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Profile of Musculoskeletal Tumours in the Orthopaedics and Traumatology Department of the Brazzaville University Hospital

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Abstract **Original Research Article**

Introduction: Musculoskeletal tumours have a significant impact on the musculoskeletal system, and their specific diagnosis requires a biopsy. The aim of this study is to determine the epidemiological, clinical and histological profiles of musculoskeletal tumours in the department. ***Patients and methods:*** This was a descriptive cross-sectional study based on medical records from January 2021 to December 2024, involving musculoskeletal tumours in the department for which a surgical biopsy had been performed. Our variables were epidemiological, clinical, surgical and anatomopathological. Statistical analysis of the data was done using Epi-Info 7 software. ***Results:*** Over a period of 5 years, we identified 26 patients with musculoskeletal tumours. These included 9 women and 17 men with an average age of 47. The median time to consultation was 8 months, and the circumstances of finding were limb swelling in 53.85%, ulcerative-budding lesions in 30.77%, and pathological fracture in 15.38%. The lower limb was more commonly affected (80.77%), with the tumour evolution at the expense of bone in 34.62% of cases and soft tissue in 57.69% of cases. The surgical procedure was either a biopsy (38.46%) or a biopsy excision (61.54%). The immediate postoperative outcomes were uncomplicated in 65.39% of cases and complicated in 19.23% of cases. From a histological aspect, there were 9 benign tumours and 13 malignant tumours, including 8 sarcomas and 3 metastatic adenocarcinomas. In 4 cases, the histological profile was unknown. ***Conclusion:*** This study provided insight into the profile of musculoskeletal tumours in the orthopaedic traumatology department with a view to improving treatment strategies. Surgical biopsy plays an important role in the process of confirming the diagnosis of musculoskeletal tumours.

Keywords: Musculoskeletal tumour, surgical biopsy, soft tissue sarcoma, benign tumour, malignant tumour.

INTRODUCTION

Musculoskeletal tumours are lesions that develop abnormally through the skeleton and soft tissues (muscles, fatty and conjunctive tissues). They severely affect the musculoskeletal system and can be benign, primary malignant or secondary malignant. Malignant forms are not only devastating, but also a cause of mutilation and mortality around the world [1]. They are more commonly found in the form of secondary lesions or metastases from cancers of so-called osteophilic organs, including the thyroid, breast, lung, kidney and prostate [2]. Primary musculoskeletal tumours are dominated by sarcomas, which account for 0.2 to 0.5% of all malignant tumours in all age groups worldwide and less than 1% of adult cancers in North America [3, 4]. In sub-Saharan Africa, its incidence is poorly documented, with most of the available data coming from hospital service frequencies. Overall, musculoskeletal tumours account for less than 3% of all tumours in the human body [1]. This is a highly polymorphic group of tumours, the diagnosis of which is based on a combination of clinical and radiological findings, but above all on pathological anatomy, through the removal of a sample of soft tissue or bone. This sample can be taken either percutaneously and radiologically guided (using a fine needle or trocar) or surgically, using a procedure known as a 'surgical or incisional biopsy' [5]. Through this study, we aimed to determine the epidemiological, clinical and histological aspects of musculoskeletal tumours biopsied surgically in the orthopaedic-

traumatology department of the Brazzaville University Hospital.

PATIENTS AND METHODS

This was a descriptive cross-sectional study based on medical records covering the period from January 2021 to December 2024, i.e. five years. The study was conducted in the orthopaedic trauma department of Brazzaville University Hospital. Our sources of information were surgical reports, hospitalization records and medical records. The patients came from the medical oncology department, the emergency department and the orthopaedic outpatient department. We included patients over the age of 15 with bone or soft tissue tumours who had undergone surgical biopsy. Biopsies performed for chronic inflammatory or infectious conditions were excluded from this study. The study variables were epidemiological, clinical, radiological, surgical, and anatomo-pathological.

Statistical analysis was performed using Epi-Info 7 software. Qualitative variables were presented as frequencies and quantitative variables as means with standard deviations or medians with interquartile ranges (IQR).

