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Epidemiological, Clinical and Therapeutic Aspects of Osteochondral Tumors in Bamako, Mali: A Five-Year Multicenter Study

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ABSTRACT

The management of osteochondral tumors is a major challenge due to their rarity, diagnostic complexity, morbidity, and mortality. The objective was to assess the epidemiological, diagnostic, and therapeutic aspects of osteochondral tumors in Bamako (Mali). A retrospective, multicenter, descriptive, and analytical study was conducted over a five-year period (January 2019 to December 2023) in three university hospitals of Bamako, Mali. Patients admitted during the study period with complete medical records who were followed for at least six months were included. The prevalence was 6.2 cases per 10,000 patients. The mean age of patients was 35.3 ± 20 (range: 2 to 82 years). Pain was the most common presenting symptom in 90.6% (184 cases). Pelvic localization represented 166 cases (81.3%). There were 154 cases of malignant tumors, including 140 primary cases (70%) and 14 secondary cases (7%). Stage IV according to the TNM classification represented 26.1% of cases. Surgical treatment was the most common, accounting for 61.6% (125 cases), combined with chemotherapy in 106 cases (52.2%) and/or radiotherapy in 7 cases (3.4%). The outcome was favorable in 59.1% of cases. Recurrence and death were associated with malignant tumors in 16 cases (7.9%) and 19 cases (9.3%), respectively.

Introduction

The management of osteochondral tumors is a major challenge due to their rarity, diagnostic complexity, morbidity, and mortality. These osteochondral tumors can be primary or secondary, benign or malignant [1, 2]. Certain genetic risk factors and previous radiotherapy increase the risk of malignant forms [3]. Diagnosis is based on clinical, radiological, and, above all, pathological assessment. Multidisciplinary management in specialized centers is essential to minimize diagnostic errors and optimize therapeutic outcomes [1, 3, 4]. In Mali, as in many resource-limited countries, the management of osteochondral tumors faces major difficulties. Access to certain imaging techniques (MRI, CT scan) and specialized treatments (chemotherapy, radiotherapy) is often limited, leading to diagnostic delays and suboptimal management. Local epidemiological data on these tumors are rare, which is an obstacle to the implementation of appropriate public health strategies. This study aims to assess the epidemiological profile, diagnostic features, and therapeutic outcomes of osteochondral tumors in the main referral hospitals of Bamako, Mali."

Materials and Methods

We performed a 5-year retrospective (January 2019 to December 2023), multicenter, descriptive, and analytical study conducted in three university hospitals in Bamako (Mali): Professor Bocar Sidy Sall in Kati, Gabriel Touré, and Mère Enfant Luxembourg. The study population consisted of patients admitted to the three centers for limb tumors. Data were collected from registers (consultation, hospitalization, surgical reports, and anatomy-cytopathology) and medical records (outpatient consultations and hospitalization). Patients admitted during the study period with complete medical records who were followed for at least six months were included. The variables studied were sociodemographic, clinical, and paraclinical data. Malignant tumors were staged according to the TNM classification [5].

Results

Epidemiologically, over a five-year period, 89,296 patients were admitted. Of these patients, 426 had an osteochondral tumor (Figure 1, 2 and 3), corresponding to a prevalence of 6.2 per 10,000 patients. The medical records of 203 patients, representing 47.7%, were complete and usable.

The average age of patients was 35.3 ± 20 (range: 2 to 82 years), including 33% aged 0–20 years. Males were in the majority (59.1%). The time taken to receive treatment at a specialist center was as follows: less than 3 months (12.8%); between 3 and 6 months (18.2%); more than 6 months (70%).

Clinically, pain was the reason for consultation in 90.6% (184 cases) and was associated with a palpable mass in 90.1% (183 cases), ulceration in 4.3% (10 cases), and complete loss of function in 59 cases (29.1%). Pathological fracture was the circumstance in which the tumor was the revealing circumstance in 3.9% (8 cases). The general condition was considered good (73.4%), fair (8.7%), and poor (7.9%). The location in the pelvic limb represented 166 cases (81.3%), with a preference to the knee in 43 cases (21.2%).

