



Comprehensive analysis of cervico-maxillofacial tumors: Epidemiological, histopathological, therapeutic, and outcome data from the University Clinics of Lubumbashi

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Abstract

Tumor pathology, although under-reported, is increasingly frequent in our context due to several factors and presents a public health problem. We also note the strengthening of health provision even if this remains insufficient. The objective of this study was to study the epidemiological and pathological profile as well as the management and evolution of cervico-maxillo-facial tumors. This is a cross-sectional descriptive study covering 38 cases of cervicomaxillo-facial tumors collected at University Clinics of Lubumbashi (UCL) from January 1, 2020 to December 31, 2022. On the epidemiological level we noted an annual average of 12.67 cases of cervico-maxillo-facial tumors. Our sample included 63.16% of male cases and 36.84% of female cases with a sex ratio of 1.53, or 153 men per 100 women. The age group of 31 to 43 was the most represented with 31.58%. Swelling was the most common cause at 100% and the location of the tumors was cervical in 65.79% of cases. Ultrasound was the most requested paraclinical examination at 78.95%. Malignant tumors were more frequent at 26.32% of cases with a predominance of liposarcoma at 25% of cases. The low socio-economic level, ignorance, recourse to a traditional practitioner, delay in consultation at advanced stages and limited therapeutic means constitute a handicap to care in our African context.

Keywords: Global approach, Tumors, cervical, maxillary, facial, epidemiology, pathology, management, evolution, CUL, Lubumbashi

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1. Introduction

Cervico-maxillo-facial tumors constitute a heterogeneous group of pathologies affecting the anatomical

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structures of the neck, face, and oral cavity. They represent a major public health challenge due to their increasing frequency, their functional and esthetic impact, and the complexity of their management ([Amana et al., 2016](#); [Nestor et al., 2020](#)). Cervico-maxillo-facial tumors represent a pathology with multiple implications, both diagnostically and therapeutically. In the context of the Democratic Republic of Congo, their management often faces several challenges: delayed diagnosis, insufficient technical and human resources, limited access to pathology, and irregular post-therapeutic follow-up ([Nestor et al., 2020](#)). At the University Clinics of Lubumbashi (UCL), a reference structure, the diversity of cases received provides an ideal framework for evaluating epidemiological and clinical characteristics, histological results, therapeutic strategies implemented, as well as patient outcomes. Despite the potential severity of these conditions and the diversity of cases managed at the University Clinics of Lubumbashi, there is little local data to better understand their actual frequency, clinical presentation, histological nature, as well as therapeutic outcomes. The objective of this work is to establish a comprehensive approach to cervico-maxillo-facial tumors in the CCMF department of the CUL.

2. Methods

We conducted a retrospective cross-sectional descriptive study of cervico-maxillofacial tumors diagnosed in the Department of Cervico-Maxillofacial Surgery (CCMF) at the University Clinics of Lubumbashi (UCL) from January 2020 to December 2022, a period of three years. Data were collected from patient records and the histological examination results register, analyzed by the CUL Pathology Laboratory. Patients presenting with a cervico-maxillofacial tumor seen in the CCMF department, whose diagnosis was established clinically and/or based on histopathological examination, were included. Data were entered and analyzed using Epi-Info 7.2.2.6 software; comparisons of the studied characteristics were performed using chi-square tests or the Relative Risk (RR). Decisions were made with a 5% risk level.

3. Results

During the study period, we collected 38 cases of cervico-maxillofacial tumors out of 3,237 patients who consulted the surgical department of the University Clinics of Lubumbashi (UCL), representing a hospital incidence of 1.17%. The average incidence was 12.7 cases per year. Males were affected in 24 cases (63.16%) and females in 14 cases (36.84%), for a male-to-female ratio of 1.53. The average age of the patients was 45 years, with a range from 10 to 76 years. The 31-43 age group was the most represented. Table 1 illustrates the distribution of patients with cervico-maxillofacial tumors according to sex and age.

Table 1: Distribution of patients by sex and age		
General Characteristics of Patient	Number n = 38	Percentage
Sex		
Male	24	63.16%
Female	14	36.84%
Age		
4-13	1	2.63%
14-30	7	18.42%
31-43	12	31.58%
44-56	9	23.68%
57-69	7	18.42%
70-76	2	5.26%

In 21.05% of cases, most of our patients had a history of dental caries, and alcoholism was investigated in four of them. All our patients presented with a swelling. Cervical cancer was the most frequently observed

type, representing 65.79% of cases. Lipomas were clinically diagnosed in 39.47% of cases of cervico-maxillofacial tumors (Table 2).