RESULTS

Epidemiological aspects

Twenty-six (26) surgical biopsies were performed on 26 patients. These included 17 men and 9 women, giving a sex ratio of 1.89. The mean age was 47±18.5 years, with extremes of 16 and 91 years (figure 1). Twenty-three (23) patients lived in the capital, two patients came from another urban area, and one patient came from a rural area. The series was dominated by the informal sector (30.8%), followed by civil service employees (23.10%). Pensioners and students were in equal proportions, at 15.38%.

Clinical Aspects

The median time to consultation was 8 months (IQR= 4–24). Patients consulted for swelling in 53.85% of cases, a budding lesion with or without ulceration in 30.77% of cases, and a pathological fracture in 15.38% of cases. Physical condition was poor in 11 cases, marked by weight loss, and the lower limb was the most impacted in 21 cases. The physical examination of the tumour revealed a firm mass in 38.46% of cases, a bud with peripheral induration in 19.23% (figure 2), a hard mass in 11.54% and superinfected ulceration in 11.54%. In 4 patients, the affected limb segment had a normal appearance. The tumours were most commonly located in the thigh (Table 1).

Table 1: Distribution of biopsies according to tumour topography

	Effective	Percentage
Forearm	1	3.85
Pelvic area	1	3.85
Shoulder girdle	2	7.69
Elbow	1	3.85
Thigh	7	**26.92**
Knee	3	11.54
Hip	3	11.54
Leg	3	11.54
Hand	2	7.69
Foot	3	11.54
Total	**26**	**100.00**

Radiological findings

The medical imagery used for diagnostic purposes in biopsied tumours included standard X-rays in 17 cases, soft tissue ultrasound in 4 cases, and magnetic resonance imaging (MRI) in 12 cases. The tumour was located in bone in 34.62% of cases and in soft tissue in 57.69% of cases. In two patients, it infiltrated both bone and soft tissue.

Operative and Post-operative Findings

The surgical approach performed was a lesion biopsy in 10 cases (38.46%) and a biopsy excision, including amputation, in 16 cases (61.54%). Additional procedures included osteosynthesis with acrylic cement filling of bone loss in 3 cases and bone filling with acrylic cement alone in 1 case (figure 3). The postoperative follow-up was uneventful in 17 cases (65.39%) and complicated in 5 cases (19.23%), including 2 cases of surgical site infection controlled by antibiotic therapy according to the antibiogram and 3 cases of surgical site haemorrhage requiring blood transfusion. Four patients (15.38%) died within 6 months of the biopsy.

Anatomopathological Aspects

Anatomopathological results from biopsy specimens were available for only 22 patients within a median time frame of 36 days (IQR= 21–60). The anatomical pathology diagnosis was a benign tumour in 40.91% of cases and malign tumours in 59.09% of cases. The margins were specified for 6 biopsy excision and were safe in 2 cases. Immunohistochemistry was not available. The benign tumour group was dominated by fibrolipoma, followed by aneurysmal cysts, and the malignant tumour group was represented by soft tissue

sarcomas and bone metastases from prostate tumours.
Table 2 shows the histological nature of the tumours.

Table 2: Distribution of biopsies according to tumour histological type

	Histological type	Effective
Benign tumour (n=9)	Fibrolipoma	4
	Hyperplastic seborrheic keratosis	1
	Aneurysmal cyst	2
	Osteochondroma	1
	Giant cell tumour	1
Malignant tumours (n=13)	Metastatic adenocarcinoma of the prostate	3
	Infiltrating epidermoid carcinoma	1
	Liposarcoma	1
	Plasmacytoma (multiple myeloma)	1
	Giant cell osteosarcoma	1
	Soft tissue sarcomas*	6

* These are other soft tissue sarcomas not specified due to lack of immunohistochemistry.