Radiologically, the appearance was mixed in 36.5% (74 cases), osteolytic in 35% (71 cases), osteocondensation in

24.6% (50 cases), and normal in 3.9% (8 cases). Laboratory findings included anemia (42.8%), elevated C-reactive protein (43.5%), and abnormal lipid profile (24.1%).

Surgical biopsy was performed in all our patients. The pathological examination revealed (table **1**): there were 154 malignant tumors, including 140 primary cases (70%) and 14 secondary cases (7%). Stage IV according to the TNM classification accounted for 26.1% of cases. Secondary locations were: pulmonary in 54 cases (26.6%), abdominopelvic in 31 cases (15.3%), spinal in 6 cases (3%), and cranioencephalic in 2 cases (1%).

Surgical treatment was the most common, accounting for 61.6% (125 cases). In the case of malignant tumors, 33% (67 cases) involved excision and curage, and 28.6% (58 cases) involved amputation. Surgery was combined with chemotherapy in 106 cases (52.2%) and/or radiotherapy in 7 cases (3.4%).

The outcome was favorable in 59.1% of cases. The following complications were noted: persistent pain in 5 cases (2.5%), infection in 7 cases (3.4%), recurrence in 20 cases (9.8%), and death in 26 cases (12.8%). Recurrence and death were related to malignant tumors in 16 cases (7.9%) and 19 cases (9.3%), respectively.

Figures

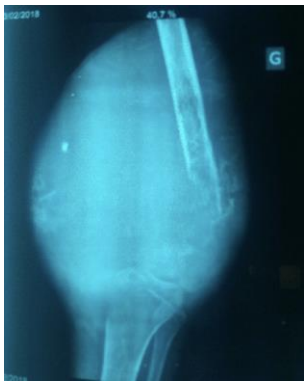

Figure 1: Distal femur Osteosarcoma

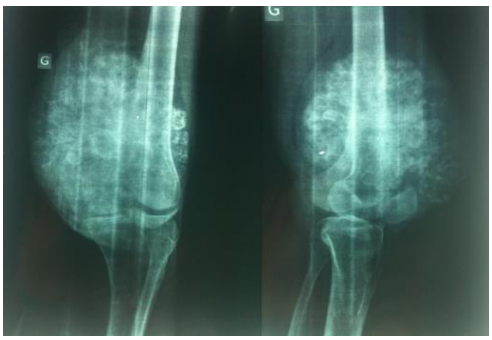

Figure 2: Distal femur chondrosarcoma

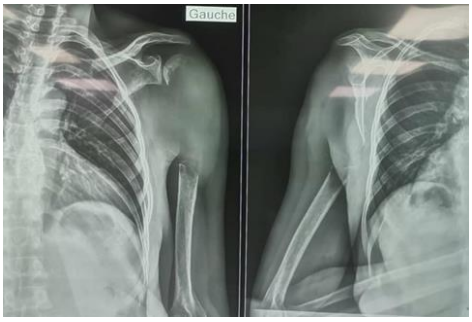

Figure 3: lytic tumors of the proximal humerus

Table 1: Distribution by histological type

Histological type	Number	%
Osteosarcoma	51	25.1
Undetermined	30	14.8
Fibrosarcoma	25	12.3
Osteoid osteoma	13	6.4
Ewing's sarcoma	13	6.4
Rhabdomyosarcoma	12	5.9
Clark and Mihm IV melanoma	9	4.4
Adenocarcinoma	5	2.5
Squamous cell carcinoma	5	2.5
Chondroma	5	2.5
Aneurysmal cyst	5	2.5
Chondrosarcoma	4	2.0
Chordoma	4	2.0
Fibroma	2	1.0
Essential cyst	2	1.0
Leiomyosarcoma	2	1.0
Liposarcoma	2	1.0
Osteochondroma	2	1.0
Kaposi's sarcoma	2	1.0
Synovial sarcoma	2	1.0
Adamanthinoma	1	.5
Granuloma	1	.5
Hodgkin's lymphoma	1	.5
Myeloma	1	.5
Neurofibroma	1	.5
Osteoblastoma	1	.5
Schwannoma	1	.5
Syringocystadenocarcinoma	1	.5
Total	203	100

Discussion

This five-year multicenter study provided data on epidemiology, the nature of limb tumors, and patient outcomes after treatment. Several limitations were encountered. Being retrospective, the study suffered from incomplete or missing data. This significantly reduced the sample size, making it difficult to interpret the statistical tests.