Table 2: Distribution of patients according to clinical presentation		
	Number n =38	Percentage
Medical history		
Alcohol	4	10.53%
Tooth decay	8	21.05%
Diabetes	3	7.89%
HTA	1	2.63%
Tobacco	1	2.63%
Reason for consultation		
Swelling	38	100.00%
Pain	13	34.21%
Lymphadenopathy	7	18.42%
Tumor site		
Cervical	25	65.79%
Cervicofacial	2	5.26%
Mandible	6	15.79%
Maxillary	5	13.16%
Clinical diagnosis of tumors		
Adenocarcinoma	1	2.63%
Ameloblastoma	1	2.63%
Angiosarcoma	1	2.63%
Chondroblastoma	1	2.63%
Goitre	11	28.95%
Hemangioma	1	2.63%
Lipoma	15	39.47%
Liposarcoma	3	7.89%
Hodgkin lymphoma	1	2.63%
Non-Hodgkin's lymphoma	1	2.63%
Osteosarcoma	1	2.63%
Rhabdomyosarcoma	1	2.63%

Ultrasound was the most frequently requested imaging modality, used in 78.95% of cases (Table 3). Tumors confirmed by pathology examination accounted for 12 cases (31.58%), of which 26.32% were malignant (Table 4).

Table 3: Distribution of patients according to imaging

Type of imaging	Number n = 38	Percentage
Ultrasound	30	78.95
CT scan	9	23.68
Dental panoramic	1	2.63
Cervical X-ray	6	15.79
Radio face/profile	6	15.79

Table 4: Distribution of patients according to the pathology report and histological type of tumors

	Number n = 38	Percentage
Anatomopathological examination		
Not done	26	68.42
Accomplished	12	31.58
Tumor type according to the pathology report		
Benign tumor	2	5.26
Malignant tumor	10	26.32
Anapath not performed	26	68.42
Histological type		
Adenocarcinoma	1	8.33
Ameloblastoma	1	8.33
Angiosarcoma	1	8.33
Chondroblastoma	1	8.33
Hemangioma	1	8.33
Liposarcoma	3	25.00
Hodgkin lymphoma	1	8.33
Non-Hodgkin's lymphoma	1	8.33
Osteosarcoma	1	8.33
Rhabdomyosarcoma	1	8.33

Surgery was the most common primary treatment, performed in 60.53% of cases among patients with cervico-maxillofacial tumors. The outcome was marked by 2 deaths (5.26%) and 25 cases lost to follow-up (65.79%) (Table 5). We observed a predominance of cervical location in benign tumors in both sexes, with an equal prevalence, although this association was not statistically significant ($\chi^2 = 4.74$; $df = 3$; $p = 0.19$). Furthermore, a predominance of cervical location in malignant tumors in men was noted, again without a statistically significant association ($\chi^2 = 0.9$; $df = 3$; $p = 0.84$) (Table 6).

Table 5: Distribution of patients according to treatment and tumor progression

	Effective	Percentage
Support		
Chemotherapy	10	26.32
primary surgery	23	60.53
Medical-surgical	5	13.16
Evolution		
Death	2	5.26
Lost from sight	25	65.79
Exit on request	11	28.95

Table 6: Distribution of patients according to tumor location and sex

	Female	Male	Total
Site of benign tumors			
Cervical	10	10	20
Cervicofacial	1	0	1
Mandible	2	2	4
Maxillary	0	4	4
Site of malignant tumors			
Cervical	1	4	5
Cervicofacial	0	1	1
Mandible	0	2	2
Maxillary	0	1	1

4. Discussion

The average frequency in our study was 40 cases per year. This number may be an underestimate, given that some patients do not reach the hospital because they are deliberately referred to the traditional healer. Furthermore, a large number of clinically suspected cases could not be validated ([Amana *et al.*, 2016](#)). The prevalence of CMF tumors reported in studies is generally associated with the presence of risk factors such as alcoholism and smoking, which are generally more prevalent in men ([Amana *et al.*, 2016](#)). Currently, we are observing a feminization of these risk factors in our countries, and the incidence of CMF tumors is decreasing in men while increasing in women ([Amana *et al.*, 2016](#); [Nestor *et al.*, 2020](#)). This could explain the rather low sex ratio in our sample. The reason for the rather young average age in most cases, including ours, could first be linked to the increase in alcohol and tobacco use among young people. Secondly, it could also be explained by a relatively low life expectancy in sub-Saharan Africa ([Amana *et al.*, 2016](#)). The literature recognizes the role of poor oral hygiene in the development of oropharyngeal cancers ([Amana *et al.*, 2016](#); [Alexandre *et al.*, 2009](#)). Indeed, according to the work of Scully and Porter ([2001](#)), tobacco represents the main risk factor: 75% of people diagnosed with oral cavity cancer are smokers ([Scully and Porter, 2001](#)). Alcohol is also a risk factor, and the combination of tobacco and alcohol considerably amplifies this risk ([Scully and Porter, 2001](#)). According to Morse *et al.* ([2007](#)), smoking is associated with both the development of cancer and oral mucosal dysplasia.