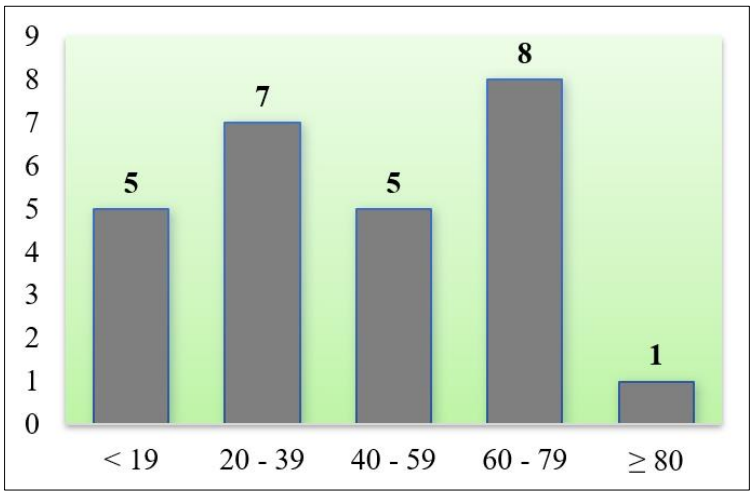

Figure 1: **Distribution of patients by age**

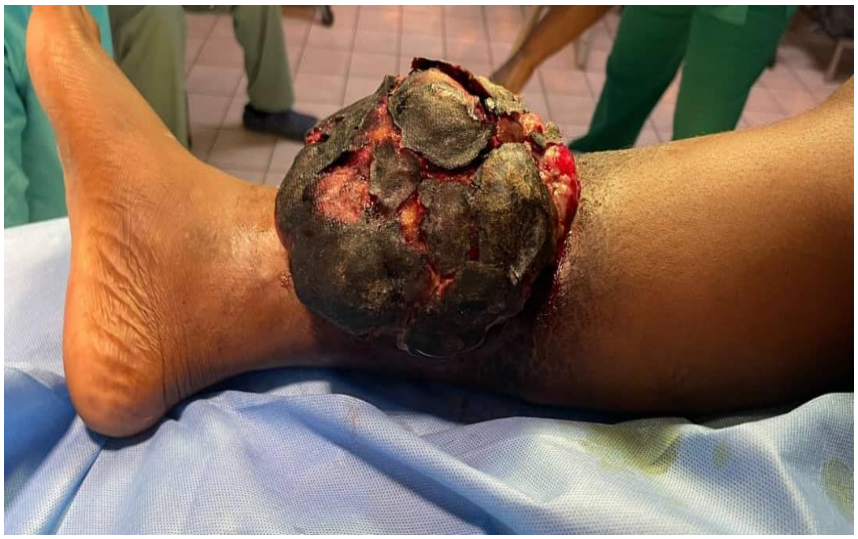

Figure 2: Clinical image of a budding tumour in the soft tissue of the right leg in a 42-year-old female patient