Frequency: The prevalence of osteochondral tumors was 0.06% remains low in our context, as confirmed by the work of Lamah L. (0.9%)[6] and Barry A et al (1.3 cases per year) [7]. In the United States and Europe, the incidence is higher [8,9]. These differences could be due to the limited access to specialized care, with many patients initially consulting traditional healers.

Gender: In our series, osteochondral tumors were more common in men (59.1%: sex ratio=1.4). This result is in accordance with the literature [7,10]. Several hypotheses could explain this trend: the role of androgens in bone growth and environmental or occupational factors exposing patients to tumor risks [7,10].

Age: The mean age of patients was 35.3 ± 20 (range: 2 to 82 years). Patients aged 21-60 years represented 53.2% of cases and those under 20 years represented 33.0%. Our results are comparable to some authors who found a prevalence of 58% for the 20-60 age group [7,11]. These age groups are characterized by a predominance of malignant tumors such as osteosarcoma (Figure 1) and Ewing's sarcoma, as well as some benign tumors such as osteoid osteoma. In contrast, the incidence decreases significantly beyond the age of 60, where osteochondral tumors are mainly bone metastases.

Diagnostic aspects: the clinical manifestations of osteochondral tumors are polymorphic. In this series, they were dominated by the presence of a mass in 90.1% (183 cases), pain in 90.6% (184 cases), and signs of severity such as ulceration in 4.3% (10 cases). The variability in symptoms observed could be explained by delayed consultation, as pointed out by some authors [7]. In fact, in 49.8% (101 cases), patients presented themselves without prior medical referral. This mode of admission reflects difficulties in accessing care or gaps in the referral system.

The location of these osteochondral tumors was the pelvic limb in 166 cases (81.3%). This preferential location has been confirmed by many authors [10,12,13]. They are probably related to high mechanical stress and the presence of areas of active growth in young patients, who are more likely to develop tumors.

Primary malignant tumors predominate, accounting for 69.0% of cases. The most common are osteosarcoma (25.1%), fibrosarcoma (12.3%), Ewing's sarcoma (6.4%), and rhabdomyosarcoma (5.9%). The age of our predominantly young patients is related to this histological type [10].

Treatment strategies vary depending on the type of tumor. For benign tumors, surgical removal is the main treatment method. In the case of malignant tumors, treatment consisted of removal followed by curage in 33% of cases (67 cases) or amputation in 28.6% of cases (58 cases). This high rate of amputation is due to patients being admitted at an advanced stage of the disease, significantly reducing their chances of recovery. Surgery was combined with chemotherapy in 106 cases (52.2%) and/or radiotherapy in 7 cases (3.4%). Chemotherapy is the mainstay of treatment; when combined with polychemotherapy, the cure rate for osteosarcoma increases from 20% to 50% [14].

Prognostic factors depend on the stage of the tumor, its nature, the patient's general condition, and the quality of care. Overall, the majority of patients (59.1%) had a favorable outcome. However, 25.1% developed complications highlighting the severity of osteochondral tumors. Primary malignant tumors had an unfavorable outcome in 23.1% of cases. The most common complications were death (12.8%) and recurrence (9.8%). The majority of deaths occurred in the first few months after diagnosis, especially for malignant tumors.

Conclusion

Osteochondral tumors of the limbs remain rare, with a prevalence of 0.06% in our series. Late presentation, often after more than twelve months of symptoms, complicates management and worsens outcomes. Surgery remains the mainstay of treatment, often combined with chemotherapy or radiotherapy. Despite limited resources, 59.1% of patients achieved favorable outcomes. Efforts should focus on early diagnosis, multidisciplinary care, and strengthening technical facilities

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