However, the link between alcohol consumption and the development of cancer is much stronger than that with dysplasia. The cervical region was the most represented, accounting for 65.79% of cases, followed by the mandibular region at 15.79%. Several authors have reported the predominance of mandibular cancer (Bayala, 2012; Jebblaoui *et al.*, 2007; Sriram and Shetty, 2008). However, Ouedraogo in Burkina Faso and N'Diaye F. in Senegal found a predominance of maxillary tumor location in 66% and 51% of cases, respectively (Ouedraogo *et al.*, 2006; N'diaye Faty *et al.*, 1995). The involvement of the maxilla and mandible in numerous studies could be due to the complexity of facial structures, which include various tissues, such as epithelia, connective tissues, and cavities (Bayala, 2012). Demoutiery Justin Sanou, in his 2014 study, found 61% of cases to be benign tumors, which differs from our study (Demoutiery, 2014). Diombana *et al.* found in their studies 29.6% carcinomas and 18.5% Burkitt lymphoma (Diombana *et al.*, 1998). The rate of carcinomas appears to be higher in some literature (Amana *et al.*, 2016; Bayala, 2012; Magne Tamga Denise Diane, 2007). Ultrasound was the most frequently requested examination, accounting for 78.95% of cases among patients with cervico-maxillofacial tumors. Our result differs from that of Bayala Jean-Baptiste, who found that only 47.37% of patients underwent a radiological examination (Bayala, 2012). Geographic inaccessibility and the prohibitive cost of radiological examinations, particularly CT scans, MRIs, and scintigraphy, would explain not only the rarity of these paraclinical examinations but also the fact that some of them are not requested. The low socioeconomic status of the Lubumbashi population is also noteworthy. Surgery was the most common primary treatment, performed in 60.53% of cases among patients with cervico-maxillofacial tumors. Our study aligns with that of Millogo *et al.* (2019), who found that surgery was performed in 31.5% of cases (Millogo *et al.*, 2019). According to Kpemissi *et al.* (2009), partial resection constituted 69.23% of the cases in their series of 91 mandibular tumors. Diombana and Tonde respectively reported rates of 64.71% of cases in a series of 51 facial bone tumors involving the maxillary sinus and 30.3% of cases in a series of 89 malignant tumors of the jaws in adults (Diombana *et al.*, 1998; Tonde Lucien, 2008). Chemotherapy can be considered before surgery; this is called neoadjuvant chemotherapy. The goal of this chemotherapy is to reduce the size of the tumor to make surgery easier. It also aims to reduce the likelihood of cancer recurrence. 65.79% of our patients were lost to follow-up. As for Bayala (2012), it lost 12.6% of patients to follow-up. The high rate of patients lost to follow-up compared to other therapeutic interventions may be due to the frequent use of traditional healers and the socio-economic problems encountered.

5. Conclusion

In Lubumbashi, Medullary Craniosacral Tumors (MCTs) are quite common and a public health concern. Although men are most frequently affected, a significant number of women are also impacted. Patients' medical histories often revealed dental caries, while the most commonly affected areas include the neck, the cervicofacial region, and the mandible. Liposarcoma accounts for the majority of histological cases, followed by adenocarcinoma and non-Hodgkin lymphoma.

Data sharing statement

This study presents results derived from data collected and analyzed using the detailed techniques and equipment. All generated data are included in the manuscript. The raw dataset supporting these conclusions can be obtained by contacting the corresponding author (Bienvenu KONGOLO).

Ethical approval

This work is part of an ongoing study on the management of cervico-maxillofacial tumors at the University Clinics of Lubumbashi. The study received approval from the ethics committee of the University of Lubumbashi (Democratic Republic of the Congo) and the archives department. Principles of confidentiality and discretion were scrupulously observed, and all data were analyzed in strict adherence to participant anonymity. Although our research did not constitute a clinical trial, it was conducted in accordance with the principles of the Declaration of Helsinki. This compliance is evidenced by the formal approval of the study protocol by the University of Lubumbashi ethics committee, thereby ensuring that the research met rigorous ethical standards regarding participant well-being and data integrity.

Consent to participate

Data for this retrospective study were obtained from hospital medical records and surgical department registries.

The analysis was conducted in strict compliance with anonymity requirements, and the results were used exclusively for scientific purposes and for the improvement of patient care. Given the retrospective nature of the study, the ethics committee waived the requirement for researchers to obtain informed consent.

Author contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; agreed on the journal to which the article has been submitted; and agreed to be accountable for all aspects of the work.

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Conflicts of interest

The authors declare that they have no conflicts of interests in this work.

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