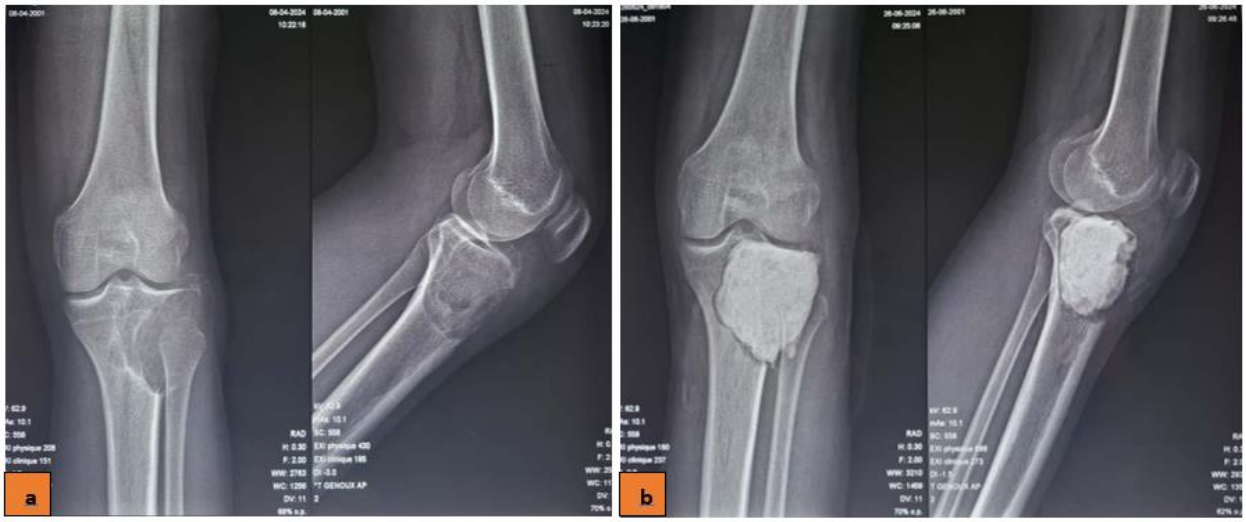

Figure 3: **Radiographic image of acrylic cement filling following surgical biopsy of a bone tumour in the left tibia in a 26-year-old patient**

DISCUSSION

Musculoskeletal tumours are most commonly found in men, affecting approximately two men for one woman in our series. The literature reports highly variable ratios, sometimes showing a male predominance [1, 4, 6, 7] and other times a female predominance [8, 9], but with ratio values not exceeding 1.5. The average age of 47 seems too high compared to other African research on the same subject, which has much lower average ages than ours, not exceeding 35 [6, 10, 14]. It should be noted that in these series, the reviews focused on patients of all ages. However, in their study on the profile of malignant bone tumours in patients over 15 years of age in Lomé, Kodjo K. *et al.*, [6] report an average age of 55, which is higher than ours. Despite these differences in values, it appears that the majority of patients are young, and the similar findings have been observed by African colleagues [6, 14], with Africa having a demographic composed of increasingly younger inhabitants. No fortuitous discovery was made; almost all patients consulted late and sometimes at the stage of complications (pathological fractures, infected ulcerative lesions). This delay was even more pronounced, lasting up to 17 months, in the study by Kodjo K *et al.*, [6]. However, socio-economic and cultural contexts (traditional treatment) may be the reasons for this delay in the consultation. The few cases of pathological fractures at the time of consultation highlight this delay, as a bone weakened by a tumour lesion first manifests itself through bone pain, which is either ignored by the patient or alleviated by anti-inflammatory drugs, significantly delaying the aetiological diagnosis.

The lower limb was the most affected, and the thigh was the site most commonly affected by tumours. These predominant tumour locations in both the lower limb and thigh have been reported in other studies [7, 11]. This is not the case in the study by Samba K et al. [10], where they identified the maxillofacial region as the most common site, followed by the lower limb. It should be noted that the authors found a very high number of Burkitt's lymphomas located in the maxillofacial region in children in their series, which included patients of all ages.

Before performing biopsies, radiological examination of suspected cases allowed us to realize that our series was dominated by soft tissue tumours (57.69%) rather than bone tumours, which could explain the interest in performing MRI in half of the series in the diagnosis of suspected cases. The majority of diagnoses were made with biopsy specimens (61.54%) based on the principles of cancer resection [12, 13]. Biopsy excision was performed either on tumours suspected to be benign or on tumours suspected to be malignant with a favourable staging. These approaches were observed in the series by Gbessi D.G. *et al.*, [9] and Darré T. *et al.*, [14].

