesions, and jaw tumours rather than only conventional primary malignant bone sarcomas. The mean age of 43.7 years and the peak frequency in the 41–50-year age group differ from many Nigerian bone-tumour series that report a younger peak in the second decade of life [8-11,13]. This difference is likely related to the prominence of multiple myeloma and plasmacytoma in the present dataset. Plasma cell neoplasms are predominantly diseases of adulthood and older age and can substantially shift the overall age distribution upward when all musculoskeletal tumours in a hospital biopsy series are analysed together [2]. The finding illustrates the importance of clearly defining the analytic category when comparing hospital-based musculoskeletal tumour studies.

The lower limb accounting for half of all tumours is broadly consistent with the known predilection of many bone and soft-tissue tumours for the appendicular skeleton, particularly around the femur and tibia [2,3]. It also aligns with Nigerian and African reports in which extremity lesions, especially lower-limb tumours, feature prominently in orthopaedic oncology practice [6-11,13].

A major finding is the frequency of multiple myeloma which slightly exceeded osteosarcoma. This contrasts with several Nigerian studies focused specifically on primary bone tumours, where osteosarcoma is usually the leading malignant diagnosis [7-11,13]. The difference is understandable because the present study did not restrict analysis to primary bone sarcomas alone; instead, it included all musculoskeletal tumours captured in the institutional dataset, including plasma cell neoplasms and other non-sarcomatous lesions presenting within musculoskeletal pathology practice. Once this broader inclusion is recognised, the continued prominence of osteosarcoma as the commonest primary malignant bone sarcoma in the present series remains consistent with the Nigerian literature [7-11,13]. Rhabdomyosarcoma was the leading soft-tissue sarcoma. It's presence in this cohort is compatible with the recognised importance of this tumour across paediatric and young-adult soft-tissue sarcoma practice [5]. The low number of Ewing sarcoma cases may reflect the relatively small sample size, the age structure of the cohort, referral bias, or underrepresentation in biopsy submissions.

This study included locally aggressive or intermediate tumours such as giant cell tumour, chondroblastoma, and ameloblastoma. From a strict malignant bone-sarcoma perspective, these lesions are distinct from high-grade malignant neoplasms. However, their inclusion is defensible within the broader category of musculoskeletal tumours because they often present as destructive masses, require histologic confirmation, and contribute meaningfully to the diagnostic workload of tertiary orthopaedic and maxillofacial services [1-4]. The predominance of primary malignant tumours in the present dataset may partly reflect referral bias. In low-resource settings, painful, enlarging, aggressive, or disabling lesions are more likely to reach tertiary centres and undergo biopsy than small or asymptomatic benign lesions [6,12]. This possibility is supported by previous Nigerian work highlighting late presentation, financial barriers, and limited diagnostic infrastructure as persistent challenges in musculoskeletal oncology [12,13].

Limitations of this study It includes its retrospective, single-centre, and relatively small sample size, so its findings cannot be interpreted as population incidence. Clinicoradiologic details, tumour grade, stage, treatment, and outcomes were not available in the data sheet, precluding survival analysis and clinicopathologic correlation. In addition, inclusion of plasma cell neoplasms, lymphoma, and jaw lesions broadens the spectrum beyond conventional primary malignant musculoskeletal sarcoma series. Nevertheless, this breadth is also a strength because it reflects the real-world tumour spectrum encountered in clinical practice.

VI. Conclusion

These findings provide useful baseline data on the musculoskeletal tumour profile encountered at UPTH and add to the limited literature from the South-South region of Nigeria. They also highlight the importance of institutional histopathology reviews in settings where tumour registries are incomplete. Further multicentre and prospective studies incorporating radiologic, therapeutic, and outcome variables would help clarify the epidemiology and clinical behaviour of musculoskeletal tumours in the Niger Delta.

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