The high proportion of excision specimens in our series, as in other series from sub-Saharan Africa, could be explained by the societal realities in this part of the continent and the habits of some surgeons. Indeed, patients' financial difficulties, delayed consultation, and inadequate equipment in anatomy and pathology laboratories, making it difficult to perform extemporaneous examinations, are sometimes reasons that lead surgeons to perform all procedures at once. This observation is particularly true in cases involving thigh amputation for a large, highly malignant tumour in a patient who consulted very late. In the series by Walla A *et al.*, [8], amputation was almost systematic for malignant tumours of the limbs. Vichard P. and Gagneux E. [15] suggest that radical treatment should be reserved for large bone tumours invading soft tissue. Ultimately, we are aware that, in the long term, it will be better to equip ourselves and avoid resections without histological confirmation, as surgical resection for diagnostic purposes rarely meets the criteria for cancer resection

(with healthy margins). Which is why it is preferable, especially in the case of soft tissue tumours suspected of being malignant, to proceed with percutaneous biopsies, which offer very satisfactory results [16], before considering surgical excision, which are therapeutic in nature. Osteosynthesis with cement filling has been systematic during surgical biopsies of bone tumours complicated by pathological fractures. Our approach is in line with the recommendations in the literature [15, 17], with the requirement to prioritize the verticalization of patients, all over the age of 50, in order to minimize the risks associated with decubitus.

Histologically, the diagnoses were confirmed very late, sometimes two months after the biopsy procedures, with margins that were not all clear. Of the 22 biopsy specimens analysed, malignant tumours were in the majority, as reported by Bahebeck J. *et al.,* [18] and Solooki S. [1]. But not in most of the results available in the literature, where benign tumours constitute the majority of musculoskeletal tumours [4, 7, 18]. In our case, the reason put forward is, on the one hand, the selection criteria of excluding children, which indirectly eliminated the inclusion of several benign tumours often found in children, the most common being osteochondroma [19], and on the other hand, the decision not to analyse tumours considered benign based on clinical and imaging findings, thereby reducing the number of biopsy specimens favourable to benign tumours. As in the study, by Katchy K.C. *et al.,* [20], soft tissue sarcomas largely dominated the group of primary malignant tumours in our series, alongside a rare case of multiple myeloma. These results contrast with those of several studies that place musculoskeletal malignancies, osteosarcoma [1, 4, 17, 19, 21] or plasmacytoma [6] in first place. The unavailability of immunohistochemistry has been a disability in determining the subtypes of these soft tissue sarcomas. All secondary bone tumours were adenocarcinoma of the prostate, accounting for 23.07% of malignant tumours. This result is slightly higher than those of Baena-Ocampo *et al.,* [22] and Settakorn *et al.,* [23], who found 18.6% and 11% of bone metastases in large series, respectively. However, other African studies on large series, notably by Kodjo K. *et al.,* in Togo [6] and Omololu *et al.,* in Nigeria [24], report a high rate of bone metastases. All these results show a significant proportion of bone metastases in musculoskeletal tumours. In addition, the high percentages of bone metastases compared to primary cancers reflect the facility of diagnosis of these secondary tumours in our countries, as they are often complicated by deformities or pathological fractures, forcing patients to visit a specialist. Bone metastases are caused by several primary sites [2, 20], however, in our series it was prostate cancer alone. This may be explained by the small size of our series compared to that of other authors. Osteochondroma and giant cell tumours occupied the last place among benign tumours, contrary to the reported literature [4, 7, 19]. Here again, the selection criteria for patients, which only included adults, may explain this, but this result leads us to question whether osteochondroma still represents the most common benign bone tumour in adults.

CONCLUSION

Based on cases of surgical biopsies, the most commonly used sampling technique in our working conditions, this study provides an overview of the profile of malignant musculoskeletal tumours in our department, a profile dominated by soft tissue sarcomas. Although percutaneous needles or trocar-guided biopsy has become the standard technique in most orthopaedic oncology centres, surgical biopsy still has its place in the histological diagnosis of musculoskeletal tumours in our hospital facilities, despite its disadvantages (haemorrhage, infection, tumour flare, etc.). Its use is particularly justified in cases of osteogenic tumours or pathological fractures requiring palliative treatment. These results inspire us to continue this work through a large-scale, multidisciplinary study involving all participants in the musculoskeletal tumour care process, in order to better develop strategies for treating these tumours, specifically sarcomas, in our country.

Declaration of competing interest: No conflicts of interest

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